

FACTS + FIGURES

2021

ROHDE & SCHWARZ

Make ideas real



TEST AND MEASUREMENT

**BROADCAST AND
MEDIA**

AEROSPACE | DEFENSE | SECURITY

NETWORKS AND CYBERSECURITY

SERVICE

PRESENT IN OVER 70 COUNTRIES

**NET REVENUE OF
EUR 2.58 BILLION**

12,300 EMPLOYEES

THANKS TO ITS INDUSTRY-LEADING TECHNOLOGICAL EXPERTISE, ROHDE & SCHWARZ IS A RELIABLE PARTNER FOR SHAPING THE FUTURE OF COMMUNICATIONS, INFORMATION AND SECURITY.

Rohde & Schwarz develops, produces and markets a wide range of electronic capital goods for industry, infrastructure operators and government customers.

The independent group is among the technology and market leaders in all of its business fields, including

wireless communications and RF test and measurement, broadcast and media, professional radio-communications, cybersecurity and network technology.

A worldwide service and support network safeguards customer investments.

OUR BUSINESS FIELDS

TEST AND MEASUREMENT	BROADCAST AND MEDIA	AEROSPACE DEFENSE SECURITY	NETWORKS AND CYBERSECURITY
T&M instruments and systems for wireless communications, aerospace and defense, automotive, research and industrial electronics applications	Broadcast, post production and T&M equipment for network operators, broadcasters, studios, the film industry and manufacturers of entertainment electronics	Communications and signal monitoring technology for armed forces, government authorities and air traffic control, security products for critical infrastructures as well as T&M equipment for A&D applications	Network technology for professional users as well as IT security products to protect communications and information

FOR A SAFER AND CONNECTED WORLD

A photograph of a modern glass skyscraper with a blue sky background. The building is tall and has many windows. The sky is blue with some white clouds. The building is the main focus of the image.

Rohde&Schwarz successfully completed its 2019|2020 fiscal year despite a difficult global economic environment and the impact of the COVID-19 pandemic. The group has grown for the third year in a row with a 20 percent net revenue increase.

Although the pandemic left its mark on Rohde&Schwarz, the declining demand in individual market and product segments was compensated by strong order intake from other areas such as test and measurement solutions for 5G and other wireless communications technologies as well as communications and security products for aviation and government customers.

5G investments remain strong

5G networks were set up faster than expected. The coronavirus-induced slump in the user equipment market has not noticeably affected the mobile communications industry's willingness to invest. The size and significance of the market and intense competition on both the device and network side meant that both user equipment manufacturers and infrastructure providers continued to invest heavily in T&M equipment so as not to lose market share. Rohde&Schwarz benefited

throughout the entire value chain of mobile communications. Demand for T&M equipment from the aerospace and defense industry as well as electronics manufacturers from other industries also proved robust.

Public sector expands connectivity

COVID-19 clearly illustrated the value of faster and more secure internet connections – not only for private households but also in the industrial and public sectors. Germany's digital pact for schools (DigitalPakt Schule), a well-financed federal and state program, generated numerous orders for WLAN networks at schools. Several German states invested in the IT security of their administrative networks and equipped public authorities with BSI certified encryption technology from Rohde&Schwarz.

Air traffic safety market still solid

Despite the significant decrease in air traffic in the second half of the fiscal year, radio system sales to air traffic controllers and sales of security scanners for passenger processing remained solid. The CERTIUM® air traffic control portfolio from Rohde&Schwarz provides complete hardware, software and service component solutions. The

portfolio was expanded in 2020 to include a state-of-the-art radio family. Rohde&Schwarz security scanners have conquered a significant market share since their launch three years ago and are used in airports around the world.

Naval forces trust communications systems from Rohde & Schwarz

Ongoing military procurement programs remained largely unaffected by the coronavirus. Rohde&Schwarz benefited from this stability, particularly in equipping naval vessels. Our technically leading communications systems impressed naval forces in Europe and overseas and generated strong order intake in this segment.

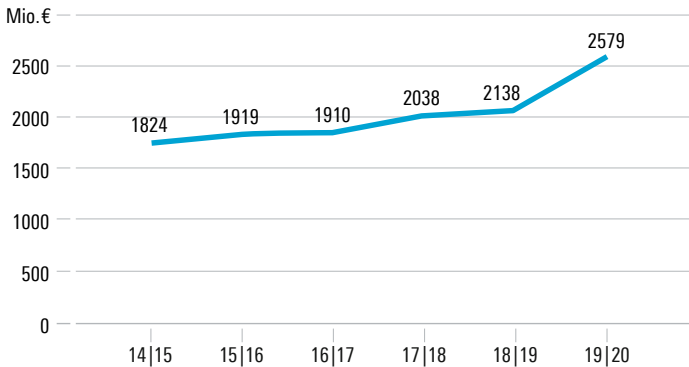
The impact of the COVID-19 pandemic on the course of business in the coming years is virtually impossible to assess. Rohde&Schwarz has the economically sound foundation, flexible processes and structures to handle all future scenarios.

KEY DATA

2019 | 2020

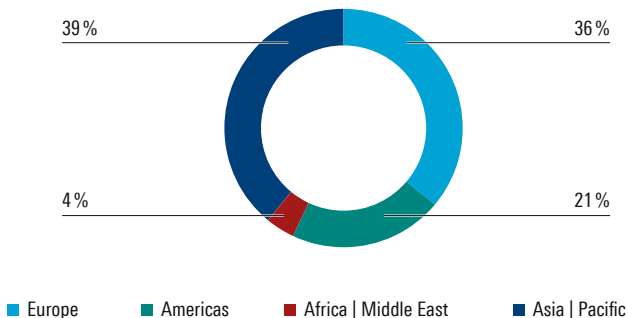
NET REVENUE OF COMPANY GROUP

Business development in recent years



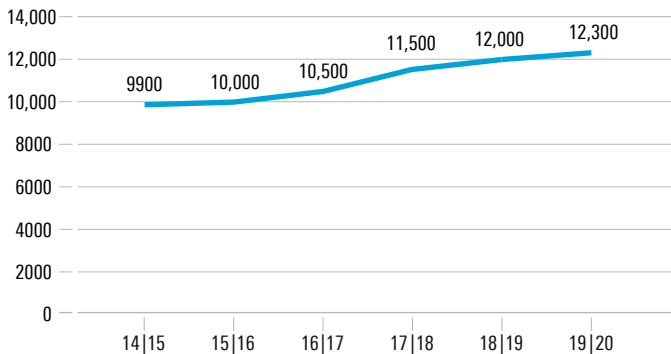
NET REVENUE BY REGION

Total: EUR 2.58 billion



EMPLOYEE TREND

Group, worldwide Rounded values as of June 30, 2020



TEST AND MEASUREMENT





Test and measurement solutions for the wireless market, automotive applications, aerospace and defense, industrial electronics, research and education

No industrial sector can do without electronics. Test and measurement solutions from Rohde&Schwarz are there every step of the way, from R&D to quality assurance, manufacturing and service. Our portfolio includes all types of RF T&M equipment and systems as well as complementary products.

We focus on the requirements of the mobile and wireless communications market, a market we have been closely involved with for decades, on the requirements of the automotive industry, whose added value is increasingly based on vehicles' electronic features, and on the T&M requirements of the aerospace and defense industry. Manufacturers of entertainment electronics, power electronics, RF components, IT and network equipment as well as medical technology companies and other sectors also benefit from our wide range of products.

TEST AND MEASUREMENT AND MONITORING SOLUTIONS FOR THE WIRELESS MARKET



Rohde&Schwarz helped write the unparalleled success story of digital wireless communications from the very beginning. In the early 1990s, the GSM system simulator from Rohde&Schwarz established the technological basis for testing user equipment, thereby paving the way for mass production.

As a strategic partner of the wireless communications industry, the company has since supported the rollout of new standards with a comprehensive portfolio of T&M solutions for every stage of the value chain.

Our customers include chipset manufacturers, infrastructure providers, consumer electronics manufacturers and network operators. Rohde&Schwarz is the only single-source provider of T&M equipment for the entire network lifecycle.

Device manufacturers find all the T&M equipment they need, including RF measuring instruments for fundamental research, complex network simulators for standard-compliant QM acceptance tests, and T&M instruments for mass production. Telecommunications regulators rely on monitoring systems from Rohde&Schwarz to keep an eye on spectral activities. Any interference can be eliminated immediately. Rohde&Schwarz supplies the necessary equipment – from handheld direction finders to nationwide networks for radio testing and direction finding.

Our portfolio

- ▶ Basic RF T&M instruments such as signal generators and analyzers with standard-specific T&M options
- ▶ Wireless device RF and protocol testers for all common cellular and noncellular wireless communications standards
- ▶ Conformance and preformance test systems
- ▶ Products for measuring quality in mobile networks
- ▶ System equipment, e.g. shielded chambers
- ▶ ITU-compliant radiomonitoring solutions

Testing 5G millimeterwave radio products (5G FR2) requires the use of over-the-air test and measurement equipment. The R&S®CMPQ test system measures and fine-tunes 5G FR2 devices in series production.



T&M EQUIPMENT FOR THE AUTOMOTIVE INDUSTRY



Ever since the car began its transformation from a simple mode of transport into a highly complex mobile communications platform equipped with sensors and sophisticated electronics, the test and measurement needs of suppliers and manufacturers have steadily grown.

Driver assistance systems increasingly use sensor input and radiocommunications to collect information from a vehicle's surroundings to make safety-critical decisions. To be able to ensure 100 percent reliability, these systems must be tested under realistic conditions.

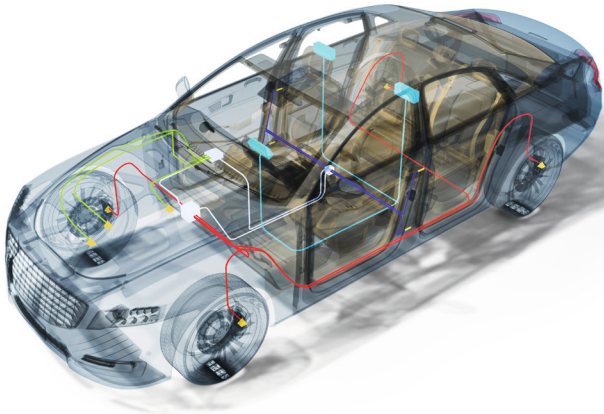
Rohde & Schwarz offers a wide range of T&M solutions for the entire spectrum from the audio to the millimeter-wave frequency range, effectively covering all electronic components in vehicles.

We support our customers at all stages of the value chain – when developing chipsets, assemblies, devices and systems, and during prototype acceptance, manufacturing and quality assurance.

Our portfolio

- ▶ T&M equipment for infotainment and wireless connectivity components such as V2X, 5G, eCall, GNSS and Bluetooth®
- ▶ Solutions for testing radar chips and sensors in R&D and production
- ▶ Conformance T&M equipment for bus systems such as Ethernet and CAN
- ▶ EMC T&M equipment

In the future, the internal electrical and electronic components of vehicles will represent a significant proportion of automotive added value. Specialized T&M solutions are needed for the development and integration of these subsystems.



TEST AND MEASUREMENT FOR AEROSPACE AND DEFENSE

As a leading manufacturer of high-end test and measurement equipment, Rohde&Schwarz fulfills the stringent requirements of the aerospace and defense sectors. Customers benefit from the company's in-house expertise in military radiocommunications, air traffic control and signal intelligence.

The extensive product range includes T&M solutions for generating and analyzing signals up into the millimeterwave range. Thanks to their outstanding performance and application-tailored measurement functions, these products meet the specific needs of the A&D sector. This includes protecting measurement data in secure areas as well as emulating obsolete instruments so they can be replaced in legacy ATE systems by state-of-the-art components with the same functionality.



As a solution-oriented partner, Rohde&Schwarz supports R&D, manufacturing, quality assurance and service. Sustainable product strategies ensure that Rohde&Schwarz products keep up with advances in technology throughout the long lifecycles customary in these industries. Individual service agreements ensure maximum availability over the entire lifecycle. Tailored product and technology training enables customers to use our solutions effectively.

Our portfolio

- ▶ Extensive range of RF and microwave T&M instruments for lab and field measurements
- ▶ Catalog systems and customer-specific solutions
- ▶ Test and measurement solutions for radar, avionics, navigation, satellite communications and military radiocommunications
- ▶ Full range of EMC measuring equipment
- ▶ Millimeterwave and sub-millimeterwave components

In satellite, radar and communications technology, operating frequencies continue to become higher and bandwidths wider. The market-leading performance of the R&S®FSW signal and spectrum analyzer makes it the ideal instrument for all of these measurement tasks.



TEST AND MEASUREMENT FOR INDUSTRY, COMPONENT MANUFACTURERS AND RESEARCH & UNIVERSITIES



With its T&M solutions for component manufacturers, industrial electronics, research and universities, Rohde & Schwarz focuses on fundamental research, technologies and components at the start of the value chain. In cooperation with universities and research institutes, future solutions such as 6G, terahertz applications and quantum technologies are tested and prepared for real-world applications.

The high transmission frequencies and clock rates of modern information and communications technologies require state-of-the-art T&M solutions. Electronics manufacturers use our measuring equipment to efficiently develop their components, modules and devices, test them for conformity with relevant compliance standards and manufacture them economically.

Power supply management is becoming increasingly important in electronic designs, both in the low-power range, where minimizing consumption is a priority, and in power electronics. Avoiding unwanted influences of the supply lines on function modules and developing power converters with maximum energy efficiency are key requirements.

Rohde&Schwarz cybersecurity solutions reliably protect the connected production facilities of future smart factories against misuse.

Customers from a wide range of industries benefit from our broad product spectrum. The portfolio covers all price and performance classes, from basic testers for training purposes to RF test instruments for R&D labs and production facilities, millimeterwave technology for research and universities, and fully equipped EMC test chambers.

Our portfolio

- ▶ Broad spectrum of T&M instruments from DC to the high millimeterwave range for development, production, research and universities
- ▶ Full range of EMC and coexistence measuring equipment
- ▶ RF power amplifiers for science and research
- ▶ Cybersecurity solutions for production facilities

The rising data rates of digital interfaces as well as the complexity and density of advanced circuit designs are driving the need for detailed data jitter analysis. Thanks to a new patented method, the R&S®RTO and R&S®RTP oscilloscopes provide jitter analyses at the push of a button.



BROADCAST AND MEDIA



Solutions for the production, processing, broadcasting, measurement and quality control of audiovisual signals

Like many industries, broadcast and media has to keep pace with ongoing digitalization and the shift towards internet based solutions. Rohde&Schwarz, an innovator in the field of broadcasting for more than 70 years, supports this transformation with ground-breaking solutions.

Today, the entire signal processing chain, from camera output to transmission via the various broadcast channels, can be realized with Rohde&Schwarz products. The Rohde&Schwarz portfolio includes T&M equipment for developing, manufacturing and ensuring the quality of consumer electronics devices and infrastructure components as well as monitoring products for broadcast networks.

TV and mobile communications are merging. In the future, TV transmitters will be used to broadcast top-quality multicast transmissions to mobile devices without burdening mobile networks. A typical application is the live broadcast of major sports events.





Film and broadcast production studios face the challenge of migrating to ultra high definition HDR formats, which means that almost all of their technical equipment has to be replaced. Rohde&Schwarz offers studios state-of-the-art ingest and playout servers, video workstations, high-performance storage and monitoring solutions.

UHD formats are transmitted via internet, satellite and even terrestrial transmitters. Most terrestrial transmitter networks around the world have been upgraded to digital transmission technology. In the next few years, networks will be upgraded to UHD capable technologies. South Korea was the first country to put a nationwide terrestrial UHD capable transmitter network into operation – for the 2018 Winter Olympics – with ATSC 3.0 transmitters from Rohde&Schwarz.

Cost-efficient uplink amplifiers are required for satellite TV and data transmission. Rohde&Schwarz is driving a technological shift by providing solid-state amplifiers as a reliable alternative to tube amplifiers.

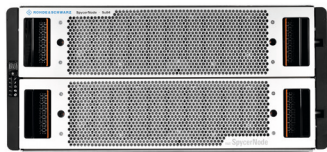
The introduction of 5G opens up new opportunities to combine technologies and use terrestrial broadcast infrastructure for mobile communications. Television signals and data can be broadcast to mobile devices without burdening mobile networks. Rohde&Schwarz has proven the practicality of this approach in research and demonstration projects and has already incorporated the technology into series products.

Network operators can buy the transmission technology from Rohde&Schwarz as well as the T&M and monitoring equipment needed to install, maintain and monitor broadcast networks. Consumer electronics manufacturers will appreciate the fact that the Rohde&Schwarz portfolio includes signal generators and signal analyzers designed specifically for the audio and video sector.

The R&S®SpycerNode storage solution uses high-performance computing technologies to meet the high storage bandwidth requirements of video applications.

Our portfolio

- ▶ Software based solutions for live studio production, premium post production and media content layout
- ▶ TV and radio transmitters in all power classes and for all standards, including 5G Broadcast
- ▶ Solid-state satellite uplink amplifiers
- ▶ Software defined multiviewing and monitoring solutions
- ▶ Audio/video and broadcast T&M equipment



AEROSPACE | DEFENSE | SECURITY



Security products for critical infrastructures

At a time when crises and conflicts regularly make the headlines, critical infrastructures and public areas need more protection than ever. Rohde & Schwarz addresses this need with a diversified product and solution portfolio. Air traffic controllers in 80 countries and at more than 200 airports and traffic management centers use our radio systems to ensure smooth air traffic.

Rohde & Schwarz security scanners also provide protection in the form of efficient security checks at airports and other high-security locations. Drones are opening up new possibilities in logistics, aerial photography and recreation.

However, they can also easily be used for illegal purposes such as industrial espionage or disrupting flight operations. The Rohde & Schwarz drone detection system reliably detects these unwelcome intruders so that countermeasures can be taken.

And, finally, our IT security products protect IT infrastructures such as the signal lines in railway networks and control systems in supply engineering against tampering and tapping.

Our portfolio

- ▶ Radio systems for air traffic control (CERTIUM®)
- ▶ Security scanners
- ▶ Radiomonitoring and direction finding systems, also specifically for drones
- ▶ IT security solutions

The new R&S® Series5200 ATC radio family sets new standards in terms of connectivity, serviceability and total cost of ownership.



Secure radiocommunications systems

Today's military missions are typically combined operations in a multinational environment. The key to success is achieving information superiority through network centric operations. Rohde & Schwarz supplies interoperable radiocommunications systems for deployment on land, at sea and in the air. These systems are designed for simultaneous data and voice transmission, consistently high voice quality and low latency.

The company uses recognized standards to securely, cost-effectively, flexibly and sustainably connect customer platforms. The encryption processes meet the most exacting domestic and international security requirements and ensure the digital sovereignty of our government customers.



Radiomonitoring

Reliable situational awareness is essential for making decisions in crisis situations and during military missions. Communications intelligence is a key factor that potentially contributes to de-escalation and conflict resolution. Rohde&Schwarz has supplied this segment for decades, offering an extensive range of sensors and software. The user-configurable systems for deployment on land, at sea and in the air process signals in all frequency ranges from HF to SHF.

Our radar intelligence (ELINT) systems detect state-of-the-art LPI radars, effectively increasing the safety of deployed forces.

The NAVICS® and SOVERON® product families from Rohde & Schwarz, deployed onboard naval vessels around the world, provide complete communications and radio-monitoring infrastructures.

Our secure radiocommunications portfolio

- ▶ Integrated modular communications systems for armies, navies and air forces
- ▶ Encryption technology for all classification levels

Our intelligence and situational awareness portfolio

- ▶ Radiomonitoring systems
- ▶ Radar intelligence systems
- ▶ Satellite monitoring systems
- ▶ Network traffic analysis systems



NETWORKS AND CYBERSECURITY



Network and cybersecurity solutions for business and government authorities

High-performance data networks and IT components are the backbone of business and society. The volume of dormant and transmitted data is growing exponentially, driven by the digitalization of all business processes, the increasing outsourcing of IT services to the cloud and the emerging internet of things.

Highly interconnected networks attract unwanted attention. According to the estimates of reliable organizations, cyberattacks, especially theft of intellectual property, cost the global economy hundreds of billions of dollars each year.

Online threats can be effectively countered with security products such as R&S®Cloud Protector.

But intangible assets are not the only assets that need protection. The large quantities of sensitive public sector data as well as personal data generated by the financial sector, the health care system and online commerce also need to be protected. Manufacturers of network components and IT security technology have to provide secure, high-performance solutions for the transmission and storage of this data.

The Rohde&Schwarz subsidiaries Rohde&Schwarz Cybersecurity and LANCOM Systems offer a wide range of infrastructure components for networking as well as products to ensure customers can work securely in networked structures.





The Rohde & Schwarz subsidiary LANCOM Systems is the leading European manufacturer of network infrastructure solutions for business and administration. LANCOM supplies all the components needed for secure site networking, both locally and between sites. Cloud management based on software defined networks ensures maximum installation and configuration convenience, flexibility and security. 8000 national and international sales partners find the right solution for every customer.

Rohde & Schwarz Cybersecurity is expanding the company portfolio by adding security products for applications, stationary and mobile devices, cloud computing and high-performance encryption solutions.

Rohde & Schwarz Cybersecurity designs its products strictly in line with the security-by-design principle. This gives priority to proactive defense against cyberattacks through security centric system design over reactive measures such as virus scanners.

Both LANCOM Systems and Rohde&Schwarz Cybersecurity have the Federal Office for Information Security verify and certify selected network and security products. The high level of protection, which meets the requirements of government users, is equally beneficial to customers in the business world.

As part of the digital pact for schools (DigitalPakt Schule) support program, the German federal and state governments are providing more than EUR 5 billion for school digitalization. Numerous educational institutions have already purchased WLAN network technology from LANCOM Systems.



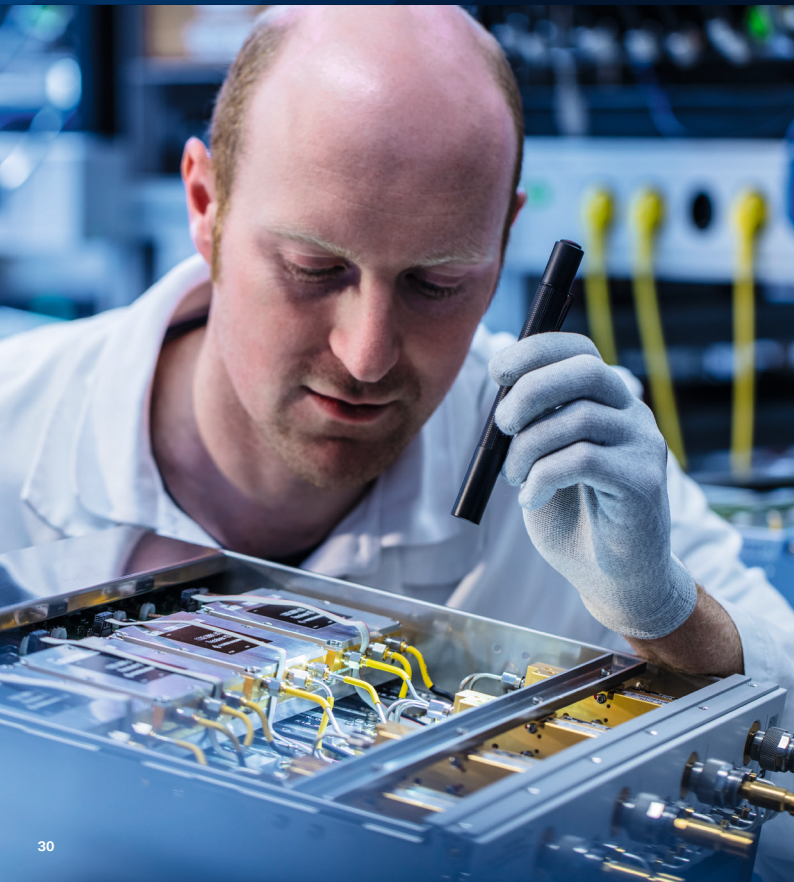
Our portfolio

- ▶ All components for secure WAN, SD-WAN, LAN and WLAN connectivity
- ▶ Network security products, e.g. firewalls
- ▶ Products to protect web and cloud applications
- ▶ Products to protect desktop applications
- ▶ Secure products for mobile communications
- ▶ High-security encryption systems

Unified firewalls offer customized protection for small and medium-sized businesses. The next generation LANCOM models R&S®UF-160 and R&S®UF-260 offer significantly increased performance.



SERVICE



Rohde & Schwarz stands for innovative service products over the entire product lifecycle and operates a global service network.

The following services are available in more than 70 countries:

- ▶ Calibration
- ▶ Maintenance and repair
- ▶ Product updates and upgrades
- ▶ Remote service

Rohde & Schwarz regional service centers, plants and specialized subsidiaries provide a wide range of additional services for system customers:

- ▶ System integration
- ▶ Application support
- ▶ Development of customized modules, equipment and systems
- ▶ Software development
- ▶ Installation and commissioning

Our 24/7 customer support centers answer any questions regarding our products and services (p. 39).

Service that adds value

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

During the product's useful life, Rohde & Schwarz offers its customers the following service level agreements:

- ▶ System support
- ▶ Training
- ▶ Maintenance
- ▶ Spare parts service
- ▶ Integrated logistics support
- ▶ Obsolescence management
- ▶ Technical documentation



HEADQUARTERS

At company headquarters in Munich, around 3200 employees work in research and development, central sales and service, marketing and administration.

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Technology Center II is one of the most striking buildings on the company campus in the Munich Werksviertel district.



GLOBAL PROXIMITY

Rohde & Schwarz maintains a global sales and service network with subsidiaries and offices in more than 70 countries. Other countries are served by regional centers.

www.sales.rohde-schwarz.com

A few sites in the global Rohde & Schwarz network.



Columbia, Maryland (USA)



Singapore



Beijing



Madrid



Seoul



London



Kuala Lumpur



Paris



Vienna

ROHDE & SCHWARZ WORLDWIDE





HIGH DEGREE OF VERTICAL INTEGRATION



Memmingen plant

The plant in Memmingen is the competency center for complex equipment and standard systems. It is responsible for electronic module assembly, microelectronics, microwave engineering, final production, and manufacture of test equipment for most Rohde&Schwarz products. It also services and manages the demo pool for these products. The plant has a calibration laboratory that is accredited by the German accreditation body (DAkkS) and an antenna test chamber that is unique throughout Europe.

Rohde & Schwarz Messgerätebau GmbH

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Teisnach plant

The Teisnach plant is the mechatronics center in the Rohde&Schwarz group. It produces housings, shielding components, antennas, printed boards, micromechanical precision parts, electromechanical custom-made products of all types, and much more. As the competency center for transmitters and systems, the Teisnach plant manufactures, delivers and services all broadcast transmitters, security scanners and customized radiocommunications systems.

Rohde & Schwarz GmbH & Co. KG

Teisnach plant
Kaikenrieder Straße 27
94244 Teisnach | Germany
Phone +49 9923 85 70
info.teisnach@rohde-schwarz.com



Vimperk plant

As the competency center for standard equipment, the Czech plant manufactures products of low to medium complexity. The plant's high manufacturing depth covers the complete value chain, including cable production and assembly.

Rohde & Schwarz závod Vimperk, s.r.o.

Location Spidrova 49
38501 Vimperk | Czech Republic
Phone +420 388 45 21 09
info.vimperk@rohde-schwarz.com

As part of their complete range of services, the plants in Memmingen, Teisnach and Vimperk also offer production services for external customers.



Singapore and Malaysia plants

In Singapore and in neighboring Malaysia, Rohde & Schwarz operates smaller plants for final assembly and shipping of standard equipment of low to medium complexity.

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Sales

The addresses of the local sales companies can be found at www.sales.rohde-schwarz.com

Customer Support

Our regional support centers will be happy to answer any questions regarding our products and services:

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Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

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