

Rohde & Schwarz: the expert in

Test & Measurement

Broadcast and Media

Secure Communications

Cybersecurity


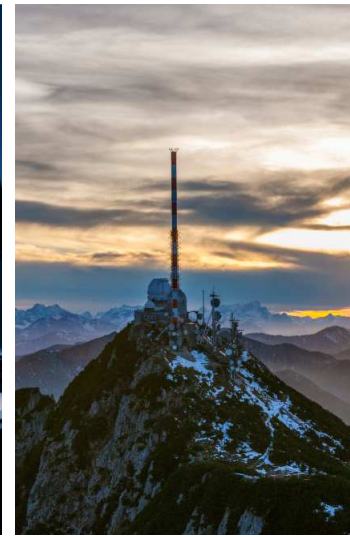
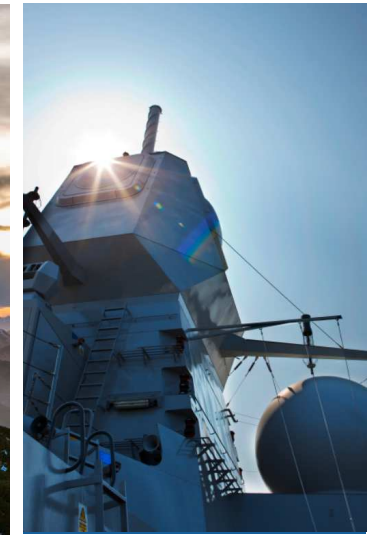
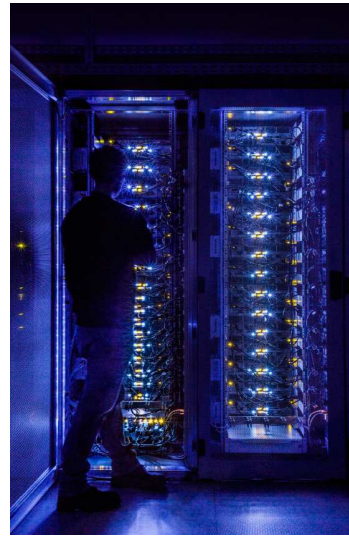

Monitoring and Network Testing

The company group at a glance

History	Type of enterprise	Global presence	Net revenue	Employees	Success
Established 1933 in Munich, Germany	Independent family-owned company	In over 70 countries, more than 60 subsidiaries	EUR 1.92 billion (FY 15/16)	10,000 worldwide	A leading international supplier in all of its fields of business



Business fields

Test and Measurement	Broadcast and Media	Secure Communications	Cybersecurity	Monitoring and Network Testing
				
Service				



Customers and markets



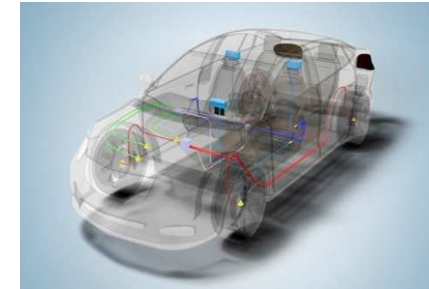
Manufacturers of mobile communications and other wireless terminal equipment



Operators of wireless communications and broadcast networks



Electronics manufacturers and service providers



Automotive industry



Aerospace and defense



Studios and broadcasters



Government authorities and other public sector customers



Companies of all types and sizes



Leading-edge solutions



R&S®CMW500
Universal test platform for all common mobile communications and wireless technologies



R&S®RTO
Fastest oscilloscope on the market with the world's first digital trigger



R&S®CLIPSTER
Mastering station for video postproduction



R&S®QPS200
Latest generation millimeterwave security scanner for airports



R&S®ARDRONIS
Drone detection and location system



R&S®SDTR
Military radio based on state-of-the-art software defined radio (SDR) technology



R&S®SITLine ETH40G
Fastest Ethernet encryptor (40 GBit/s)

Real-time Ethernet Encryption R&S[®]SITLine ETH



Secure landline, radio relay and satellite transmission

R&S®SITLine ETH

- Ethernet encryptor family from 25 Mbit/s to 40 Gbit/s
- Advanced cryptographic methods and standards (elliptic curves, AES, X.509)
- Tamper protection and random numbers



Designed with growing bandwidths in mind

R&S®SITLine ETH encrypts 100 MbE, 1 GbE and 10 GbE

R&S®SITLine ETH10G/ETH40G

- 10 Gbit/s to 40 Gbit/s per device
- ETH10G: 1 optical/electrical 10 GbE line
- ETH40G: 4 electrical 10 GbE lines
- ETH40G: 4 optical 10 GbE lines

R&S®SITLine ETH4G

- 100 Mbit/s to 4 Gbit/s per device
- 1 or 4 optical/electrical 1 GbE lines (cross media connect)
- In-field upgrade to 10 GbE support



Ethernet encryptor for harsh environmental conditions

R&S®SITLine ETH50

- Ruggedized:

Temperature range for operation -20°C to +70°C, fanless operation, MTBF > 300 000 h

- Flexible:

Variants with 10, 25, 50, 100 Mbit/s throughput

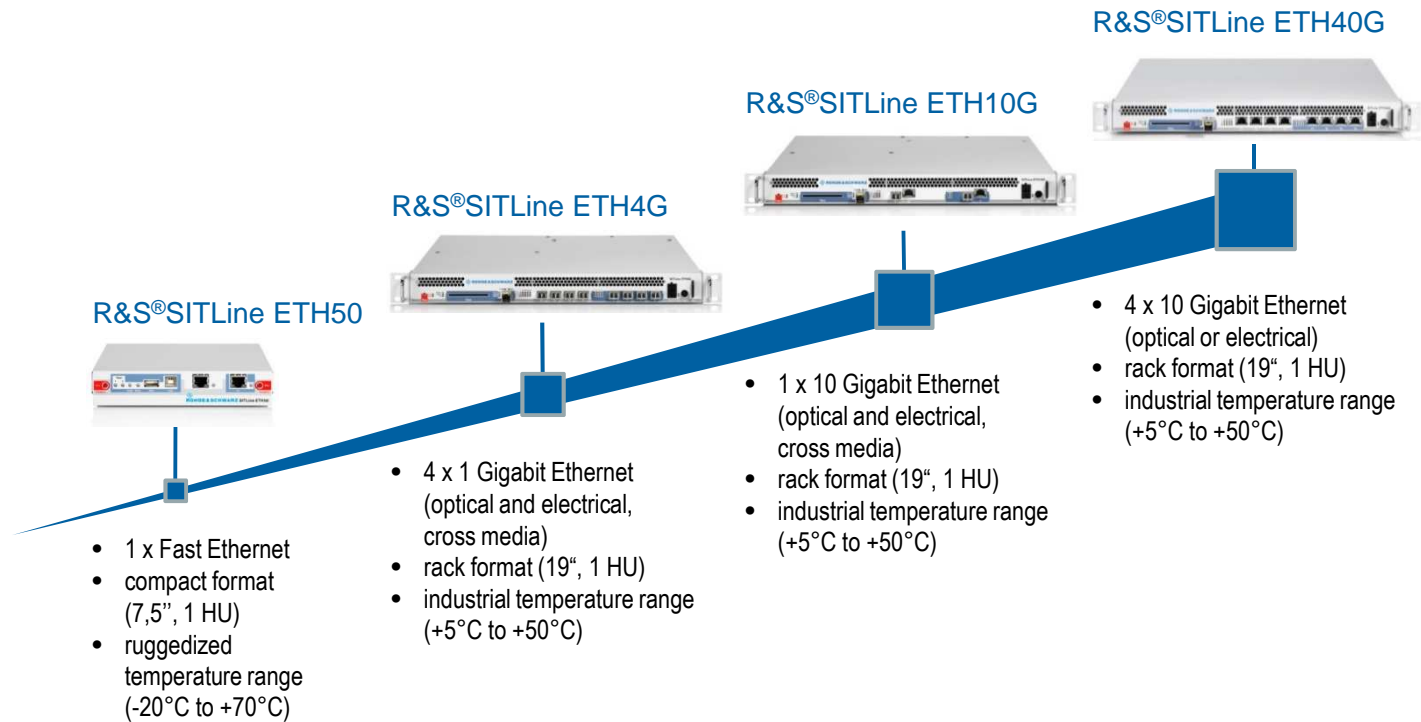
- Certified:

BSI-certified for German “restricted” (VS-NfD) and NATO restricted



Flexible solutions for heterogeneous infrastructures

Meet your networks needs



R&S®QPS Quick Personnel Security Scanner



QPS201: Quick Personnel Security Scanner

The R&S®QPS is a state-of-the-art millimeter-wave full-body scanner that automatically detects potentially dangerous items carried on the body or in clothing. The scanner can be used for airport security checks, security at public events with a high threat potential and access control at security related facilities.



Data acquisition time ≈ 32 ms

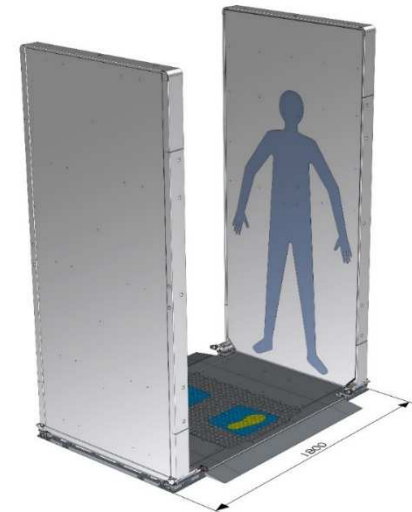
Frequency 70 to 80 GHz ($\lambda \approx 4$ mm)

High resolution < 2 mm

Image dynamic range > 30 dB

Processing time ≈ 3 sec

Peak Power ≈ 1 mW



Overview

The R&S®QPS201 detects

Security threats and objects of interest of **various nature and shape:**

- metallic and non-metallic
- plastics
- ceramics
- explosives
- liquids and gels
- powder
- monetary bunch
- others



body-shaped
explosives

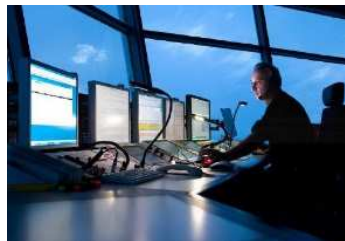
Detection is based on material parameters, not on comparison of images or shapes!



Secure Communications

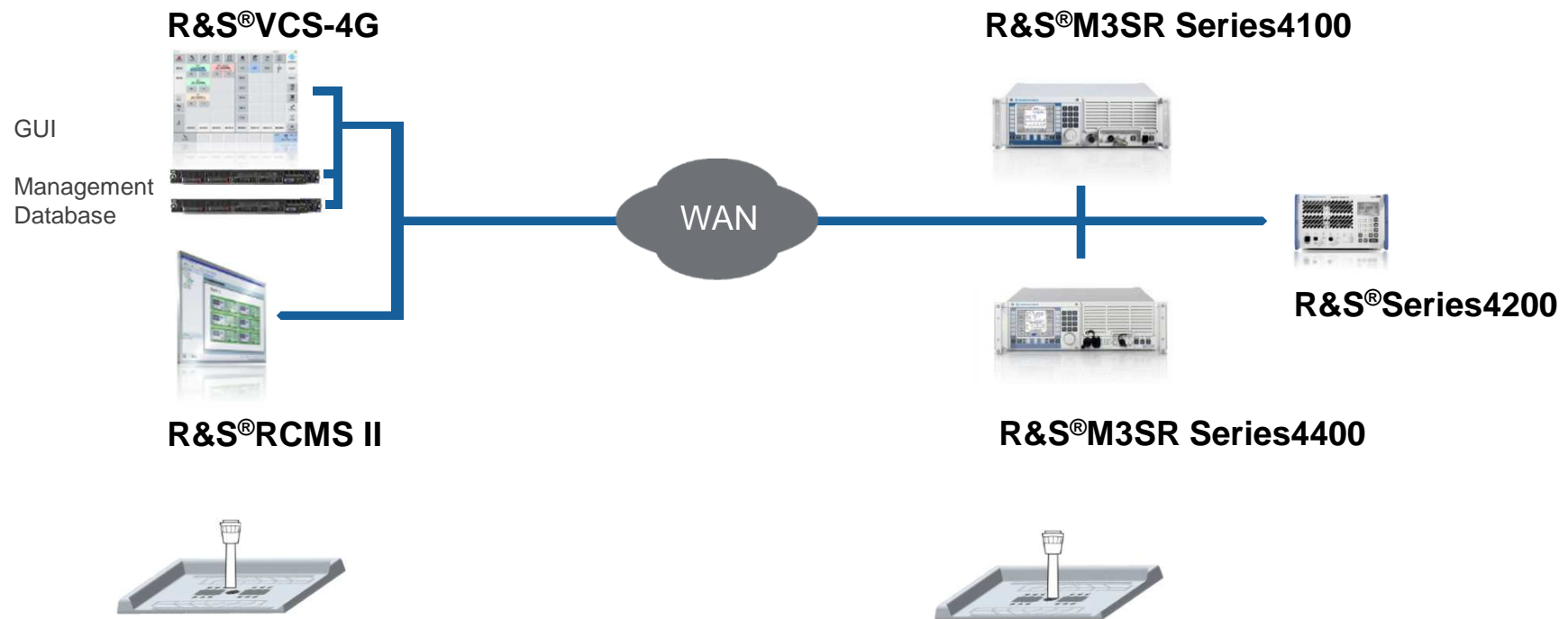
World-leading technology

- Software defined radios (SDR) for Army, Navy, Air Force
- Seamless integration and adaptation into IP networks
- Jamming-resistant and high data rate waveforms
- High-grade and customizable crypto solutions
- Waveform development and porting expertise
- Customized solutions



ATC/AD communications

“From the microphone to the antenna”



ATC/AD communications equipment - extract



R&S® Series 4200

VHF and UHF transceiver / transmitter / receiver



R&S® M3SR Series 4100/4400

HF and VHF/UHF EPM (ECCM) transceiver



R&S® VCS-4G

Voice communications system



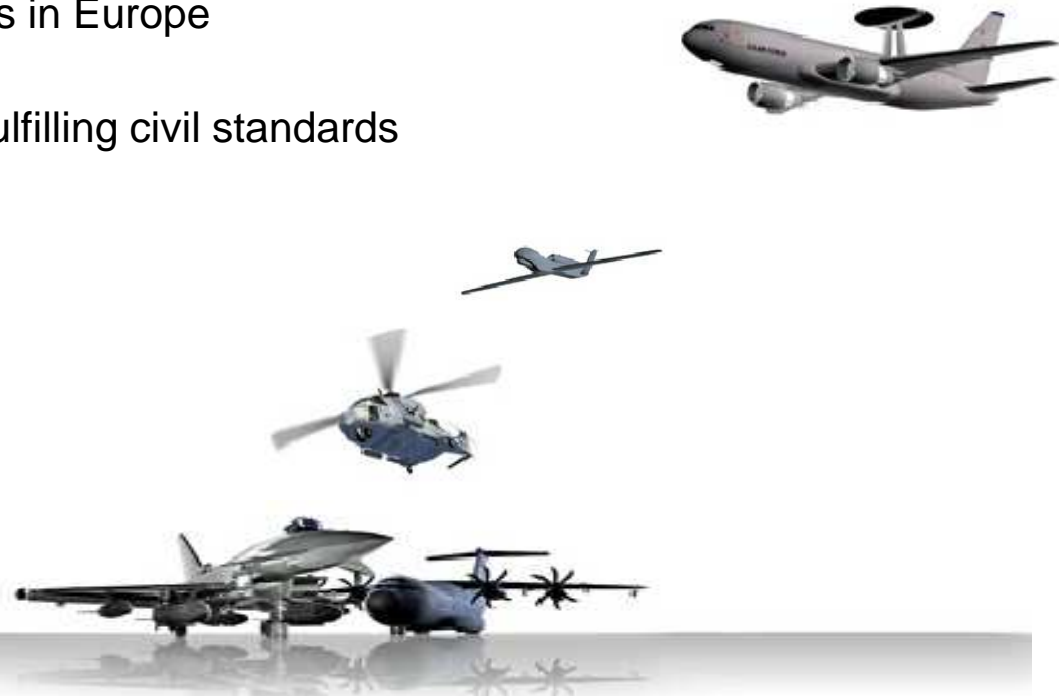
R&S® RCMS II

Remote control and monitoring system

Airborne communications

R&S®M3AR family

- More than 7,000 units delivered
- Leading supplier for airborne radios in Europe
- VHF/UHF frequency range
- Unique supplier of military radios fulfilling civil standards



Airborne communications equipment

R&S®MR6000L

10 W
local control
TRANSEC/COMSEC



ARC-164
housing

R&S®MR6000R

10 W
remote control
TRANSEC/COMSEC



ARC-164
housing

R&S®MR6000A

20 W
remote control
embedded NATO
COMSEC (optional)



ARINC 600
standard

R&S®MR6000E

20 W
remote control
embedded NATO
COMSEC



L-shape

compact - lightweight - rugged

Naval communications

Integrated Communications Systems (ICS)

System solutions for

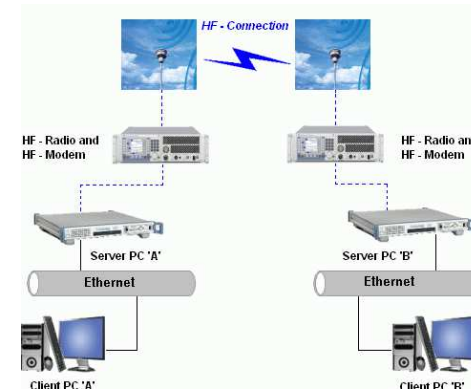
- Ship-ship communications
- Ship-shore communications
- Message handling
- Information management
- Electronic warfare (optional)



HF/VHF/UHF radiocommunications



System engineering

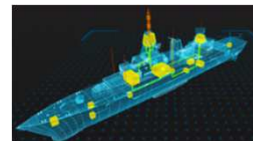


Message handling

+

Information management

System



integration

Naval communications equipment - extract



R&S®M3SR Series4400
VHF/UHF EPM (ECCM) transceiver

R&S®M3SR Series4100
HF receiver, transmitter, transceiver
100 W / 500 W / 1000 W
Broadband 4 kW
Split-site systems



R&S®Postman III
IP data transfer via
HF and VHF/UHF radio networks



R&S®MMHS
Military message handling system
in line with STANAG 4406



R&S®SIMCOS II
Signals management and
control system



R&S®NAVICs
Naval integrated
communications system

Tactical communications

Vehicular installation

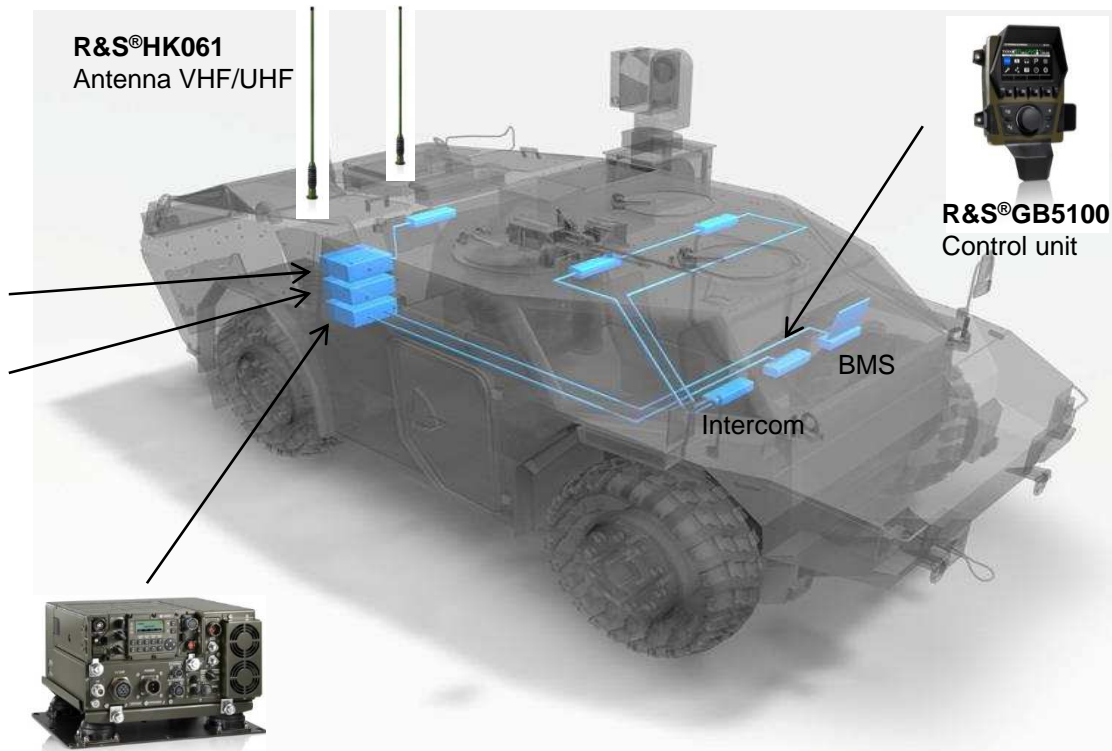
R&S®SDTR for VHF/UHF applications

- R&S®HDR
- HAVE QUICK I/II
- Other waveforms



R&S®M3TR for HF applications

- ALE-3G
- IP xDL (STANAG 4538)
- Other waveforms



Tactical communications equipment - extract



R&S®SDTR VR5000
VHF/UHF SDR for vehicular application



R&S®M3TR MR3000P
VHF transceiver for handheld application



R&S®GB5100
Control unit for three tactical radios



R&S®M3TR MR3000U/H
HF/VHF/UHF SDR for
vehicular/manpack application



R&S®RNMS SDxR
Radio network management system

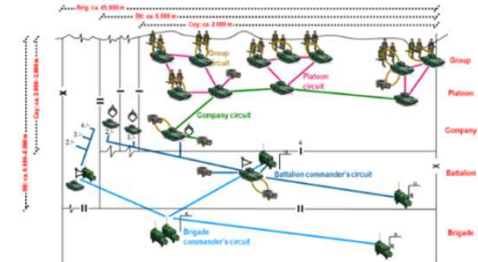


R&S®C2UBE
Integrated C2 system

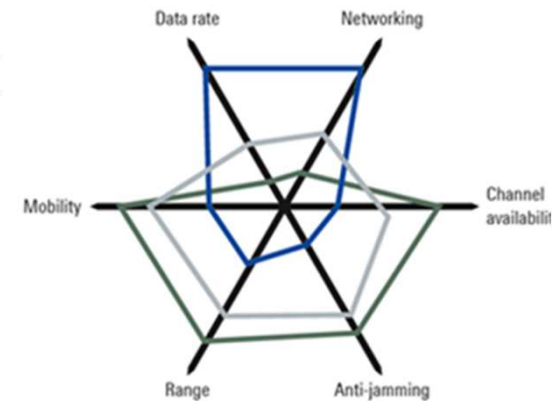
Tactical communications

Solutions for the forward area brigade

- Radios (stationary, vehicular, mobile)
- Legacy and SCA-based waveforms
- System components (key and network management, tactical router, intercom, battle management system, etc.)
- Support (waveform porting, customized crypto solution etc.)
- Service (logistics, training, maintenance, etc.)



Waveform development environment



High data rate waveforms

International SCA programs

Germany is one of the pioneering countries in SCA programs, with Rohde & Schwarz as the system integrator for the German SDR program.



Thank you for your time.

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-
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