R&S®ETH
Handheld TV Analyzer
Portable DVB-T/H signal analysis up to 3.6/8 GHz

75 Years of Driving Innovation

R&S

ROHDE & SCHWARZ

R&S®ETH Handheld TV Analyzer
At a glance

The R&S®ETH handheld TV analyzer was specially designed for daily service and maintenance work on DVB-T/H gap-filler and low-power transmitters as well as nonvehicular coverage measurements. In addition, the universal capabilities of the R&S®ETH allow it to be used for repair and development of TV components.

The R&S®ETH handheld TV analyzer is a compact combination of a TV analyzer, spectrum analyzer and network analyzer. The functional diversity of the R&S®ETH makes it unnecessary to carry along other measuring equipment. Its frequency range extends up to 3.6 GHz or 8 GHz. The housing was specially designed for mobile use and is therefore rugged and splash-proof. Its large, daylight-friendly color display, low weight and replaceable lithium-ion battery enhance its portability. To improve its receive sensitivity and selectivity, the R&S®ETH can be equipped with internal preselection.

The core component of the R&S®ETH is an FPGA-based DVB-T/H demodulator that operates in realtime. It features maximum measuring performance and provides a demodulated MPEG-2 transport stream at the TS-ASI output. The readings are displayed on straightforward measurement screens and can be stored internally or on SD cards. The R&S®ETH View software that comes with the instrument allows measurement results to be displayed on a PC and makes it easy to transfer the data via the USB or LAN interface.

Main features
- Frequency range for DVB-T/H from 5 MHz to 3.6 GHz or 8 GHz
- Frequency range for spectrum analysis from 100 kHz to 3.6 GHz or 8 GHz
- TV, spectrum and network analyzer in a single box
- FPGA-based realtime DVB-T/H demodulator with TS-ASI output
- High measurement speed
- MER performance >40 dB
- Internal preselection (option)
- LAN and USB interface
- SCPI-compliant remote control
- Replaceable lithium-ion battery for two to four hours of operation
- 6.5" daylight-friendly color display
- Compact, rugged and splash-proof housing for portable outdoor use
- Low weight (approx. 3.3 kg)

Major applications
Benefits and
key features

Service and maintenance of DVB-T/H gap-filler and low-power transmitters
❙ Precise analysis of signal quality and output power
❙ Fast and easy detection of impermissible spurious emissions

Nonvehicular coverage measurements
❙ Outdoor and indoor field strength measurement
❙ Determination of receive conditions under practical conditions

Advantages

Comprehensive analysis functions in one box
❙ Combination of TV, spectrum and network analyzer
❙ Consistent measurements

Detection of short-time interference
❙ Signal analysis and demodulation for DVB-T/H in realtime
❙ High measurement speed
❙ BER measurements
❙ MPEG-2 transport stream output (ASI)

Reliable measurement results
❙ Narrow measurement tolerances
❙ High MER performance
❙ Support of power sensors
❙ Frequency locking to external 10 MHz reference signal

Coverage measurements under real conditions
❙ Internal preselection with preamplifier (option)
❙ AGC
❙ Antenna factors taken into account
❙ Replaceable lithium-ion battery

Simple outdoor use
❙ Compact and rugged housing
❙ Splash-proof
❙ High-resolution, daylight-friendly 6.5" color display
❙ Low weight

Easy and fast documentation of measurement results
❙ Measurement values saved internally or on SD card
❙ Data exchange via LAN and USB interface

Reproducible measurement results due to user-specific instrument configuration
❙ R&S®ETH View PC software for configuring instrument settings, measurements, channel tables, etc., via LAN and USB interface
❙ Exchange of instrument configurations between multiple R&S®ETH analyzers using the R&S®ETH View software

Access via remote-control interfaces
❙ LAN interface for accessing up to five users via R&S®ETH View
❙ LAN and USB interface for reading out internally stored measurement values and SD card using R&S®ETH View
❙ Remote control via LAN and USB interface in accordance with SCPI standard

Specifications in brief

Data		
Frequency range (TV receiver mode)	model .04, .14	5 MHz to 3.6 GHz
	model .08, .18	5 MHz to 8 GHz
Frequency range (spectrum analyzer mode)	model .04, .14	100 kHz to 3.6 GHz
	model .08, .18	100 kHz to 8 GHz
Frequency accuracy	internal oscillator	1 ppm/year
Phase noise	Δf = 30 kHz, RF = 500 MHz	≤100 dBc/Hz
IP3	RF = 500 MHz, RF attenuation = 0 dB, R&S®ETH-K1 = OFF R&S®ETH-K1 = ON	typ. 0 dBm typ. –10 dBm
Level uncertainty		typ. <0.5 dB
Tracking generator		
Frequency range	model .14	200 kHz to 3.6 GHz
	model .18	200 kHz to 8 GHz
Output level	model .14, .18	–40 dBm to 0 dBm
DVB-T/H analysis (R&S®ETH-K140 option)		
Channel bandwidth		5 MHz, 6 MHz, 7 MHz, 8 MHz
FFT modes		2k, 4k, 8k
QAM order		4QAM, 16QAM, 64QAM
QAM hierarchy		none, alpha = 1, 2, 4
Guard interval		1/4, 1/8, 1/16, 1/32
Code rates		1/2, 2/3, 3/4, 5/6, 7/8
Measurements		level, shoulder attenuation, carrier frequency offset, symbol rate offset, MER/EVM, bit error rate before Viterbi, bit error rate before Reed-Solomon, packet error ratio, packet errors, MPEG TS bit rate, constellation diagram, TPS information
MER system performance	RF = 500 MHz, level = –30 dBm	≥40 dB
Spectrum analysis		
Displayed average noise level (DANL)	RF = 500 MHz, RF attenuation = 0 dB, resolution bandwidth = 1 Hz, VBW = 10 Hz R&S®ETH-K1 = OFF R&S®ETH-K1 = ON	typ. –158 dBm/Hz typ. –165 dBm/Hz
Reference level		–80 dBm to +20 dBm
Resolution bandwidths		100 Hz to 3 MHz in 1/3 sequence
Video bandwidths		10 Hz to 3 MHz in 1/3 sequence
Sweep time	span >0 Hz	20 ms to 1000 s
	span = 0 Hz, resolution bandwidth = 3 MHz	117 µs to 100 s
I/Q demodulation bandwidth		10 MHz
Detectors		auto peak, max peak, min peak, sample, RMS
Trigger functions		free run, video, ext. pos. edge, ext. neg. edge
Interfaces		
RF input		N connector (female), 50 Ω
Tracking generator output		N connector (female), 50 Ω
10 MHz reference/ trigger input		BNC connector (female)
TS-ASI output		BNC connector (female), 75 Ω
Accessories control	1 × at top of instrument, 1 × at side	7-pole connector (female)
LAN interface		LAN (Ethernet 10/100BaseT)
USB interface		USB 1.1
Memory card		SD card

Specifications in brief

Data		
General data		
Operating temperature range	with battery	0 °C to +50 °C
Power supply	AC, with external power supply	100 V AC to 240 V AC, 50 Hz/60 Hz, 700 mA
	external DC	15 V DC ± 10 %, 2 A
Battery (Li-ion)	Battery runtime in TV receiver mode	approx. two hours
	Battery runtime in spectrum analyzer mode	approx. four hours
Dimensions	H × W × D (without handle)	300 mm × 192 mm × 75 mm (11.81 in × 7.56 in × 2.95 in)
Weight		3.3 kg (7.28 lb)

Ordering information

Designation	Type	Order No.
Handheld TV Analyzer, up to 3.6 GHz	R&S®ETH	2114.1508.04
Handheld TV Analyzer, up to 8 GHz	R&S®ETH	2114.1508.08
Handheld TV Analyzer, up to 3.6 GHz, with tracking generator	R&S®ETH	2114.1508.14
Handheld TV Analyzer, up to 8 GHz, with tracking generator	R&S®ETH	2114.1508.18
Equipment supplied with base unit		
Li-ion battery, plug-in power supply, LAN cable (2 m), USB cable, quick start guide, CD with R&S®ETH View control software and documentation		
Hardware options		
RF Preselection up to 3.6 GHz	R&S®ETH-K1	2114.1608.04
RF Preselection up to 8 GHz	R&S®ETH-K1	2114.1608.08
Software options		
DVB-T/H Firmware	R&S®ETH-K140	2114.1708.02
Remote Control for R&S®ETH	R&S®ETH-K40	2114.1814.02

About Rohde & Schwarz

Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

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For data sheet, see
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