

R&S® POSTMAN III

Radiocommunications system for
state-of-the-art IP based data transmission



Product Brochure
Version 02.00

ROHDE & SCHWARZ

Make ideas real



AT A GLANCE

Civil and military missions require that all entities involved can communicate efficiently and reliably. While voice communications continues to play an important role, data communications is increasingly gaining in importance. R&S®Postman III is a forward-looking radiocommunications solution for IP based data transmission.

R&S®Postman III enables efficient data transmission over radio networks, thus significantly contributing toward the success of civil and military missions. In addition to naval and coast guard scenarios, such missions will be carried out in disaster situations and as part of border control or rescue operations. In the event of a failure of wired communications media, such as used by embassies and consulates, R&S®Postman III can replace existing infrastructures by providing shortwave radiocommunications.

R&S®Postman III offers IP based applications and can therefore use standard IP infrastructures such as LAN/WAN or SatCom. R&S®Postman III has been optimized for communications over HF and VHF/UHF radio networks with low and variable data rates. The system supports the use of modern IP enabled radios as well as radios with a serial data interface.

R&S®Postman III supports multiline operation. In radio-communications, this means that information can be exchanged simultaneously with multiple entities over the same or different radio networks. R&S®Postman III automatically selects a line suitable for communicating with the remote entity.

Email and chat capabilities and the display of position data are some of the key applications that are made available through the intuitive user interface. Based on the data gained from these applications, R&S®Postman III can generate and display a force's situation picture. This is a crucial prerequisite for enabling coordinated action in both civil and military operations.



KEY FACTS

- ▶ IP based data transmission for narrowband radio channels
- ▶ Multiline capability for simultaneous communications with multiple radio network entities
- ▶ Generation of common situation picture based on position data from all radio network entities

BENEFITS

State-of-the-art, forward-looking technology

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Role based task division for efficient, convenient operation

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Simple and comprehensive communications applications

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Blue Force Tracking

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STATE-OF-THE-ART, FORWARD-LOOKING TECHNOLOGY

R&S®Postman III features multiline capability, allowing the simultaneous use of multiple HF and VHF/UHF radio lines. Its integrated radio protocols enable high-performance data transmission. R&S®Postman III also supports LAN/WAN and satellite communications.

Efficient, IP based data transmission methods for narrowband radio channels

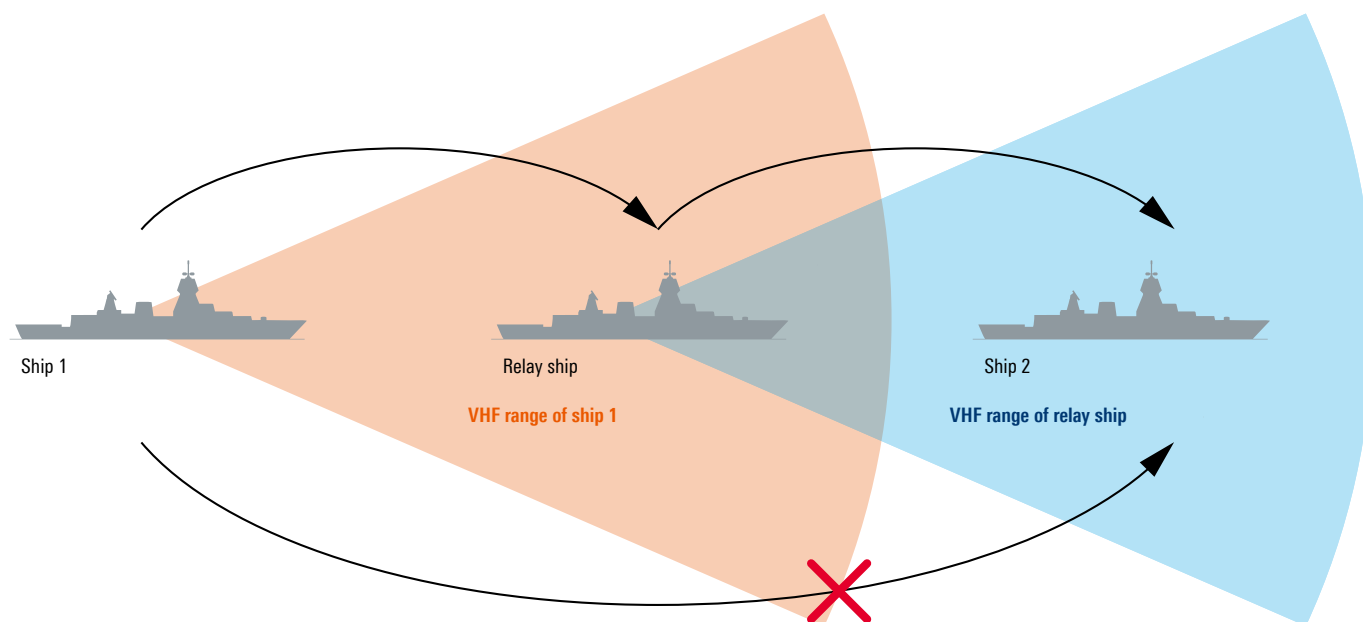
R&S®Postman III employs robust and adaptive radio transmission methods to accommodate for different mission scenarios. It offers special radio protocols to support national and multinational missions. The STANAG 5066 standard HF radio protocol is available as an option to allow the exchange of emails with NATO partners.

Modern radios using frequency-hopping and encryption techniques can be integrated to make communications jam-resistant and tap-proof.

Variations in channel quality, as encountered especially in HF radiocommunications, lead to variations in usable data rates; poor channel quality may even disrupt data transmission. R&S®Postman III, in conjunction with modern Rohde&Schwarz radios, provides special mechanisms to ensure optimal control of the data flow.

Different communications scenarios call for different data transmission methods. For data exchange between two entities, R&S®Postman III employs a point-to-point method. For data exchange among multiple radio network entities, a point-to-multipoint radio protocol is used.

R&S®Postman III relay stations extend communications beyond the line of sight (LOS)



Extending communications beyond the line of sight (LOS)

To reach a destination beyond the sender's line of sight, R&S®Postman III can be configured as a relay station that automatically forwards messages to the other station.

R&S®Postman III therefore eliminates the line-of-sight restriction for data communications in VHF/UHF radio networks.

Multiline capability for simultaneous communications with multiple radio network entities

R&S®Postman III allows data to be transmitted simultaneously over multiple HF and VHF/UHF radio lines, and also supports the integration of SatCom and LAN/WAN infrastructures. This enables naval communications scenarios such as ship-to-ship and ship-to-shore.

When used by ground forces, this capability makes it possible for a battalion command post to communicate with its companies and with its superordinate regiment at the same time.

Further radio lines can be added, and existing ones reconfigured, on the R&S®Postman III graphical user interface by using the drag&drop function. This can be done during radio operation.

Secure and reliable information exchange over radio networks

The R&S®Postman III applications support various state-of-the-art radiocommunications methods for secure and reliable data exchange over radio networks.

In HF radio networks, automatic link establishment (ALE) is supported. This method offers the advantage that it automatically selects a suitable, unused frequency.

In VHF/UHF radio networks, the R&S®SECOS 5/16 TDMA method is used. With TDMA based data transmission (TDMA – time division multiple access), each entity is allocated fixed timeslots for transmission and reception. As a result, all entities can utilize the available data transmission capacity without colliding or interfering with each other. R&S®SECOS 5/16 TDMA also offers frequency-hopping capability (TRANSEC) to protect data transmission against interference.

R&S®Postman III supports both COMSEC encryption integrated in Rohde&Schwarz radios and encryption by means of external devices for tap-proof data transmission.

Conflict-free data and voice communications on a radio line

Voice communications over radio networks continues to play an important role in many missions.

With data communications gaining in significance, conflicts may arise if data and voice are to be transmitted over the same radio line. When voice is to be transmitted over a radio line during an ongoing data transmission, R&S®Postman III detects this as a voice-priority-over-data condition, interrupts data transmission for voice transmission, and resumes it when voice transmission is over. See the table on page 14 for the data transmission methods (waveforms) and radios supporting this feature.

ROLE BASED TASK DIVISION FOR EFFICIENT, CONVENIENT OPERATION

The R&S®Postman III role concept allows tasks to be divided between users and the operator in order to optimize working efficiency and convenience.

Reducing the user's workload

Users are assigned the following tasks:

- ▶ Handling email messages
- ▶ Exchanging chat messages
- ▶ Exchanging files
- ▶ Analyzing the position data of subunits

The R&S®Postman III intuitive user interface allows fast and smooth communications with other network entities. Users can perform their tasks efficiently without requiring any expert knowledge.

Since, under the R&S®Postman III role concept, the operator is responsible for data traffic management, users are free to focus on their tasks.

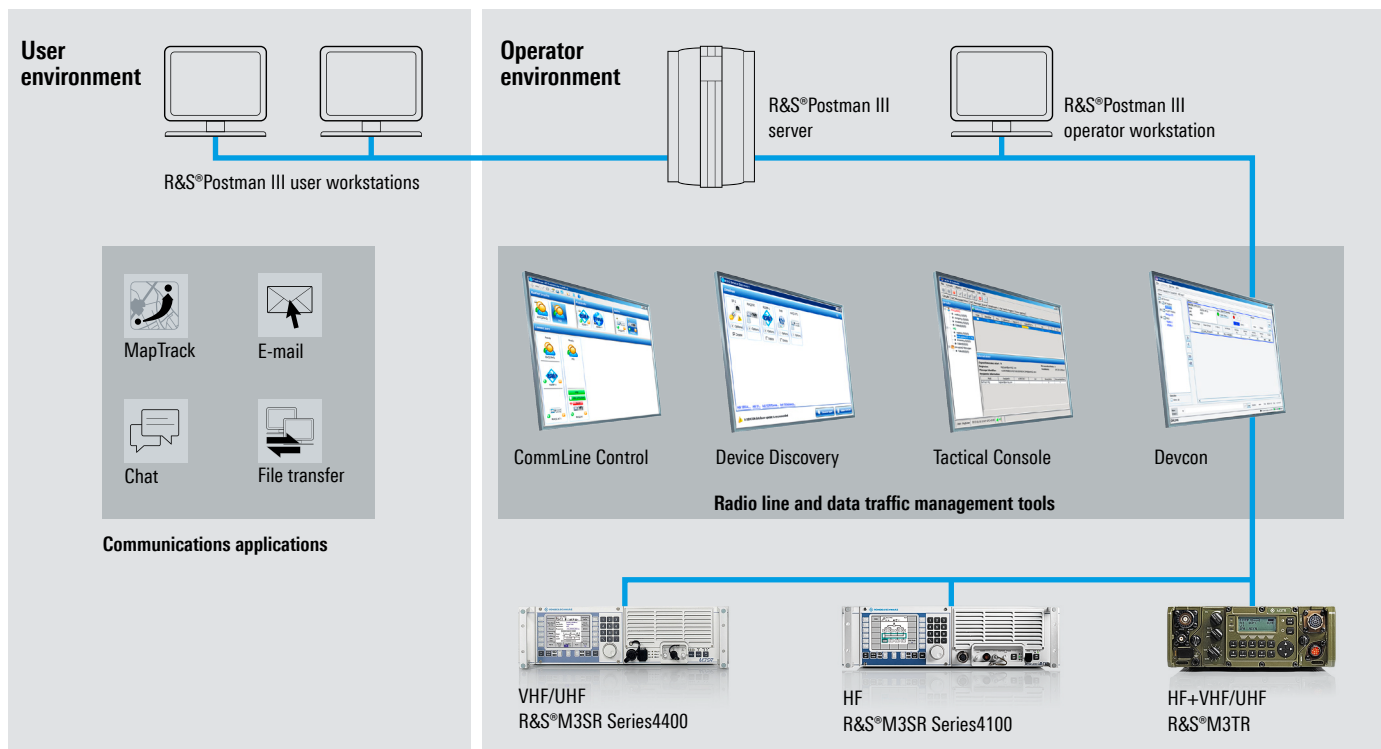
Operator focus on data traffic management

The operator is responsible for ensuring smooth data transmission and is assigned the following tasks:

- ▶ Configuring the system (system setup)
- ▶ Defining and monitoring radio lines
- ▶ Monitoring data transmission
- ▶ Remote control of radio line components

The management tools integrated in R&S®Postman III help the operator perform these tasks efficiently and reliably.

R&S®Postman III role based task division



Integrated management tools facilitate operator tasks

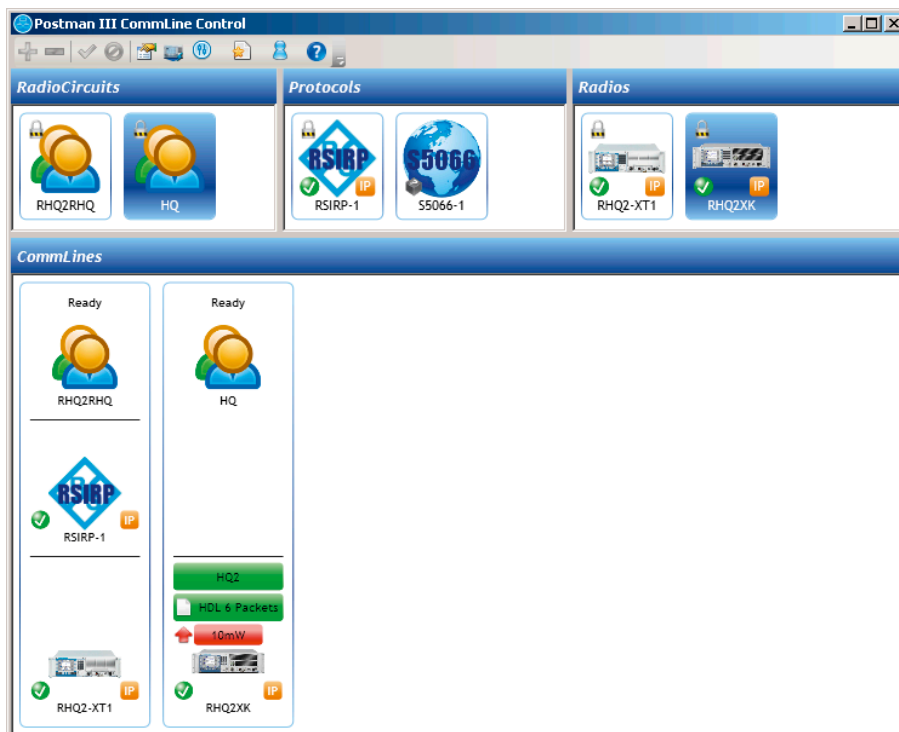
The operator is responsible for ensuring correct and reliable data transmission. A set of management tools integrated in R&S®Postman III help the operator accomplish this task.

Device Discovery

The Device Discovery tool assists the operator in configuring an R&S®Postman III system. Similarly to a plug&play mechanism, the tool detects the available radios, radio protocols and services. It automatically reads and displays the main configuration data for these components, and it detects and displays any modifications made to system components, for example when a radio has been replaced. Available system components are graphically displayed by category and are used by the CommLine Control tool for configuring radio lines.



Plug & play configuration tool



Radio line management tool

CommLine Control

The CommLine Control tool helps to accomplish three tasks:

- ▶ Defining radio lines
- ▶ Monitoring radio line components
- ▶ Monitoring data transmission

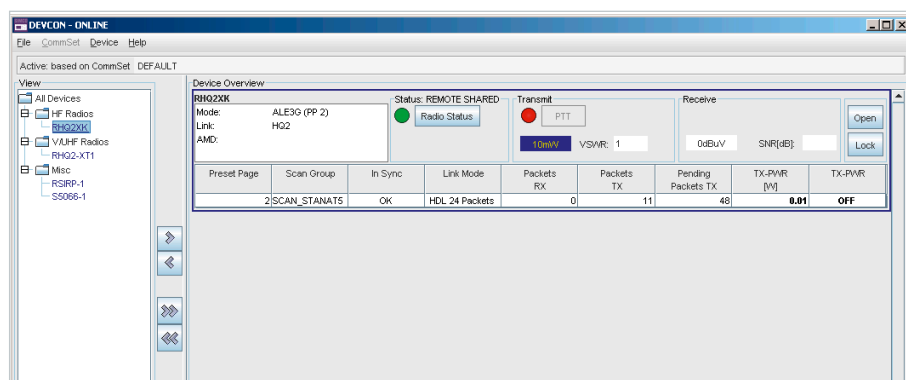
The operator defines a radio line by selecting a radio, its operating mode and, if necessary, a radio protocol. The operator drags and drops the required components from the system component pool, thus making them available for the R&S®Postman III system for data transmission. Radio lines configured in this way can be stored, loaded and activated as required. During radio line component monitoring, CommLine Control indicates the operating status of the individual radios and radio protocols. When data is transmitted on a radio line, the name of the opposite station is displayed together with the main transmission parameters.

A service message concept integrated in R&S®Postman III allows frequent radiocommunications activities to be executed largely automatically. Such activities include:

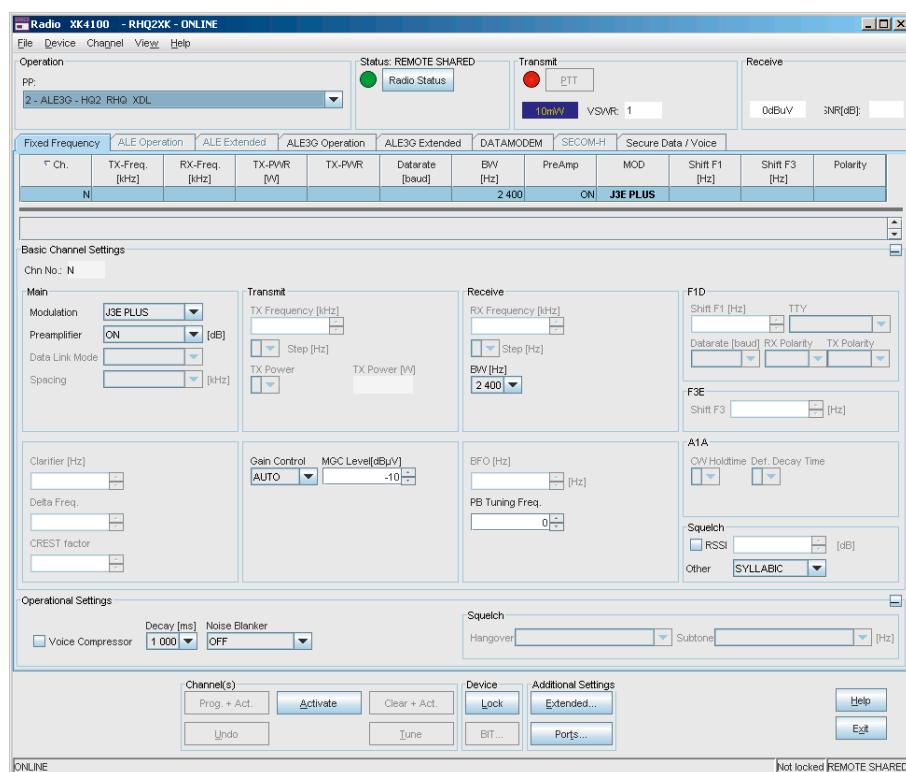
- ▶ Circuit testing: functional testing of a radio line
- ▶ EMCON message (EMission CONtrol): signaling of radio silence condition
- ▶ Address localization: query as to which station hosts a user for email communications

Devcon

The Devcon (Device Control) tool allows the operator to swiftly respond to changing operational conditions by adapting the configuration parameters of the radio and radio protocol as required. Devcon provides two different views: a condensed overview showing the key parameters of all radio line components used in a system, and a detailed view displaying a large number of configuration parameters that the operator can check and modify on the R&S®Postman III workstation by remote control.



Remote control application (overview; figure shows upper portion of screenshot)



Remote control application (detailed view)

Tactical Console

The Tactical Console tool offers a wide range of functions for monitoring and analyzing data traffic in an R&S®Postman III system.

The Tactical Console user interface shows detailed information for all data transmissions that are currently active or planned. Transmissions are assigned to the available radio lines and categorized according to their status (waiting, outgoing, incoming, failed). This provides a clear picture of the local TX and RX transmission activities, and the operator can intervene in automatic data transmission if necessary. For example, the operator can stop ongoing transmissions, reassign a message for transmission over a different radio line, or manually enable specific radio lines and messages, thereby controlling the data flow.

The Tactical Console tool also offers a journal function that provides a detailed, chronological record of the events in a radiocommunications system. Similar to a logbook function, this function records all transmitted and received emails, files and service messages. This enables the operator to analyze in full detail the events that have occurred in a radio system during a selected period of time.

Radio line and data traffic monitoring tool

The screenshot displays the Tactical Console application window. The interface includes a menu bar (File, Circuits, Objects, SVC Messages, Tools, Help) and a toolbar. Below the toolbar is a tabbed interface with tabs for Circuits, SVC Messages Inbox, SVC Messages Journal, EMail Registry, File Transfer Registry, and Session Warnings. The 'Circuits' tab is active, showing a tree view of radio lines. The 'Outgoing Queue' tab is also active, displaying a table of outgoing messages. The 'Selected object' section shows details for a specific message, including its originator, message identifier, and recipients information.

Type	Identifier	Prio.	Submission ...	Time to Co...	Transmitted %	Ack	Tx	Exp.
✉	123	Medium	2012-01-18 ...	102	45%	0%	---	Exp.

Selected object

Elapsed time since start: 54
Originator: rhq2user@pm-rhq2.com
Message Identifier: <139D7B5BD01042F1880385F8E89C5846@pmrhq2.com>

Retransmitted Blocks: 0
Total blocks: 109 (109.00 KBytes)

Recipients Information:

Host	Recipients	in EMCON ?	Ack	Missing Blocks	Retransmitted Blocks
GwTact-HQ	hqUser@pm-hq.com			0	0

User: rhq2User 2012-01-18 15:27 UTC+0100

SIMPLE AND COMPREHENSIVE COMMUNICATIONS APPLICATIONS

The right application for every mission

Communications requirements of civil and military sub-units can differ widely for different mission scenarios. A stationary environment allows the detailed exchange of information using emails and email attachments. In vehicles, on the other hand, short chat messages can be sent, for example, to indicate a vehicle's position. Position information delivered by all subunits involved in a mission makes it possible to plan missions and coordinate actions in civil and military operations.

R&S®Postman III provides reliable exchange of information for many different mission scenarios, offering the different applications required in a single product.

Email

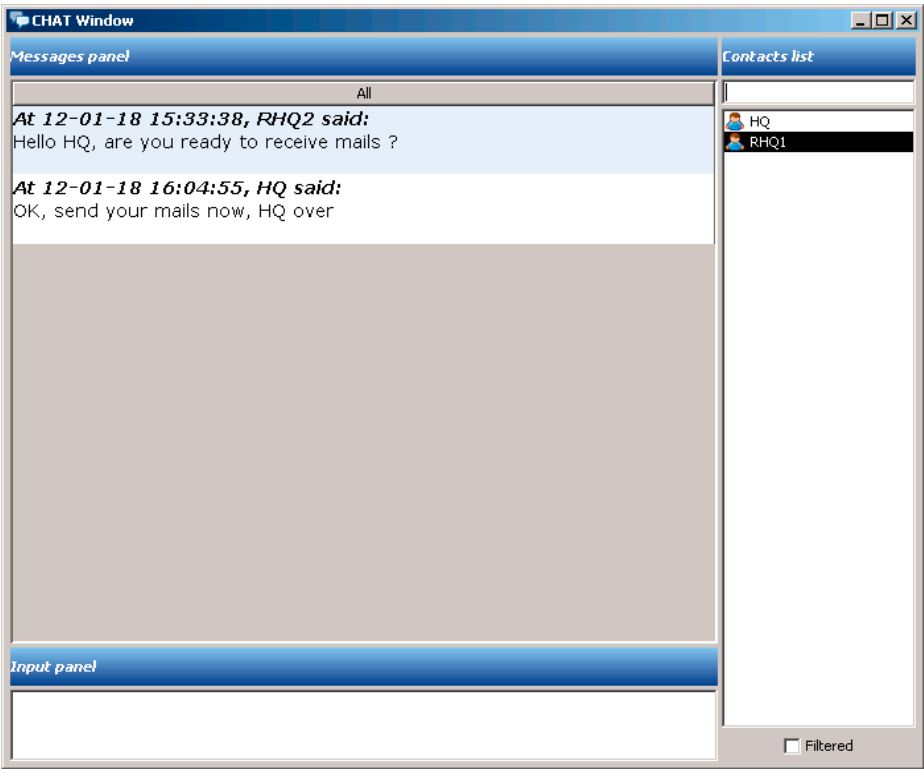
Emails play a key role in today's information exchange. The standards used in R&S®Postman III support widely employed and established email clients such as Microsoft Outlook Express. These clients do not as standard limit the size of email attachments. To prevent large files being sent inadvertently, the user can define size limits above which automatic message transmission will be blocked.

For example, a JPEG picture to be sent as an email attachment will automatically be compressed to a user-definable size. The user can view the compressed picture and enable its transmission.

File transfer

R&S®Postman III offers a file transfer application for scenarios that require no more than the transfer of information between radio stations. For this, R&S®Postman III includes a directory structure that contains an input and an output directory for each station in a network. When a user places a file into the output directory of a specific station, R&S®Postman III will automatically transfer that file to the input directory of the target station. The file transfer application can be employed by users or, if appropriate for a given mission scenario, by customer-specific applications, for example to identify persons based on database information.

Whenever an application creates a file in a station's output directory, the file will be automatically transmitted, regardless of its type or content.



Chat application

Chat

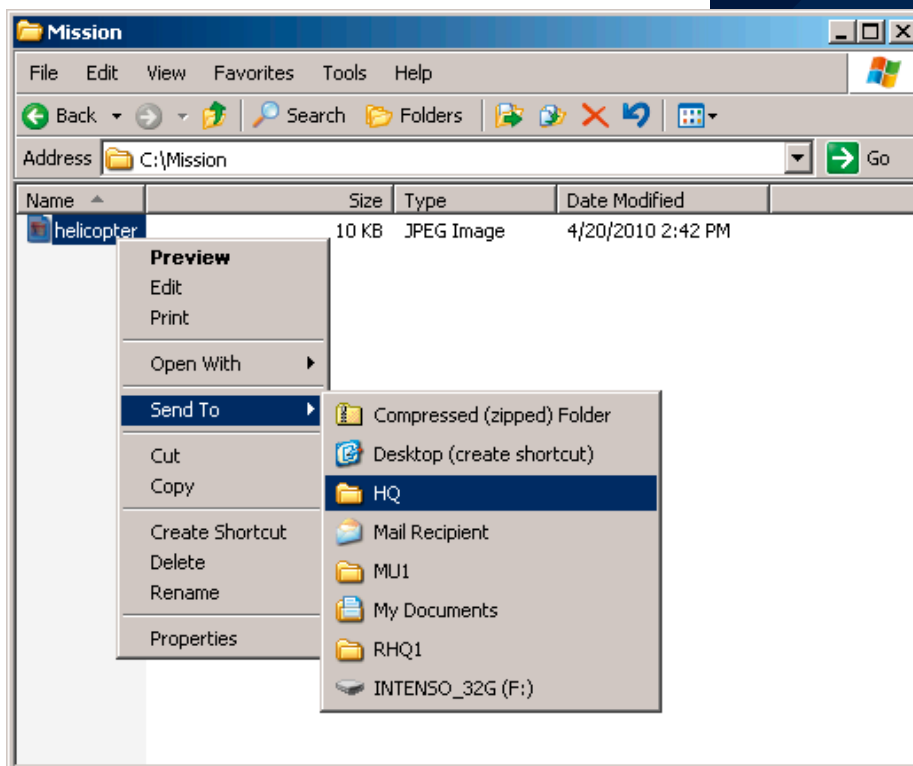
The chat application allows the fast exchange of short messages with other, directly accessible radio stations. Unlike email messages, chat messages are transmitted immediately after they are created. If a chat message is to be sent during an ongoing data transmission, such as an email transmission, R&S®Postman III inserts the chat message as the higher-priority message into the data transmission. This is done automatically; no intervention is required on the part of the user. Chat is the preferable application for scenarios that call for fast, prioritized information transmission.

Real-time data transfer

R&S®Postman III allows the transmission of time-critical data among multiple entities in an R&S®SECOS 5/16 TDMA radio network. Using this Rohde&Schwarz UHF transmission method, data of any content can be transmitted deterministically between predefined radio stations within a network.

R&S®Postman III includes a socket interface that allows the transmission of data generated by customer-specific applications, such as radar or position data.

File transfer application



BLUE FORCE TRACKING

The R&S®Postman III MapTrack function visualizes the positions and movements of subunits on a map, enabling a fast situational assessment. Position data can be exported and used for a subsequent, detailed operational analysis.

Graphical display of current positions and movements of subunits

State-of-the-art Rohde&Schwarz tactical radios automatically exchange the GPS position data of all mobile entities in a network (see table on page 14). The optional R&S®Postman III MapTrack function displays the current geographical positions and movements of subunits on a map, using data that is publicly available on the Internet in the OpenStreetMaps and ESRI Shapefile formats, which are used as standard. Other map formats can be integrated into MapTrack on request. Easy-to-use control functions and tools such as a distance meter, zooming, and continuous centering of an entity on a map, make operation very convenient.

The position and movement data of the entities in a network can be forwarded via file transfer or email to other R&S®Postman III stations. At the operations center, this data is used to generate a consolidated situation picture encompassing all subunits involved in a mission. This makes it significantly easier to coordinate the activities within one subunit and among multiple subunits.

Reliable alarm function

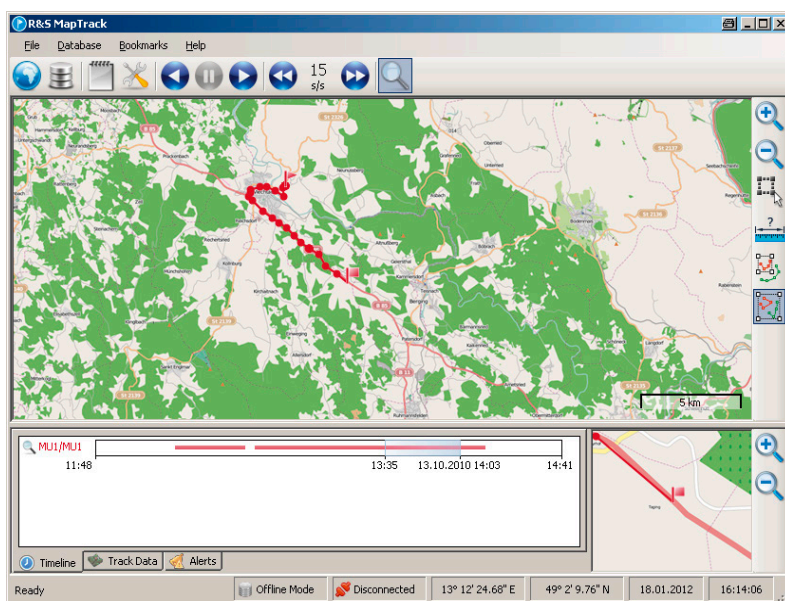
The R&S®M3TR and R&S®MR3000P tactical radios from Rohde&Schwarz include an alarm function that can be activated on the radio. If an alarm is received indicating an emergency situation for an entity, MapTrack displays the alarm along with the entity's current position data.

Detailed analysis

The position data is stored for each subunit. A replay function makes it possible to subsequently analyze and assess the movements of individual subunits or a mission as a whole. The information delivered by MapTrack is used to gain insight into operational issues, and it serves as a basis for debriefing. Easy-to-use control functions and tools, such as a distance meter, provide fast access to the required information.

Export of tracks to navigation systems

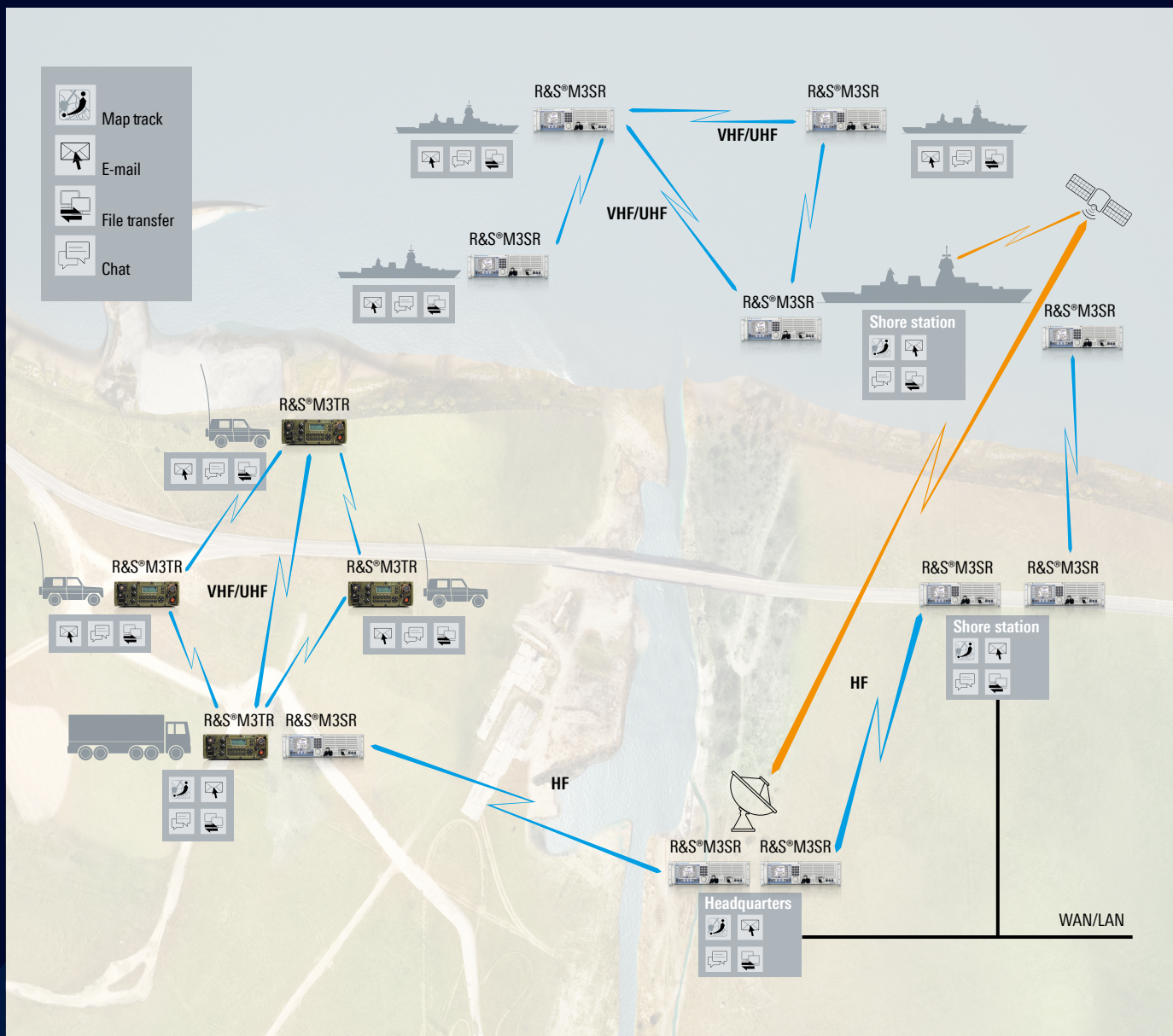
Recorded tracks can be exported to navigation systems via the R&S®Postman III import/export interface. Tracks can also be exported to a USB stick for further processing. R&S®Postman III uses the GPX standard data format, which makes it easy to import tracks into waypoint navigation systems. For example, a rescue vehicle can be immediately given the shortest possible route for reaching a subunit in distress. Tracks exported from MapTrack can be imported into Google Earth, where a wide range of display modes are available.



Blue Force Tracking

TYPICAL MISSION SCENARIO

The figure shows, as an example, how R&S®Postman III can be used for civil and military missions on land and at sea.



SUPPORTED DEVICES AND DATA TRANSMISSION METHODS

R&S®Postman III – data transmission methods

Frequency range	Data transmission method	Maximum data rate	Data interface	COMSEC	TRANSEC	Voice priority over data
HF	STANAG 4285	2 400 bit/s ¹⁾	serial	• ²⁾	–	–
	STANAG 4539	9 600 bit/s ¹⁾	serial	• ²⁾	–	–
	STANAG 4538-xDL	8 500 bit/s ³⁾	Ethernet	• ⁴⁾	–	•
	ALE4G-WB-RDL	150 000 bit/s ⁵⁾	Ethernet	• ⁴⁾	–	•
VHF/UHF	R&S®SECOM-P	7 100 bit/s	serial	• ⁴⁾	•	–
	R&S®SECOM-V	16 000 bit/s	Ethernet	• ⁴⁾	•	•
	R&S®SECOS 5/16	16 000 bit/s	serial	• ⁴⁾	•	–
	R&S®SECOS 5/16 TDMA	2 400 bit/s ⁶⁾	serial	• ⁴⁾	•	–

¹⁾ Data rate of serial modem.

²⁾ External encryption device is supported.

³⁾ 8500 bps UDP/IP payload data rate with ARQ protocol.

⁴⁾ Integrated Rohde & Schwarz encryption is supported.

⁵⁾ 240 kbps is the theoretical maximum defined in MIL-STD-188-110D.

Realistic expectations under favorable conditions: ground wave up to 144 kbps, sky wave up to 77 kbps.

⁶⁾ Depending on the number of entities, e.g. 2400 bit/s with four entities.

R&S®Postman III – supported radios

Frequency range	Data transmission method	R&S®M3TR	R&S®M3SR Series4100	R&S®M3SR Series4400	R&S®XK2000 with internal modem	R&S®XK2000 with external modem
HF	STANAG 4285	•	•	–	•	•
	STANAG 4539	•	•	–	• ¹⁾	•
	STANAG 4538-xDL	•	•	–	–	–
	ALE4G-WB-RDL	–	•	–	–	–
VHF/UHF	R&S®SECOM-V	•	–	–	–	–
	R&S®SECOS 5/16	•	–	•	–	–
	R&S®SECOS 5/16 TDMA	•	–	•	–	–

¹⁾ Limitation of autobauding capability.

PRODUCT INFORMATION

Designation	Type
Basic software package	
R&S®Postman III server software with one workstation license supporting one radio line using one radio (R&S®M3SR Series4100 or R&S®M3TR) with an IP capable waveform. Applications included: email, chat, file transfer, remote control (of Rohde & Schwarz R&S®M3SR Series4100, R&S®M3SR Series4400 and R&S®M3TR radios).	R&S®NS5150
Software options	
License for one additional workstation enabling the use of the R&S®Postman III applications. R&S®Postman III supports up to six workstations.	R&S®NS5150-KWL
License for support of multiple communications lines on one R&S®Postman III server (communications lines include radio, SatCom, LAN/WAN).	R&S®NS5150-KML
Software for position data transfer and display (MapTrack). Note: maps are not included.	R&S®NS5150-KPD
License for R&S®SECOS 5/16 TDMA based transfer of customer-specific data. R&S®Postman III has a configurable interface to customer-specific applications. Customer applications must be analyzed to ensure that the interface can meet the requirements. Please contact Rohde & Schwarz Munich for details. ¹⁾	R&S®NS5150-KS5
Radio protocol licenses	
License for data transmission using one VHF/UHF radio (R&S®M3TR, R&S®M3SR Series4400) with R&S®SECOS 5/16 DPP operating mode for R&S®Postman III applications. ¹⁾	R&S®NS5150-KV1
License for data transmission using one HF radio (R&S®M3TR, R&S®M3SR Series4100) with STANAG 4285 or STANAG 4539 waveform for R&S®Postman III applications. Email interoperability with STANAG 5066 systems is included. ¹⁾	R&S®NS5150-KH1

¹⁾ R&S®Postman III supports a maximum of six radio lines using R&S®SECOS 5/16, STANAG 4285 or STANAG 4539 operating mode/waveforms.
Each radio line requires one of licenses R&S®NS5150-KV1, R&S®NS5150-KH1 or R&S®NS5150-KS5. More than six radio lines can be supported on request.

R&S®Postman III systems are hardware and software configurable radio systems.
The system delivered has the configuration as confirmed in the order.

Service that adds value

- ▶ 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 more than 85 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

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 Quality Management

AQAP-2110

Certified Quality Management

EN 9100

Rohde & Schwarz training

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Rohde & Schwarz customer support

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