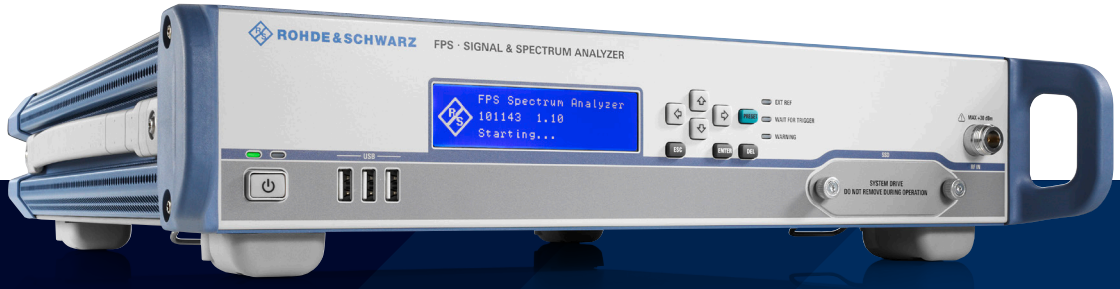
R&S®FPS
SIGNAL AND SPECTRUM ANALYZER

3 year warranty

Compact and fast for automated tests



Product Brochure
Version 08.00

ROHDE&SCHWARZ
Make ideas real

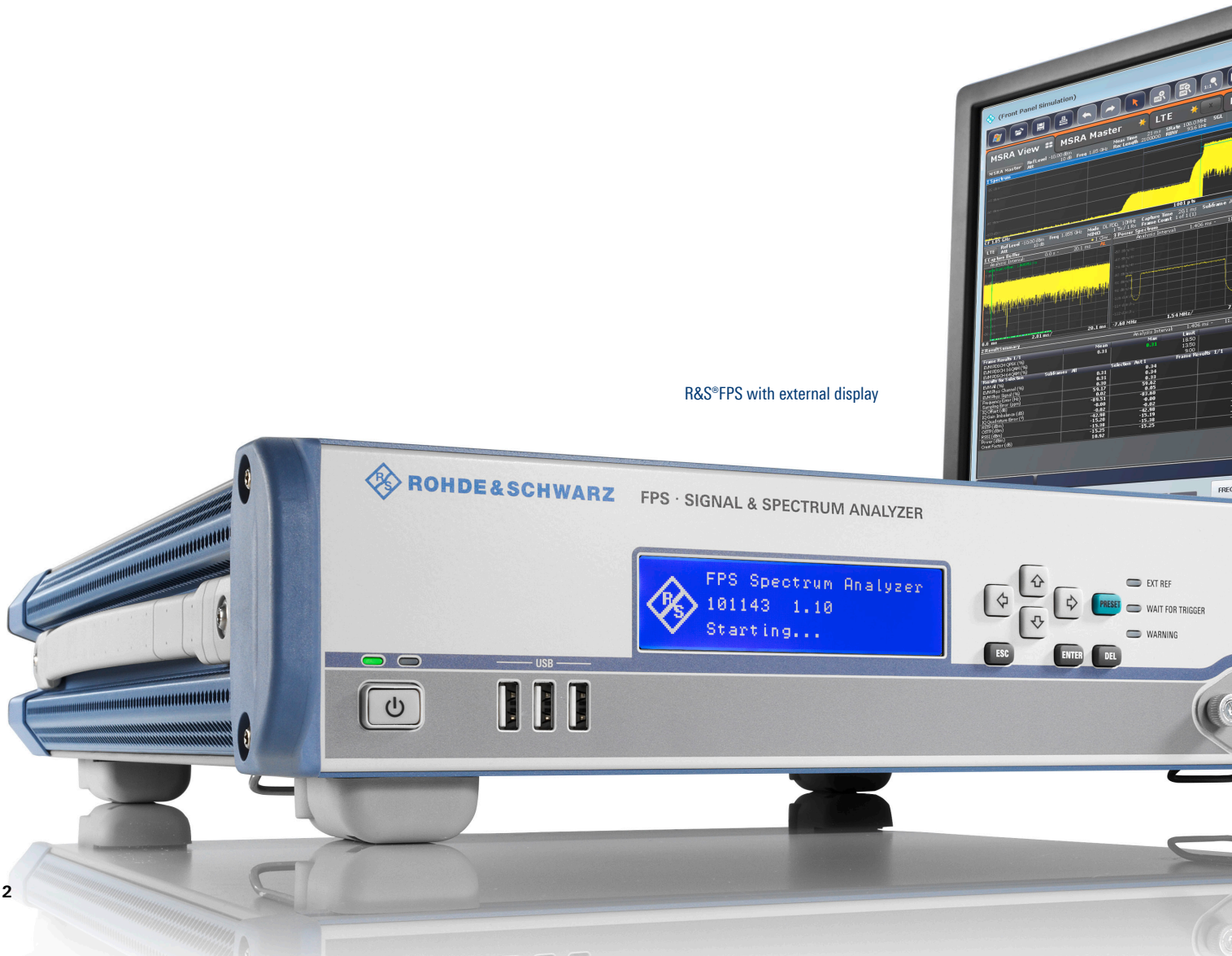
AT A GLANCE

The R&S®FPS is an exceptionally fast and compact signal and spectrum analyzer for performance oriented users. In production and in monitoring systems, only 2 HU of rack space are required – a reduction of 50 % compared with traditional instruments.

The R&S®FPS excels with its high measurement speed, 160 MHz signal analysis bandwidth and wide range of analysis packages for analog modulation methods and wireless/wideband communications standards. It is up to five times faster than comparable signal and spectrum analyzers and provides measurement routines optimized for speed and high data throughput, which is a crucial advantage in production applications.

Key facts

- Frequency range up to 4/7/13.6/30/40 GHz
- Up to 160 MHz signal analysis bandwidth
- 0.4 dB level measurement uncertainty up to 7 GHz
- Measurement applications for GSM/EDGE (including EDGE Evolution), WCDMA/HSPA+, LTE, WLAN, vector signal analysis
- –110 dBc (1 Hz) phase noise at 10 kHz frequency offset
- +15 dBm third order intercept (TOI)
- –155 dBm displayed average noise level (DANL) at 1 GHz in 1 Hz bandwidth
- Removable hard disk for applications where security is a concern



R&S®FPS with external display

BENEFITS AND KEY FEATURES

High throughput for efficient production

- Up to five times faster than other signal and spectrum analyzers
- Fast switchover between instrument setups
- Fast and accurate measurement results
- Reduced volume in test racks
- Customized test routines for production applications
- Efficient operation via remote control

page 4

Connectivity

- Numerous interfaces that can be integrated into any environment

page 6

Ready for tomorrow's standards

- Fully digital backend ensures high measurement accuracy and excellent repeatability
- 160 MHz signal analysis bandwidth, suitable for WLAN IEEE 802.11ac
- Easy transition to the next generation in signal analysis
- Always up-to-date

page 7

HIGH THROUGHPUT FOR EFFICIENT PRODUCTION

The R&S®FPS signal and spectrum analyzer significantly reduces the testing time and expense in a production environment. It performs everything from simple measurements to complex modulation analyses quickly, reliably and with low measurement uncertainty.

Fast access to I/Q data with a wide bandwidth allows the speedy execution of complex evaluation routines in an external computer and the use of the R&S®FPS as a fast digitizer with a wide dynamic range for fast, flexible and efficient production.

Up to five times faster than other signal and spectrum analyzers

The R&S®FPS is up to five times faster than other signal and spectrum analyzers. This high measurement speed cuts production time, especially in cases that require the averaging of a large number of measurements (as specified in many standards).

Measurement speed	
List mode, 500 MHz frequency change	1.7 ms
Marker peak search	1.6 ms
Capture and transfer of 1 Msample	125 ms
WCDMA downlink demodulation	100 ms
LTE 10 MHz uplink demodulation	110 ms

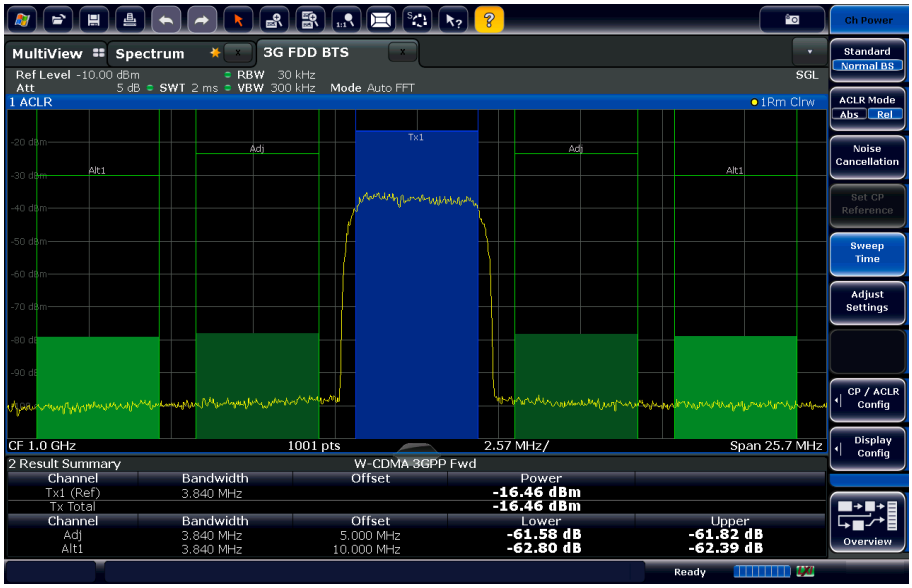
Power measurement is one of the most common measurements in automated test systems. Power meters are irreplaceable for their absolute accuracy that exceeds that of spectrum analyzers. Once the absolute level has been established at a given frequency, the following measurement can be performed five times faster with the R&S®FPS than with an industry standard diode power meter.

WCDMA power measurements	
R&S®FPS	**Power meter**
1.1 ms	5.7 ms

In a more complex sequence with a combination of modulation accuracy and spectral measurements, the R&S®FPS together with a Rohde&Schwarz signal generator is more than five times faster than comparable modular solutions.

Fast switchover between instrument setups

With the R&S®FPS, different instrument setups can be kept in RAM simultaneously to accommodate measurements requiring different settings. This minimizes the time to switch between instrument setups and operating modes. For example, test routines that involve switchover between spectrum and modulation measurements are performed faster.



Adjacent channel leakage ratio (ACLR) measurement of a 3GPP WCDMA signal

Fast and accurate measurement results

In production tests, the repeatability of the measurement results are of highest importance. The R&S®FPS measures the power of a WCDMA signal with a standard deviation of < 0.01 dB and sends the results to the controller PC in less than 15 ms, which is five times faster than competitor instruments.

Reduced volume in test racks

The R&S®FPS requires only 2 HU of rack space, reducing the needed space by 50% compared with a traditional signal and spectrum analyzer. This reduction is made possible by removing the measurement display from the instrument. The R&S®FPS comes with a small status display that provides essential status information as well as information on connecting the instrument. With the help of the status display, the operator can also check the status of the instrument and perform maintenance tasks such as self-alignments. For development or debugging, an external display can be connected to access a complete spectrum analyzer user interface with the functionality of a modern signal and spectrum analyzer. For remote operation, the instrument's full display functionality can be accessed via a Windows Remote Desktop connection.

Customized test routines for production applications

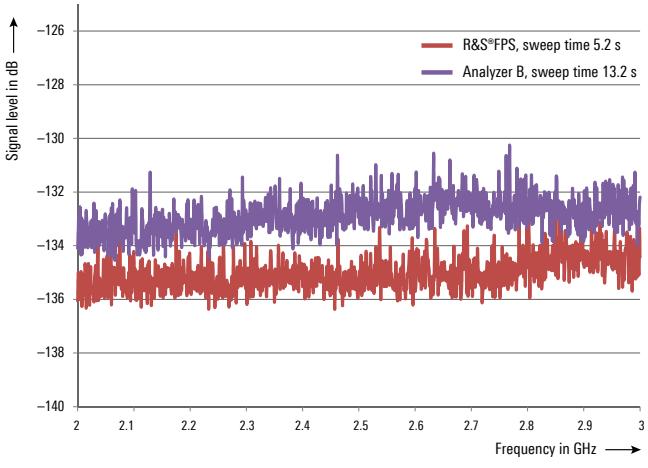
The R&S®FPS also offers a number of functions that speed up test routines, shorten alignment and measurement time and increase the overall throughput:

- Frequency list mode: fast measurement on up to 300 different frequencies using different analyzer settings with a single remote control command
- Measurement of different power levels in the time domain in a single sweep for very fast alignment (multisummary marker)
- Fast ACP measurement
- Frequency counter with 0.1 Hz resolution at a measurement time of < 50 ms
- Fast FFT sweep mode for accelerated spurious measurements and spurious searches

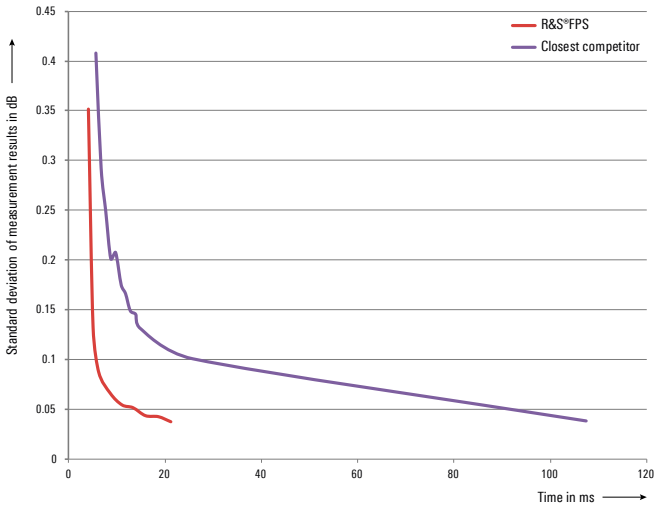
Efficient operation via remote control

- Gigabit LAN interface for quickly transferring large quantities of data
- Trigger output for synchronization with the production system in frequency list mode

Spurious emissions measurement over 1 GHz span



Standard deviation of the power measurement of a WCDMA signal as a function of measurement time



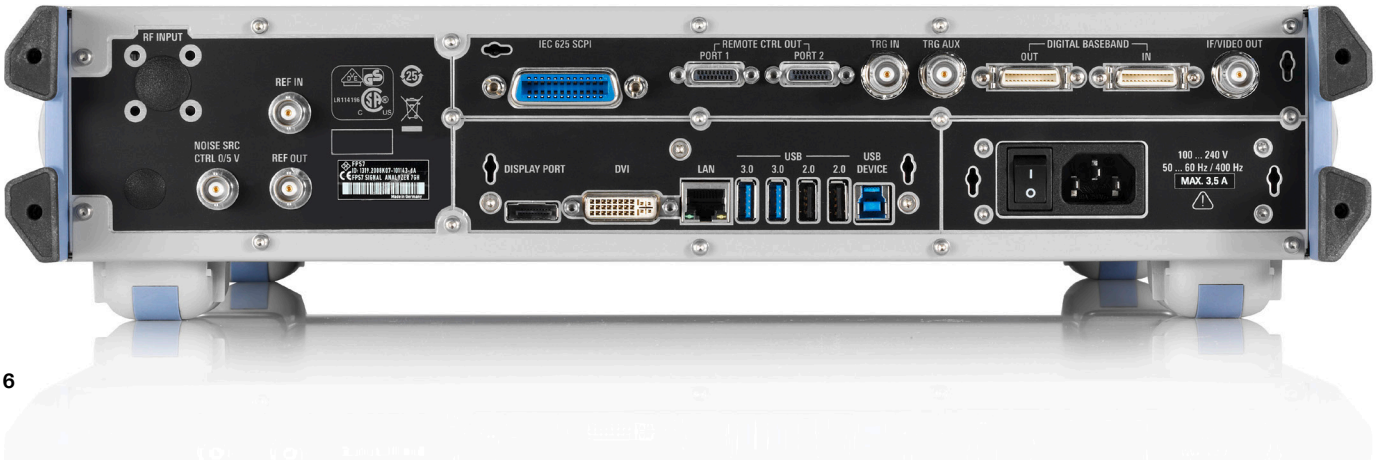
CONNECTIVITY

Numerous interfaces that can be integrated into any environment

The R&S®FPS supports all standard interfaces. It communicates with other measuring instruments and the controller PC via GPIB, LAN (Gigabit Ethernet) or USB.

SCPI commands can be issued directly without going through a script interpreter. This triples the speed of measurement tasks compared with communicating via SCPI.

All R&S®FPS ports are located on the rear panel, making it ideal for integration into rack systems.



READY FOR TOMORROW'S STANDARDS

Featuring a signal analysis bandwidth of up to 160 MHz, the R&S®FPS is a sound investment, ready for the future. The R&S®FPS has what is needed to analyze and demodulate existing and future communications standards.

Fully digital backend ensures high measurement accuracy and excellent repeatability

- 28 MHz signal analysis bandwidth with base unit; optionally 40 MHz and 160 MHz
- 200 Msample signal memory
- High measurement accuracy and good repeatability with digitally implemented analysis filters

160 MHz signal analysis bandwidth, suitable for WLAN IEEE 802.11ac

Wireless communications systems are using ever larger RF bandwidths in their quest to boost data rates and transmission capacity. Due to its large signal analysis bandwidth and wealth of software options, the R&S®FPS signal and spectrum analyzer can handle all existing and most future wireless communications applications.

Easy transition to the next generation in signal analysis

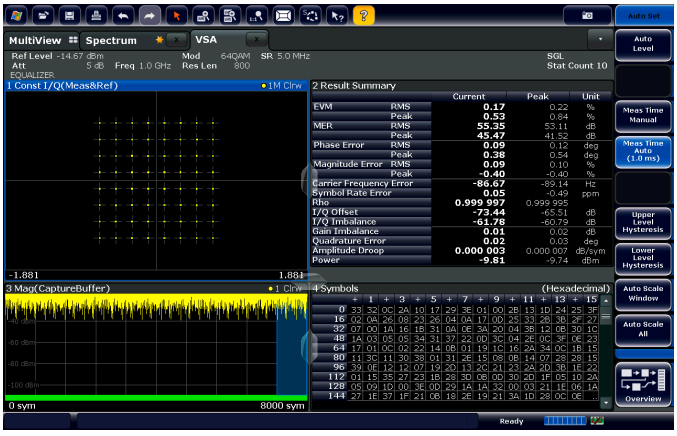
Functional compatibility with existing Rohde&Schwarz signal and spectrum analyzers.

Always up-to-date

The firmware can be updated using a USB storage device or the LAN port.

Free firmware updates are simply downloaded from the Internet at www.rohde-schwarz.com.

Vector signal analysis of a single carrier 64QAM signal with 5 MHz/s symbol rate.



Signal analysis bandwidth			
Standard	**28 MHz bandwidth (standard)**	**40 MHz bandwidth (optional)**	**160 MHz bandwidth (optional)**
5G NR	for signals with up to 25 MHz bandwidth	covers channel bandwidths up to 40 MHz	for carrier bandwith configurations > 40 MHz
LTE	exceeds the 20 MHz max. channel width of LTE signals	with LTE carrier aggregation, up to two neighboring 20 MHz LTE channels can be analyzed	wireless communications bands can be fully analyzed
WLAN	exceeds the 20 MHz channel width of WLAN IEEE 802.11a/b/g signals	covers WLAN IEEE 802.11n wideband technology	covers WLAN IEEE 802.11ac wideband technology
WCDMA	exceeds the 20 MHz bandwidth required for CCDF measurements on four-carrier WCDMA signals	–	–

MEASUREMENT APPLICATIONS FOR WIR

Measurement application/ technology	Power	Modulation quality	Spectrum measurements	Miscellaneous	Special features
R&S®FPS-K10 GSM/EDGE/ EDGE Evolution	► Power measurement in time domain, including carrier power	► EVM ► Phase/frequency error ► Origin offset suppression ► Constellation diagram	► Modulation spectrum ► Transient spectrum	–	► Single burst and multiburst ► Automatic detection of modulation
R&S®FPS-K72/-K73 3GPP FDD (WCDMA)	► Code domain power ► Code domain power versus time ► CCDF	► EVM ► Peak code domain error ► Constellation diagram ► I/Q offset ► Residual code domain error ► I/Q imbalance ► Gain imbalance ► Center frequency error (chip rate error)	► Spectrum mask ► ACLR ► Power measurement	► Channel table with summary of channels used on base station ► Timing offset ► Power versus time	► Automatic detection of active channels and decoding of useful information ► Automatic detection of encryption code ► Automatic detection of HSDPA modulation format ► Support of compressed mode signals ► Support of HSPA and HSPA+ (HSDPA+ and HSUPA+)
R&S®FPS-K76/-K77 TD-SCDMA	► Code domain power ► Code domain power versus time ► CCDF	► EVM ► Peak code domain error ► Constellation diagram ► Residual code domain error ► I/Q offset ► Gain imbalance ► Center frequency error (chip rate error)	► Spectrum mask ► ACLR ► Power measurement	► Channel table with summary of channels used on base station ► Timing offset ► Power versus time	► Automatic detection of active channels and decoding of payload information ► Automatic detection of HSDPA modulation format ► Support of HSPA+ (HSDPA+ and HSUPA+)
R&S®FPS-K82/-K83 CDMA2000®	► Carrier power ► Code domain power ► Code domain power versus time ► CCDF	► RHO ► EVM ► Constellation diagram ► I/Q offset ► I/Q imbalance ► Center frequency error	► Spectrum mask ► ACLR ► Power measurement	► Channel table with summary of channels used on base station ► Timing offset	► Automatic detection of active channels and decoding of user information ► Robust demodulation algorithms for reliable measurement of multicarrier signals
R&S®FPS-K84/-K85 1xEV-DO	► Carrier power ► Code domain power ► Code domain power versus time ► CCDF	► RHO_{Pilot} (R&S®FPS-K84) ► RHO_{Data} (R&S®FPS-K84) ► RHO_{MAC} (R&S®FPS-K84) ► $RHO_{Overall}$ ► EVM ► Peak code domain error ► Constellation diagram ► Residual code domain error ► I/Q offset ► Gain imbalance ► Center frequency error (chip rate error)	► Spectrum mask ► ACLR ► Power measurement	► Channel table with summary of channels used on base station ► Timing offset	► Automatic detection of active channels and decoding of payload information ► Robust demodulation algorithms for reliable measurement of multicarrier signals

ELESS COMMUNICATIONS SYSTEMS

Measurement application/ technology	Power	Modulation quality	Spectrum measurements	Miscellaneous	Special features
R&S®FPS-K91 WLAN IEEE 802.11a **R&S®FPS-K91P** WLAN IEEE 802.11p **R&S®FPS-K91N** WLAN IEEE 802.11n **R&S®FPS-K91AC** WLAN IEEE 802.11ac	► Power versus time ► Burst power ► Crest factor	► EVM (pilot, data) ► EVM versus carrier ► EVM versus symbol ► Constellation diagram ► I/Q offset ► I/Q imbalance ► Gain imbalance ► Center frequency error ► Symbol clock error ► Group delay	► Spectrum mask ► ACLR ► Power measurement ► Spectrum flatness	► Bitstream ► Signal field ► Constellation versus carrier	► Automatic detection of burst type ► Automatic detection of MCS index ► Automatic detection of bandwidth ► Automatic detection of guard interval ► Estimation of payload length from burst
R&S®FPS-K100/ -K101/-K104/K-105 EUTRA/LTE TDD and FDD UL and DL	► Power measurement in time and frequency domains ► CCDF	► EVM ► Constellation diagram ► I/Q offset ► Gain imbalance ► Quadrature error ► Center frequency error (symbol clock error)	► Spectrum mask ► ACLR ► Power measurement ► Spectrum flatness	► Bitstream ► Allocation summary list ► Averaging over multiple measurements	► Automatic detection of modulation, cyclic prefix length and cell ID
R&S®FPS-K102 EUTRA/LTE MIMO		► See R&S®FPS-K100/ -K104 modulation quality measurements for each individual MIMO path			► MIMO time alignment for R&S®FPS-K100/-K104 ► Interband carrier aggregation time alignment
R&S®FPS-K103 EUTRA/ LTE-Advanced UL			► Multicarrier ACLR for FDD and TDD ► SEM for contiguously aggregated component carriers		
R&S®FPS-K106 EUTRA/LTE NB-IoT		► EVM ► Constellation diagram ► I/Q offset ► Gain imbalance ► Quadrature error ► Center frequency error (symbol clock error)	► Spectrum mask ► ACLR ► Power measurement ► Spectrum flatness		► Support of all modes, out of band, guard band and in-band mode ► Automatic detection of modulation, cyclic prefix length and cell ID
R&S®FPS-K118 Verizon 5GTF downlink	► Power versus time ► CCDF	► EVM ► EVM xPDSCH ► Constellation diagram ► I/Q offset ► I/Q imbalance ► Gain imbalance ► Center frequency error		► Allocation summary ► Multi carrier filter	► Automatic detection of Cell ID
R&S®FPS-K144 5G NR Rel. 15 downlink **R&S®FPS-K148**[1] 5G NR Rel. 16 extension	► Power versus time	► EVM ► EVM xPDSCH ► Constellation diagram ► I/Q offset ► I/Q imbalance ► Gain imbalance ► Center frequency error	► ACLR ► SEM	► Allocation summary ► Channel table with channels used on base station	► Automatic detection of Cell ID ► Support of multiple bandwidth parts

[1] Requires R&S®FPS-K144.

MEASUREMENT APPLICATIONS FOR GENERAL PURPOSE APPLICATIONS

Measurement application	Measurement parameters	Measurement functions
R&S®FPS-K6 Pulse measurements	► Pulse parameters: pulse width, pulse repetition rate, pulse repetition interval, duty cycle, rise/fall time, settling time ► Frequency: carrier frequency, pulse-to-pulse frequency difference, chirp rate, frequency deviation, frequency error ► Power: peak power, average power, peak-to-average power, pulse-to-pulse power ► Phase: carrier phase, pulse-to-pulse phase difference, phase deviation, phase error ► Amplitude: droop, ripple, overshoot width	► Point-in-pulse measurements: frequency, amplitude, phase versus pulse, trends and histograms for all parameters ► Pulse statistics: standard deviation, average, maximum, minimum ► Pulse tables ► User-defined measurement parameters
R&S®FPS-K30 Noise figure and gain measurements based on Y-factor method	► Noise figure ► Noise temperature ► Gain ► Y factor	► Analyzer noise correction (2nd stage correction) ► Measurements on frequency-converting DUTs ► Control of a generator as an LO in frequency converting measurements ► SSB and DSB
R&S®FPS-K40 Phase noise measurements	► SSB phase noise ► Residual FM and residual φM ► Jitter	► 1 Hz to 10 GHz offset range ► Selection of resolution bandwidth and number of averages for each offset range ► Definable evaluation ranges for residual FM/φM ► Signal tracking ► Optional suppression of spurious emissions

R&S®LEGACY PRO – EASY REPLACEMENT OF OBSOLETE ANALYZERS

In a test system, core elements such as spectrum analyzers may have to be replaced, for example because an analyzer becomes inoperative and repair is not possible, or because the user wants to benefit from the higher measurement speed of a more state-of-the-art instrument.

Replacement may be required even though the test system software has been validated at substantial cost and effort. The R&S®FPS supports the remote control command sets of other Rohde&Schwarz signal and spectrum analyzers, such as the R&S®FSU and R&S®FSQ, and those of other manufacturers' instruments (R&S®Legacy Pro). Replacing an obsolete analyzer with an R&S®FPS therefore poses no problems. In most cases it is sufficient to verify the response of the R&S®FPS during a measurement sequence. Numerous successful reference projects where obsolete analyzers have been replaced by the R&S®FSV or R&S®FSU prove the efficiency of this approach.

Ready for tomorrow's standards

- Fully digital backend ensures high measurement accuracy and excellent repeatability
- Signal analysis bandwidth of 160 MHz, suitable for WLAN IEEE 802.11ac and multistandard radio analysis

IDENTIFYING INTERACTION BETWEEN SIGNALS

Multistandard radio analyzer (MSRA)

The constantly growing demand for wireless transmission capacity results in increasingly complex signal scenarios. Multistandard transmitters transmit signals to various standards over a common RF path. Measuring RF signal quality and RF signal interaction poses new challenges for signal and spectrum analyzers, both in terms of speed and the ability to measure different signals in parallel.

The R&S®FPS meets this challenge with its multistandard radio analyzer function. The MSRA simultaneously measures signals of different standards (GSM, WCDMA, LTE, etc.) at different frequencies within its 160 MHz analysis bandwidth.

This technique is also beneficial when it comes to optimizing automated test systems, for example where the DUT configuration time is a significant part of the total test time. The R&S®FPS can perform measurements on the captured data while the DUT is reconfigured for the next measurement.

Multiview display of two LTE signals measured on the same I/Q data for interference analysis

R&S®FPS-K7 OPTION

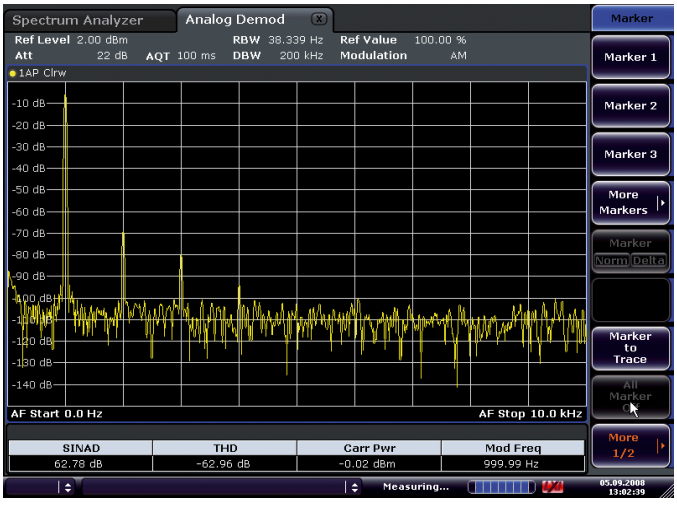
AM/FM/φM MEASUREMENT DEMODULATOR

The R&S®FPS-K7 AM/FM/φM measurement demodulator option converts the R&S®FPS into an analog modulation analyzer for amplitude-, frequency- or phase-modulated signals. It measures not only characteristics of the useful modulation, but also factors such as residual FM and synchronous modulation.

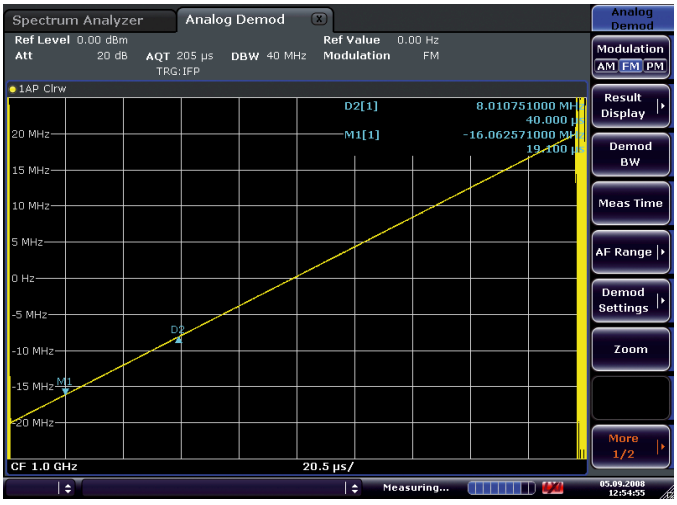
Display and analysis alternatives

- Modulation signal versus time
- Spectrum of the modulation signal (FFT)
- RF signal power versus time
- Spectrum of the RF signal
- Table with numeric display of
  - Deviation or modulation factor, RMS weighted, +peak, –peak, ±peak/2
  - Modulation frequency
  - Carrier frequency offset
  - Carrier power
  - Total harmonic distortion (THD) and SINAD

THD measurement on an amplitude-modulated signal. The first harmonic of the modulation signal is well suppressed by 69 dB. This corresponds to a THD (D2) < 0.1 %.



Measurement of the linearity of an FM ramp versus 40 MHz bandwidth.



Specifications in brief

Demodulation bandwidth	100 Hz to 28 MHz, 40 MHz optional
Recording time (depends on demodulation bandwidth)	7.5 ms to 3932 s
AF filters	
Highpass filters	20 Hz, 50 Hz, 300 Hz
Lowpass filters	3/15/23/150 kHz and 5/10/25 % of demodulation bandwidth
Deemphasis	25/50/75/750 µs
Modulation frequency	< 14 MHz, > 20 MHz optional, max. 0.5 × demodulation bandwidth
Measurement uncertainty (deviation or modulation factor)	3 %

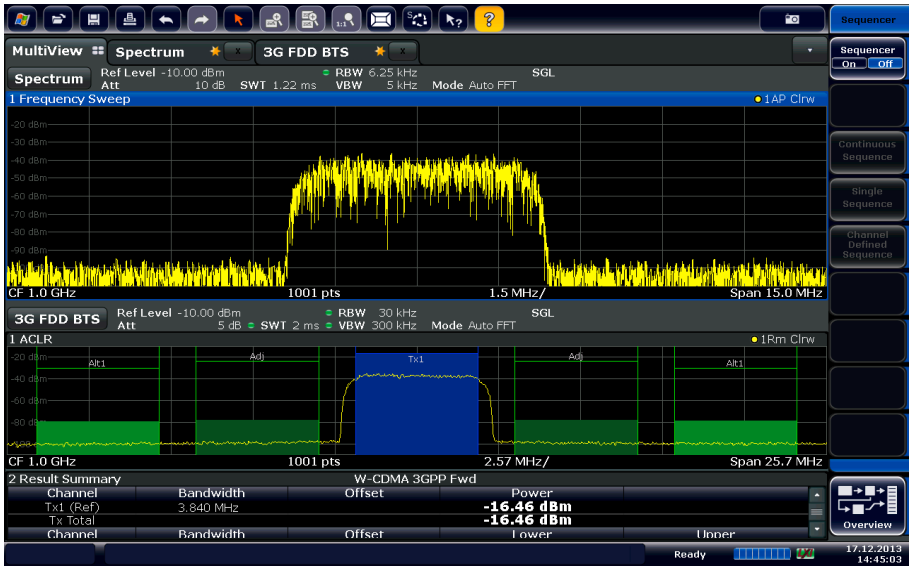
R&S®FPS-K18 OPTION

AMPLIFIER MEASUREMENTS APPLICATION

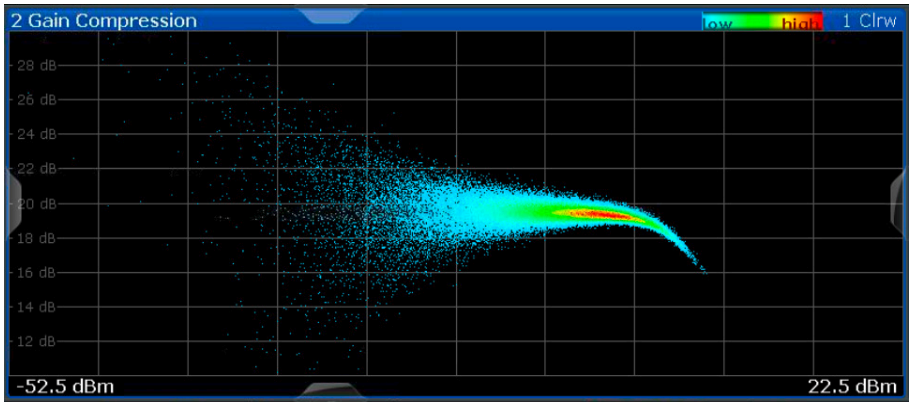
The R&S®FPS-K18 simplifies and speeds up power amplifier measurements in characterization and in production. The R&S®FPS-K18 takes control of an R&S®SGT100A RF vector source and performs a number of tasks:

- Servoing, to reach a defined output power of the device under test
- AM/AM, AM/φM and gain compression measurements, for amplifier characterization
- Width measurements of AM/φM and AM/AM curves, frequently used when measuring amplifiers with envelope tracking
- Standard agnostic EVM measurement without signal demodulation for signal distortion analysis on any signal
- Digital predistortion, the measured characteristics of the DUT is uploaded to the Rohde&Schwarz signal generator and its DPD functionality is enabled, immediately showing the performance of the DPD
- The R&S®FPS-K18D adds a direct digital predistortion capability that compensates for memory effects in the power amplifier.

Amplifier measurement showing numerical results and graphical representation of AM/AM and AM/φM distortion



Gain compression.



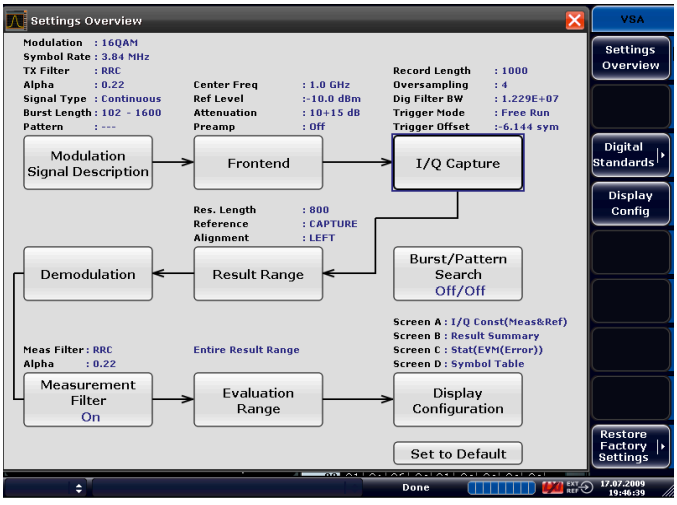
R&S®FPS-K70 OPTION
VECTOR SIGNAL ANALYSIS APPLICATION

The R&S®FPS-K70 option enables users to flexibly set the analysis of digitally modulated single carriers down to the bit level. The clearly structured operating concept simplifies measurements despite the wide range of analysis tools.

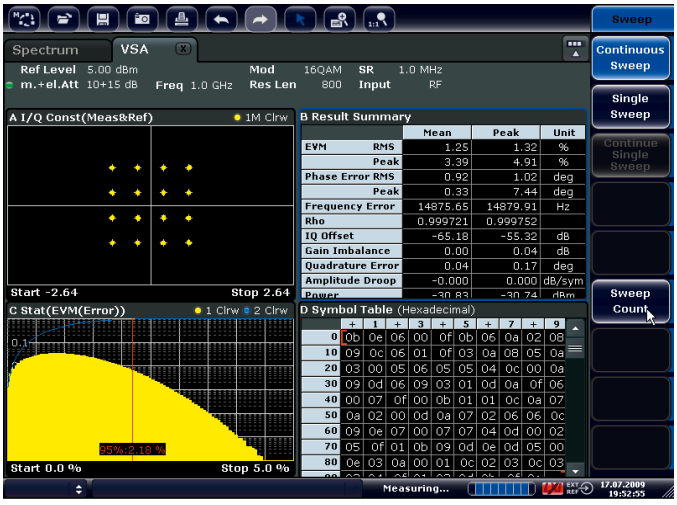
Flexible modulation analysis from MSK to 64QAM

- Modulation formats
  - 2FSK, 4FSK
  - MSK, GMSK, DMSK
  - BPSK, QPSK, offset QPSK, DQPSK, 8PSK, D8PSK, π/4-DQPSK, 3π/8-8PSK, π/8-D8PSK
  - 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, 16APSK (DVB-S2), 32APSK (DVB-S2), π/4-16QAM (EDGE), –π/4-16QAM (EDGE)

Clearly structured block diagram display



16QAM with four screens



- Symbol rate: up to 32 MHz
- Analysis length: up to 50 000 symbols
- Signal analysis bandwidth: 28 MHz; 40 MHz and 160 MHz optional

Numerous standard-specific default settings

- GSM, GSM/EDGE
- 3GPP WCDMA, CDMA2000®
- TETRA, APCO25
- Bluetooth®, ZigBee
- DECT

Easy operation with graphical support

The visualization of the demodulation stages and the associated settings is so clear that even beginners and infrequent users can find the correct settings. The combination of touchscreen and block diagram simplifies operation and representation.

Based on the description of the signal to be analyzed (e.g. modulation format, continuous or with bursts, symbol rate, transmit filtering), the R&S®FPS-K70 option supports users in automatically finding useful settings.

Flexible analysis tools for detailed signal analysis make troubleshooting really easy

- Display choices for amplitude, frequency, phase, I/Q, eye diagram; amplitude, phase, or frequency error; constellation or vector diagram
- Statistical evaluations
  - Histogram representation
  - Standard deviation and 95th percentile in the result summary
- Spectrum analyses of the measurement and error signal considerably support users in finding signal errors such as incorrect filtering or spurious emmisions
- Flexible burst search for analyzing complex signal combinations, short bursts or signal mix – capabilities that go beyond the scope of many signal analyzers

SPECIFICATIONS IN BRIEF

Base unit		
Frequency		
Frequency range	R&S®FPS4	10 Hz to 4 GHz
	R&S®FPS7	10 Hz to 7 GHz
	R&S®FPS13	10 Hz to 13.6 GHz
	R&S®FPS30	10 Hz to 30 GHz
	R&S®FPS40	10 Hz to 40 GHz
Aging of frequency reference		1×10^{-6} per year
	with R&S®FPS-B4 option	1×10^{-7} per year
Bandwidths		
Resolution bandwidth	standard sweep	1 Hz to 10 MHz
	standard sweep, zero span	1 Hz to 10 MHz, 20 MHz, 28 MHz; 40 MHz optional
	FFT sweep	1 Hz to 300 kHz
	channel filter	100 Hz to 5 MHz
Video filter		1 Hz to 10 MHz, 20 MHz, 28 MHz, 40 MHz
Signal analysis bandwidth		28 MHz
	with R&S®FPS-B40 option	40 MHz
	with R&S®FPS-B160 option	160 MHz
Displayed average noise level (DANL)		
DANL (1 Hz bandwidth)	1 GHz	–152 dBm, –155 dBm (typ.)
	3 GHz	–150 dBm, –153 dBm (typ.)
	7 GHz	–146 dBm, –149 dBm (typ.)
	13.6 GHz	–148 dBm, –151 dBm (typ.)
	30 GHz	–144 dBm, –147 dBm (typ.)
With preamplifier, R&S®FPS-B22 option	1 GHz	–162 dBm, –165 dBm (typ.)
	3 GHz	–160 dBm, –163 dBm (typ.)
	7 GHz	–156 dBm, –159 dBm (typ.)
With preamplifier, R&S®FPS-B24 option	13.6 GHz	–164 dBm, –167 dBm (typ.)
	30 GHz	–159 dBm, –161 dBm (typ.)
Intermodulation		
Third order intercept (TOI)	f < 3.6 GHz	+13 dBm, +16 dBm (typ.)
	3.6 GHz to 30 GHz	+15 dBm, +18 dBm (typ.)
Dynamic range WCDMA ACLR	without noise compensation	70 dB
	with noise compensation	73 dB
Phase noise		
1 GHz carrier frequency	10 kHz offset from carrier	–106 dBc (1 Hz), –110 dBc (1 Hz) (typ.)
	100 kHz offset from carrier	–115 dBc (1 Hz)
	1 MHz offset from carrier	–134 dBc (1 Hz)
Total measurement uncertainty	3.6 GHz	0.28 dB
	7 GHz	0.39 dB
	13.6 GHz	1 dB
	30 GHz	1.32 dB

ORDERING INFORMATION

Designation	Type	Order No.
Signal and spectrum analyzer, 10 Hz to 4 GHz	R&S®FPS4	1319.2008.04
Signal and spectrum analyzer, 10 Hz to 7 GHz	R&S®FPS7	1319.2008.07
Signal and spectrum analyzer, 10 Hz to 13.6 GHz	R&S®FPS13	1319.2008.13
Signal and spectrum analyzer, 10 Hz to 30 GHz	R&S®FPS30	1319.2008.30
Signal and spectrum analyzer, 10 Hz to 40 GHz	R&S®FPS40	1319.2008.40
Hardware options		
Rear panel RF input	R&S®FPS-B0	1321.4310.02
OCXO, Precision Reference Frequency	R&S®FPS-B4	1321.4291.02
YIG filter bypass, for R&S®FPS30	R&S®FPS-B11	1326.5467.30
YIG filter bypass, for R&S®FPS40	R&S®FPS-B11	1326.5467.40
Spare solid state disk (SSD, removable hard disk)	R&S®FPS-B18	1321.4304.02
Preamplifier, 9 kHz to 4 GHz/7 GHz	R&S®FPS-B22	1321.4027.02
RF preamplifier, 9 kHz to 13.6 GHz	R&S®FPS-B24	1321.4279.13
RF preamplifier, 9 kHz to 30 GHz	R&S®FPS-B24	1321.4279.30
RF preamplifier, 9 kHz to 40 GHz	R&S®FPS-B24	1321.4279.40
Electronic attenuator, 1 dB steps	R&S®FPS-B25	1321.4033.02
Noise source control	R&S®FPS-B28V	1326.5996.02
40 MHz Analysis bandwidth	R&S®FPS-B40	1321.4040.02
160 MHz Analysis bandwidth, for R&S®FPS4 and R&S®FPS7	R&S®FPS-B160	1321.4285.02
160 MHz Analysis bandwidth, for R&S®FPS13	R&S®FPS-B160	1321.4285.13
160 MHz Analysis bandwidth, for R&S®FPS30 and R&S®FPS40	R&S®FPS-B160	1321.4285.40
Rackmount, preinstalled	R&S®FPS-B478	1321.4262.02
Firmware/software options		
Pulse measurements	R&S®FPS-K6	1331.3169.02
Analog modulation analysis (AM/FM/φM)	R&S®FPS-K7	1321.4079.02
Analysis of GSM, EDGE and EDGE Evolution signals	R&S®FPS-K10	1321.4091.02
Amplifier measurements	R&S®FPS-K18	1321.4662.02
Direct DPD measurements	R&S®FPS-K18	1321.4956.02
Noise figure and gain measurements	R&S®FPS-K30	1321.4104.02
Security write protection	R&S®FPS-K33	1326.6092.02
Phase noise measurements	R&S®FPS-K40	1321.4110.02
Vector signal analysis	R&S®FPS-K70	1321.4127.02
Analysis of 3GPP FDD base station signals incl. HSPA+	R&S®FPS-K72	1321.4133.02
Analysis of 3GPP FDD UE incl. HSPA+	R&S®FPS-K73	1321.4140.02
TD-SCDMA BS measurements	R&S®FPS-K76	1321.4379.02
TD-SCDMA UE measurements	R&S®FPS-K77	1321.4385.02
CDMA2000® BS measurements	R&S®FPS-K82	1321.4156.02
CDMA2000® MS measurements	R&S®FPS-K83	1321.4162.02
1xEV-DO BS BS measurements	R&S®FPS-K84	1321.4179.02
1xEV-DO MS measurements	R&S®FPS-K85	1321.4185.02
Analysis of WLAN IEEE 802.11a/b/g/j signals	R&S®FPS-K91	13214191.02
Extension of R&S®FPS-K91 to IEEE 802.11n [1]	R&S®FPS-K91n	1321.4204.02
Extension of R&S®FPS-K91 to IEEE 802.11p [2]	R&S®FPS-K91p	1321.4391.02
Extension of R&S®FPS-K91 to IEEE 802.11ac [3]	R&S®FPS-K91ac	1321.4210.02

Designation	Type	Order No.
Analysis of EUTRA/LTE FDD downlink signals	R&S®FPS-K100	1321.4227.02
Analysis of EUTRA/LTE FDD uplink signals	R&S®FPS-K101	1321.4340.02
EUTRA/LTE downlink MIMO measurements [4]	R&S®FPS-K102	1321.4233.02
EUTRA/LTE-Advanced uplink measurements [5]	R&S®FPS-K103	1321.4356.02
Analysis of EUTRA/LTE TDD downlink signals	R&S®FPS-K104	1321.4233.02
Analysis of EUTRA/LTE TDD uplink signals	R&S®FPS-K105	1321.4362.02
Analysis of EUTRA/LTE NB-IoT downlink signals	R&S®FPS-K106	1321.3246.02
VERIZON 5GTF DL measurements	R&S®FPS-K118	1321.4962.02
5G NR Rel. 15 downlink measurements [6]	R&S®FPS-K144	1321.4979.02
5G NR Rel. 16 extension [7]	R&S®FPS-K148	1331.3298.02

[1] Requires R&S®FPS-K91 and R&S®FPS-B40 or R&S®FPS-B160.
[2] Requires R&S®FPS-K91.
[3] Requires R&S®FPS-K91 and R&S®FPS-B160.
[4] Requires R&S®FPS-K100 or R&S®FPS-K104.
[5] Requires R&S®FPS-K101 or R&S®FPS-K105.
[6] R&S®FPS-B160 option is mandatory for R&S®FPS-K144 to support 5G NR carrier bandwidth configurations > 40 MHz. R&S®FPS-B11 option is required in addition for 5G NR analysis at frequencies > 7 GHz.
[7] Requires R&S®FPS-K144.

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All other items		1 year
Options		
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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	

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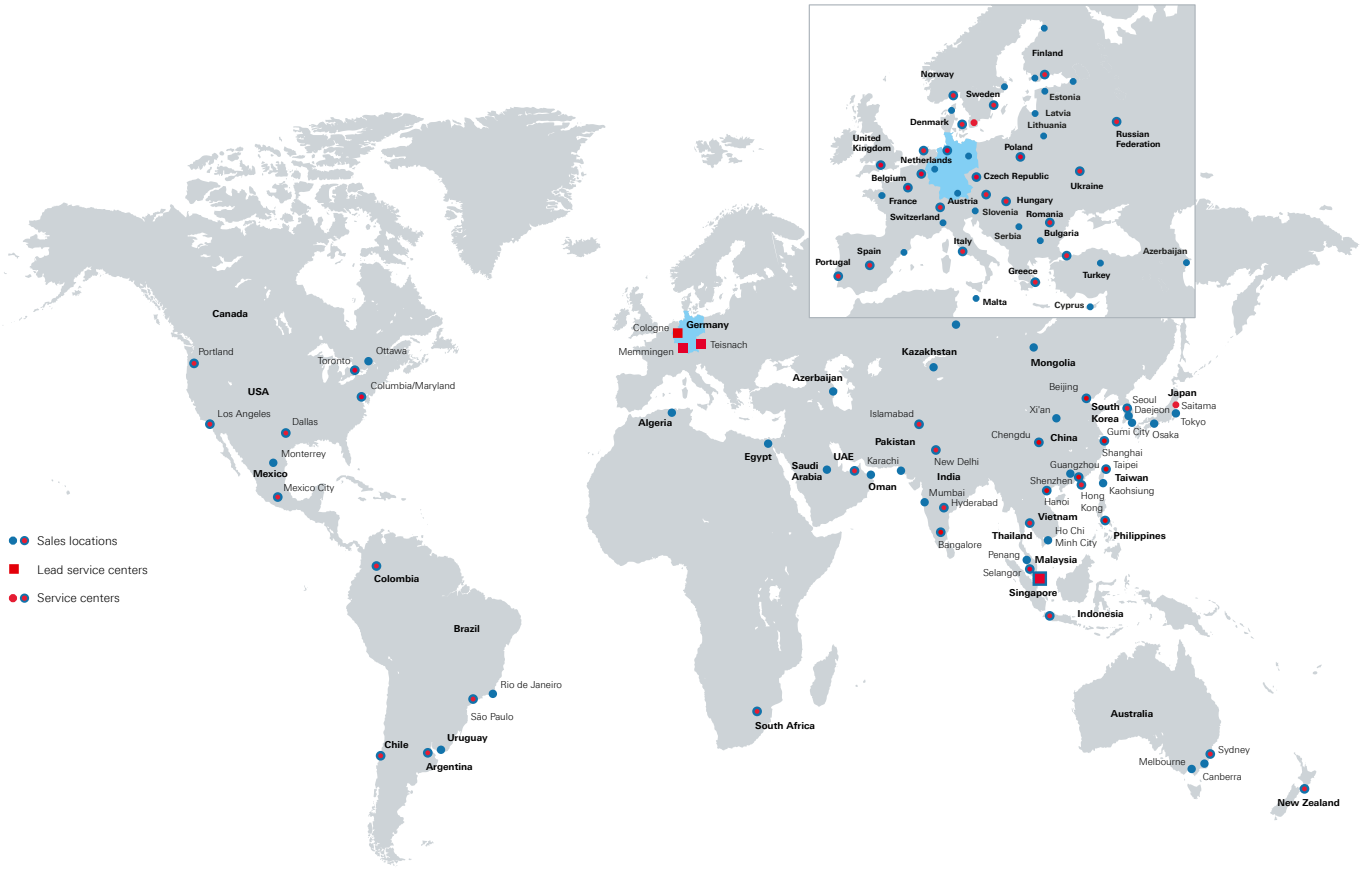

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