

R&S® EDST300 TACAN/DME STATION TESTER

Specifications



Data Sheet
Version 03.00

ROHDE & SCHWARZ

Make ideas real



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Definitions

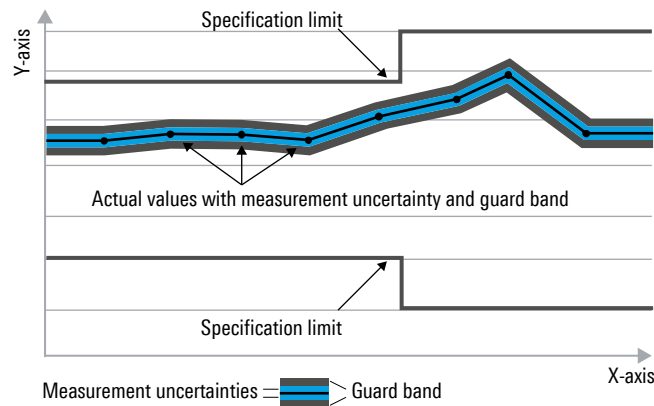
General

Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes 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 $<$, \leq , $>$, \geq , \pm , 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.

Specifications

Standards

| | | |
|--------------------|--|------------------------------|
| Military standards | | STANAG 5034, MIL-STD-291C |
| Civil standards | | ICAO Annex 10, ICAO Doc 8071 |

Frequency

| | | |
|----------------------|--|---------------------|
| Frequency range | | 960 MHz to 1215 MHz |
| Frequency resolution | | 0.1 MHz |

| Reference frequency, internal | | |
|------------------------------------------|-----------------|---------------------------------------------------------------------------------------|
| Accuracy | | ±(time since last adjustment × aging rate + temperature drift + calibration accuracy) |
| Aging per year | | ≤ 1 ppm |
| Temperature drift | +5 °C to +40 °C | ≤ 1 ppm |
| Achievable internal calibration accuracy | | ≤ 1 ppm |

| RF frequency measurement | | |
|---------------------------------------|-----------------------------------------------|--------------|
| Offset from nominal channel frequency | | |
| Resolution | | 0.1 kHz |
| Accuracy | -60 dBm to +30 dBm, measurement time ≥ 200 ms | 1 ppm (nom.) |

TX power measurement (R&S® EDST300 analyzer)

| Maximum input level | | |
|---------------------|----|---------|
| DC voltage | DC | +25 V |
| RF pulse power | | +36 dBm |

| Power measurement | | |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Units | | dBm and W |
| Display range | | -120 dBm to +30 dBm |
| Measurement range, peak detector | autorange mode | |
| | RF input 1 | -80 dBm to +30 dBm |
| | RF input 2 | -100 dBm to +10 dBm |
| Measurement range, average detector | autorange mode | |
| | RF input 1 | -95 dBm to +30 dBm |
| | RF input 2 | -110 dBm to +10 dBm |
| Level resolution | | 0.01 dB |
| Peak level deviation | standard TACAN signal in line with MIL-STD-291C or standard DME signal in line with ICAO Annex 10, RF input 1, level range: 15 dBm to 25 dBm, 95 % confidence level, +20 °C to +30 °C | 0.3 dB |
| Additional linearity error | 10 dBm to -70 dBm, normal mode | < 0.5 dB |
| Internally generated spurious signals | RF input 2, low noise mode | < -95 dBm |

| Total measurement uncertainty | | |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Peak level deviation | standard TACAN signal in line with MIL-STD-291C or standard DME signal in line with ICAO Annex 10, RF input 1 or 2, level range: -80 dBm to +30 dBm, 95 % confidence level, +20 °C to +30 °C | < 1 dB (nom.) |

| Intermodulation | | |
|-----------------------------------|---------------------------------|----------------|
| 1 dB compression point | RF input 1, low distortion mode | +33 dBm (nom.) |
| | RF input 2, low distortion mode | +10 dBm (nom.) |
| Third order intercept point (TOI) | RF input 1, low distortion mode | +50 dBm (typ.) |
| | RF input 2, normal mode | +20 dBm (typ.) |

TACAN modulation analysis (R&S®EDST-K1 option)

| | | |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Input level range | RF input 1 | -80 dBm to +30 dBm |
| | RF input 2 | -92 dBm to +10 dBm |
| Modulation depth | 5 % to 50 % | |
| Resolution | | 0.01 % |
| Deviation | 15 Hz/135 Hz ± 5 % ¹ | < 0.5 % |
| AF | | |
| Resolution | | 0.01 Hz |
| Deviation | 15 Hz/135 Hz ± 5 % ¹ | < 0.1 Hz |
| Bearing | | |
| Resolution | | 0.01° |
| Deviation | -70 dBm to +30 dBm, RF input 1, standard TACAN signal in line with STANAG 5034, modulation depth of 15 Hz and 135 Hz signals = 21 %, measurement time ≥ 1 s | < 0.2° |
| Additional bearing error | -70 dBm to +30 dBm, RF input 1, standard TACAN signal in line with STANAG 5034, modulation depth of 15 Hz and 135 Hz signals = 7 % to 30 %, measurement time ≥ 1 s | < 0.1° |
| Deviation | -90 dBm to -70 dBm, RF input 2, standard TACAN signal in line with STANAG 5034, modulation depth of 15 Hz and 135 Hz signals = 21 %, measurement time ≥ 1 s | < 0.5° |
| Bearing acquisition time | | < 3 s |
| Phase angle 15 Hz/135 Hz | | |
| Resolution | | 0.01° |
| Deviation | standard TACAN signal in line with STANAG 5034, modulation depth of 15 Hz and 135 Hz signals = 20 %, measurement time ≥ 500 ms | < 0.5° (nom.) |
| MRB pulse count | range X | 8 to 14 double pulses/MRB |
| | range Y | 8 to 15 single pulses/MRB |
| MRB pulse spacing | range X/Y | 28 µs to 32 µs |
| ARB pulse count | range X | 4 to 8 double pulses/ARB |
| | range Y | 8 to 15 single pulses/ARB |
| ARB pulse spacing | range X | 22 µs to 26 µs |
| | range Y | 13 µs to 17 µs |
| Pulse spacing | | |
| Resolution | | 0.001 µs |
| Deviation | | < 0.05 µs |
| Pulse repetition rate | | 1/s to 8000/s |
| Identifier analysis | | |
| ID code | morse code | 2 to 4 characters |
| ID pulse repetition rate | | 1325 Hz to 1375 Hz |
| Equalizer pulse delay | range | 80 µs to 120 µs (nom.) |
| Uncertainty of ID timing measurements | | < 2 ms (nom.) |
| Dot length | range | 80 ms to 170 ms. (nom.) |
| Dash length | range | 240 ms to 510 ms (nom.) |
| ID period | range | 10 s to 50 s (nom.) |

¹ Maximum frequency drift of modulation signal.

Pulse shape analysis (time domain, R&S®EDST-K2 option)

| | | |
|-------------------------------|------------------|-----------------------------------------------------------------|
| Resolution bandwidth | selectable | 0.5 MHz, 10 MHz (nom.) |
| Display range | | displayed noise floor up to +30 dBm |
| Time/division | | 0.5/1/2/5/10/20/50 μ s, selectable |
| Reference level | | -70 dBm to +30 dBm |
| Trace functions | | clear/write, average, max. hold |
| Trigger | | |
| Trigger source | | level/external/DME pulse/interrogator MRB/ARB trigger source |
| Trigger delay | | -500 μ s to +8000 μ s |
| Pulse shape analysis | pulse 1, pulse 2 | rise time, duration, decay time |
| Resolution | | 0.01 μ s |
| Deviation | | < 0.05 μ s (nom.) |
| Pulse spacing | | |
| Resolution | | 0.001 μ s |
| Deviation | | < 0.05 μ s |
| Additional measurement values | | peak variation |

Transponder delay/distance measurement ²

| | | |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Modes | | search, track, memory |
| Input level range | RF input 1 | -80 dBm to +30 dBm (nom.) |
| | RF input 2 | -100 dBm to +10 dBm (nom.) |
| Delay/distance measurement | | |
| Delay/distance range | | 20 ns to 4 ms (nom.), 0 NM to 400 NM (nom.) |
| Resolution | | 0.01 μ s, 0.001 km, 0.001 NM |
| Deviation | -70 dBm to +30 dBm, RF input 1, measurement time \geq 200 ms, PRR \geq 100/s, 95 % confidence level | \leq 50 ns, \leq 7.5 m (nom.), \leq 0.005 NM (nom.) |
| | -80 dBm to +10 dBm, RF input 2, measurement time \geq 200 ms, PRR \geq 100/s, 95 % confidence level | \leq 50 ns, \leq 7.5 m (nom.), \leq 0.005 NM (nom.) |
| | -90 dBm to -80 dBm, RF input 2, reply efficiency > 70 %, measurement time \geq 500 ms 95 % confidence level | \leq 500 ns, \leq 75 m (nom.), \leq 0.05 NM (nom.) |
| | -95 dBm to -90 dBm, RF input 2, measurement time \geq 500 ms 95 % confidence level | 500 ns, (nom.), 75 m (nom.), 0.05 NM (nom.) |
| Lock-on time | reply efficiency > 70 %, search mode pulse rate 150/s | < 3 s |
| Reply efficiency | range | 0 % to 100 % |

² Requirement: interrogator (R&S®EDST-B2).

RX measurement (R&S®EDST300 generator, R&S®EDST-B2 option)

| | | |
|----------------------------------------------------|-----------------------------------|------------------------------------|
| Frequency range | | 960 MHz to 1215 MHz |
| Frequency step size | | 100 kHz |
| Channels | | 1X to 126X, 1Y to 126Y |
| Output power | | -80 dBm to +30 dBm |
| Output power step size | | 0.1 dB |
| Level uncertainty | +20 °C to +30 °C | < 1 dB, 0.5 dB (typ.) |
| Interrogation loading/reply capability test | | |
| Pulse rate | default mode | 5 Hz to 6000 Hz in 1 Hz steps |
| | ICAO compliant mode, search/track | 5 Hz to 150 Hz/30 Hz in 1 Hz steps |
| Decoder rejection test | | |
| Pulse spacing | X mode | 12 µs (default) |
| | Y mode | 36 µs (default) |
| Setting range | X/Y mode | 8 µs to 42 µs in 0.1 µs steps |
| Deviation | | 0.05 µs |
| Pulse duration | 50 % points, default | 3.5 µs ± 0.2 µs |
| | setting range, 50 % points | 1 µs to 4.5 µs in 0.1 µs steps |
| Pulse rise time | 10 % to 90 % | 2.0 µs ± 0.25 µs |
| Pulse decay time | 90 % to 10 % | 2.5 µs ± 0.3 µs |
| Peak variation | coded pulse pair on 50 Ω load | < 0.5 dB |
| Pulse counter | | |
| Frequency range | | 2 Hz to 1 MHz |
| Resolution | | 1 Hz |
| Uncertainty | | < 1 Hz (nom.) |
| Time resolution | | 50 ns |

Inputs and outputs (front)

| | | |
|----------------|-------------------------------------------------------------------|----------------------------|
| RF 1 IN/OUT | RF input/output | N connector, 50 Ω |
| VSWR | | < 2.0 |
| RF 2 IN | RF input | N connector, 50 Ω |
| AF OUT | headphone | 3.5 mm female connector |
| Antenna supply | | 12 V ± 0.5 V (nom.) |
| USB | USB flash drive for data logging, R&S®EDST-K1 and software update | USB 2.0 double A connector |

Inputs and outputs (rear)

| | | |
|--------------------------|-------------------------------------------------------------------|---------------------------------------------------|
| Analog OUT | analog output | BNC connector, 50 Ω (nom.) |
| Analog IN | analog input | BNC connector, 50 Ω (nom.) |
| Trigger OUT | trigger output | BNC connector, 40 Ω (nom.) |
| Trigger IN | trigger/counter input | BNC connector, 100 kΩ (nom.) |
| Sync OUT 1 (R&S®EDST-B6) | trigger output (MRB) | BNC connector, 40 Ω (nom.) |
| Sync OUT 2 (R&S®EDST-B6) | trigger output (ARB) | BNC connector, 40 Ω (nom.) |
| Suppress IN/OUT | input/output for suppressor line | BNC connector, 30 kΩ in (nom.), 0.5 kΩ out (nom.) |
| Ref 10 MHz IN/OUT | | BNC connector, 50 Ω (nom.) |
| LAN | LAN interface | RJ-45, 100BASE-T |
| RS-232 | | RS-232, 9-pin D-Sub connector |
| USB | USB flash drive for data logging, R&S®EDST-K1 and software update | USB 2.0 double A connector |
| External monitor | | DVI-D |

DME test antenna (R&S®EDST-Z1 option)

| | | |
|---------------------|--------------------|---------------------------------------------------------------------|
| Frequency range | | 960 MHz to 1215 MHz |
| Polarisation | | vertical |
| Impedance | | 50 Ω (nom.) |
| Gain | | 11 dBi (nom.) |
| Front-to-rear ratio | | > 26 dB (nom.) |
| Pulse power | | max. 1000 W |
| VSWR | | 1:2 (typ.) |
| Connector | | type N female |
| Dimensions | W x H x D | approx. 429 mm x 350 mm x 243 mm (16.89 in x 13.78 in x 9.57 in) |
| Weight | | 1.6 kg (3.53 lb) |
| Temperature range | | -30 °C to +50 °C |
| Mounting | fixed installation | clamps included for mast mounting |
| | portable use | 5/8" screw for prism pole or tripod |

General data

| Environmental conditions | | |
|---------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Temperature | without built-in R&S®EDST-B3 battery | |
| | operating temperature range | +5 °C to +40 °C |
| | permissible temperature range | 0 °C to +50 °C |
| | storage temperature range | -25 °C to +70 °C |
| | with built-in R&S®EVSG-B3 battery | |
| | operating temperature range | +5 °C to +40 °C |
| | permissible temperature range | |
| | charge | 0 °C to +45 °C |
| | discharge | 0 °C to +50 °C |
| Damp heat | storage temperature range | |
| | | -20 °C to +60 °C |
| Altitude | +25 °C/+40 °C, 95 % rel. humidity, cyclic, in line with EN 60068-2-30 | |
| | operating | 4600 m (without external power supply) |
| | transport | 10000 m (without external power supply) |
| Mechanical resistance | | |
| Vibration | sinusoidal | 5 Hz to 55 Hz, 0.15 mm amplitude const., 55 Hz to 150 Hz, 0.5 g const., in line with EN 60068-2-6 |
| | random | 10 Hz to 300 Hz, acceleration 1.2 g RMS, in line with EN 60068-2-64 |
| Shock | | 40 g shock spectrum, in line with MIL-STD-810E, method 516.4, procedure I |
| Power supply | | |
| Rated voltage | base unit | 20 V to 28 V DC |
| | base unit with internal battery | 24 V (±5 %) |
| | external power supply | 100 V to 240 V AC (±10 %) |
| Rated frequency | external power supply | 50 Hz to 60 Hz (±5 %) |
| Rated current | | 5.0 A DC (max.) |
| | external power supply | 1.4 A |
| Battery | R&S®EDST-B3 option | lithium-ion |
| Operating time | new, fully charged battery | > 2.5 h |
| Charging time | instrument in standby mode | 3.5 h (nom.) |
| | instrument switched on | 6.5 h (nom.) |
| Product conformity | | |
| Electromagnetic compatibility | EU: in line with EMC Directive 2014/30/EU | applied harmonized standards: IEC/EN 61326-1, IEC/EN 61326-2-1, EN 55022 (class B) |
| Electrical safety | EU: in line with Low Voltage Directive 2014/35/EU | in line with IEC 61010-1, EN 61010-1, UL 61010-1, CAN/CSA-C22.2 No. 61010-1 |
| Test mark | | VDE, cCSA _{US} |
| Calibration interval | recommended for highest accuracy | 12 months |
| | for general test and measurement applications | 24 months |
| Display | | 6.5" TFT color display |
| Antireflection | | interference optical coated glass |
| Resolution | | 800 × 600 pixel |
| Pixel failure rate | | < 1.1 × 10 ⁻⁵ |
| Dimensions | W × H × D | 342 mm × 157 mm × 266 mm (13.46 in × 6.18 in × 10.47 in) (3/4 19", 3 HU) |
| Weight | with battery, external power supply not included | 7.2 kg (15.9 lb) |

Ordering information

| Designation | Type | Order No. |
|-------------------------------------|--------------|--------------|
| Base unit | | |
| TACAN/DME station tester | R&S®EDST300 | 5202.9009.02 |
| Hardware options | | |
| Interrogator | R&S®EDST-B2 | 5202.9509.02 |
| Internal battery | R&S®EDST-B3 | 5202.7187.02 |
| Additional interfaces | R&S®EDST-B6 | 5202.9167.02 |
| Software options | | |
| TACAN analysis | R&S®EDST-K1 | 5202.9515.02 |
| Pulse shape analysis | R&S®EDST-K2 | 5202.9521.02 |
| Accessories | | |
| DME test antenna | R&S®EDST-Z1 | 5202.9538.02 |
| Antenna mast (monopole) | R&S®EDST-Z8 | 1330.0295.02 |
| Verification test | R&S®EDST-Z10 | 5202.9544.02 |
| Rugged transport case | R&S®EDS-Z2 | 5202.8202.02 |
| Documentation of calibration values | R&S®DCV-2 | 0240.2193.10 |

| | | |
|-------------------------------------------------------------------|---------|--------------------------------------------------|
| Warranty | | |
| Base unit | | 3 years |
| All other items ³ | | 1 year |
| Service options | | |
| Extended warranty, one year | R&S®WE1 | Contact your local Rohde & Schwarz sales office. |
| Extended warranty, two years | R&S®WE2 | |
| Extended warranty with calibration coverage, one year | R&S®CW1 | |
| Extended warranty with calibration coverage, two years | R&S®CW2 | |
| Extended warranty with accredited calibration coverage, one year | R&S®AW1 | |
| Extended warranty with accredited calibration coverage, two years | R&S®AW2 | |

Extended warranty with a term of one and two years (WE1 and WE2)

Repairs carried out during the contract term are free of charge ⁴. Necessary calibration and adjustments carried out during repairs are also covered.

Extended warranty with calibration coverage (CW1 and CW2)

Enhance your extended warranty by adding calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated, inspected and maintained during the term of the contract. It includes all repairs ⁴ and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

³ For options that are installed, the remaining base unit warranty applies if longer than 1 year. Exception: all batteries have a 1 year warranty.

⁴ Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

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- ▶ Customized and flexible
- ▶ Uncompromising quality
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Rohde & Schwarz

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Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

Certified Quality Management
ISO 9001

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