

ROHDE & SCHWARZ

Make ideas real



NAVIGATIONAL SUPPORT FOR VESSEL TRAFFIC SERVICE

Solution overview



SECURITY
SCREENING



CELLULAR NETWORK ANA-
LYSIS



TEST &
MEASUREMENT



AIR TRAFFIC
CONTROL



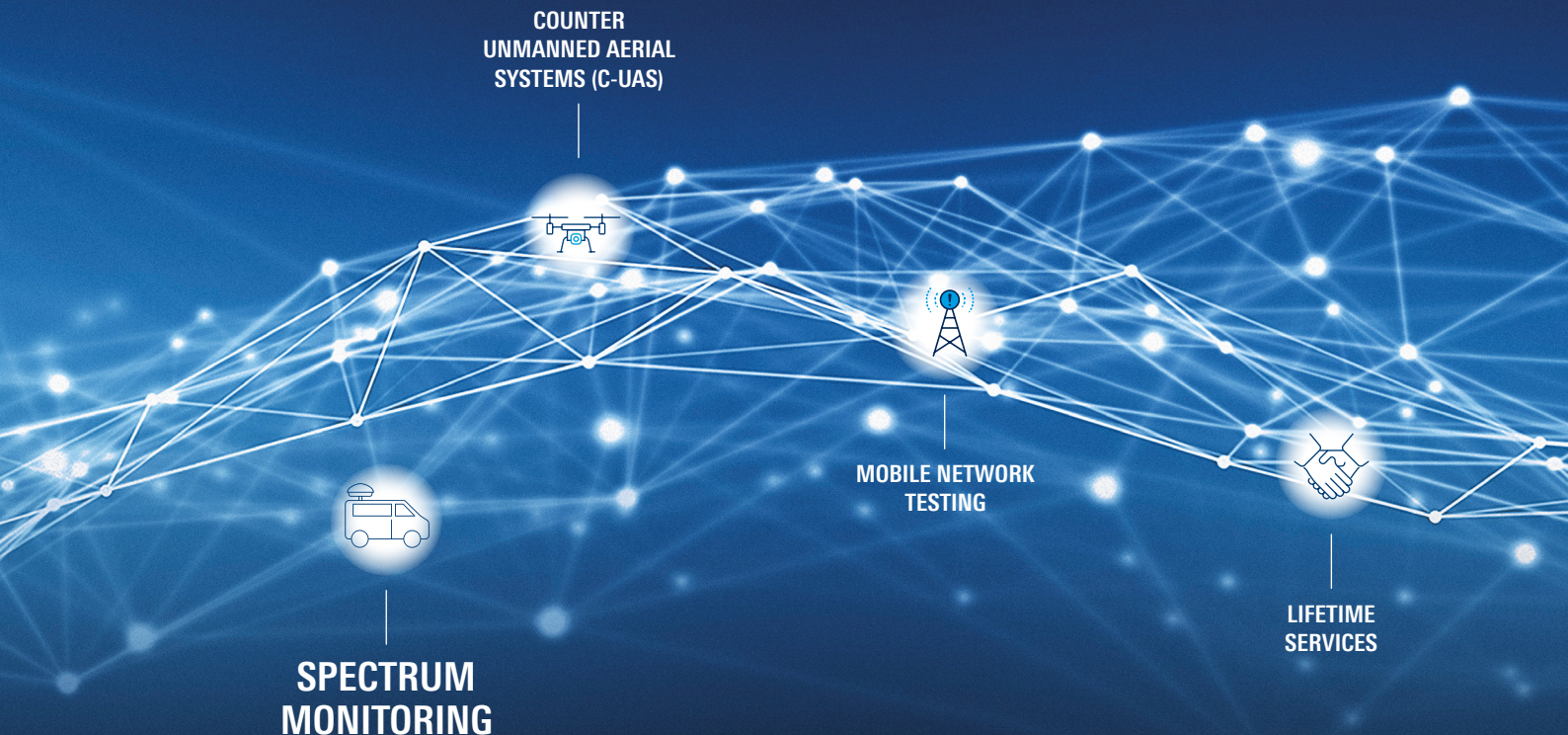
CYBERSECURITY



ROHDE & SCHWARZ CRITICAL INFRASTRUCTURE SOLUTIONS

The electromagnetic spectrum holds the potential to protect critical infrastructures. It not only enables communications that enhance safety and security but can also reveal potential threats such as illegal drone intrusion, unauthorized bugging devices, infiltration of harmful goods and radio jamming.

Rohde&Schwarz spectrum monitoring systems can detect suspicious or unwanted emissions, support interference mitigation and provide the basis for secure radio communications.



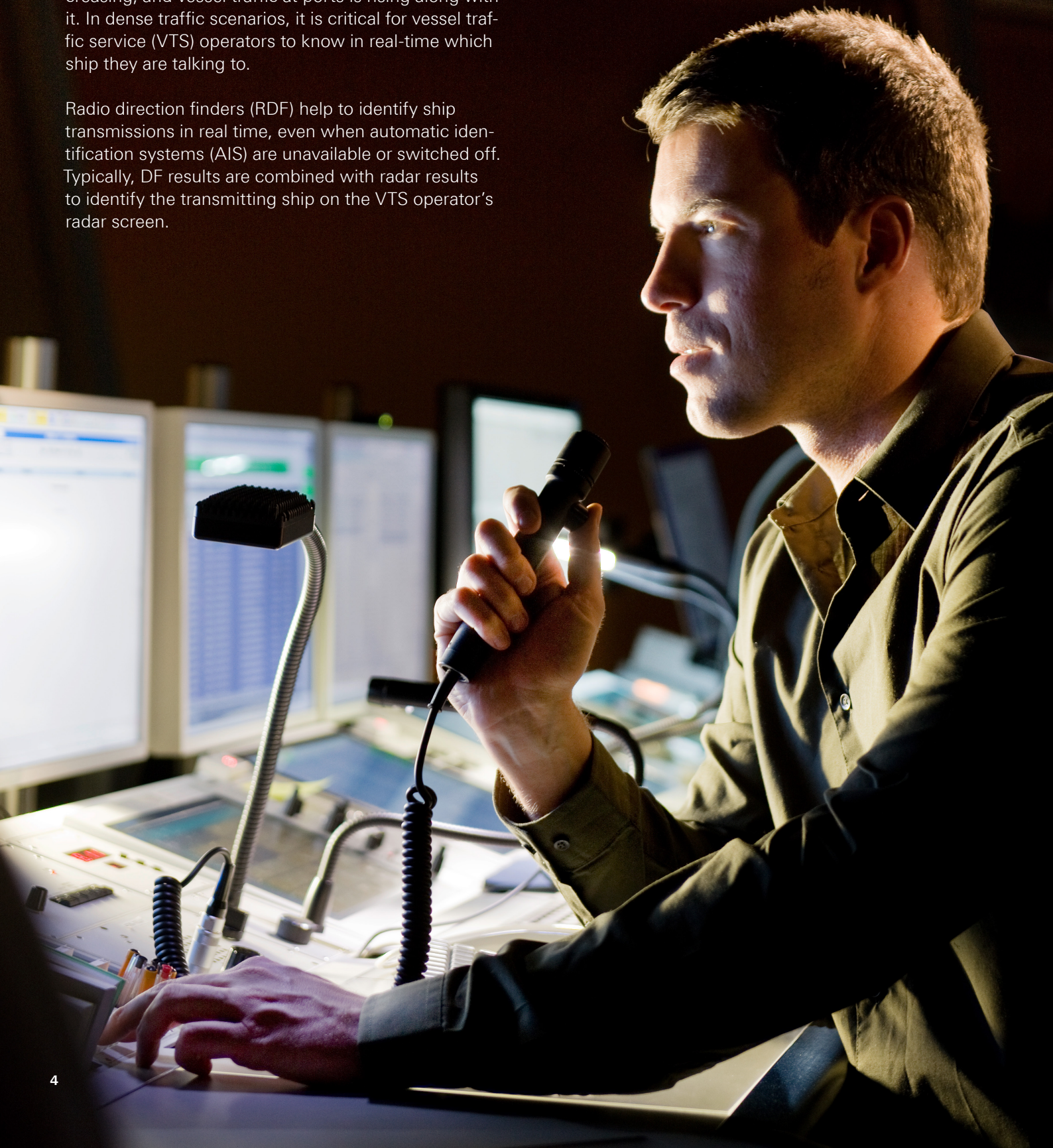
SYSTEM SOLUTION PARTNER

In addition to spectrum monitoring, Rohde&Schwarz is the partner of choice for safeguarding the performance of critical infrastructure and networks. As a system integrator and manufacturer of all core components, the company supplies turnkey solutions for the entire lifecycle – from system engineering and project implementation to aftersales service.

VESSEL TRAFFIC SERVICE

The flow of goods shipped between countries is increasing, and vessel traffic at ports is rising along with it. In dense traffic scenarios, it is critical for vessel traffic service (VTS) operators to know in real-time which ship they are talking to.

Radio direction finders (RDF) help to identify ship transmissions in real time, even when automatic identification systems (AIS) are unavailable or switched off. Typically, DF results are combined with radar results to identify the transmitting ship on the VTS operator's radar screen.



SEARCH AND RESCUE

Merchant shipping and private boat ownership are both on the rise, and this increase in vessels has meant more vessels in distress. Radiocommunications equipment is mandatory for the merchant marine, and skippers must be able to operate it. But in the stress and disorientation that ensues when a vessel is sinking or on fire, the skipper of a vessel in distress may forget or misjudge their position. As a result, the search areas that need to be scanned to find a vessel in distress can be very large. Time is of the essence in such search operations because survival time in cold water is limited.

Automatic radiolocation systems based on radio direction finders can locate vessels in distress to within a few hundred meters with just a brief transmission from shipboard radiocommunications equipment. Typically, this information speeds up search-and-rescue (SAR) missions significantly.

Coast guards also face a growing number of hoax calls, which waste money and resources. Sometimes fake distress calls are used to divert authorities away from criminal activity. Location information from automatic radiolocation systems can help to distinguish between real and fake distress calls.



SOLUTIONS

The R&S®DDF200M digital direction finder for VTS and SAR can be installed in fixed monitoring stations located at harbors or along coastlines. It measures multiple ship transmissions on different frequency channels simultaneously with high accuracy.

The R&S®DDF200M has an open SCPI interface for easy integration into VTS and SAR systems.

The R&S®DDF200M can be installed on the same mast as maritime radiocommunication transmitters using the optional interference cancellation module.

SYSTEMS WITH INTERFERENCE CANCELLATION

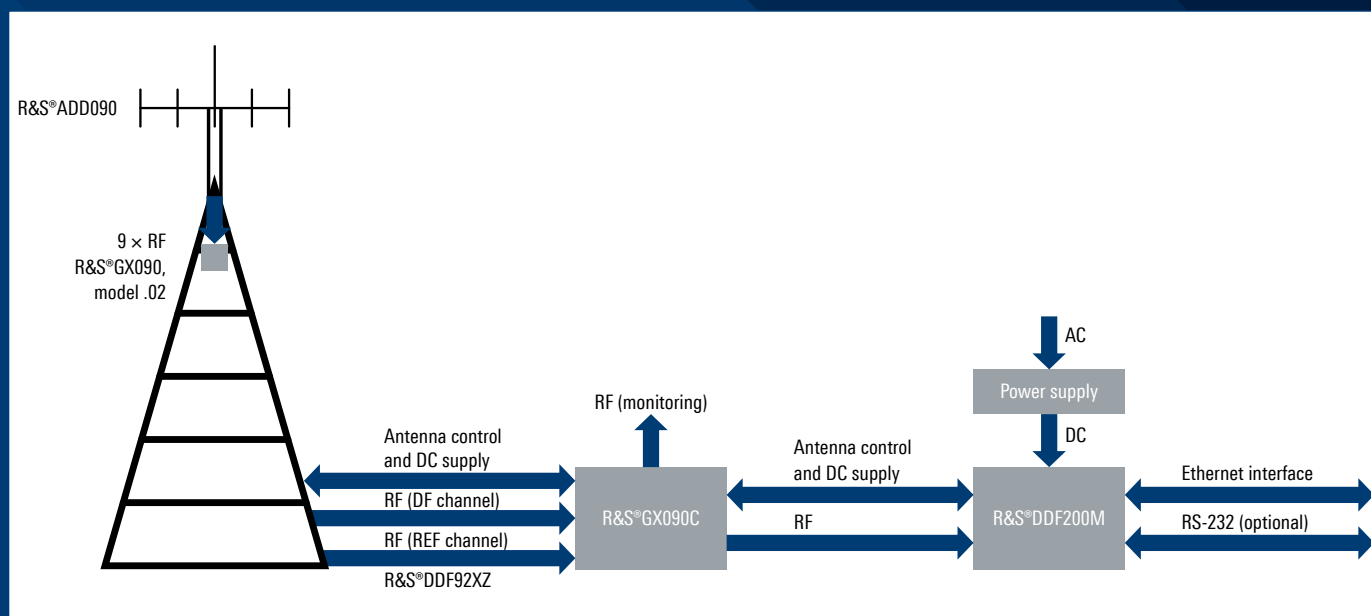
Typically, transmitters for maritime radiocommunication are installed on separate masts with sufficient distance to monitoring stations. In some cases this is not possible, and transmit antennas have to be installed on the same mast as the RDF antenna.

The R&S®DDF200M can be equipped with an optional interference cancellation module (ICM). The ICM adequately suppresses maritime radiocommunications signals from transmit antennas installed on the same mast. Passive filters cannot serve the same purpose because

the transmit and receive frequencies are so close. This is when the adaptive interference cancellation provided by the ICM is necessary.

Systems with interference cancellation are the R&S®DDF200M with the R&S®ADD090 DF antenna and an R&S®GX090 antenna network as well as the R&S®GX090C combiner network connected via the R&S®DDF92XZ DF antenna cable set (see below).

System configuration with interference cancellation



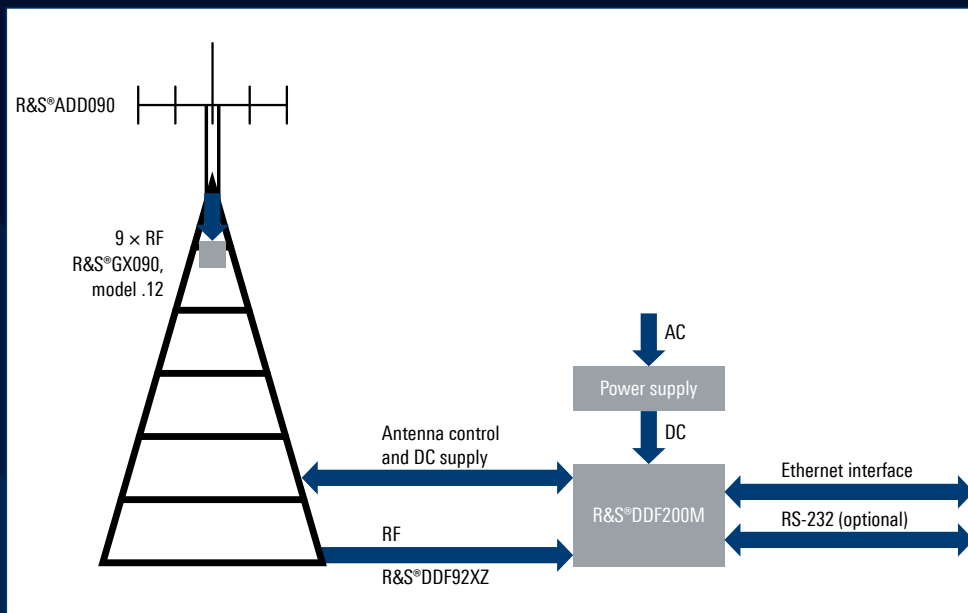


SYSTEMS WITHOUT INTERFERENCE CANCELLATION

If maritime radiocommunications transmitters are installed on separate masts with sufficient distance to the RDF antenna, interference cancellation is not required.

A system that does not need interference cancellation is the R&S®DDF200M with the R&S®ADD090 DF antenna and an R&S®GX090 antenna network connected via the R&S®DDF91XZ DF antenna cable set (see below).

System configuration without interference cancellation



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- ▶ 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.

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