

**ROHDE & SCHWARZ**

Make ideas real



# CERTIUM – A NEW STANDARD FOR FUTURE ATC COMMUNICATIONS



# CERTIUM

Safety and efficiency beyond existing market standards.

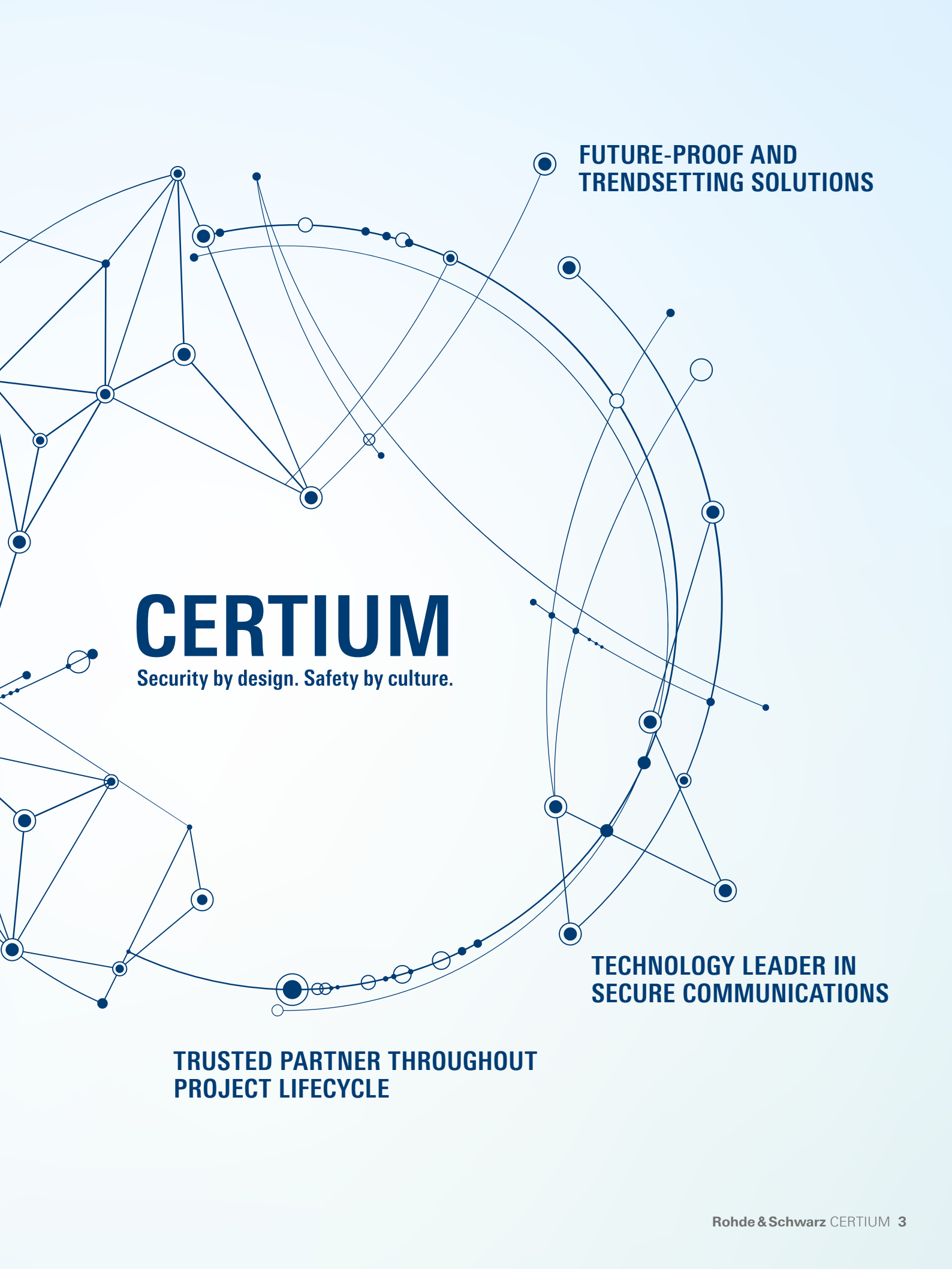
Global air traffic volumes are extremely volatile. Higher volumes in the skies and the continued upwards trajectory of air traffic, along with recovering rapid technological change, evolving cyber threats and limited resources, pose significant challenges for air navigation service providers.

However, safety, security and efficiency need to keep pace and are key requirements for air traffic control. To meet these demands, Rohde & Schwarz introduces CERTIUM, an advanced ATC communications suite from the microphone to the antenna.

**ONE-STOP-SHOP FOR  
ATC COMMUNICATIONS**

**SAFETY AND SECURITY THROUGH  
DESIGN AND CULTURE**





**FUTURE-PROOF AND  
TRENDSETTING SOLUTIONS**

# **CERTIUM**

**Security by design. Safety by culture.**

**TECHNOLOGY LEADER IN  
SECURE COMMUNICATIONS**

**TRUSTED PARTNER THROUGHOUT  
PROJECT LIFECYCLE**

# A COMPLETE PORTFOLIO FROM A SINGLE SOURCE.


© ONE-STOP-SHOP FOR  
ATC COMMUNICATIONS





# 100

**A manufacturing depth of almost 100% ensures traceable quality and interface control down to the last detail.**



“ Longevity is a fundamental quality feature of Rohde & Schwarz. However, the high pace of innovation in modern communications technology means that products have to be regularly updated and adapted to new technological developments.

Rohde & Schwarz takes turnkey responsibility and is a one-stop-shop for customers who want one supplier to talk to.”

**MARIUS MÜNSTERMANN**

VICE PRESIDENT ATC

# ONE-STOP-SHOP FOR ATC COMMUNICATIONS

With CERTIUM, Rohde&Schwarz offers a true one-stop-shop for the full lifecycle of an ATC communications system – from design, manufacturing, system integration to tailored services for the entire lifecycle.

CERTIUM features a complete portfolio from a single source with perfectly matched components based on full IP technology.

ATC controllers and decision-makers benefit from just one contact and clear responsibilities for the whole ATC communications system. This has a decisive effect on reliability, availability and efficiency.

### CERTIUM: ONE CONTACT - ONE RESPONSIBILITY



### WORLDWIDE REFERENCES

<b>United Kingdom</b>	<b>Two NATS area control centers and a corporate and technical center are equipped with 600 CWPs, connecting to 1700 radios and various ground-to-ground lines across the UK.</b>	
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# CREATING HIGHER STANDARDS.

● FUTURE-PROOF AND  
TRENDSETTING SOLUTIONS





An aerial photograph of a city, likely New York City, viewed from a high altitude. The city's grid pattern, a winding river, and several skyscrapers are visible. In the foreground, the white wing of an airplane is seen from a passenger's perspective, extending across the top and right sides of the frame. The sky is a clear, vibrant blue with scattered white clouds. The number '80' is superimposed in a large, bold, light blue font over the center of the city.

# 80

**Rohde & Schwarz ATC solutions for ground-to-air and ground-to-ground communications are deployed in more than 80 countries.**

## FUTURE-PROOF AND TRENDSETTING SOLUTIONS

By participating in several working groups Rohde&Schwarz implements future standards, encouraging intense collaboration with air navigation service providers.

Voice over IP is one of the key technologies for future air traffic control and defined in the global EUROCAE ED-137 standard.

As a key player, Rohde&Schwarz is actively involved in the standardization process.

CERTIUM is fully IP based in accordance with global standards and goes even further. The scalable, cost-effective and future-proof ATC communications suite paved the way for innovative operational concepts such as geographically distributed virtual center and remote tower solutions.

### VIRTUAL CENTER



Making geographically distributed and redundant ATC a reality.

### REMOTE TOWER



Towers remotely controlled from central locations.

### DIRECTION FINDING



Taking bearings and determining the position of calling aircrafts.

A portrait of Alexandru Negulescu, a middle-aged man with short grey hair, wearing a dark blue suit jacket over a light blue patterned shirt. He is smiling and standing in a modern office environment with large windows in the background.

## ALEXANDRU NEGULESCU

MANAGING DIRECTOR R&S CENTER OF COMPETENCE FOR VCS

“The innovative virtual ATC center concept developed exclusively by Rohde & Schwarz reaffirms the company’s technological leadership role.

It makes geographically distributed, redundant ATC a reality, enabling our customers to operate a VCS group with maximum flexibility for considerably greater failsafety.”

### WORLDWIDE REFERENCES

Iceland  
Ireland

ISAVIA of Iceland and IAA of Ireland manage their mutual air traffic operation as if they were virtually in the same location by implementing a common VCS infrastructure and accessing HF radios.



# SAFETY MEETS SECURITY.

◎ SAFETY AND SECURITY THROUGH  
DESIGN AND CULTURE





2000

ATC systems from Rohde & Schwarz contribute to air traffic safety at more than 200 airports and area control centers all over the world.

A portrait of Francesco Gualtieri, a middle-aged man with grey hair, wearing a blue and white checkered button-down shirt. He is smiling slightly and looking directly at the camera. The background is a blurred office interior with large windows.

**FRANCESCO GUALTIERI**

PRODUCT MANAGER ATC

“With CERTIUM, Rohde & Schwarz strongly focuses on using the security-by-design approach when developing its products and on leveraging its expertise in cybersecurity solutions.”

## SECURITY BY DESIGN, SAFETY BY CULTURE

Rohde&Schwarz follows a strict “security by design” approach for all mission-critical components. Multiple layers of redundancy including an innovative quad-redundant VCS system architecture ensure uninterrupted availability.

Secure communications has been a core competence of Rohde&Schwarz for many decades. The company is a leading IT security company that protects digital assets of critical infrastructures around the world and provides approved solutions for classified communication levels.

Safety is a vital part of the company’s DNA. As an independent, privately owned enterprise/group, Rohde&Schwarz does not have to think in terms of quarterly results, it can plan sustainably for the long term.



### PROVEN TRACK RECORD IN SAFETY-CRITICAL APPLICATIONS

With more than 600 employees at its cybersecurity business unit, Rohde&Schwarz is one of Europe’s largest providers of network and cybersecurity equipment for professional customers.

### WORLDWIDE REFERENCES

#### Singapore

240 radios at busy Changi airport provide high-quality voice connections between pilots and air traffic controllers, featuring Detection of Simultaneous Transmissions (DSiT).



**CERTIUM**  
Advanced ATC  
communications suite

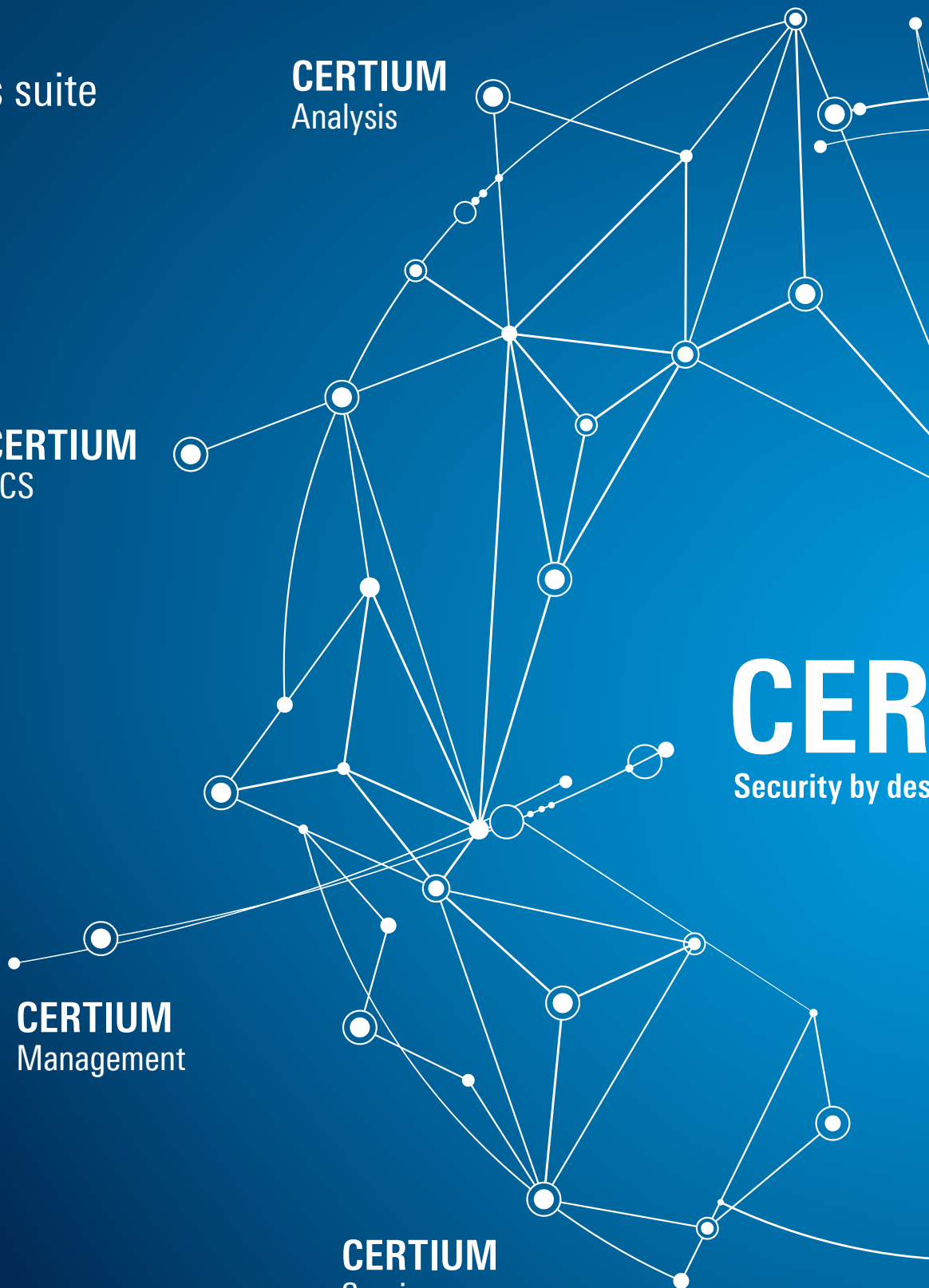
**CERTIUM**  
Analysis

**CERTIUM**  
VCS

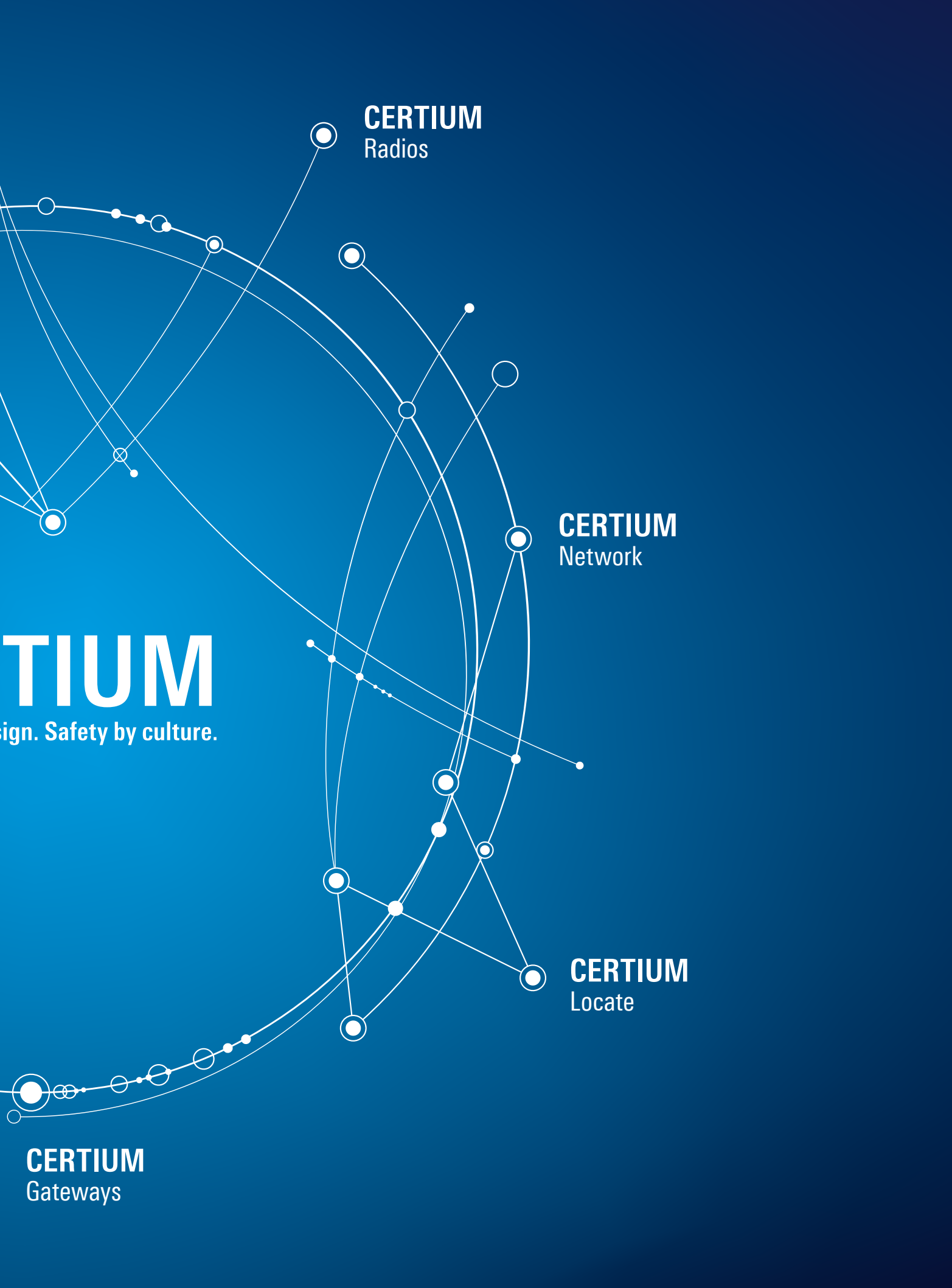
**CERTIUM**  
Management

**CERTIUM**  
Service

**CER**  
Security by des







**CERTIUM**  
Radios

**CERTIUM**  
Network

**CERTIUM**  
Locate

**CERTIUM**  
Gateways

**CERTIUM**  
Design. Safety by culture.

# CERTIUM PORTFOLIO

From the microphone  
to the antenna.



## CERTIUM VCS

The quad-redundant, IP based voice communications system integrates perfectly with the entire CERTIUM portfolio to ensure safe, secure and efficient airspace operation. CERTIUM VCS combines flexible and resilient state-of-the-art purely IP based architecture with strong security mechanisms. Its rapid scalability allows implementations from a small tower to a countrywide system.

With advanced capabilities CERTIUM VCS can support remote towers but also virtual centers, flexibly transferring responsibilities quickly between centers and countries.



## CERTIUM Radios

The communication between pilots and controllers requires reliable and secure radios. CERTIUM Radios cover the entire range used in ATC from HF to VHF to UHF with outstanding transmission parameters.

The comprehensive portfolio of software defined radios includes the brand-new R&S® Series5200 featuring an innovative security-by-design architecture and a cost-efficient maintenance concept.



## CERTIUM Locate

CERTIUM Locate provides methods for increasing the airspace capacity while reducing the mental load of the air traffic controller and improving overall safety.

Locating the communicating aircraft and highlighting it on the radar screen provides enhanced situational awareness and reduces the risk of call sign confusion. Air traffic controllers can safely handle more aircrafts simultaneously at a reduced stress level.



## CERTIUM Analysis

CERTIUM Analysis ensures regulatory compliance by using market-leading service assurance systems as well as test and measurement solutions for VoIP networks, radios and navigation.

The products use unique technologies to provide easy operation of the entire system. The portfolio ranges from high-value frequency and signal analyzers and radio test systems to voice quality and signal transmission assurance systems.



## CERTIUM Gateways

It is common to integrate legacy applications into IP infrastructure with phased migration scenarios in order to safeguard previous investments.

CERTIUM Gateways supports all common interface types from analog to TDM and enables integration of radios, VCS and telephony systems into an IP infrastructure. Gateways can be used as a standalone solution or in combination with CERTIUM VCS and/or CERTIUM Radios.



## CERTIUM Network

24/7 operation of sensitive, critical infrastructure requires highly resilient and secure networks.

Rohde & Schwarz provides delay-free and easy-to-implement network encryption for critical infrastructure as well as a unique ATC session border controller for protection on the edges of ATC voice networks in order to enhance and secure existing network infrastructure.



## CERTIUM Management

Easy-to-use centralized management of VCS and radios provides a real-time view of the system and enables central system configuration and software management.

Using multiple configurations, the system can be easily switched over to new parameters but also rolled back if needed. Central monitoring and reporting make the work of the system administrators much more efficient.



## CERTIUM Service

Rohde&Schwarz provides customer support throughout the lifecycle of the projects – from system design, project implementation, extensive acceptance testing and professional training up to long-term lifecycle support.

From 70 service centers worldwide, Rohde & Schwarz provides customers with support 24 hours a day, 7 days a week, mostly in the local language. The entire chain ensures many years of smooth system operation.

# SECURING THE SKIES.

◎ TECHNOLOGY LEADER IN  
SECURE COMMUNICATIONS





S5200VX 10:40:39  
124.100 AM  
ACT  
CBIT-STATUS OK

S5200VX · Transceiver

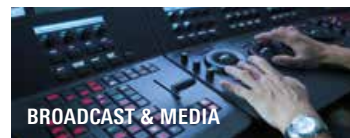
# 40,000

Almost 40,000 software defined ATC radios are successfully deployed all over the world.

## TECHNOLOGY LEADER IN SECURE COMMUNICATIONS

For decades, Rohde&Schwarz has supplied innovative communications systems to authorities, governments and security organizations. The company has built a market-leading reputation in these safety-critical sectors, being recognized as the technology leader for secure communications systems.

14,000 employees in over 88 countries are driving wireless and secure innovation. Today a unique portfolio from ATC working positions to antennas is backed by extensive expertise in providing turnkey solutions and market standards.







## JÖRG KILPERT

DIRECTOR ATC SYSTEM ENGINEERING  
AND PRODUCT MANAGEMENT

“As head of air traffic control system engineering and product management, I am committed to satisfying current customer needs and planning for future demands. Every year Rohde & Schwarz launches 300 products or improvements to make customer visions real.

Rohde & Schwarz offers industry leading technological expertise, focused on solutions that contribute to a safe and connected world.”

### WORLDWIDE REFERENCES

#### Germany

Turnkey ATC radio infrastructure with 100+ radio sites and remote control/monitoring, accessed by DFS controllers from the four area control centers in Germany.



# A BASIS OF TRUST.


● TRUSTED PARTNER THROUGHOUT  
PROJECT LIFECYCLE





88

Rohde & Schwarz has an extensive sales and service network and is present in more than 88 countries.

A man with short dark hair, wearing a blue suit jacket over a light blue button-down shirt, is smiling slightly. He is holding a white marker with a blue cap in his hands. He is standing in front of a glass wall, and his reflection is visible on the left side. The background is a bright, modern office environment.

“As a reliable partner, we support you through all phases of the project lifecycle and stand by you with an extensive and constantly growing portfolio of services that can be tailored to your specific needs.

We keep our promises and are there when you need us.”

## **FLORIAN ISTRATE**

**DIRECTOR CUSTOMER PROJECTS ATC**

## TRUSTED PARTNER THROUGHOUT PROJECT LIFECYCLE

Rohde&Schwarz products are on the cutting edge of technology, and so are the related services. The company offers customers innovative, tailored and forward-looking service packages for design, integration and protection of their high-end equipment.

A decisive pillar of CERTIUM is trusted partnership. Rohde&Schwarz supports customers by offering expertise and advice through all phases of the project lifecycles – from system engineering to project implementation to aftersales service. Based on the vast experience from ATC projects around the world, technology experts provide advice on updates, migration and enhancement of existing systems.

### SYSTEM ENGINEERING

Based on the customers' input, our experts develop a tailored system design to optimally address your operational requirements.

### SERVICE LEVEL AGREEMENT

With a service level agreement, you define the scope of service that best matches your business and technical requirements.

### PROJECT IMPLEMENTATION

Experienced project managers and integration experts ensure project completion on time and on budget.

### SERVICE PARTNER PROGRAM

The service partner program offers various concepts, from the verification of device functionality to manufacturer-independent repair.

### TESTING & TRAINING

Comprehensive acceptance testing and hands-on training for engineering and maintenance teams ensure a smooth system handover.

### OBSOLESCENCE MANAGEMENT

The obsolescence management monitors the availability of all your system components as well as the presence of in-house software and service skills.

### WORLDWIDE REFERENCES

#### Finland

A full-IP VCS with almost 100 CWP's in Helsinki connects seamlessly with 300+ VoIP radios. Future cooperation with neighboring countries is supported by built-in virtual center capabilities.



**THE NUMBER OF AIRLINE  
PASSENGERS WILL RECOVER TO  
ABOUT 10 BILLION BY 2040.**

**ROHDE & SCHWARZ IS PREPARED.**





Constantly setting new benchmarks in the aviation sector requires the best technology. This increase is attributable not least to improvements in safety and efficiency. Rohde & Schwarz supports air traffic controllers, pilots as well as security and technical personnel at airports with a future-proof aviation portfolio beyond CERTIUM:

#### **URBAN AIR MOBILITY**

Urban air mobility is shaping the future of aerospace. As an expert in aerospace test applications, Rohde & Schwarz is leading the way with innovations for testing and validating sensors (radar), communications (HF / VHF / UHF, 4G / 5G, SATCOM), flight navigation (GNSS) and overall electronic system performance.

LDACS is a terrestrial datalink technology that ensures high-speed, reliable and secure connections between aircraft and the ground for both ANSPs (ATC) and airline services (AOC).

Rohde & Schwarz is actively involved in advancing the deployment of this innovative technology, both in avionics and on the ground.

#### **AIRPORT SECURITY**

Security operations at airports have long demanded high-performance technology to support efficient and reliable checkpoint operations. Body scanners from Rohde & Schwarz provide high-resolution security scanning and recognize prohibited items in a matter of seconds.

#### **INTERFERENCE HUNTING**

Reliable communications between controllers and pilots as well as between airport personnel are essential. The dramatic upsurge in mobile and other wireless services has caused the number of cases of interference to rise. Rohde & Schwarz offers a comprehensive portfolio for hunting interferences.

#### **DRONE CONTROL DETECTION AND DISRUPTION**

Drones that fly above prohibited areas are an increasing security risk. Rohde & Schwarz offers unique solutions for the demanding applications in drone monitoring and countermeasures.

#### **AIRBORNE RADIO COMMUNICATIONS**

In addition to refining its well established airborne high frequency voice/data radios used in commercial long-haul aircraft, Rohde & Schwarz is shaping the future of aeronautical communication with innovative LDACS airborne radios.

#### **FUTURE AERONAUTICAL DATA COMMUNICATIONS**

Efficient new operational concepts like trajectory based operations (TBO) and other sustainability-oriented operational improvements in aviation depend on the reliable exchange of large amounts of data between ground and air.

## Service at Rohde & Schwarz You're in great hands

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

## Rohde & Schwarz

The Rohde & Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test measurement, technology systems and networks cybersecurity. Founded 90 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

[www.rohde-schwarz.com](http://www.rohde-schwarz.com)

## Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

Certified Quality Management

**ISO 9001**

Certified Environmental Management

**ISO 14001**

Certified Information  
Security Management

**ISO 27001**

Certified Collaboration  
Management System

**ISO 44001**

[www.rohde-schwarz.com/certium](http://www.rohde-schwarz.com/certium)

