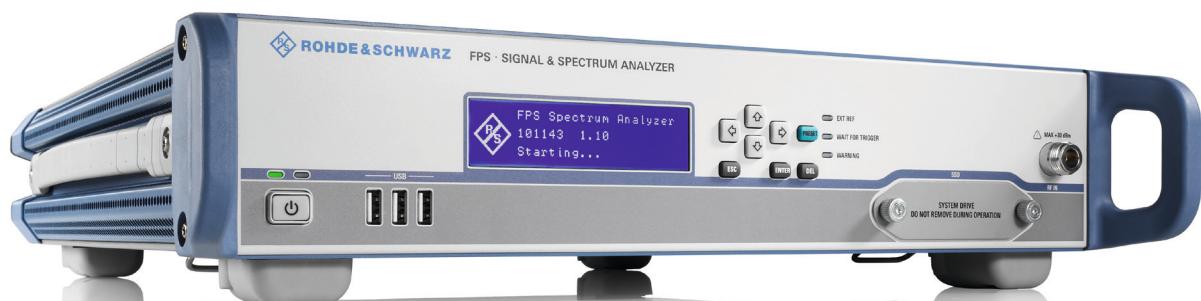


R&S®FPS

Signal and Spectrum Analyzer

Compact and fast for automated tests



R&S®FPS

Signal and

Spectrum Analyzer

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 4/7/13.6/30/40GHz
- 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.



R&S®FPS

Signal and

Spectrum Analyzer

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 IEEE802.11ac
- 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

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 signal generator from Rohde & Schwarz 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

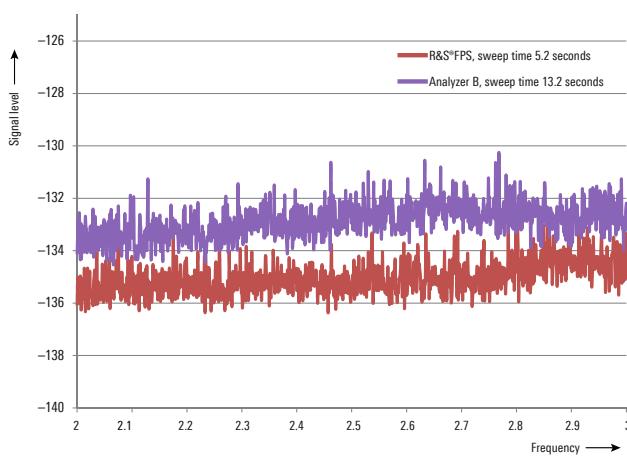
The R&S®FPS also offers a number of functions that speed up test routines, shorten alignment and measurement time and increase the overall throughput:

- PCIe for very fast control of signal generators
- 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

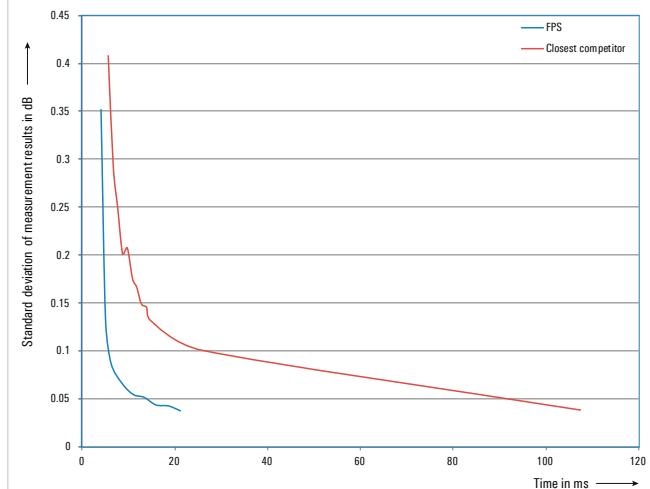
Efficient operation via remote control

- Gbit 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

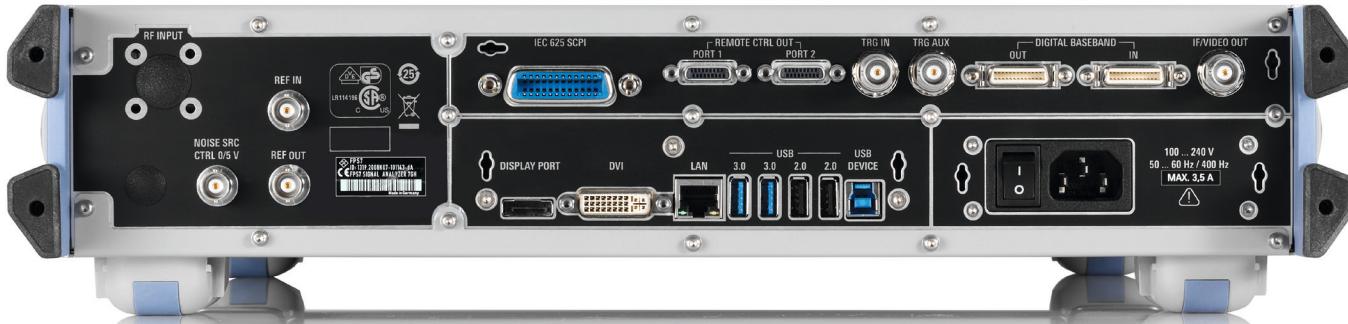
The R&S®FPS supports all standard interfaces. It communicates with other measuring instruments and the controller PC via GPIB, LAN (Gigabit Ethernet) or USB.

R&S®SGS100A SGMA RF sources can be extremely efficiently controlled via the PCIe bus. With R&S®FPSrun, the R&S®FPS can directly access the R&S®SGS100A register/memory/processor to change settings. This drastically reduces setup times.

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

These optimizations make it possible to set the frequency and level in 280 µs (typ.).

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

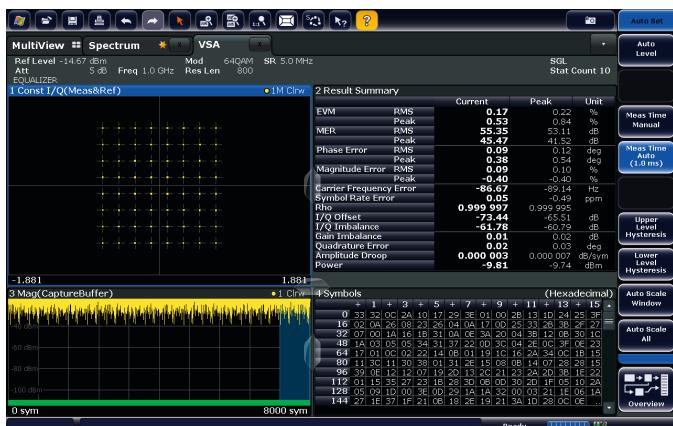
- Remote control compatibility with R&S®FSP and R&S®FSU spectrum analyzers
- Functional compatibility with existing Rohde & Schwarz signal and spectrum analyzers

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/symbol rate.



Signal analysis bandwidth

Standard	28 MHz bandwidth (standard)	40 MHz bandwidth (optional)	160 MHz bandwidth (optional)
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 wireless communications systems

Measurement application/technology	Power	Modulation quality	Spectrum measurements	Miscellaneous	Special features
R&S®FPS-K10 GSM/EDGE/EDGE Evolution	<ul style="list-style-type: none"> Power measurement in time domain, including carrier power 	<ul style="list-style-type: none"> EVM Phase/frequency error Origin offset suppression Constellation diagram 	<ul style="list-style-type: none"> Modulation spectrum Transient spectrum 	–	<ul style="list-style-type: none"> Single burst and multiburst Automatic detection of modulation
R&S®FPS-K72/-K73 3GPP FDD (WCDMA)	<ul style="list-style-type: none"> Code domain power Code domain power versus time CCDF 	<ul style="list-style-type: none"> 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) 	<ul style="list-style-type: none"> Spectrum mask ACLR Power measurement 	<ul style="list-style-type: none"> Channel table with summary of channels used on base station Timing offset Power versus time 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Code domain power Code domain power versus time CCDF 	<ul style="list-style-type: none"> EVM Peak code domain error Constellation diagram Residual code domain error I/Q offset Gain imbalance Center frequency error (chip rate error) 	<ul style="list-style-type: none"> Spectrum mask ACLR Power measurement 	<ul style="list-style-type: none"> Channel table with summary of channels used on base station Timing offset Power versus time 	<ul style="list-style-type: none"> 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®	<ul style="list-style-type: none"> Carrier power Code domain power Code domain power versus time CCDF 	<ul style="list-style-type: none"> RHO EVM Constellation diagram I/Q offset I/Q imbalance Center frequency error 	<ul style="list-style-type: none"> Spectrum mask ACLR Power measurement 	<ul style="list-style-type: none"> Channel table with summary of channels used on base station Timing offset 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Carrier power Code domain power Code domain power versus time CCDF 	<ul style="list-style-type: none"> 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) 	<ul style="list-style-type: none"> Spectrum mask ACLR Power measurement 	<ul style="list-style-type: none"> Channel table with summary of channels used on base station Timing offset 	<ul style="list-style-type: none"> Automatic detection of active channels and decoding of payload information Robust demodulation algorithms for reliable measurement of multicarrier signals

Measurement application/technology	Power	Modulation quality	Spectrum measurements	Miscellaneous	Special features
R&S®FPS-K91 WLAN IEEE 802.11a	■ 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-K91P WLAN IEEE 802.11p					
R&S®FPS-K91N WLAN IEEE 802.11n					
R&S®FPS-K91AC WLAN IEEE 802.11ac					
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®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.

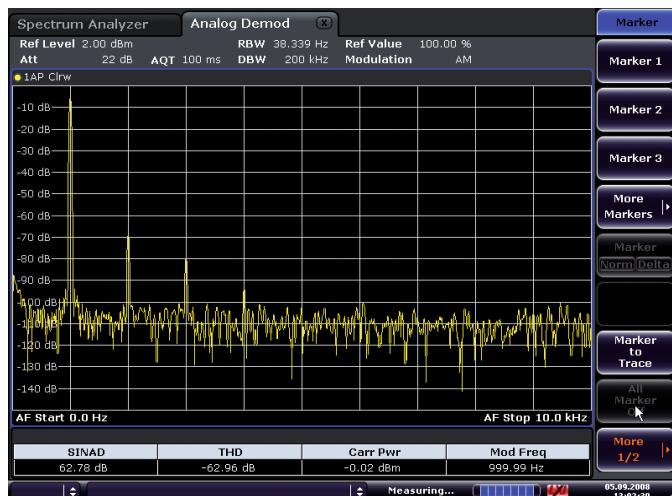
R&S®FPS-K7 option AM/FM/φM measurement demodulator

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, \pm peak/2
 - Modulation frequency
 - Carrier frequency offset
 - Carrier power
 - Total harmonic distortion (THD) and SINAD

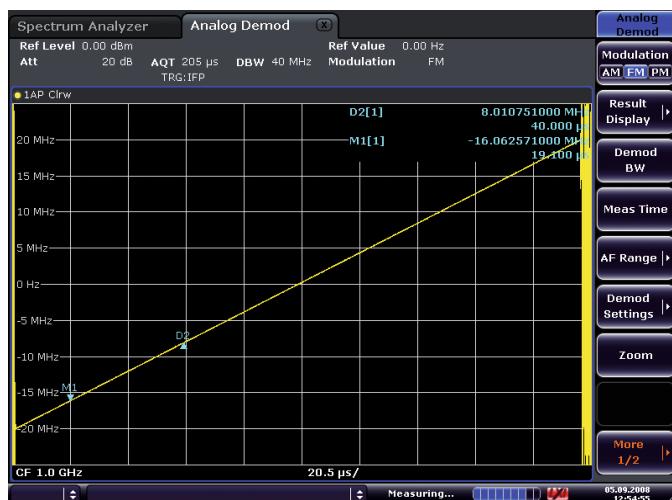
THD measurement on an amplitude-modulated signal. The first harmonic of the modulation signal is well suppressed by 69 dB. This corresponds to a THD (D2) < 0.1%.



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 kHz, 15 kHz, 23 kHz, 150 kHz and 5%, 10% or 25% of demodulation bandwidth
Deemphasis	25/50/75/750 μ s
Modulation frequency	< 14 MHz, > 20 MHz optional, max. 0.5 \times demodulation bandwidth
Measurement uncertainty (deviation or modulation factor)	3%

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



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, $\pi/4$ -DQPSK, $3\pi/8$ -8PSK, $\pi/8$ -D8PSK
- 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, 16APSK (DVB-S2), 32APSK (DVB-S2), $\pi/4$ -16QAM (EDGE), $-\pi/4$ -16QAM (EDGE)

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

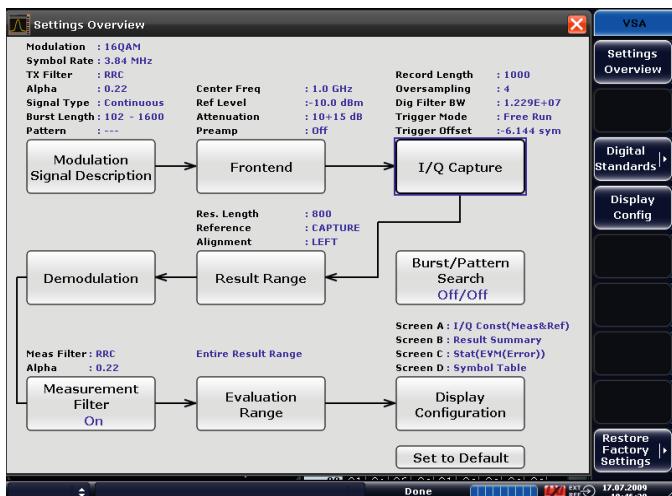
Statistical evaluations

- Histogram representation
- Standard deviation and 95th percentile in the result summary

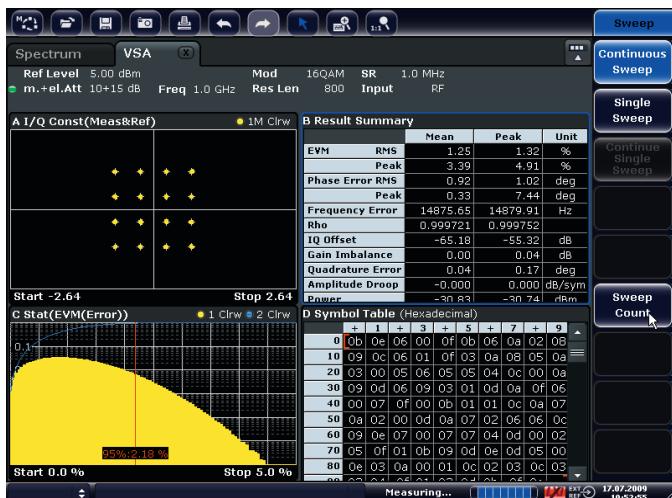
Spectrum analyses of the measurement and error signal considerably support users in finding signal errors such as incorrect filtering or spurious emissions

Flexible burst search for analyzing complex signal combinations, short bursts or signal mix – capabilities that go beyond the scope of many signal analyzers

Clearly structured block diagram display.



16QAM with four screens.



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

For data sheet, see PD 3606.9433.22 and www.rohde-schwarz.com

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
External Generator Control	R&S®FPS-B10	1321.4256.02
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
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
Rack Mount, preinstalled	R&S®FPS-B478	1321.4262.02
Firmware/software options		
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
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	R&S®FPS-K91n ¹⁾	1321.4204.02
Extension of R&S®FPS-K91 to IEEE 802.11p	R&S®FPS-K91p ²⁾	1321.4391.02
Extension of R&S®FPS-K91 to IEEE 802.11ac	R&S®FPS-K91ac ³⁾	1321.4210.02
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	R&S®FPS-K102 ⁴⁾	1321.4233.02
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

¹⁾ Requires R&S®FPS-K91 and R&S®FPS-B40 or R&S®FPS-B 160.

²⁾ Requires R&S®FPS-K91.

³⁾ Requires R&S®FPS-K91 and R&S®FPS-B 160.

⁴⁾ Requires R&S®FPS-K100 or R&S®FPS-K104.

Service options		
Extended Warranty, one year	R&S [®] WE1	Please contact your local Rohde & Schwarz sales office.
Extended Warranty, two years	R&S [®] WE2	
Extended Warranty, three years	R&S [®] WE3	
Extended Warranty, four years	R&S [®] WE4	
Extended Warranty with Calibration Coverage, one year	R&S [®] CW1	
Extended Warranty with Calibration Coverage, two years	R&S [®] CW2	
Extended Warranty with Calibration Coverage, three years	R&S [®] CW3	
Extended Warranty with Calibration Coverage, four years	R&S [®] CW4	

Your local Rohde & Schwarz expert will help you determine the optimum solution for your requirements.
To find your nearest Rohde & Schwarz representative, visit www.sales.rohde-schwarz.com

Service that adds value

- Worldwide
- Local and personalized
- Customized and flexible
- Uncompromising quality
- Long-term dependability

About Rohde & Schwarz

The Rohde & Schwarz electronics group is a leading supplier of solutions in the fields of test and measurement, broadcasting, secure communications, and radiolocation. Founded more than 80 years ago, this independent global company has an extensive sales network and is present in more than 70 countries. The company is headquartered in Munich, Germany.

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

Certified Environmental Management
ISO 14001

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