

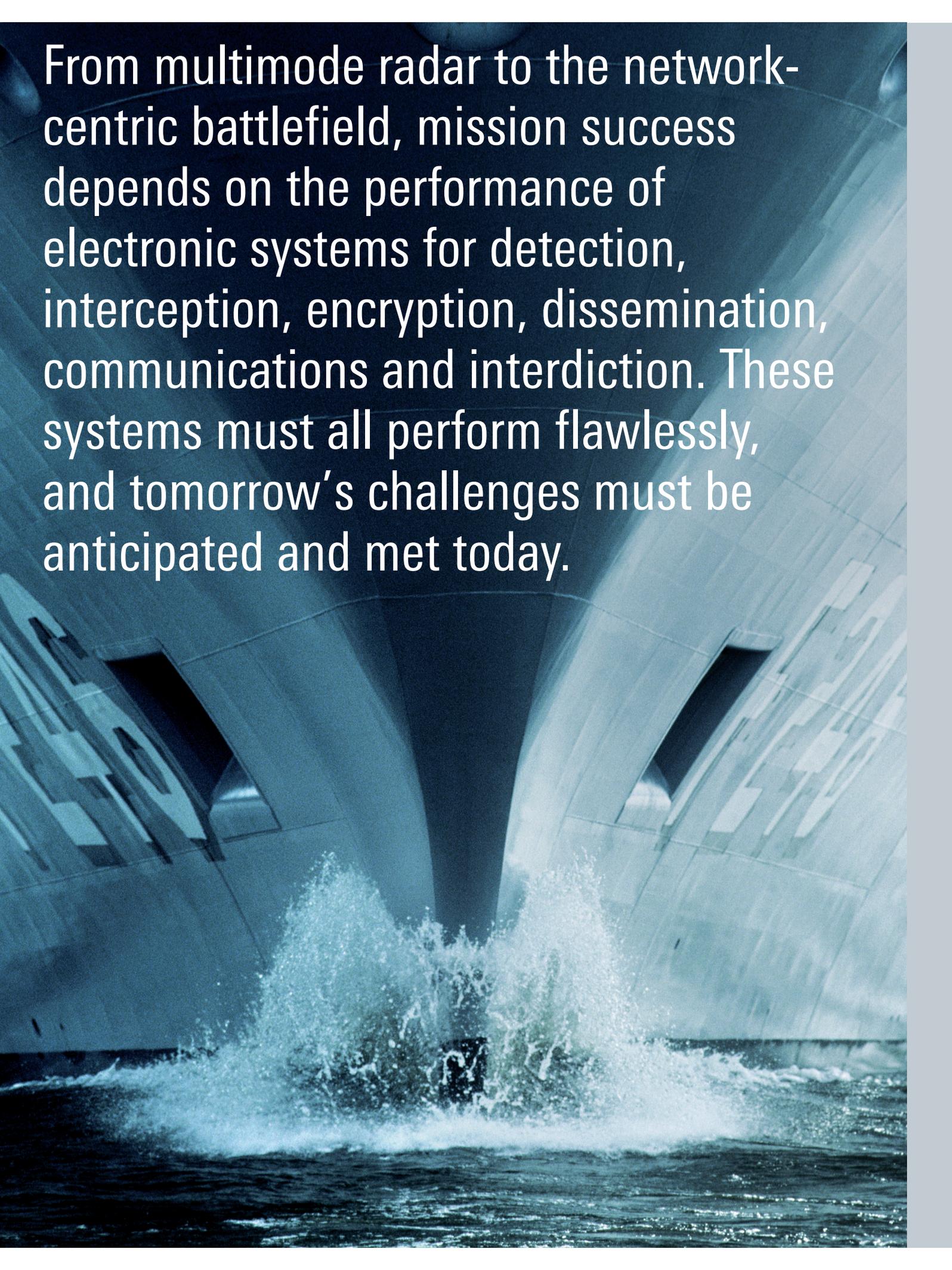
# Meeting tomorrow's challenges

Test and measurement solutions for aerospace and defense

  
**ROHDE & SCHWARZ**



From multimode radar to the network-centric battlefield, mission success depends on the performance of electronic systems for detection, interception, encryption, dissemination, communications and interdiction. These systems must all perform flawlessly, and tomorrow's challenges must be anticipated and met today.



Rohde&Schwarz plays an integral role in meeting the challenges tomorrow will bring. We're one of the world's leading innovators in electronic test and measurement, radiocommunications, and radiomonitoring and radiolocation.

Aerospace and defense programs rely on the unsurpassed performance and quality of Rohde&Schwarz solutions. Since we keep all manufacturing in-house, we can maintain the tight control on quality that only co-located engineering and manufacturing can provide. We also provide a unique level of support. With facilities in over 70 countries, comprehensive service and the ability to serve any need, including custom solutions and systems, we not only win on performance – we win on support too.

### The force behind innovation

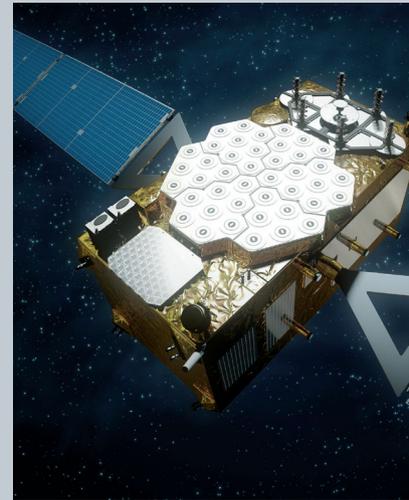
Rohde&Schwarz has been developing test and measurement solutions for more than 80 years, starting with our first frequency meter in 1933. We've been instrumental in moving the technological benchmark – with developments such as state-of-the art TOI performance and 500 MHz analysis bandwidth in our high performance spectrum analyzers. High-precision network analysis up to 500 GHz,

innovative signal generators with up to two signal paths in one instrument, oscilloscopes with one million waveforms per second and up to 16 bit vertical resolution, power meters with smart sensor technology, and the unique R&S®PR 100 handheld radiomonitoring receiver are further examples of pacesetting Rohde&Schwarz products.

For decades, Rohde&Schwarz solutions have been in use by military services and government agencies. Aerospace and defense contractors use our test and measurement solutions in cutting-edge R&D, production and operational support programs alike. We work collaboratively with the aerospace and defense industry to bring focused solutions that meet our customers' exacting requirements. Our developments are integral parts of many of the most cutting-edge defense programs in the world today.

Rohde&Schwarz is committed to long-term customer relationships and strives to be your partner of choice for aerospace and defense. Confidence in Rohde&Schwarz as a partner for test and measurement solutions in aerospace and defense is underscored by numerous direct government contracts won in various countries over the last decade.

Test and measurement technology is key to the proper functioning of electronic systems in all branches of the military.





# Designed for the job

We understand the specific needs of the aerospace and defense community, and design our solutions to meet these needs.

## Instrument security

Aerospace and defense security requirements demand the ability to remove user data and instrument usage information. Many of our instruments offer removable data storage and memory clearing procedures to address these security issues. Easy-to-follow, clearly written application notes simplify compliance with recommended procedures.

## Software-code compatibility

Software-code compatibility is another critical requirement for aerospace and defense ATE systems. Due to the costs and technical issues surrounding TPS modifications, legacy TPS programs demand that upgrade and replacement instrumentation be code-compatible. Rohde&Schwarz takes the issue of code compatibility seriously, and many of our instruments provide near drop-in replacement for key legacy instrumentation.

## Longevity

From system development and demonstration to production and field-operational support, Rohde&Schwarz instrumentation is designed to meet the aerospace and defense industry's long program life cycles. Our modular instruments allow users to add additional capabilities as

required, and we regularly provide enhancements to keep our instruments at the forefront of technology.

## Repair and calibration autonomy

We offer a wide range of service and support choices, from complete turnkey services to specialized "self-service" programs. We work collaboratively with aerospace and defense metrology organizations to ensure that technical, business and process requirements are met. Our calibration and adjustment tools give the aerospace and defense metrologist a large degree of autonomy.

## LXI solutions

Rohde&Schwarz products are designed to provide maximum functionality and flexibility together with a small form factor to satisfy emerging system test requirements. LXI-conformant and supported by IVI drivers, they fit seamlessly together with other concepts, e.g. synthetic instruments, into framework standards required by next generation ATEs. We actively support the LXI Consortium and the move to open standards for modular instrument platforms. We joined the Consortium as a strategic member at an early stage in 2004. We chair the Conformance Working Group and we are leading the effort to define the conformance process. Over 60 Rohde&Schwarz instruments are certified LXI-conformant, including spectrum analyzers, network analyzers and signal generators.

Many Rohde&Schwarz instruments offer removable data media for secure storage of settings and test data.



Code compatibility with important legacy instruments makes many Rohde&Schwarz spectrum analyzers and signal generators drop-in replacements for older instruments.



Instruments such as the R&S®SMB 100A consist of just a few modules for ease of service. Replacement modules come factory-adjusted, so instruments are ready for use immediately after servicing. User calibration is also possible.



# Test and measurement solutions

The aerospace and defense industry places extremely high demands on its radar, electronic warfare, satellite, navigation, guidance, communications and radiomonitoring systems. These complex systems require state-of-the-art measuring equipment to verify their performance and makes it possible to develop these systems in the first place. As a recognized leader in test instrumentation, Rohde&Schwarz provides focused solutions for the aerospace and defense industry. Our advanced test and measurement instrumentation often pushes the limits of what is technically feasible and is therefore ideal for extremely demanding measurement tasks up into the millimeter wave range.

# Solutions for radar and electronic warfare

With the rapid advances across the entire spectrum of radar and electronic warfare technology, the capabilities of test and measurement systems must be continually enhanced. Rohde&Schwarz solutions are at the leading edge of performance, capability and ease of use.

Our solutions include:

- Flexible signal generator solutions, from creating complex pulsed signals to turnkey solutions for phase-coherent multichannel radar signal simulation
- High performance spectrum analyzers and signal analyzers with up to 500 MHz analysis bandwidth internally and 2 GHz with a R&S®RTO 1044 oscilloscope as external ADC
- Pulse measurements, including modulation on pulse, trend analysis and pulse-to-pulse measurements
- Unique network analysis solutions, e.g. for embedded LO group delay measurements, pulse distortion measurements and using four internal sources for double converting devices
- Signal generators with excellent phase noise performance for generating digitally modulated signals or stable LO signals in radar and EW hardware design and test applications
- Complete test solutions for fast T/R module characterization in development and production



# Solutions for navigation and guidance

Civil aviation and military operations alike depend on accurate distance, location and direction measuring systems for public safety and military mission success. VOR, ILS, DME, satellite-based navigation systems like GPS, Glonass, Galileo, BeiDou or QZSS and augmenting systems like GBAS are just a few of the areas that require unique test and measurement capabilities. With demonstrated experience in this field, Rohde&Schwarz provides accurate, flexible, high-performance test solutions to cover every need, from design, development and production to operational maintenance.

Our solutions include:

- The most complete signal generation solution for producing highly accurate test signals for VOR, ILS, Marker Beacon, GBAS and DME
- Vector signal generators that provide accurate and repeatable signals for GNSS and GBAS testing. They can generate dynamic signals for up to 24 GPS, Glonass, Galileo, BeiDou or QZSS satellites and are easy to configure for RF or localization testing of navigation receivers
- The R&S®FSMR measuring receiver handles the complete calibration of VOR/ILS generators or navigation testers
- For ground and flight inspection of VOR, ILS, Marker Beacon and GBAS stations, the portable and battery-powered R&S®EVS 300 provides high accuracy, low weight and the measurement speed this application requires
- For service and maintenance of pulsed terrestrial navigation signals from DME and TACAN ground stations, the R&S®EDS 300 offers high-precision timing measurements and accurate level and modulation analysis



# Solutions for satellite communications

Satellite testing brings unique challenges, from the satellite and its payload to the ground station terminal. Rigorous testing is necessary to ensure that the satellite works right the first time – there is no room for error. RF and microwave measurements must be as accurate as possible, from SSPA and TWTA components or LO and PLL subsystems to complete satellite assembly, test and integration. With our leadership in spectrum analysis, cutting-edge network analyzer technology and wide range of signal generators and power meters, we have the right tools to ensure that your satellite system is tested correctly.

Our solutions include:

- A full range of signal generators, spectrum analyzers, network analyzers and power meters for R&D, installation, maintenance and monitoring of satellite components and systems
- High-performance signal analyzers which capture up to 500 MHz, and up to and 2 GHz with an R&S®RTO 1044 oscilloscope as an external ADC for wideband modulation measurements or frequency response and group delay tests
- Realtime spectrum analyzers for the evaluation of sporadic interference
- Multicarrier group delay measurements with signal analyzers/signal generators for fast group delay measurements with very simple calibration



# Solutions for military communications

As a manufacturer of test and measurement equipment and secure military radios for airborne, shipborne and ground operation, Rohde&Schwarz has the combined expertise to meet any test challenge, from legacy communications to the latest SDR designs. Our equipment is used for testing ADC/DAC, local oscillators, power amplifiers, transmitters/receivers and antenna subsystems. Rohde&Schwarz is a leader in test solutions for OFDM and MIMO technologies and has broad expertise in all of the latest commercial communications standards.

Our solutions include:

- Vector signal generators and analyzers to generate and analyze many types of unmodulated and modulated signals: from CW to analog or pulse modulation, from simple digital modulation to the most complex and generic OFDM modulation schemes. Wide modulation (up to 528 MHz) and 2 GHz demodulation bandwidths with the R&S®RTO allow tests even on wideband multi-carrier systems
- Flexible fading solutions for signal generators allow the testing of military communications equipment under real-world conditions such as moving transmitters and receivers or multipath signal propagation
- Short frequency and level setting times in our signal generators, which is essential when generating signals for testing hopping systems
- Realtime spectrum analyzers for the evaluation of sporadic interference



# Solutions for field testing

Civil aviation, trunked radio, military and other government applications require reliable, accurate and portable solutions to meet the demanding requirements for measurements out in the field. Rohde&Schwarz offers a wide range of portable and handheld instruments which provide unexcelled capabilities in very convenient form factors. From the portable R&S®ZVL spectrum/network analyzer and the versatile R&S®FSH handheld spectrum analyzer to the R&S®EVS 300 ILS/VOR analyzer, we equip users with the tools needed to keep systems running to specification.

Our solutions include:

- A broad range of signal generators, spectrum analyzers and network analyzers that are ideal for field use
- Power sensors that can be operated standalone with a laptop. They require only simple measurement setups yet deliver highly accurate test results
- Network scanners and software to obtain information about mobile radio networks, including RF channel utilization, system information, and the number and position of base stations
- Digital I/Q recorders to stream RF spectra off the air onto hard disk for replay and postprocessing
- Easy-to-use handheld cable and antenna analyzers for the setup and maintenance of antenna sites

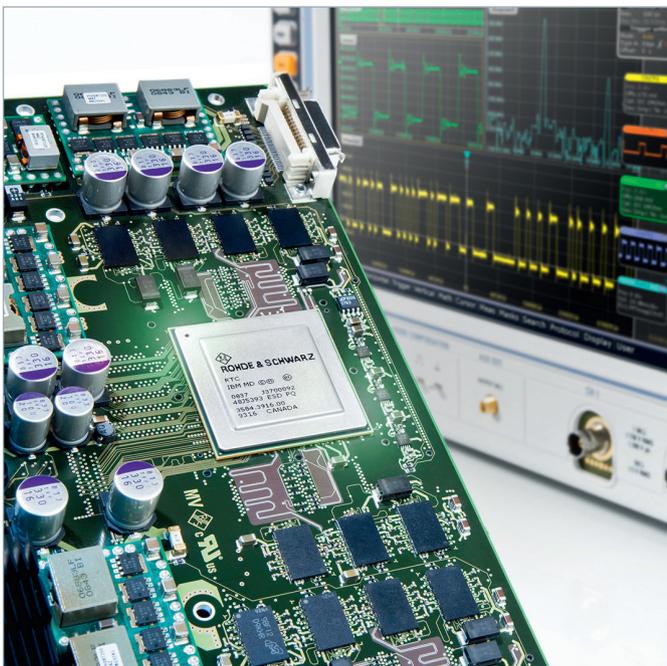


# Solutions for electronic design and engineering (EDE)

For the development and testing of electronic designs, general purpose test equipment is essential. It is also required for production, installation and maintenance of electronic devices and systems. The most versatile test instrument in this regards is the oscilloscope. Modern oscilloscopes are used for multiple functions in the design and engineering process of electronic components consisting of analog, digital and RF parts. Use ranges from simple voltage and current measurements to more sophisticated applications such as power analysis. Trigger and decode on data and communication buses are also common oscilloscope applications, similar to signal integrity and jitter analysis on high-speed serial links. Rohde&Schwarz oscilloscopes offer even more functionality, enabling users to carry out RF and spectrum analysis or perform EMI debugging on an engineer's desk.

Our oscilloscope solution includes:

- A broad product portfolio consisting of instruments and accessories for a comprehensive electronic design and engineering process
- Versatile measurement features and options for analog, digital, power and RF applications
- Powerful trigger and decode capabilities for data and communications buses like USB and Ethernet or ARINC 429 and MIL-STD-1553
- Power analysis capability, including military standards such as MIL-STD-1399
- RF signal and pulse analysis bandwidth up to 4 GHz; in combination with R&S®FSW up to 85 GHz with a 2 GHz analysis bandwidth
- Measurement automation via remote control and rack mounting solutions for production, service and maintenance
- Remote control emulation of widely used oscilloscopes to replace legacy products
- Support of secure environment requirements
- Ruggedized design in line with MIL-PRF-28800F



# Test and measurement instruments

Our test and measurement instruments are in use around the world. Prime contractors, subcontractors and military services alike choose Rohde&Schwarz to meet their most

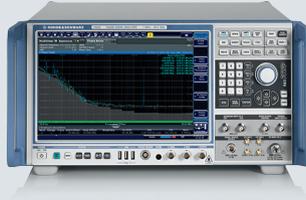
demanding test needs. Here we show just a small selection of the wide range of products we offer.

## Selected products for A&D applications



**The R&S®FSMR measuring receiver** is a fast and accurate single-box solution for calibrating signal generators and attenuators. It combines multiple instrument capabilities:

- High-precision level calibrator (absolute and relative level)
- Spectrum analyzer
- Power meter base unit
- Modulation analyzer for AM/FM/φM
- Audio analyzer with THD and SINAD measurement and separate audio input
- VOR/ILS analyzer
- Support of vector signal analysis to analyze digital modulation formats



**The R&S®FSWP phase noise analyzer** combines a signal and spectrum analyzer and phase noise tester in one box. Internal LOs with excellent phase noise performance in combination with cross correlation provides unrivalled dynamic range for phase noise measurements.

- Measurement of (pulsed) phase noise at the push of a button
- Cross correlation technique for phase noise and AM noise measurement
- Up to 10 times faster than comparable solutions
- Internal source for residual/additive phase noise measurements



**The R&S®FSW signal and spectrum analyzer** is designed for high performance requirements and is the ideal analysis tool for aerospace and defense applications.

- Frequency coverage up to 85 GHz in one sweep (up to 110 GHz with external harmonic mixers from Rohde&Schwarz)
- Unmatched phase noise – ideal for measuring oscillators for radar and communications applications
- Up to 500 MHz analysis bandwidth (2GHz when combined with the R&S®RTO1044 Digital Oscilloscope)
- 160 MHz real-time analysis
- Pulse measurements option



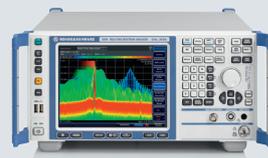
**The R&S®FPS signal and spectrum analyzer** is an exceptionally fast and compact signal and spectrum analyzer for performance oriented users. As a system or production solution, only 2 HU of rack space is required – a reduction of 50 % compared with traditional instruments.

- Frequency range up to 40 GHz
- Up to 160 MHz signal analysis bandwidth
- Vector signal analysis
- Removable hard disk for use in secure areas



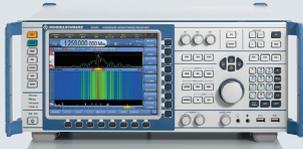
**The R&S®FSV signal analyzer** is a very fast, wideband, mid-range instrument for general-purpose applications.

- Fastest signal analyzer on the market with up to 1000 sweeps/s
- 40 MHz analysis bandwidth, e. g. for analyzing wideband radar chirps
- Touchscreen for convenient manual operation
- < 0.4 dB measurement uncertainty up to 7 GHz
- Removable hard disk as standard



**The R&S®FSVR realtime spectrum analyzer** consists of a full-featured R&S®FSV (see left) plus a realtime spectrum analyzer with 40 MHz analysis bandwidth.

- Realtime analysis up to 40 GHz, with ext. mixers even up to 110 GHz
- Gap-free analysis for detection of even the shortest events
- Triggering on events in the frequency domain (frequency mask trigger)
- Realtime spectrogram display
- Realtime spectrum with persistence function
- Realtime power vs. time display



**The R&S®ESMD wideband monitoring receiver** sets new standards for realtime spectrum monitoring and processing. Highest RF performance plus powerful digital signal processing are the basis for fast and reliable signal detection and analysis.

- ▮ Frequency range from 20 MHz to 3.6 GHz, optionally from 9 kHz to 26.5 GHz
- ▮ 20 MHz realtime bandwidth (80 MHz optional)
- ▮ Gap-free FFT spectrum computation
- ▮ Demodulation bandwidth up to 20 MHz (31 IF filters)
- ▮ RF, IF and video spectrum
- ▮ Scan speed up to 300 GHz/s
- ▮ Upgradable to a direction finder



**The R&S®FSH spectrum analyzer** puts bench-level RF measurement up to 20 GHz in a compact, battery-operable handheld unit designed for use in the field.

- ▮ Spectrum analysis, power measurements, transmission and reflection measurements, monitoring tasks, EMF measurements
- ▮ Frequency range from 9 kHz to 20 GHz
- ▮ High sensitivity ( $< -141$  dBm (1 Hz)), with preamplifier  $< -161$  dBm (1 Hz)
- ▮ 20 MHz demodulation bandwidth for analyzing LTE signals
- ▮ Low measurement uncertainty ( $< 1$  dB)
- ▮ Measurement functions for all important measurement tasks related to the startup and maintenance of transmitter systems



**The R&S®ZVH cable and antenna analyzer** is an easy-to-use field instrument for all tasks associated with the setup and maintenance of antenna sites.

- ▮ Models up to 3.6 GHz and 8 GHz
- ▮ Wizard-guided measurements for more efficiency and ease of use
- ▮ Short ( $< 1$  s) switching times between measurement functions for smooth workflow
- ▮ Automatic test report generation
- ▮ Robust, splash-proof housing for rough field operation with 4.5 hour battery supply



**The R&S®FS-Z60/R&S®FS-Z75/R&S®FS-Z90/R&S®FS-Z110 harmonic mixers** extend the frequency range of various Rohde&Schwarz signal, spectrum and phase noise analyzers up to 110 GHz. (R&S®FSx-B21 option required.)

- ▮ Low conversion loss
- ▮ High 1 dB compression point
- ▮ High LO frequency range
- ▮ No biasing required



**The R&S®SMW200A vector signal generator** is ideal for generating digitally modulated signals required for aerospace and defense applications.

- ▮ Frequency range from 100 kHz to 40 GHz
- ▮ Optional second RF path from 100 kHz to 20 GHz
- ▮ Up to 160 MHz I/Q modulation bandwidth (in RF) with internal baseband
- ▮ Optional integrated fading simulator with up to 160 MHz bandwidth
- ▮ Support of all key MIMO modes including 3x3, 4x4, 8x2, 2x8 and 4x2x2



**The R&S®SMA 100A analog signal generator** offers excellent signal quality, high output power and analog modulation capabilities, plus high-performance pulse modulation for radar tests.

- ▮ Fast frequency and level setting
- ▮ Outstanding SSB phase noise performance
- ▮ Generation of highly accurate VOR, ILS and DME signals
- ▮ Emulation of a wide range of legacy signal generators
- ▮ Removable mass storage for use in secure areas



**The R&S®SMB 100A analog signal generator** is a mid-range instrument with best-of-class signal quality, making it a perfect all-purpose RF source.

- ▀ Wide frequency range up to 40 GHz
- ▀ High output power
- ▀ Capability to generate CW or analog modulated signals
- ▀ Compact size



**The R&S®SMBV 100A vector signal generator** is a mid-range instrument that offers excellent RF performance along with very high output levels and short setting times.

- ▀ Versatile capabilities for generating unmodulated as well as complex modulated pulses
- ▀ Generation of static and dynamic GNSS scenarios with up to 24 satellites
- ▀ Coupling of multiple instruments for phase-coherent RF generation (e. g. in phased array antenna applications)
- ▀ Generation of GPS, Glonass, Galileo, BeiDou and QZSS signals (including hybrid constellations)



**The R&S®SMF 100A microwave generator** sets new standards in signal quality, speed and flexibility.

- ▀ Outstanding pulse capabilities for radar component and system tests
- ▀ Generation of CW and analog modulated signals
- ▀ Best phase noise performance
- ▀ Emulation of legacy signal generators
- ▀ Removable mass storage for use in secure areas



**The R&S®SGS100A RF source** is designed to meet the requirements of automated test systems. It is available as a CW source or as a vector signal generator with an integrated I/Q modulator. With its frequency range of up to 12.75 GHz, the vector signal generator version covers the essential digital signals.

- ▀ Smallest fully integrated vector signal generator on the market, space-saving design for system integration
- ▀ Enables high throughput thanks to very short frequency and level setting times of typ. 280  $\mu$ s via PCIe interface
- ▀ Excellent RF performance in a compact format



**The R&S®SGU100A upconverter** extends the frequency range of the R&S®SGS100A to 40 GHz. The combined instruments offer the same connections as the R&S®SGS100A itself: one RF output for the entire frequency range and one analog I/Q input for vector modulation.

- ▀ Frequency extension to 40 GHz with the R&S®SGU100A upconverter
- ▀ Two instruments into one: one RF output for the entire frequency range
- ▀ Seamless integration into existing user interfaces
- ▀ Lowest form factor and power consumption on the market
- ▀ High performance up to microwave frequencies



**The R&S®SGT100A** vector RF source is an RF vector signal generator with an integrated baseband generator. It has been optimized for use in production and automated applications.

- ▀ Fastest vector signal generator with frequency and level switchover times of 240  $\mu$ s (typ.) for optimized throughput in production
- ▀ Smallest standalone vector signal generator up to 6 GHz with integrated baseband generator (1 HU 1/2 19")
- ▀ Integrated baseband generator with I/Q modulation bandwidth of up to 160 MHz (in RF) supporting all advanced digital standards, including IEEE 802.11ac



**The R&S®SMZ frequency multiplier** family, when combined with a microwave signal generator, provides precisely adjustable output levels from 50 GHz to 170 GHz.

- ▮ High signal quality
- ▮ Wide dynamic range
- ▮ Extremely easy handling together with the R&S®SMF100A microwave generator (the combination behaves like a single unit)
- ▮ Integrated mechanically or electronically controlled attenuators



**The R&S®OSP open switch and control platform** is a modular system designed to handle RF switch and control tasks, from simple measurement setups to complex A&D test systems.

- ▮ Base and extension units, cascadable via CAN bus
- ▮ Wide selection of plug & play modules, also with terminated relays for antenna test systems or relays up to 40 GHz for radar test systems
- ▮ Sophisticated path control for easy, reliable, independent switching of complex configurations
- ▮ Integration of application-specific functions possible



**The R&S®CMA180 radio test set** is a radiocommunications tester for radio systems that operate in the 100 kHz to 3 GHz range.

- ▮ Frequency range from 100 kHz to 3 GHz
- ▮ Analog modulation and demodulation (CW, AM, FM, PM, SSB)
- ▮ Up to 150 W peak input power and up to 100 W continuous input power
- ▮ Automated test sequence control available with R&S®CMArun
- ▮ Integrated audio and arbitrary generators
- ▮ Audio quality tests (SINAD, THD, SNR)
- ▮ Integrated sweeping spectrum analyzer



**The R&S®RTO oscilloscopes** combine excellent signal fidelity, high acquisition rate and the world's first realtime digital trigger system with a compact device format in the 1 GHz and 4 GHz class.

- ▮ One million waveforms per second: fault finding without guesswork
- ▮ Smooth, fast operation due to hardware-accelerated measurement and analysis functions
- ▮ Convincing accuracy
- ▮ Novel user interface for intuitive, fluent operation
- ▮ High-performance probes with extensive accessories
- ▮ 16-bit vertical resolution in high definition mode and extremely low-noise frontend for precise results



**The R&S®RTE oscilloscopes** are uncompromised in performance and impressively user-friendly, with bandwidths from 200 MHz to 2 GHz and top performance parameters.

- ▮ Sampling rate of 5 Gsample/s and deep memory of 200 Msample for accurate acquisition of long signal sequences
- ▮ Acquisition rate of more than one million waveforms/s for finding signal faults quickly
- ▮ 16-bit vertical resolution in high definition mode and extremely low-noise frontend for precise results
- ▮ Highly accurate digital trigger system with virtually no jitter for triggering on smallest signal details in realtime



**The R&S®RTM oscilloscopes** facilitate daily work, whether in product development or service.

- ▮ 1 GHz bandwidth, 5 Gsample/s sampling rate and 20 Msample maximum memory depth
- ▮ Precise, reliable measurement results due to very low inherent noise level and good channel-to-channel isolation
- ▮ Helpful tools such as the "Quick-Meas" function for displaying the key measurement values for the active signal at the push of a button
- ▮ Advanced marker measurements such as functions for measuring peak voltages or for automatically counting the number of pulses



**The R&S®ESR** is an EMI test receiver from 10 Hz to 26.5 GHz. It measures electromagnetic disturbances with the conventional stepped frequency scan or – at an extremely high speed – with an FFT-based time domain scan.

- ▮ Preselection with integrated 20 dB preamplifier
- ▮ Resolution bandwidths in decade steps from 10 Hz to 1 MHz (MIL-STD-461, DO-160) (option)
- ▮ Realtime spectrum analysis with up to 40 MHz span for detailed investigation of disturbances (option)
- ▮ EMI test receiver and signal/spectrum analyzer combined in a single instrument



**The R&S®ESU test receiver** breaks new ground for testing MIL-STD-461/462 EMI, with fully compliant tests for MIL-STD-461 A-F and DO 160.

- ▮ Frequency coverage from 20 Hz to 40 GHz
- ▮ High sensitivity across the entire frequency range (built-in preamplifier)
- ▮ Built-in preselector (single-box solution)
- ▮ FFT-based time domain scan for extremely fast overview measurements
- ▮ Onboard report generator
- ▮ Removable mass storage for use in secure areas



**The R&S®EVS300 ILS/VOR analyzer** is a portable level and modulation analyzer designed especially for starting up, checking and maintaining ILS, VOR and marker beacon systems.

- ▮ Extremely fast (100 measurements per second)
- ▮ Synchronization via GPS, trigger and remote interfaces
- ▮ Digital separation of course and clearance signals using only one signal processing channel (R&S®EVS-K3 option)
- ▮ Expandable to support a second signal processing channel for simultaneous localizer and glideslope measurements (R&S®EVS-B1 option)



**The R&S®EDS300 DME/pulse analyzer** is a level and modulation analyzer designed for installing and maintaining pulsed, terrestrial navigation services. Its high sensitivity and compact design make the R&S®EDS300 ideal for conducting field measurements on the ground and in the air.

- ▮ High-precision measurement of DME and TACAN systems on the ground and in the air (in line with ICAO Doc. 8071, ICAO Annex 10, STANAG 5034 and MIL-STD-291C)
- ▮ Total peak level deviation < 1 dB
- ▮ Receiver acquisition sensitivity –97 dBm
- ▮ 0.01 NM distance measurement uncertainty down to –80 dBm



**The R&S®TSMW universal radio network analyzer** scans mobile radio networks and facilitates spectrum analysis in the field.

- ▮ Two independent RF channels with 20 MHz IF bandwidth
- ▮ Supports radio bands between 30 MHz and 6 GHz
- ▮ Parallel measurement of all technologies
- ▮ Realtime I/Q streaming, e.g. for technology-independent channel measurements
- ▮ Preselector and preamplifier
- ▮ Built-in GPS with PPS



**The NRPxxS/SN three-path diode power sensors** are self-contained, fully characterized instruments offering USB capability. Plus the R&S®NRPxxSN sensors can be controlled via LAN, allowing remote control over large distances.

- ▮ Fast and accurate power measurements for CW and modulated signals
- ▮ Maximum dynamic range: –70 dBm to +23 dBm
- ▮ 10,000 triggered measurements/s
- ▮ More than 50,000 readings/s
- ▮ Web client for operation using a web browser
- ▮ Built-in trigger I/O port



The **R&S®IQR data recorder** is a high-speed recorder for recording and playing digital I/Q data streams.

- ▮ Realtime recording and playing of digital I/Q data
- ▮ Optional import and export of I/Q data via Ethernet or USB interface
- ▮ Support of automatic gain control (AGC)
- ▮ Optional recording and playing of two I/Q data streams
- ▮ Graphical display of power spectrum or I/Q level
- ▮ Optional recording of GPS coordinates
- ▮ Operation on 110 V to 220 V AC or optionally on 10 V to 30 V DC



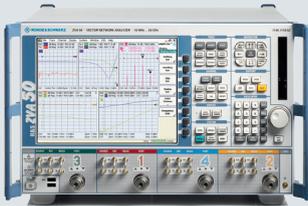
The **R&S®BTC** is a high-end broadcast test center reference signal generator with transmission link simulations featuring latest transmission technologies such as DVB-S2X.

- ▮ DVB-S/S2 and DVB-S2X
- ▮ Realtime audio/video/data generation and analysis
- ▮ End-to-end transmission link simulation
- ▮ MUX and OMUX simulation
- ▮ Complex inference simulations



The **R&S®TSMA autonomous mobile network scanner** offers all that is needed for walk tests and drive tests. WLAN or Bluetooth® connects the smartphones/tablets used for data collection.

- ▮ Battery-powered, self-contained network scanner (no external PC required)
- ▮ LTE (FDD, TDD), WCDMA, GSM, CDMA, EV-DO, WiMax™, TETRA, TD-SCDMA, PowerScan RF
- ▮ Built-in Windows PC with Intel i5
- ▮ Automatic channel detection for UMTS, LTE, CDMA and EV-DO for fast measurement



The **R&S®ZVA network analyzer** is a high-end instrument for challenging R&D tasks. It sets new standards in numerous areas and is ideal for measurements on active and frequency-converting devices.

- ▮ Measurements up to 500 GHz
- ▮ Unique solutions, e.g. embedded LO group delay measurements, pulse profile measurements, or single-connection T/R-module testing
- ▮ Arbitrary frequency conversion measurements including phase and group delay on mixers and frequency converters
- ▮ Four-port architecture with up to four integrated coherent sources, adjustable in amplitude and phase



The **R&S®ZVAX-TRM extension unit** is used together with an R&S®ZVA/ZVT network analyzer to provide signal conditioning for demanding measurements on active DUTs.

- ▮ Up to 24, 40, 50, 67 GHz
- ▮ Includes high-power couplers, combiner, pulse modulation, pre-amplification, pulse modulation, switchable generator and receiver paths access
- ▮ Tailorable with options
- ▮ Unrivalled performance in combination with R&S®ZVA with four sources
- ▮ Complete DUT characterization with a single connection



The **R&S®ZVA-Zxx millimeter-wave converters**, when combined with an R&S®ZVA or R&S®ZVT network analyzer, facilitate vector network analysis up to 500 GHz with unprecedented convenience.

- ▮ Models for the V, E, W, F, D, G, J and Y frequency bands
- ▮ Variable output power
- ▮ Multiport measurements with up to six converters
- ▮ Pulsed measurements
- ▮ Maximum ease of use due to automatic parameter setting via a connected R&S®ZVA or R&S®ZVT network analyzer

# EMC expertise

In a high-energy environment, EMC is critical. Rohde&Schwarz is an established world leader in electromagnetic compatibility testing, with deep expertise in all aspects of this exacting discipline.

We offer one-stop shopping for all EMC challenges:

- From emission (EMI) to immunity (EMS) and pulse tests
- From single test instruments and a complete range of accessories to turnkey solutions, including training
- From detection of low-level emissions to test levels of several thousand volts per meter
- From 10 Hz to 40 GHz
- For all types of equipment, from electronic subassemblies to complex systems
- For all major national and international EMC standards, e.g. MIL-STD-461F, MIL-STD-464, VG 95373, GAM EG 13, DEF-STAN 59-411 and RTCA DO-160

The German military operates Europe's largest EMC test center using Rohde&Schwarz technology. The Tiger attack helicopter uses the R&S®M3AR radio.



# Test system solutions

We develop and manufacture standard test systems as well as custom turnkey solutions, including:

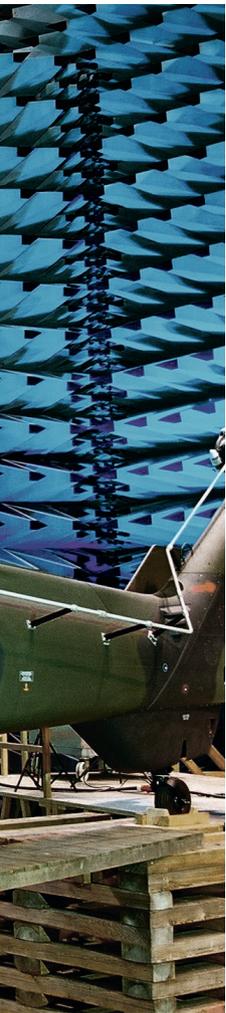
- Entire EMC test centers complete with instruments, antenna systems and software
- A phase-coherent multichannel radar signal simulator
- A transmit/receive module test system for the development and production of AESA radars
- Systems for testing LRUs and SRUs in R&D, production and maintenance

We also work with local integration partners to provide turnkey systems.

Furthermore, we offer a full range of development services:

- Test parameter and performance requirements
- Overall system design
- Project consulting and management
- System implementation and integration
- Installation and performance verification
- On-site system and software training
- Upgrades, optimization and replacement of outdated equipment
- Solutions for innovative form factors, technologies and standards

Our solutions combine leading-edge performance with expandability for tomorrow's innovations. Modular designs help maintain the value of your investment in our solutions, and our constant innovation ensures that you are always ahead of the technology curve.



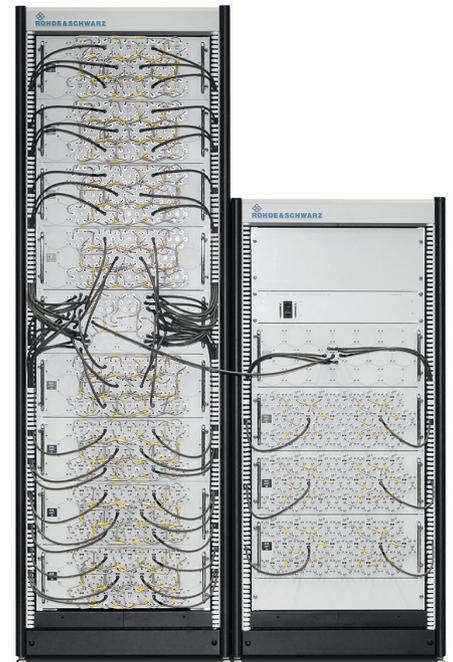
The R&S®TS6600 test system facilitates precise performance verification and calibration of radar frontends with phase-coherent multichannel signals and complex modulations.



The R&S®TS6710 test system for development and production measures the main parameters of transmit/receive (T/R) radar modules in less than 15 seconds (2500 test values) and performs a complete characterization (> 25000 test values) in less than 4 minutes.



Modular, complex microwave switching matrices, including software for calibration and automatic single-ended integrity check



# Secure radiocommunications

When a threat looms, failure is not an option. Command and control require robust, high-volume voice and data communications. Military radio systems must be secure, interoperable and utterly reliable. Rohde&Schwarz is among the leading global suppliers of radiocommunications systems for ground, air and naval forces, including HF/VHF/UHF radios in all power classes. In addition to stationary, vehicular and man-portable transceivers, we supply hardware and software for EPM and automatic link establishment (ALE), LAN and tactical Internet interfaces, tactical antennas, couplers and filters for integration on all military platforms.

The open system architecture of our software defined R&S®M3xR multiband platform means great flexibility. It has proven its mettle in climates and conditions around the world. It meets all encryption requirements, including COMSEC and TRANSEC, and uses spectra efficiently to maximize bandwidth for tomorrow's network-centric scenarios. As an established single-source provider, we are a partner of NATO and the militaries of many countries. We have the experience, technical prowess and ongoing innovation to assure the highest levels of performance and availability of our systems. Their modular design allows them to grow with changing requirements. Users can source complete systems from us, including dedicated test systems for autonomous service and maintenance.

The NH90 helicopter, like many land, air and sea platforms, uses Rohde&Schwarz radio technology.



# Radiomonitoring and radiolocation

Rohde&Schwarz is a prime supplier of equipment and systems for the detection, location and analysis of radio-communications signals. Wherever deployed e.g. for national security, search-and-rescue or on the battlefield, our systems let users know what's out there. Here again, we stand out with a depth of expertise that comes only from long-term experience with many different conditions and circumstances. As a result, we can offer systems to cover the entire scope, from satellite to local area monitoring. In fact, we lead the world in full-coverage automatic radiomonitoring systems.

Rohde&Schwarz radiomonitoring, radiolocation and analysis systems make a vital contribution to situation awareness. For example, the R&S®PR 100 portable radiomonitoring receiver leads the field in handheld signal detection, tracing and debugging (picture on left). It revolutionizes close-range reconnaissance for locating transmitters and intercepting signal emissions.





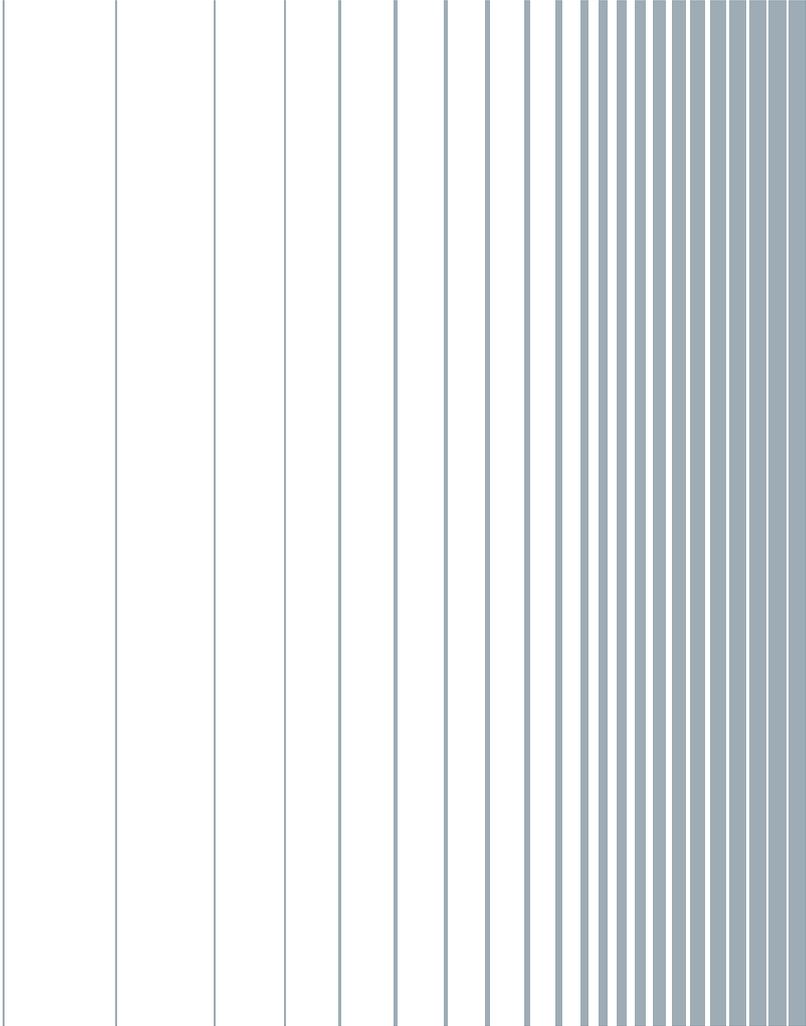
# Customer-centric

One size does not fit all, especially in the aerospace and defense field. Each customer has a unique set of parameters and requirements. To address these, we provide customization at all levels. Contractors use our custom test systems for fast, robust quality assurance on the production line. Customer-centric solutions assure users of the optimum answer to their specific challenge.

## Meeting your challenges

For test and measurement, radiocommunications and radiomonitoring solutions, few if any companies can match our ability to help you meet your challenges, today and tomorrow. Let us show you exactly what this means. Contact your local Rohde&Schwarz representative, visit [rohde-schwarz.com](http://rohde-schwarz.com) to learn more and find the location nearest you, or call one of our customer support centers. We look forward to meeting your challenge.





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