R&S®EB500
Monitoring Receiver
High-performance radiomonitoring from 9 kHz to 6 GHz

ROHDE & SCHWARZ

R&S®EB500 Monitoring Receiver
At a glance

The R&S®EB500 monitoring receiver is designed to meet the demanding requirements of ITU-compliant radiomonitoring tasks in stationary and mobile environments. The receiver is the ideal choice for these tasks because it is capable of operation via the front panel or remote-control software, performs high-speed signal searches in the spectrum, and gathers information by means of wideband demodulation. In addition, the R&S®EB500 can be used for a variety of other applications.

The R&S®EB500 monitoring receiver has an outstanding feature set for monitoring transmissions, detecting interference, locating unlicensed transmitters in the frequency spectrum, or even functioning as a search receiver. In addition, it is exceptionally compact and consumes relatively little power. The R&S®EB500 is the optimum solution for systems that need a high-specification receiver but only have limited available space. When combined with analysis software (such as R&S®GX430, for example), it provides users with a compact receiving and analysis system covering a wide frequency range from 9 kHz to 6 GHz.

The receiver can be operated with diverse antennas such as broadband omnidirectional antennas and directional antennas. To limit overloading when used with omnidirectional antennas, the R&S®EB500 is equipped with a preselection stage (as recommended by ITU) that avoids intermodulation and overloading.

Due to its compact size and excellent balance between performance and power consumption, the R&S®EB500 is designed not just for stationary operation but also for installation in vehicles, in aircraft (as payload) or in unmanned aerial vehicles (UAV).

Key facts
∎ Fast panorama scan with up to 12 GHz/s across the entire frequency range from 9 kHz to 6 GHz
∎ 1 kHz to 20 MHz IF spectrum and parallel demodulation with bandwidths from 100 Hz to 5 MHz
∎ Spectrum and spectrogram (waterfall) display on receiver (model .03) or on PC via the R&S®EB500-Control software (model .02)
∎ 1 Gbit LAN interface for remote control and data output
∎ Comparatively low power consumption for efficient DC operation, e.g. on a vehicle battery
∎ Space-saving system integration due to ½ 19" width and three height units
∎ Classification and analysis of signals up to 5 MHz bandwidth (analog and digital modulation) through evaluation of the I/Q data stream using the R&S®GX430IS software (in offline mode), for example

Front panel without control elements, remote control via LAN interface.

R&S®EB500 Monitoring Receiver
Applications and key features

Applications

Interference detection and location in professional radio networks

◾ Reliable detection of radio interference caused, for example, by defective electronic equipment
◾ Fast and effective identification of interference sources, e.g. at airports

Monitoring of user-specific radio services

◾ Monitoring of a large number of radio services with different scan modes

Nationwide monitoring system for regulatory authorities

◾ ITU-compliant spectrum monitoring using the R&S®ARGUS system software
・ When combined with the R&S®ARGUS spectrum monitoring software, the receiver reliably and efficiently performs all key measurements listed in the ITU spectrum monitoring handbook and related recommendations

Handoff receiver in networked systems

◾ Parallel demodulation of multiple narrowband signals and simultaneous broadband spectrum scanning

Key features

High receiver sensitivity, high signal resolution

◾ State-of-the-art FFT-based digital signal processing for high receiver sensitivity and detection of extremely weak signals, without any loss in processing speed
◾ Significantly superior receiver sensitivity and signal resolution (compared with conventional analog broadband receivers)

Retrieval of information through demodulation and signal analysis in a compact system

◾ Online LAN transfer from an R&S®EB500 to a PC and the R&S®GX430 analysis software, for example, for operating an efficient small system for signal reception and analysis
◾ Online analysis or recording of captured data using R&S®GX430, provision of data for documentation, replay or subsequent additional evaluation
◾ ITU-compliant signal analysis in line with ITU-R SM.1600 using R&S®GX430 and R&S®GX430IS, optimum tool for single-channel analysis and measurement of analog and digitally modulated signals in accordance with ITU requirements

Efficient operation via remote control

◾ Remote control of all receiver functions via LAN interface (SCPI command set)
◾ LAN interface for providing the maximum measured data rate during receiver operation; efficient remote operation in unattended monitoring stations (interface essential, especially for systems integrators who need to incorporate the receiver into existing software environments)

Convenient remote control with R&S®EB500-Control software

◾ Short learning curve due to straightforward menu structure and simple operation
◾ Alignment of displayed signals (depending on task), optimum display on screen
◾ Remote control of receiver via PC, recording of measured data on hard disk and replay of data on PC for analysis purposes
◾ Expansion of remote-control software functionality through options and add-ons from the R&S®RAMON software suite

Future-ready investment

◾ Wide frequency range and outstanding performance
◾ Capable of receiving, demodulating and processing signals of current and future radio services

Interference detection and location in professional radio networks

Its high performance and wide range of special functions make the R&S®EB500 an ideal choice for detecting all types of radio interference efficiently.

Reliable detection of radio interference caused, for example, by defective electronic equipment

To master these tasks, the receiver includes special functions such as selectable measurement time and continuous or periodic level output. Since these functions are also effective in the panorama scan spectrum, even non-periodic interferers can be easily detected. Such interferers are otherwise very difficult to detect due to their irregular appearance in a quickly changing spectrum.

Fast and effective identification of interference sources, e.g. at airports

The simultaneous use of the R&S®GX430 analysis software allows efficient differentiation between wanted signals and possible interference signals. Fast differentiation is especially important in security-critical radio scenarios (e.g. air traffic control, ATC) and helps the service provider to prevent costly failures. The combination of a fast panorama scan to acquire an overview of the situation with subsequent scanning and analysis in fixed-frequency mode based on I/Q data is particularly well suited to such applications.

In the panorama scan mode, the frequency range of interest is scanned in steps of max. 20 MHz, and an FFT of suitable width is calculated for each step. The step width for the fast panorama scan can be selected to match the channel spacing used by a wide variety of radio services. The panorama scan provides high scan rates at narrow resolution bandwidths, yielding high sensitivity and signal resolution.

Interference in radiocommunications, e.g. at airports, not only impedes operation — it may even pose a threat to life.

Monitoring of user-specific radio services

The frequency scan mode is mainly intended for monitoring radio services that use fixed channel spacing as compared to memory scan that is used for variable channel spacing.

Monitoring of a large number of radio services with different scan modes

In the frequency scan mode, a user-defined frequency range is scanned using fixed channel spacing. The receiver steps through the frequency range of interest and checks every channel for occupancy. If a signal is detected with a level exceeding the predefined threshold, the receiver dwells at the corresponding frequency for the set hold time, allowing for the signal to be demodulated and processed. In the case of analog modulation, the demodulated signal can be monitored via the headphones or loudspeaker.

In the memory scan mode, predefined channels stored in memory locations are consecutively scanned and analyzed to see if any signals are present. The R&S®EB500 offers 10000 user-definable memory locations. Receive parameters can be assigned separately to each memory location.

The memory scan mode is particularly useful for scanning individual frequencies that do not have a fixed channel spacing or that use different demodulation modes and bandwidths. The memory scan mode offers users a greater degree of freedom than the frequency scan mode in similar applications.

Smooth operation of an organization's own radio network is vital to ensure operational readiness — not only for government operators.

Nationwide monitoring system for regulatory authorities

ITU-compliant spectrum monitoring using the R&S®ARGUS system software

For more than 20 years, R&S®ARGUS has been a highly successful control software solution for ITU-compliant measurement and analysis tasks. It offers a variety of measuring modes designed to support typical measurement procedures and greatly simplify everyday tasks. It can also perform a large number of analyses that enable detailed evaluation of measurements and the creation of precise, in-depth reports. These capabilities are now also available in combination with the R&S®EB500.

Full access to receiver functions from a PC

The user-friendly standard interface in R&S®ARGUS makes the entire range of R&S®EB500 functionality available on a PC. Measurement results are displayed in realtime in the form of graphics and tables. The results are stored along with the receiver settings in an internal database to allow subsequent evaluation in line with ITU requirements.

The entire system is calibrated, taking into account the frequency-dependent sensitivity of the antenna and attenuation and loss in cables and switches.

Automatic identification of deviations from the desired state

In combination with R&S®ARGUS, the R&S®EB500 can automatically identify whether the current signal scenario is consistent with expectations. Users can define a valid range of values for each measurement parameter depending on the frequency. If a measured value is outside the defined range, R&S®ARGUS immediately issues an alarm. New and unknown transmitters can thus be discovered just as easily as transmitters that exceed licensed broadcast parameters (e.g. excessive frequency deviation). This is especially important in connection with digitally modulated signals such as DAB and DVB-T. The implementation of vestigial sideband measurements in R&S®ARGUS in line with ITU recommendations (comparing the realtime signal against a spectrum mask) is particularly user-friendly (see figure).

Guided measurements

One unique feature in R&S®ARGUS are its guided measurement modes. Users simply choose a frequency range and the type of measurement task (field strength, spectrum occupancy or bandwidth, for example). R&S®ARGUS then configures the right device settings automatically and selects the appropriate antenna based on the frequency and polarization. This allows even relatively inexperienced users to conduct complex measurements with the R&S®EB500.
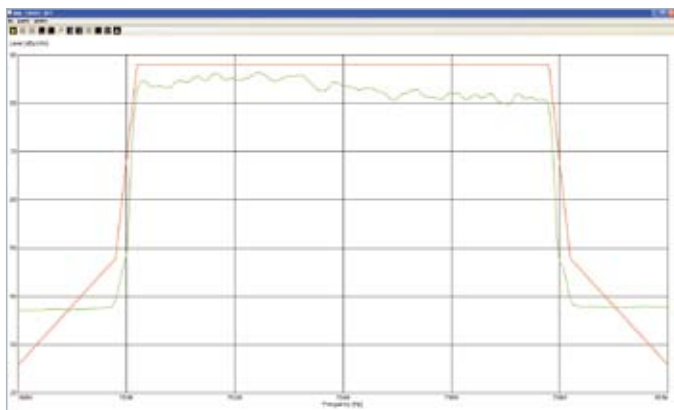
Spectrum of a DVB-T transmitter with a mask overlay in line with ITU recommendations.

Easy integration into existing R&S®ARGUS radiomonitoring systems

The R&S®EB500 is quick and easy to integrate into existing infrastructures – as a replacement for existing equipment or to expand a station's measurement capabilities. Importantly, the receiver can operate not just in combination and coordination with other equipment such as direction finders and specialized analysis devices but also as a hand-off receiver in a networked system. The ability to operate in parallel is not confined to the devices within a single radiomonitoring station: Multiple devices at separate stations can process several measurement tasks synchronously.

Remote operation made easy

Remote operability is a key requirement for radiomonitoring systems, and here, too, R&S®ARGUS sets standards. It has built-in sophisticated bandwidth management (SBM) that tunes the transmission rate to suit the available network bandwidth. If necessary, the software can reduce and compress data automatically. This ensures, for example, that the receiver's IF spectrum and audio streams reach the central station in sufficiently high quality, even with narrowband connections.

Nationwide radiomonitoring network at a glance – R&S®ARGUS SIS

Another advanced feature of R&S®ARGUS is its station information system (SIS). The SIS shows the current status of every radiomonitoring system location on an electronic map. The information provided includes the current connection status, the availability and utilization of measuring equipment, and ambient parameters such as temperature, humidity and the power supply status in unattended radiomonitoring stations.

The map display also supports remote control features. When users click a symbol on the map, R&S®ARGUS automatically connects to the receiver in question. The R&S®EB500 in the remote station is then ready to accept measurement tasks.

Station information system (SIS) display

UMS100-99992

River police

Headquarters at Munich airport (Germany)
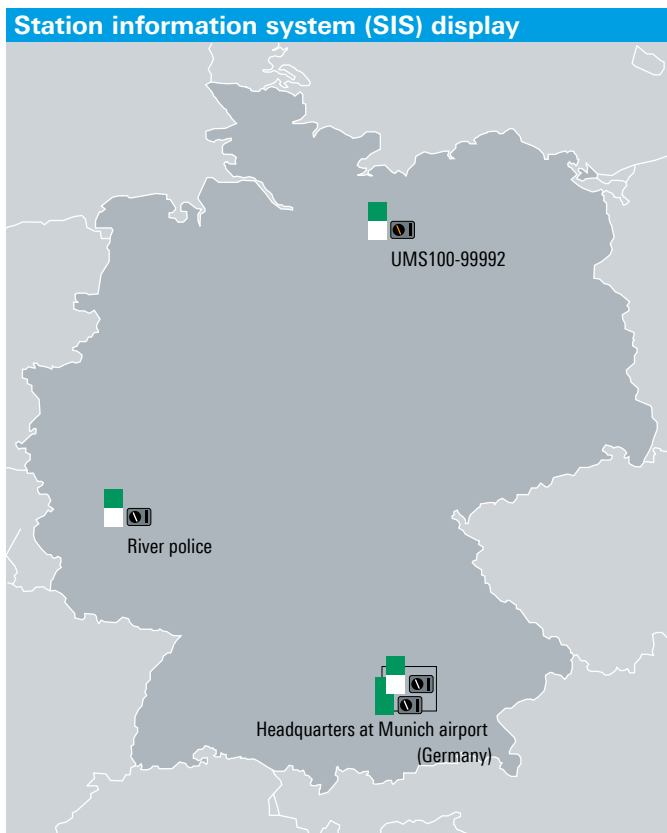
An example map showing a number of monitoring stations and their current status (indicated by different colors).

Handoff receiver in networked systems

Parallel demodulation of multiple narrowband signals and simultaneous broadband spectrum scanning

Multiple R&S®EB500 devices can be combined with a fast and powerful search receiver (e.g. the R&S®ESMD) and operated as a system. The R&S®EB500 devices demodulate signals and produce audio or I/Q data streams, while the R&S®ESMD quickly searches for other signals with an extremely high level of sensitivity. A separate R&S®EB500 is required for each signal that is to be processed in parallel.

The handover of a signal from the R&S®ESMD to an R&S®EB500 is carried out from the user workstation running with R&S®RAMON system software. The major advantage of this system configuration is that the fast signal search across a wide frequency scenario and the narrowband production of multiple audio or I/Q data streams occur simultaneously. This allows the user to achieve optimum results in a minimum of time.

Multiple R&S®EB500 devices can be operated together with an R&S®ESMD and operated as a system.

Specifications in brief of the R&S®ESMD	
Frequency range	
Base unit	20 MHz to 3.6 GHz
HF option	9 kHz to 32 MHz
SHF option	3.6 GHz to 26.5 GHz
Linearity, third-order intercept, inband	
9 kHz to 32 MHz	typ. 35 dBm (low distortion mode)
20 MHz to 3.6 GHz	typ. 25 dBm (low distortion mode)
3.6 GHz to 26.5 GHz	typ. 17 dB (attenuation > 0 dB)
Noise figure	
400 kHz to 32 MHz	typ. 12 dB (normal mode)
20 MHz to 3.6 GHz	typ. 9 dB (low noise mode)
3.6 GHz to 26.5 GHz	typ. 16 dB
IF bandwidth	
Spectral path	1 kHz to 20 MHz (80 MHz)
Demodulation path	100 Hz to 20 MHz (80 MHz for I/Q)
Data interface	1 Gbit LAN (Ethernet 1000BaseT)

Convenient remote control with R&S®EB500-Control software

The R&S®EB500-Control remote control software is supplied free of charge with the R&S®EB500. It is part of the R&S®RAMON software family and enables convenient and efficient operation of the receiver from a PC workstation. The software offers a straightforward menu structure and intuitive operation so that training requirements for operating personnel are minimal.

Major functional features of R&S®EB500-Control

Fast and simple operation
The main functions can be accessed using shortcuts.

The graphical display of results includes:
▪ IF spectrum with waterfall diagram
▪ Panorama scan spectrum with waterfall diagram
▪ Level indication based on demodulation path

Users can adapt the colors of the display and the size and arrangement of the windows as required for a specific task or area of application. Easy-to-use measurement functions are available within the diagrams.

### Display, storage and playback of spectra and waterfall data
R&S®EB500-Control enables the recording and playback of panorama scan and IF signal spectra. In addition, digital audio data and I/Q baseband data (digital IF) of up to 5 MHz bandwidth can be stored, e.g. for the subsequent analysis of digitally modulated signals.

### Buffering of frequency scan data in a ring buffer
Recording in the ring buffer can be stopped by a mouse click. The stored signals are then available in playback mode for analysis.
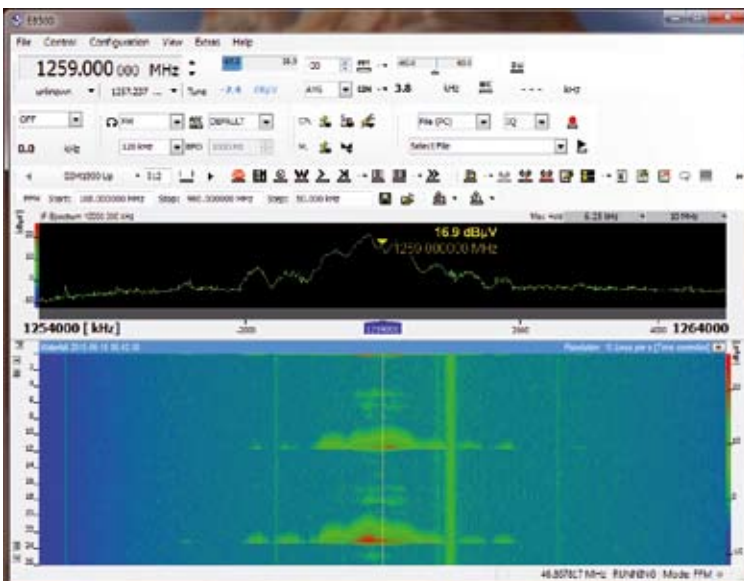
Frequency list for marking signals
With a mouse click, radio channels can be marked, saved in a list and graphically placed over the spectrum. The frequency list is available for storage and subsequent analysis.
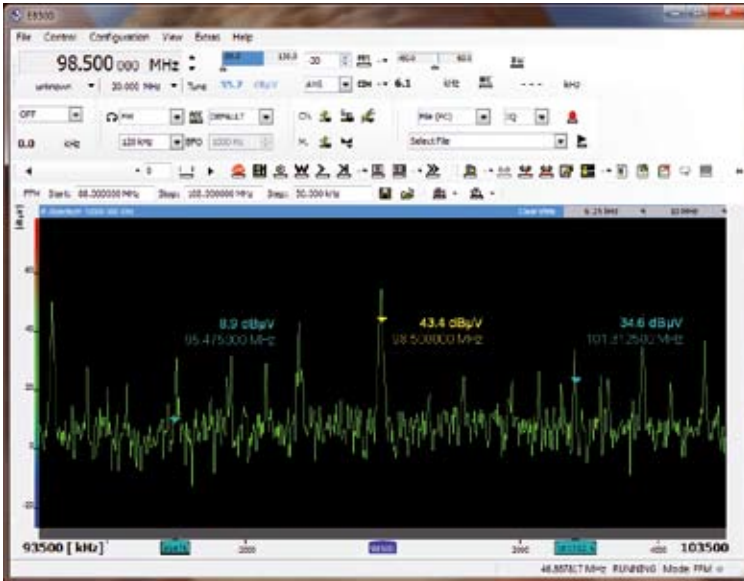
Display of IF spectrum and use of marker function.
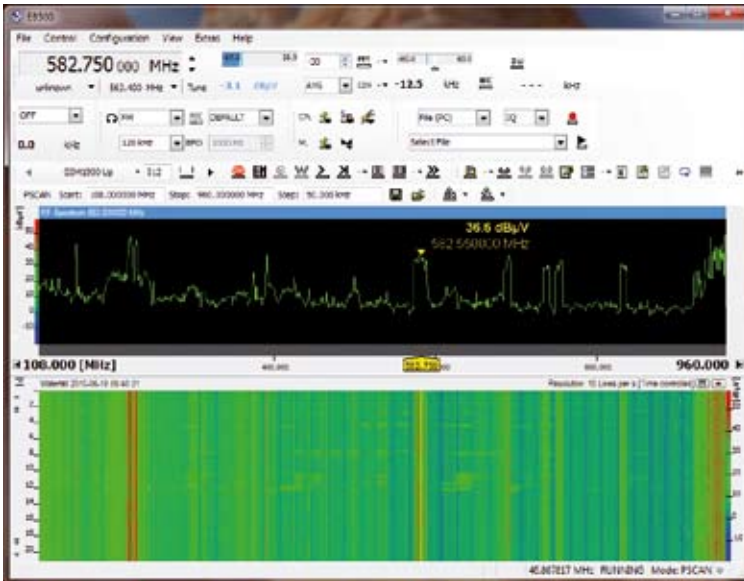
Wideband panorama scan with MaxHold function and waterfall diagram.

IF spectrum and waterfall diagram of a radar signal from Munich airport (Germany).

Operating principle

Frontend

Signals are fed in via two separate antenna sockets. One of the sockets can be used for HF signals from 9 kHz to 32 MHz, the other is a combined socket for HF/VHF/UHF signals from 9 kHz to 6 GHz. A switching system splits the input signals across three separate signal processing paths, based on frequency.

Signals from 9 kHz to 32 MHz are routed directly to the A/D converter via an HF preselection block consisting of a tunable bandpass filter and a 32 MHz lowpass filter. Signals from 20 MHz to 650 MHz or from 650 MHz to 6 GHz are routed to the two-stage or three-stage IF section through the VHF/UHF preselection and a preamplifier (variable gain). The preselection and the low distortion mode effectively protect the IF sections against overloading.

The two IF sections process the signals from 20 MHz to 6 GHz for the subsequent A/D converter.

Digital signal processing

After A/D conversion of the signal (in each case, with a 16-bit converter), the signal path is split up:

In the first path, the IF spectrum is calculated by means of a digital downconverter (DDC), a digital filter and an FFT block. The bandwidth of the bandpass filter can be selected between 1 kHz and 20 MHz. Before the IF spectrum

is output via the LAN interface or on the display, results are postprocessed by means of the Average, MinHold or MaxHold function as selected by the user.

In the second path, which also includes a DDC and digital filters, the signal is processed for level measurement or demodulation. To process the different signals with optimum signal-to-noise ratio, the receiver contains IF filters with demodulation bandwidths from 100 Hz to 5 MHz, which can be selected independently of the spectral IF bandwidth.

Prior to the level measurement, the absolute value of the level is determined and weighted using the Average, Peak, RMS or Fast (Sample) function, as selected by the user. The measured level is then output on the display or via the LAN interface.

To demodulate analog modulated signals, the complex baseband data passes through AM, FM, USB, LSB, ISB, pulse or CW demodulation stages after the bandpass filter and is subjected to automatic gain control (AGC) or manual gain control (MGC). After the AGC/MGC stage, the complex baseband data (I/Q data) resulting from the digitally modulated signals is directly output for further processing.

The results obtained are available as digital data and can be output via the LAN interface as required for the particular task. Digital audio data is reconverted to analog signals for output via the headphone socket or loudspeaker.

Block diagram of frontend
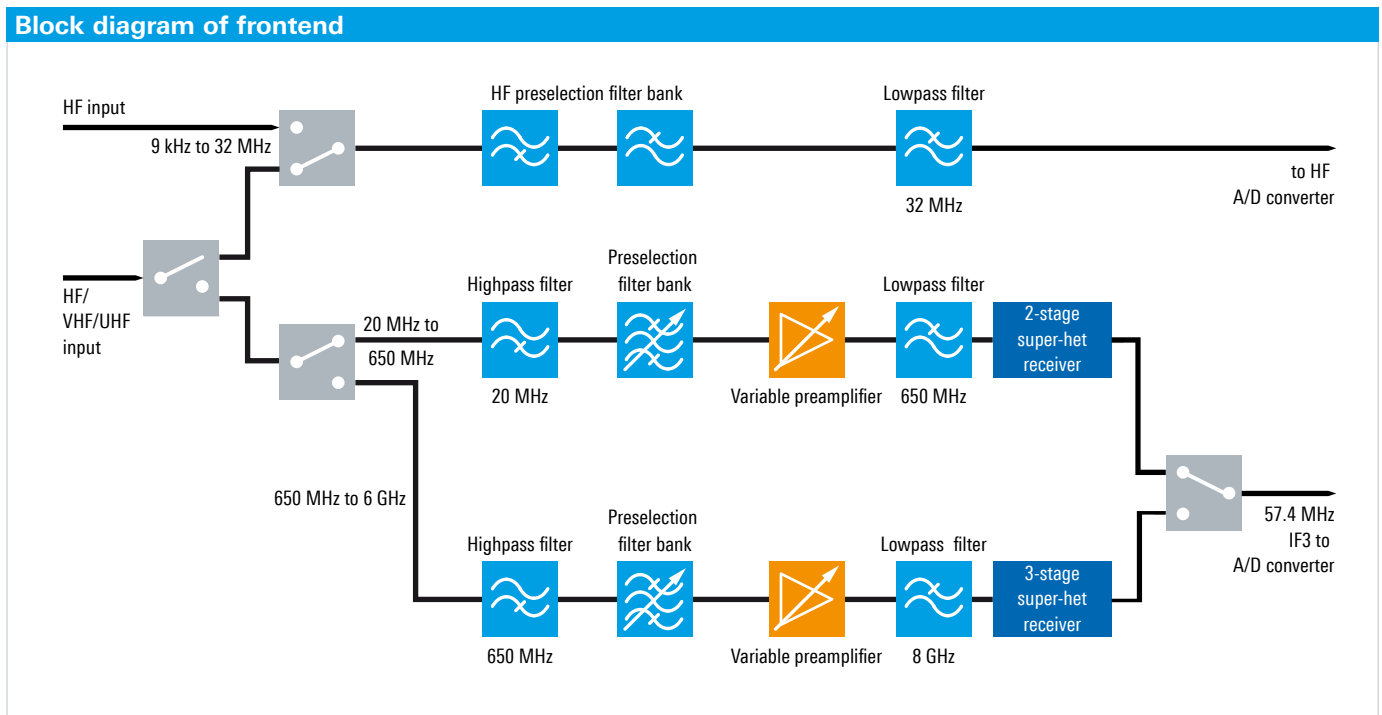
Analog signals are reconverted from the I/Q data by a 16 bit D/A converter; they are then available as analog IF signals or analog video data.

High receiver sensitivity, high signal resolution

The R&S®EB500 features an IF bandwidth of up to 20 MHz. This allows even very short signal pulses to be captured since the receiver displays the wide bandwidth of 20 MHz in a single spectrum around the set center frequency without any scanning being required.

Using the AUTO setting, the widest IF bandwidth of 20 MHz yields the widest spectral display; the narrowest IF bandwidth of 1 kHz yields maximum sensitivity and resolution.

The receiver's IF spectrum is digitally calculated using Fast Fourier Transform (FFT). The use of FFT computation at the IF offers a major advantage: The receiver sensitivity and signal resolution are clearly superior to those of a conventional analog receiver at the same spectral display width.

IF spectrum

FFT calculation of the IF spectrum is performed in a number of steps. These are described below in simplified form for an IF bandwidth of 20 MHz ($BW_{IF\ spectrum}$ = 20 MHz), which yields high spectral display.

Due to the finite edge steepness of the IF filter, the sampling rate f_S must be larger than the selected IF bandwidth $BW_{IF\ spectrum}$. The quotient of the sampling rate and the IF bandwidth is thus a value > 1 and is a measure of the edge steepness of the IF filter. This relationship is expressed by the following two formulas (for the AUTO setting):

$$\frac{f_s}{BW_{IF\ spectrum}} = const$$

or

$$f_S = BW_{IF\ spectrum} \times const$$

The value of the constant is dependent on the selected IF bandwidth, i.e. it may vary as a function of the IF bandwidth.

Block diagram of digital signal processing
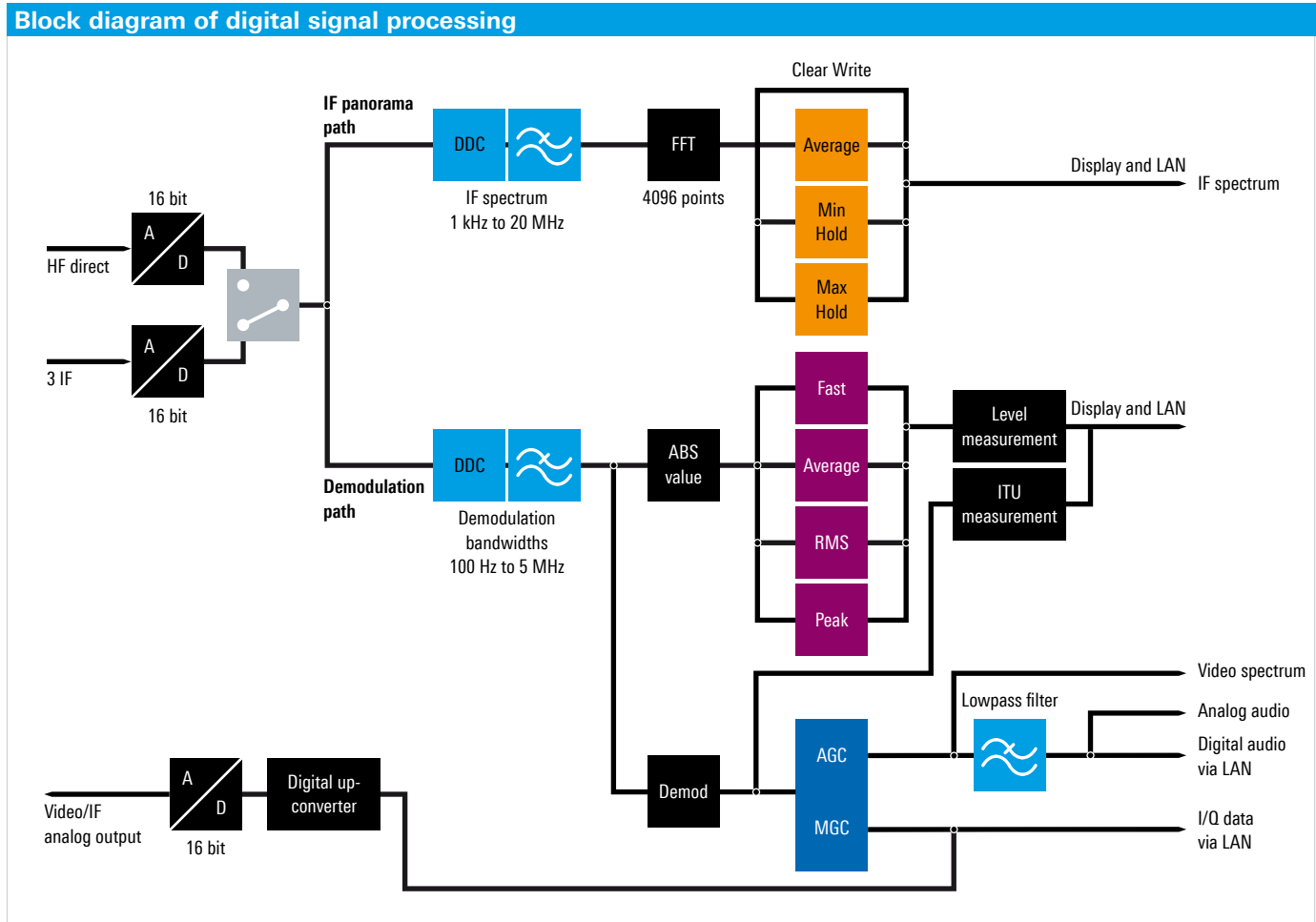
For an IF bandwidth of $BW_{IF\ spectrum}$ = 20 MHz, the constant has a value of 1.28. Therefore, to display a 20 MHz IF spectrum, a sampling rate of f_S = 25.6 MHz is required.

The R&S®EB500 uses a maximum FFT length N of 4096 points to generate the IF spectrum. To calculate these points, the 25.6 MHz sampling band in the above example is divided into 4096 equidistant frequency slices, which are also referred to as bins (see figure "Signal processing for IF spectrum").

The bandwidth BW_{bin} of the frequency slices is obtained as follows:

$$BW_{Bin} = \frac{f_s}{4096} = \frac{25.6\ MHz}{4096} = 6.25\ kHz$$

This means that in the above example only the calculated bandwidth of 6.25 kHz for each bin has to be taken into account as the noise bandwidth in the calculation of the

displayed noise level (DNL) in accordance with the formula below (the effect of the window function (Blackman window) of the FFT is not considered here for simplicity's sake):

$$DNL = -174\ dBm + NF + 10 \times \log(BW_{bin}/Hz)$$

The quantity NF represents the overall noise figure of the receiver.

The above example shows that, due to the use of the FFT, the actual resolution bandwidth (RBW) to be taken into account in DNL calculation is clearly smaller (i.e. BW_{bin}) than would be expected for the wide (unscanned) display range of 20 MHz.

Another advantage of the high spectral resolution used in the FFT calculation is that signals located close together (e.g. f_1, f_2 and f_3) can be captured and represented in the IF spectrum as discrete signals (see figure "Signal display in IF spectrum").

If, on an analog receiver, a resolution bandwidth equal to the set IF bandwidth were selected (RBW = $BW_{IF\ spectrum}$), a sum signal f_{sum} would be displayed instead of the three discrete signals f_1, f_2 and f_3.

Signal processing for IF spectrum
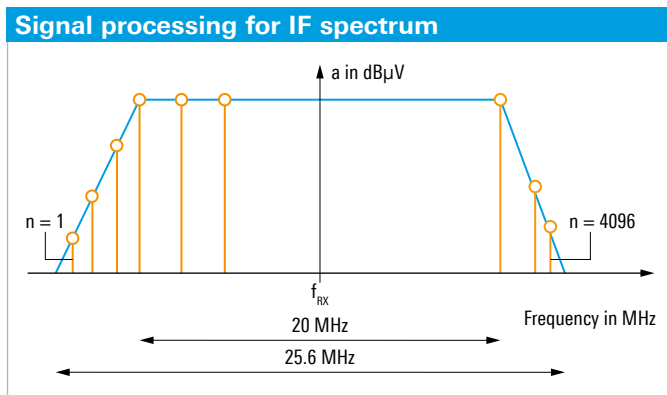
Actual sampling bandwidth compared with selected IF bandwidth.

Signal display in IF spectrum
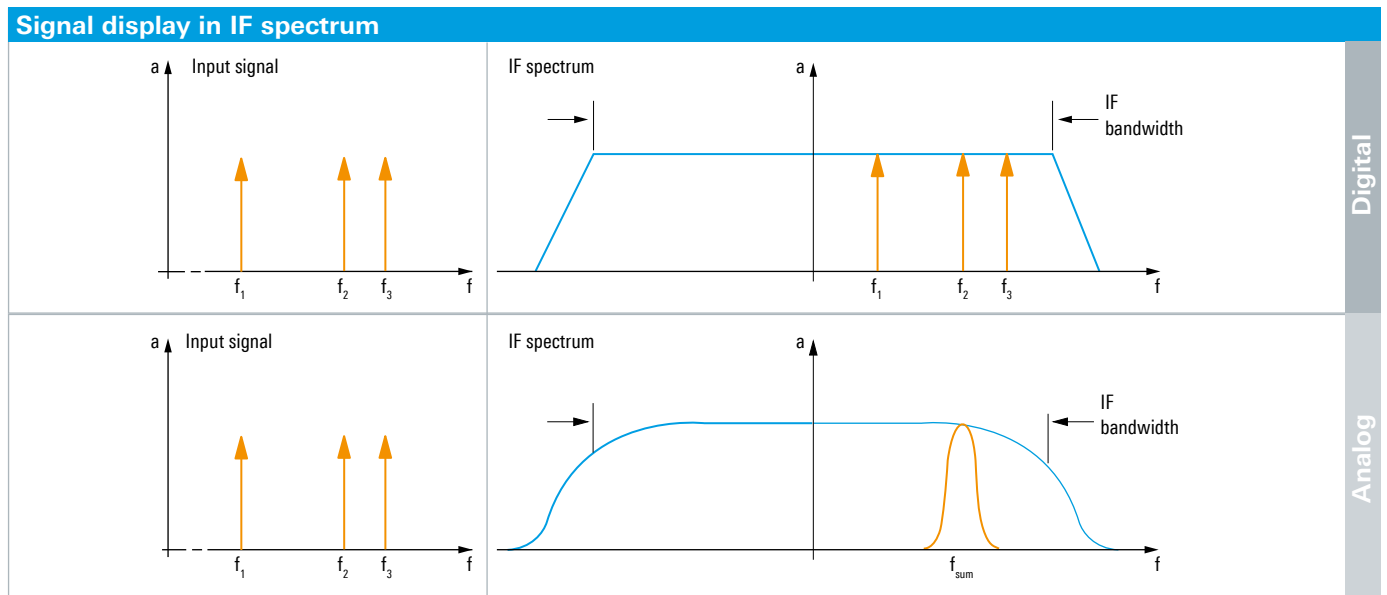
Signal resolution in IF spectrum in digital and analog receiver concept.

The realtime signal processing at the IF level also includes other high-performance capabilities, such as overlapping FFT for the optimum capture of pulsed signals and a configurable bin width for adjusting to the channel spacing of known radio services. These functions are described in detail in the user manual.

Panorama scan

The receiver's maximum FFT bandwidth of 20 MHz makes it possible to perform extremely fast scans across a wide frequency range (panorama scan). For this purpose, frequency windows of max. 20 MHz width are linked in succession, so that the complete, predefined scan range is traversed (see figure "Signal processing in panorama scan mode"). As for the IF spectrum, an FFT is used to process the broad window with a finer resolution.

The width of the frequency window and the FFT length (number of FFT points) are variable and are selected by the receiver.

In the panorama scan mode, the user can select among 24 resolution bandwidths from 100 Hz to 2 MHz. The resolution bandwidth corresponds to the width of the frequency slices (bin width) mentioned under "IF spectrum". Based on the selected bin width and start and stop frequency,

the R&S®EB500 automatically determines the required FFT length and the width of the frequency window for each scan step. The receiver selects these internal parameters so that the optimum scan speed is achieved for each resolution bandwidth (see figure "Resolution in panorama scan mode").

In the panorama scan mode, the resolution bandwidth of 2 MHz yields the maximum scan speed, while the resolution bandwidth of 100 Hz yields maximum sensitivity.

The resolution bandwidth (bin width) for the panorama scan (selectable between 100 Hz and 2 MHz) therefore corresponds to the resolution bandwidth (BW_{bin}) used in the DNL calculation for the IF spectrum (see DNL formula under "IF spectrum"), and can be used for calculating the DNL for the panorama scan. Moreover, the user selects the resolution bandwidth to obtain the desired frequency resolution (see figure "Bin width and channel spacing").

The above explanations show that the use of digital signal processing in a radiomonitoring receiver offers decisive advantages. Extremely high sensitivity (due to very fine resolution) combined with a broad spectral overview and maximum scan speed significantly increases the probability of intercept in comparison with an analog receiver.
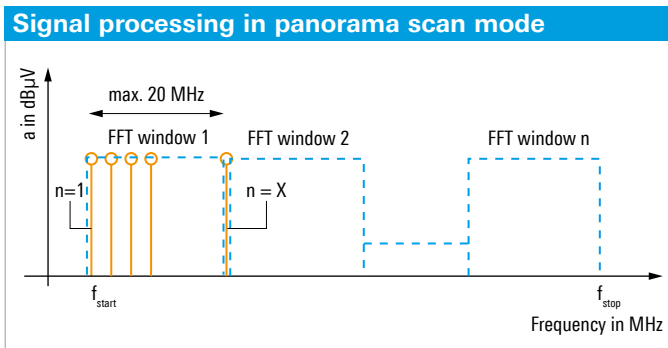
Basic sequence of steps in fast panorama scan mode.
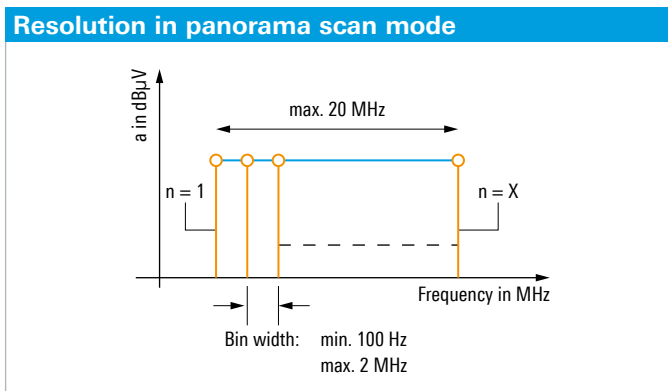
Selecting the panorama scan resolution by varying the bin width.
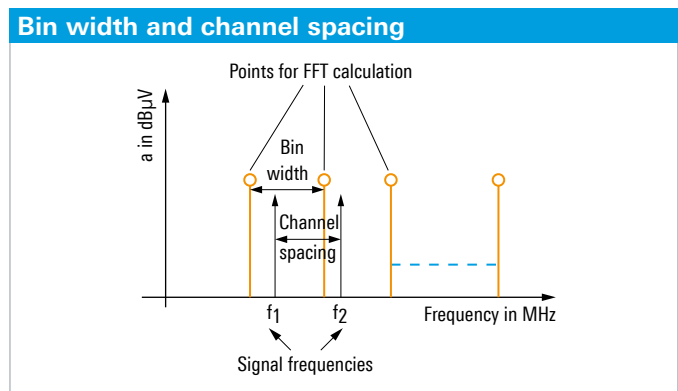
Selecting a 12.5 kHz bin width to capture a radio service using 12.5 kHz channel spacing.

Specifications in brief

Specifications in brief		
Frequency		
Frequency range	base unit	20 MHz to 3.6 GHz
	with R&S®EB500-HF option	9 kHz to 3.6 GHz
	with R&S®EB500-FE option	20 MHz to 6 GHz
	with R&S®EB500-HF and R&S®EB500-FE options	9 kHz to 6 GHz
Linearity		
Third-order intercept point (IP3)		
9 kHz to 32 MHz	low distortion mode (150 kHz spacing at –5 dBm)	
	1 MHz ≤ f ≤ 32 MHz	typ. 35 dBm
	9 kHz ≤ f < 1 MHz	typ. 30 dBm
20 MHz to 6 GHz	low distortion mode (2 MHz spacing at –20 dBm)	
	20 MHz ≤ f ≤ 650 MHz	typ. 19 dBm
	650 MHz ≤ f ≤ 6 GHz	typ. 14 dBm
Noise figure		
9 kHz to 32 MHz	normal mode	
	400 kHz ≤ f ≤ 30 MHz	typ. 12 dB
	f > 30 MHz	typ. 16 dB
20 MHz to 3.6 GHz	normal mode	typ. 10 dB
3.6 GHz to 6 GHz	normal mode	typ. 15 dB
Demodulation		
Demodulation modes	all IF bandwidths	AM, FM, PM, PULSE, I/Q
	IF bandwidths ≤ 9 kHz	LSB, USB, CW
	IF bandwidths ≥ 1 kHz	ISB
IF bandwidths		
Bandwidth	demodulation, level and offset measurements (3 dB bandwidth), 29 filters	100/150/300/600 Hz, 1/1.5/2.1/2.4/2.7/3.1/4/4.8/6/9/12/15/30/50/120/150/250/300/500/800 kHz, 1/1.25/1.5/2/5 MHz
IF panorama		
FFT IF panorama	up to 4096-point FFT	dynamic, overlapping FFT
	operating modes	automatic or variable with selectable frequency resolution
		0.625/1.25/2.5/3.125/6.25/12.5/25/31.25/50/62.5/100/125/200/250/312.5/500/625 Hz, 1/1.25/2/2.5/3.125/5/6.25/8.333/10/12.5/20/25/50/100/200/500 kHz, 1 MHz, 2 MHz
IF panorama span		1/2/5/10/20/50/100/200/500 kHz, 1/2/5/10/20 MHz
Panorama display		ClearWrite, Average, MaxHold, MinHold
Scan characteristics		
Memory scan		10 000 programmable memory locations
	speed	up to 500 channels/s
Frequency scan		user-selectable start/stop frequency and step width
	speed	up to 500 channels/s
Panorama scan	with R&S®EB500-PS option	RF spectrum with user-selectable start/stop frequency and step width: 100/125/200/250/500/625 Hz, 1/1.25/2/2.5/3.125/5/6.25/8.333/10/12.5/20/25/50/100/200/500 kHz, 1 MHz, 2 MHz
	speed	up to 12 GHz/s

Ordering information

Designation	Type, description	Order No.
Monitoring Receiver, with control front panel	R&S®EB500	4072.5004.03
	frequency range from 20 MHz to 3.6 GHz, IF spectrum (max. 20 MHz), remote control software supplied with receiver	
Monitoring Receiver, without control front panel	R&S®EB500	4072.5004.02
	frequency range from 20 MHz to 3.6 GHz, IF spectrum (max. 20 MHz), remote control software supplied with receiver	
Hardware options		
HF Frequency Range Extension	R&S®EB500-HF	4072.8003.02
	frequency range from 9 kHz to 32 MHz	
Software options		
SHF Frequency Range Extension	R&S®EB500-FE	4072.9300.02
	frequency range from 3.6 GHz to 6 GHz	
Panorama Scan	R&S®EB500-PS	4072.9200.02
	RF scan, high-speed FFT scan across user-selectable range, selectable spectral resolution	
ITU Measurement Option	R&S®EB500-IM	4072.9100.02
	ITU-compliant measurement of AM/FM-modulated signals in the R&S®EB500	
Software Package in line with ITU-R SM.1600 (PC-based software for ITU-compliant measurement of signals with analog or digital modulation)	R&S®GX430IS (R&S®GX430 required for using R&S®GX430IS with R&S®EB500)	4071.5817.02
Service options		
Two-Year Calibration Service	R&S®CO2EB500	Please contact your local Rohde & Schwarz office
Three-Year Calibration Service	R&S®CO3EB500	
Five-Year Calibration Service	R&S®CO5EB500	
One-Year Repair Service following the warranty period	R&S®RO2EB500	
Two-Year Repair Service following the warranty period	R&S®RO3EB500	
Four-Year Repair Service following the warranty period	R&S®RO5EB500	

For data sheet, see PD 5214.3800.21 and www.rohde-schwarz.com.

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

Rear view of the R&S®EB500. The power supply input, LAN interface and additional AUX interfaces are accessible from the rear for optimal rack installation.

From pre-sale
to service.
At your doorstep.

The Rohde & Schwarz network in over 70 countries ensures optimum on-site support by highly qualified experts.
The user risks are reduced to a minimum at all stages of the project:
Solution finding/purchase
∎ Technical start-up/application development/integration
∎ Training
∎ Operation/calibration/repair

Sales Level
- Sales Locations

Service Level
- Backup Service
- Area Support Center

Local Service Center
- Calibration and maintenance with standardized automatic calibration systems available
- Calibration and maintenance
- Maintenance

Service you can rely on

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

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 more than 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

Environmental commitment

∎ Energy-efficient products
∎ Continuous improvement in environmental sustainability
∎ ISO 14001-certified environmental management system

Certified Quality System
ISO 9001

Rohde & Schwarz GmbH & Co. KG

www.rohde-schwarz.com

Regional contact

∎ Europe, Africa, Middle East
 +49 89 4129 123 45
 customersupport@rohde-schwarz.com
∎ North America
 1 888 TEST RSA (1 888 837 87 72)
 customer.support@rsa.rohde-schwarz.com
∎ Latin America
 +1 410 910 79 88
 customersupport.la@rohde-schwarz.com
∎ Asia/Pacific
 +65 65 13 04 88
 customersupport.asia@rohde-schwarz.com