

R&S® EDST300

TACAN/DME STATION TESTER

Specifications



Data Sheet
Version 03.00

ROHDE & SCHWARZ

Make ideas real



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Definitions

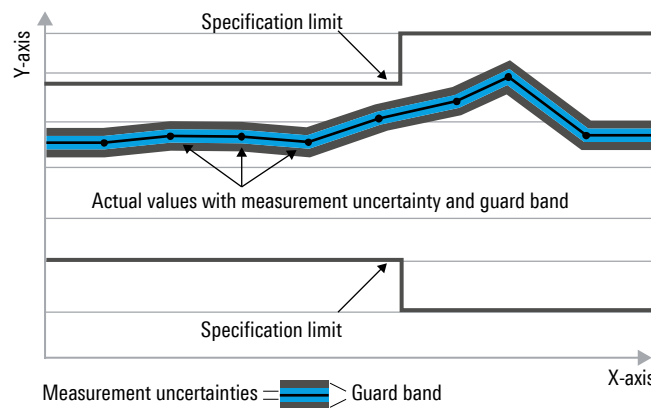
General

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 $\pm$ 5 % ¹	< 0.5 %
AF		
Resolution		0.01 Hz
Deviation	15 Hz/135 Hz $\pm$ 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 $\geq$ 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 $\geq$ 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 $\geq$ 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 $\geq$ 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 μ s to 32 μ s
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 μ s to 26 μ s
	range Y	13 μ s to 17 μ s
Pulse spacing		
Resolution		0.001 μ s
Deviation		< 0.05 μ s
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 μ s to 120 μ s (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 µs, 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 µs to +8000 µs
Pulse shape analysis	pulse 1, pulse 2	rise time, duration, decay time
Resolution		0.01 µs
Deviation		< 0.05 µs (nom.)
Pulse spacing		
Resolution		0.001 µs
Deviation		< 0.05 µs
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 µs, 0.001 km, 0.001 NM
Deviation	–70 dBm to +30 dBm, RF input 1, measurement time ≥ 200 ms, PRR ≥ 100/s, 95 % confidence level	≤ 50 ns, ≤ 7.5 m (nom.), ≤ 0.005 NM (nom.)
	–80 dBm to +10 dBm, RF input 2, measurement time ≥ 200 ms, PRR ≥ 100/s, 95 % confidence level	≤ 50 ns, ≤ 7.5 m (nom.), ≤ 0.005 NM (nom.)
	–90 dBm to –80 dBm, RF input 2, reply efficiency > 70 %, measurement time ≥ 500 ms 95 % confidence level	≤ 500 ns, ≤ 75 m (nom.), ≤ 0.05 NM (nom.)
	–95 dBm to –90 dBm, RF input 2, measurement time ≥ 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 × H × D	approx. 429 mm × 350 mm × 243 mm (16.89 in × 13.78 in × 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
	storage temperature range	–20 °C to +60 °C
Damp heat		+25 °C/+40 °C, 95 % rel. humidity, cyclic, in line with EN 60068-2-30
Altitude	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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