

R&S® ReportEdit Order and Reporting Software

For complex radiomonitoring systems



R&S[®]ReportEdit Order and Reporting Software At a glance

The R&S[®]ReportEdit software is used to control and monitor the flow of information in a complex radiomonitoring system.

Radiomonitoring involves the step-by-step interception, analysis, storage and evaluation of radiocommunications signals. R&S[®]RAMON systems use a variety of software modules to map this process, which is generally known as the intelligence cycle. An essential part of this process is the control and monitoring of the information flow, which is handled by R&S[®]ReportEdit in conjunction with an underlying report database.

As soon as there are two or more operators in a radiomonitoring system, their cooperation must be organized and coordinated. This becomes more complex as the size of a radiomonitoring system increases. For example, different teams work at the monitoring center; they are divided up into groups for specific frequency ranges or geographic regions. These teams are made up of operators with different roles – such as shift supervisors, search operators, intercept operators and evaluators.

Supervisors use the R&S[®]ReportEdit software to organize the workflow by assigning tasks to operators. Operators respond to the tasks by creating reports and returning them to the supervisor or sending them to an evaluator for further processing. Reports include plain text, screenshots and measurement data as well as hyperlinks to the results stored in the R&S[®]RAMON database. These links allow subsequent operators to quickly and easily find the needed results.

The R&S[®]RAMON software enables the shift supervisor to organize the operators into teams based on the mission at hand and to allocate them exclusive access rights to the hardware and software resources that they need to perform the assigned tasks.

R&S[®]ReportEdit interacts directly with the various R&S[®]RAMON software components to control monitoring and also with all R&S[®]RAMON software tools for the evaluation.

Key facts

- Centralized tool for controlling a radiomonitoring system's entire information flow
- Assignment of sensor parameters directly from the task
- Roll-based access from every workstation computer in the system
- Flexible team building depending on the mission at hand
- Simple networking of multiple nationwide systems



R&S[®]ReportEdit Order and Reporting Software

Benefits and key features

Control of the complete information flow

- Tasking and reporting
 - Workflow monitoring by a supervisor
 - Networking of multiple, geographically separate system sites
 - Roll-based and user-specific access
- ▷ [page 4](#)

Central data storage

- Storage of all tasks and reports in a relational database
 - Easy access to all results in the signal database
- ▷ [page 10](#)

Integration into network-centric operations systems

- Interfaces for information transfer from and to other systems
 - Export and e-mailing of reports
- ▷ [page 13](#)

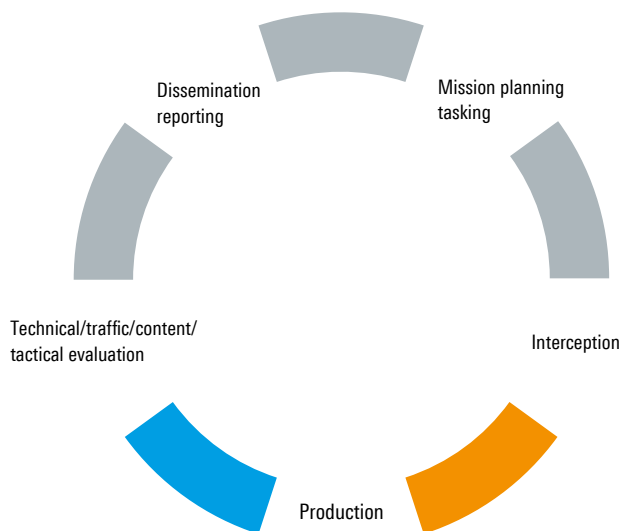
Control of the complete information flow

Tasking and reporting

In small systems, the various work steps are performed by a single operator, for example using an intercept vehicle equipped with just one operator workstation.

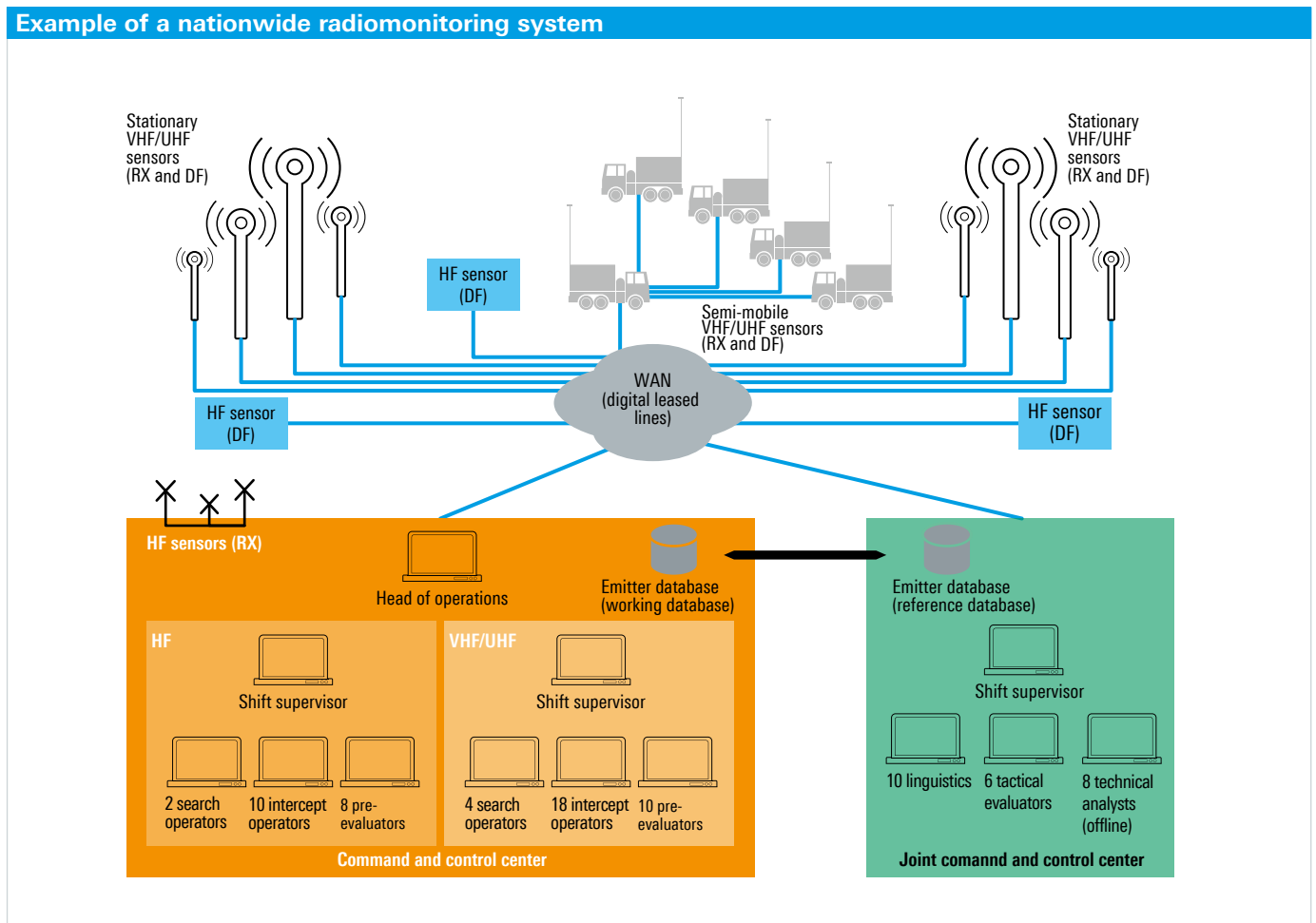
In larger, more complex systems, several operators are responsible for the individual work steps.

Intelligence cycle – work steps in a radiomonitoring system



The figure shows an example of a complex nationwide radiomonitoring system for border surveillance. Rohde&Schwarz has already implemented a number of systems of this type.

The mission planner uses R&S®ReportEdit to create a radiomonitoring order. The planner uses predefined forms to assign tasks to the individual operators. The essential data for the task, such as time, place and other parameters, is entered into these forms. The tasks may also include additional information required by the intercept operators, such as calculation results for the possible intercept range of the radiomonitoring sensors, information about the expected circular error probability (CEP), special parameter files (jobs) for direct parameterization of the monitoring sensors (radio direction finders, radio receivers) or frequency lists.



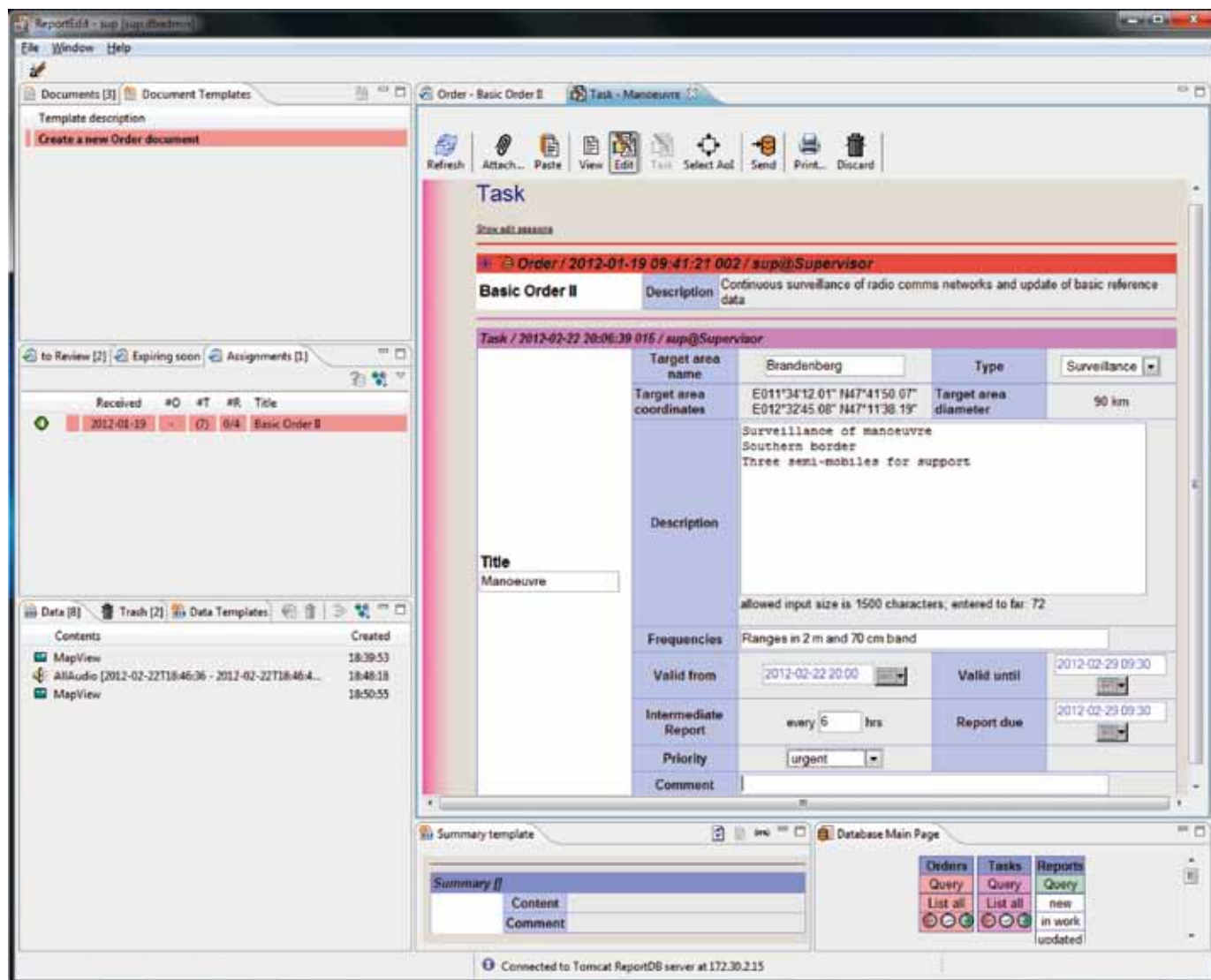
The screenshot below shows a task generated using R&S®ReportEdit from a system with a multilevel hierarchy. Based on the current mission, the head of operations (see figure on page 5) creates an order, from which the supervisors responsible for the different subsystems generate HF and VHF/UHF monitoring tasks for the individual operators. All documents are created from templates (included in R&S®ReportEdit) that are filled in by the operator. The links and interactions between the individual workstations are specifically configured for each system. These settings can be reconfigured by a system administrator at any time.

R&S®ReportEdit provides transfer tasks to allow operators to work together. For example, a search operator who does not have the technical capacity to identify a specific radio signal can send a request to an intercept operator to perform that task. The request is issued with a single mouse click.

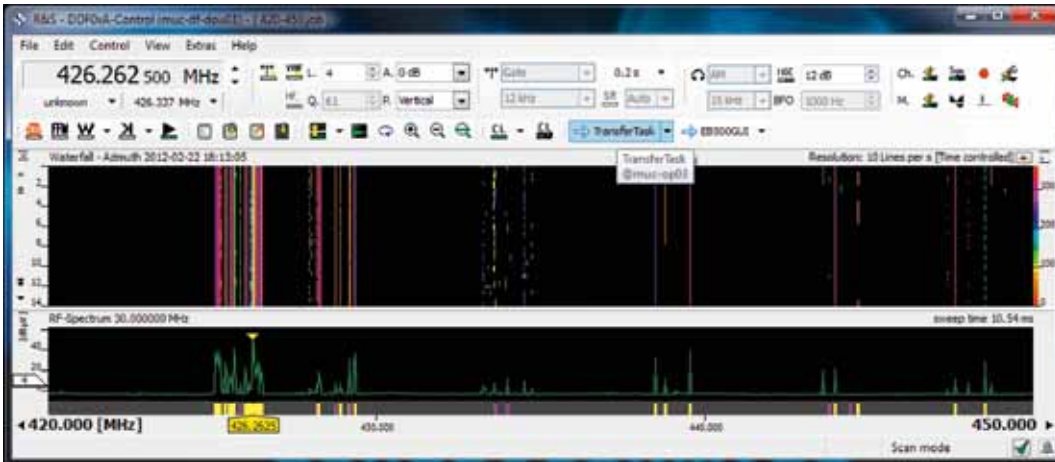
Working with transfer tasks: The upper screenshot on page 7 shows the user interface of the scanning direction finder at the search operator's workstation. A radio signal (yellow marker) is transferred to the intercept operator by clicking the Transfer Task button (at the top of the screen). The transfer task appears in R&S®ReportEdit at the intercept operator's workstation (lower screenshots on page 7).

The intercept operator simply clicks a button in the transfer task document and the frequency (426.2625 MHz in this case) is set on a classification receiver and then classified in less than a second. If the classifier is processing a delayed area digital IF data stream, the radio signal can be classified from the start of the emission and then demodulated and decoded as necessary.

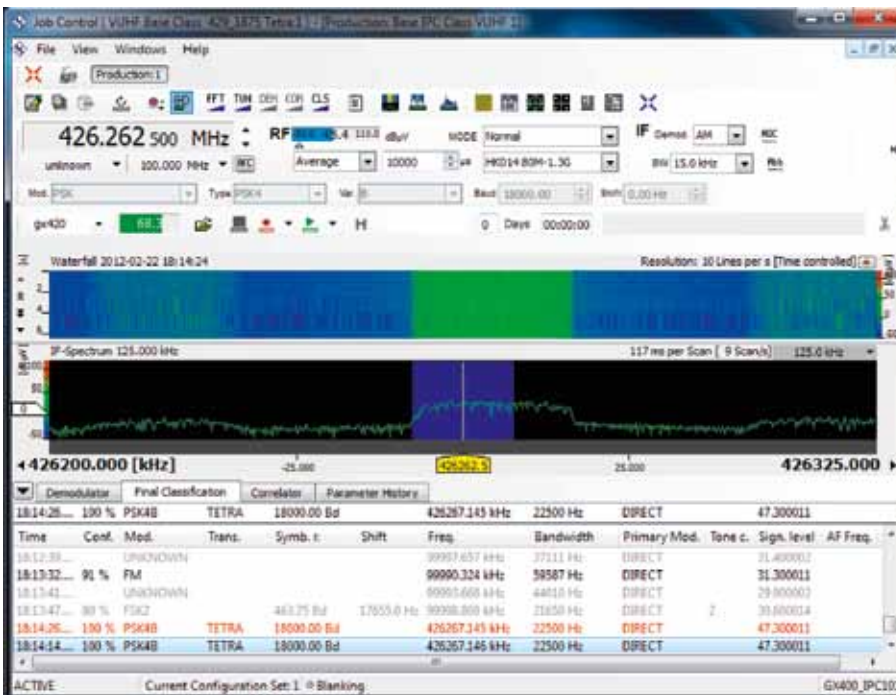
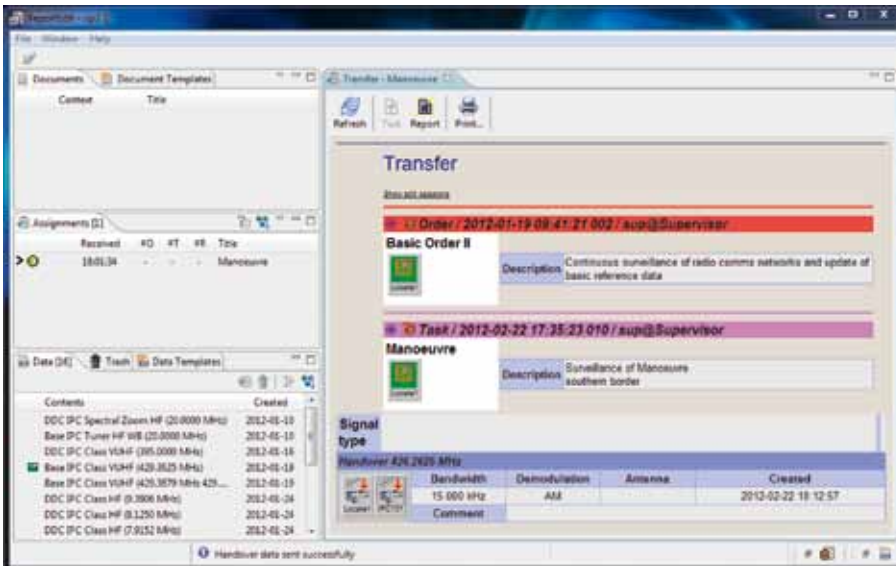
Task assigned by a supervisor to a radiomonitoring system's search operator.



Search operator workstation.



Intercept operator workstation.



Workflow monitoring by a supervisor

An authorized user, e.g. the supervisor, can view a summary of the current status of all tasks at any time. The screenshot below shows a status overview of this type. The various colors of the user names in the "Assignments" column indicate whether a task is still unopened or is being worked on, or whether reports have already been generated. The supervisor can open the reports associated with a particular task directly from this list.

Networking of multiple, geographically separate system sites

The R&S®ReportEdit software can also be used to organize the information flow in a networked system that has multiple system sites. The figure on page 5 shows a radiomonitoring system with operators at multiple sites, some in the actual command and control center and some in a joint command and control center. In this example, semi-mobile systems are also manned, and operators must exchange information with one another.

R&S®ReportEdit allows tasking and reporting across local network boundaries. The tasks and reports are exported from the transmitting system and then imported on the receiver end; the integrity of the data is maintained throughout.

Task status display.



The screenshot shows a window titled "List of Tasks" with a table containing task details. The table has columns for Order, Name, Description, Priority, Version, Valid until, Last edited by, Last modified, Actions, Reports, and Assignments. The Assignments column shows user names in different colors: yellow for unopened, red for being worked on, and blue for reports generated.

Order	Name	Description	Prio	Ver.	Valid until	Last edited by	Last modified	Actions	Reports	Assignments
Basic Order II	Manoeuvre	Surveillance of Manoeuvre southern border	urgent	0	2012-02-29 09:30	sup	2012-02-22 19:01:34.6 2012-02-22 19:01:34.6	[Icons]		Search Operator
Basic Order II	Manoeuvre II		normal	0	2012-12-31 09:30	sup	2012-02-22 09:37:02.0 2012-02-22 09:37:02.0	[Icons]		Intercept Operator 1 Intercept Operator 2 Search Operator
Basic Order II	Manoeuvre II	Check for HF comms	normal	0	2012-02-29 09:30	sup	2012-02-22 19:53:52.9 2012-02-22 19:53:52.9	[Icons]		Intercept Operator 1
Basic Order II	Cont Mon	Continuous monitoring of FLOI	normal	0	2012-02-31 09:30	sup	2012-02-22 16:57:36.6 2012-02-22 16:57:36.6	[Icons]		
Basic Order II	Cont Mon		normal	0	2012-12-31 09:30	sup	2012-02-22 14:42:12.6 2012-02-22 14:42:12.6	[Icons]		Search Operator

sup @ 172.30.1.20
ReportEdit version 3.2.0.1 © 2014-2009 by Romeo Software
Opatov, RA/CS RL/REP/ELJ/CA
Build 6201888 W 2012-01-02 12:54
Typical installation: C:\Program Files\Romeo Software\ReportEdit

Roll-based and user-specific access

Every user logs on to the system with their name and password. From this information, the R&S®RAMON user management recognizes the role of the particular user (e.g. supervisor or evaluator) and, based on this role, lets the user access the appropriate functions and documents in the database.

Access is possible from any workstation within a radio-monitoring system. Users logged onto the system see R&S®ReportEdit functions based on their assigned role and can access all documents addressed to them. If a user is not authorized to view specific documents, these documents are not visible to this user. This also applies to parts of documents, for example the description of the mission that is linked to a specific task.

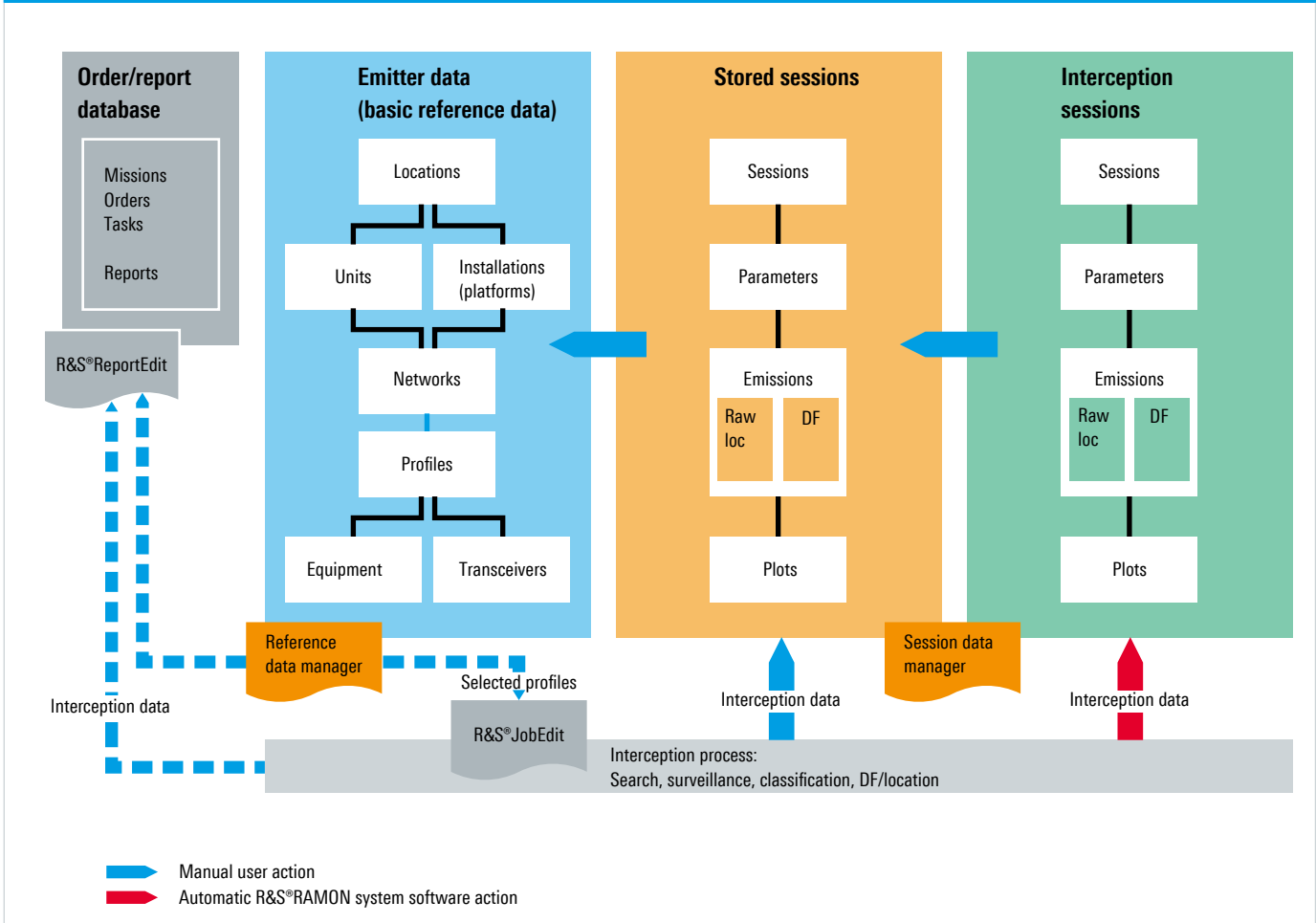
Central data storage

Storage of all tasks and reports in a relational database

Operators receive a system message¹⁾ on their workstation computer to inform them of a new task or report. These documents are stored in a database. The report database is an instance of the R&S®RAMON database, whose overall structure is shown in the figure below. A second instance of the database stores all the radiomonitoring system's intercepted and reference data.

¹⁾ Like system notifications, this is in the form of a "balloon" in the Windows tray.

Structure of the R&S®RAMON database



A convenient query mask allows operators to find documents in the database. The screenshot shows the query mask for finding reports. The query can be narrowed down by using various parameters, for example the associated order document or the geographical position of the intercepted radio signals. This means that the supervisor – in response to a requesting party’s inquiry – could rapidly search for reports related to signals being monitored within a defined frequency range and geographical area.

R&S®ReportEdit query mask.

Easy access to all results in the signal database

The R&S®ReportEdit application interacts with all software modules in the R&S®RAMON portfolio (see figure).

Each operator transfers the interception results to the reports with a click of the mouse and sends the reports to an evaluation workstation, for example. The following data can be stored in a report (and in an order) and forwarded to the subsequent operator:

- Setting parameters and measurement data delivered by receivers, direction finders and analyzers
- Screenshots from the devices' user interfaces and the current situation picture on a map
- References to recorded, demodulated audio signals or decoded texts
- References to recorded IF signal samples
- References to recorded signal activities in one or more frequency bands

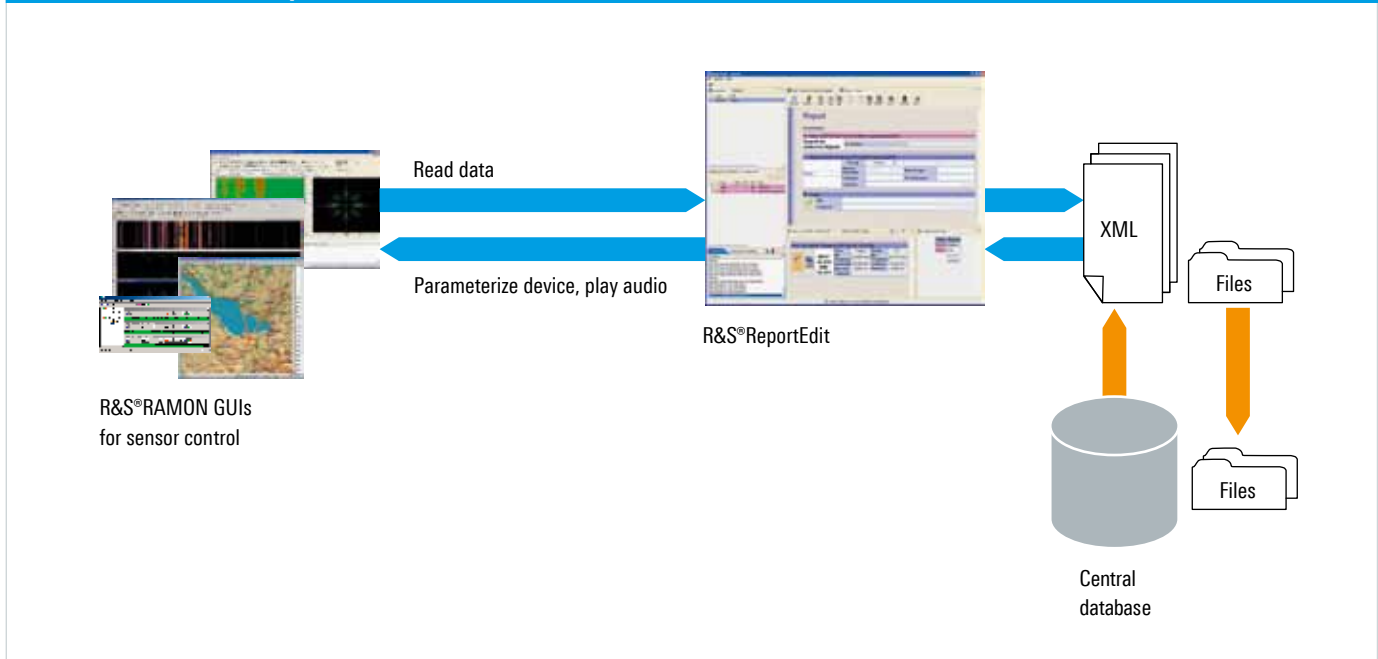
The evaluator saves the results of the technical evaluation to the R&S®RAMON database. The supervisor accesses this data and compiles reports for the requesting party and issues new orders that incorporate the results just obtained.

The references are hyperlinks to intercepted data stored in another instance of the R&S®RAMON database and allow very rapid system operation. For example, a mission planner can define a geographical area for a signal search by a search operator. The search operator opens the task and, with a click of the mouse, transfers the geographical data to the radiolocation system's R&S®RA-LOC control module software on the workstation. At the start of radiolocation, this software automatically sends azimuth sectors to each connected direction finder so that only radio signals in the defined geographical area are located and displayed on the digital map.

Hyperlinks give evaluators immediate access to all data required for their activities. Just one click of the mouse opens a recorded audio file: The R&S®AllAudio integrated digital audio software appears at the front of the screen and plays back the demodulated audio signal. Or the intercept operator sets a hyperlink to the measurement data of a defined time/frequency window stored in the R&S®RAMON database. Clicking the mouse moves the associated R&S®RAMON application to the front, displaying all measurement data of the intercepted signals and their detected radio network relationships. A shortcut displays these results immediately on the digital map in R&S®MapView.

Hyperlinks also ensure that intercepted data is not stored redundantly at different places in a radiomonitoring system.

Interaction of R&S®ReportEdit with other R&S®RAMON software modules



Integration into network-centric operations systems

Interfaces for information transfer from and to other systems

R&S®RAMON systems offer a wide range of open interfaces, which facilitates integration into existing customer systems and makes the systems a safe investment. Each R&S®RAMON radiomonitoring and radiolocation system can be integrated into the customer's order and reporting system. Missions and orders are passed down to the radiomonitoring and radiolocation system's master control level, and the results are returned to the customer as reports. The report files are transmitted in XML format, which provides an interface for data exchange.

Export and e-mailing of reports

Reports can also be exported in another format, such as PDF. This allows users in systems without R&S®RAMON software to read documents without having to convert them. When connected to an e-mail server, reports can be sent directly to an e-mail address.

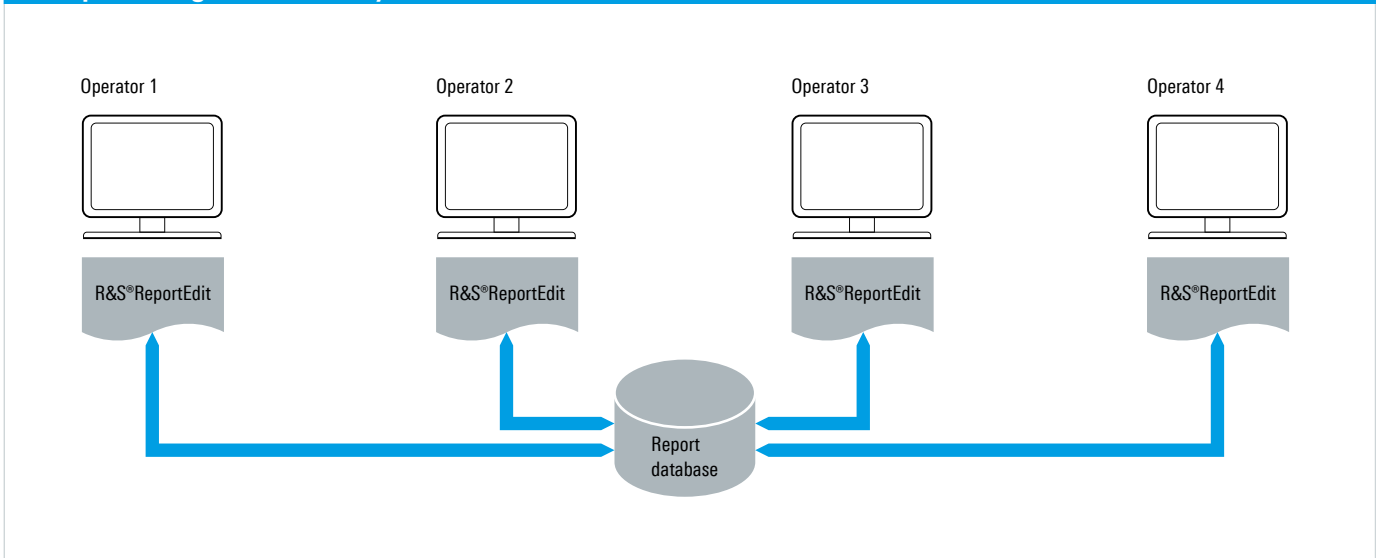
System configuration

The figure below shows an example configuration for a small system. Every workstation in a radiomonitoring system that is included in the system's order and report workflow requires an R&S®RA-REPEDIT license for the R&S®ReportEdit graphical user interface. R&S®RA-REPEDIT lets users access all of their relevant data, allowing them to create, store and send orders and reports.

Special options, such as the R&S®RA-REPXCHG option for exporting/importing orders or reports for transfer between distributed R&S®RAMON systems via a wide area network (WAN), are only required once for each report database.

One copy of the R&S®RA-DBREP server software is required for every system (or subsystem in the case of WAN networking). It is installed on a database server, which must include a database software application.

Example configuration of a system with four workstations and one database server



Ordering information

Designation	Type	Order No.
R&S®ReportEdit		
Editor (for generating and displaying missions, orders, tasks and reports)	R&S®RA-REPEDIT	3028.0379.02
	receives and saves results/settings of device controls, radiolocation module, R&S®MapView, R&S®AllAudio; devices can be set via R&S®ReportEdit; display of all saved DF/radiolocation results on R&S®MapView, storage of reports in XML format, user interface for accessing the report database (R&S®RA-DBREP); requires R&S®RA-LOGIN	
R&S®RAMON Mission, Order, Task and Report Database	R&S®RA-DBREP	3028.0362.02
	database server software; requires R&S®RA-REPEDIT as user interface; includes the import of reports into the database; supports queries for accessing reports stored in the database	
Software License for R&S®RAMON Database (PostgreSQL or Oracle Standard Edition)	R&S®RA-DBMS	3020.9019.03
	requires a database server with a quad-core processor; includes installation on the database server; suitable for R&S®RAMON systems with three to ten workstations ¹⁾	
Import and export of R&S®RAMON reports	R&S®RA-REPXCHG	3028.0385.02
	transfer of R&S®ReportEdit documents (mission, order, task, report) between R&S®ReportEdit databases within a hierarchical system with several database servers; transfer is based on pre-defined workflows; any file attachments are also sent; requires TCP/IP connection; option for R&S®RA-DBREP	

¹⁾ The database license need not be purchased if an R&S®RAMON database is already present in an existing R&S®RAMON system. The type of license depends on the size of the system and the hardware configuration of the database server, and is selected separately for each system by our Rohde&Schwarz experts.

Your local Rohde&Schwarz sales partner will help you determine the optimum solution for your requirements. To find your nearest Rohde&Schwarz representative, visit www.sales.rohde-schwarz.com

Service you can rely on

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

About Rohde & Schwarz

Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established more than 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

Environmental commitment

- | Energy-efficient products
- | Continuous improvement in environmental sustainability
- | ISO 14001-certified environmental management system

Certified Quality System
ISO 9001

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