

R&S®SRTS Software-Based R&S®RAMON Training System Operational training



R&S[®]SRTS Software-Based R&S[®]RAMON Training System At a glance

The new R&S[®]SRTS software-based R&S[®]RAMON training system allows operators of R&S[®]RAMON COMINT/CESM systems to train their staff in all operational sequences and system operation without having to resort to the productive system in a real-world signal environment.

Despite the high degree of automation in the interception, classification and evaluation of signals in R&S[®]RAMON COMINT/CESM systems, the user still plays a major role in the quality of the obtained results. This is why well trained staff is enormously important for real-world operation. Frequently, however, it is difficult to train the operating personnel. This problem is solved by R&S[®]SRTS, a software-based training system for COMINT/CESM systems that are based on the tried-and-tested R&S[®]RAMON software platform.

R&S[®]SRTS is a completely new means of training users in R&S[®]RAMON based COMINT/CESM systems. Users can receive targeted training in the operational sequences of advanced radiomonitoring systems as well as in the operation of specific devices without having to use real receiving and DF equipment. The realistic spectrum calculation and real-world signal contents such as audio data make the simulated scenario look extremely authentic. The system is easy and convenient to operate and simple to scale.

Both as a single-user system and as a multirole/multi-user model, R&S[®]SRTS is a flexible alternative to full-featured training systems in a real-world environment by providing a sophisticated virtual signal environment.

Key facts

- ▀ Completely software-based training with defined signal environments
- ▀ Scalable number of user workstations (1 to n)
- ▀ Same look and feel as productive system, thanks to R&S[®]RAMON system software
- ▀ Authentically simulated signal environment with realistic contents
- ▀ Completely user-creatable, reproducible signal scenarios with selectable scenario complexity
- ▀ Versatile and easily expandable signal archive



R&S®SRTS Software-Based R&S®RAMON Training System

Benefits and key features

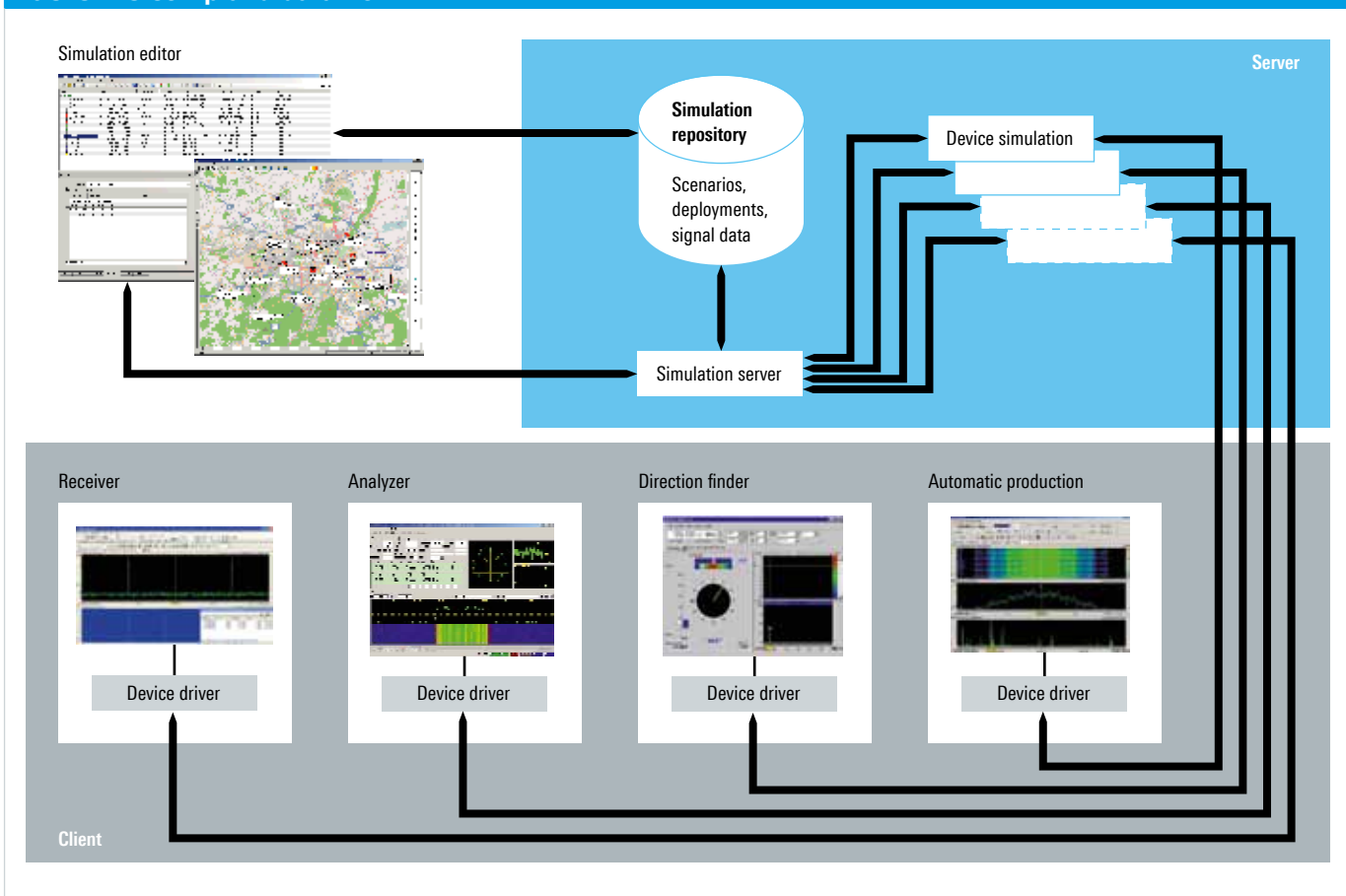
Operational training without monitoring system

- ▮ Defined and reproducible signal scenarios
 - ▮ Deceptively realistic simulation of the monitoring system
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Straightforward, flexible operational training

- ▮ Training in operational sequences as in the productive system
 - ▮ Easy and fast creation of signal scenarios in any desired complexity
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R&S®SRTS setup and data flow



All signal scenario data (activity lists, spatial distribution and transmit parameters of the virtual transmitters as well as contents such as audio) is kept in a central storage. The central simulation server administers and distributes the virtual scenario created with the simulation editor and the scenario's contents to the connected device simulations. The graphical user interfaces (GUI) of the individual workstations set up the connection to the virtual devices via a LAN or WAN.

Operational training without monitoring system

Defined and reproducible signal scenarios

The R&S®SRTS system simulates a virtual radio signal environment that is easy and convenient to create and administer using a software editor. In addition, the system simulates the behavior and the interfaces of all Rohde&Schwarz radio receivers and direction finders, which are implemented in the simulated radio scenario. All R&S®RAMON system components can be used as in a real-world system.

The signal spectra and the corresponding path losses or the losses of the received transmitters are individually calculated for each of the device simulations depending on the virtual location. They are distributed to the device simulations, displayed on the GUI and can be processed using the appropriate R&S®RAMON applications. The signals' angles of arrival are also simulated in this way for the DF stations. The complexity and size of the simulated signal environment can be selected and set by the user. The entire spectrum is finally overlaid with a realistically simulated noise floor.

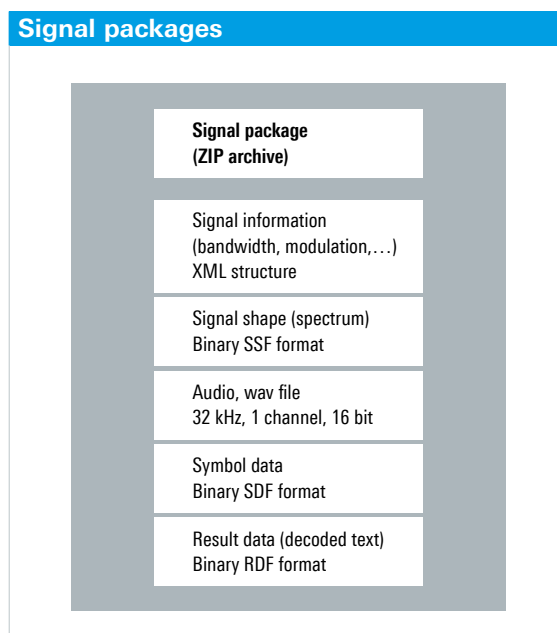
To make the simulation even more realistic, the transmitters can each be assigned certain modulations and even real contents such as audio, digital bit streams or text. The result is an astonishingly real-looking signal environment for all users. It takes a third or fourth glance to notice that it is "only" a simulation.

The signal packages are stored as a ZIP file on the PC. Users can edit existing signal packages or add new ones at any time.

Deceptively realistic simulation of the monitoring system

In R&S®SRTS, the device simulations and the virtual radio scenario usually run on a central system server. All possible signals, signal types and their contents are stored on this server. Central simulation server software monitors the complete R&S®SRTS system functionality. This software also distributes the scenario data to the device simulations and, as a result, to the connected user/trainee workstation computers.

Using the simulation editor, the trainer can create, play, administer, save and load different scenarios. The users/trainees continue to run their standard R&S®RAMON applications.



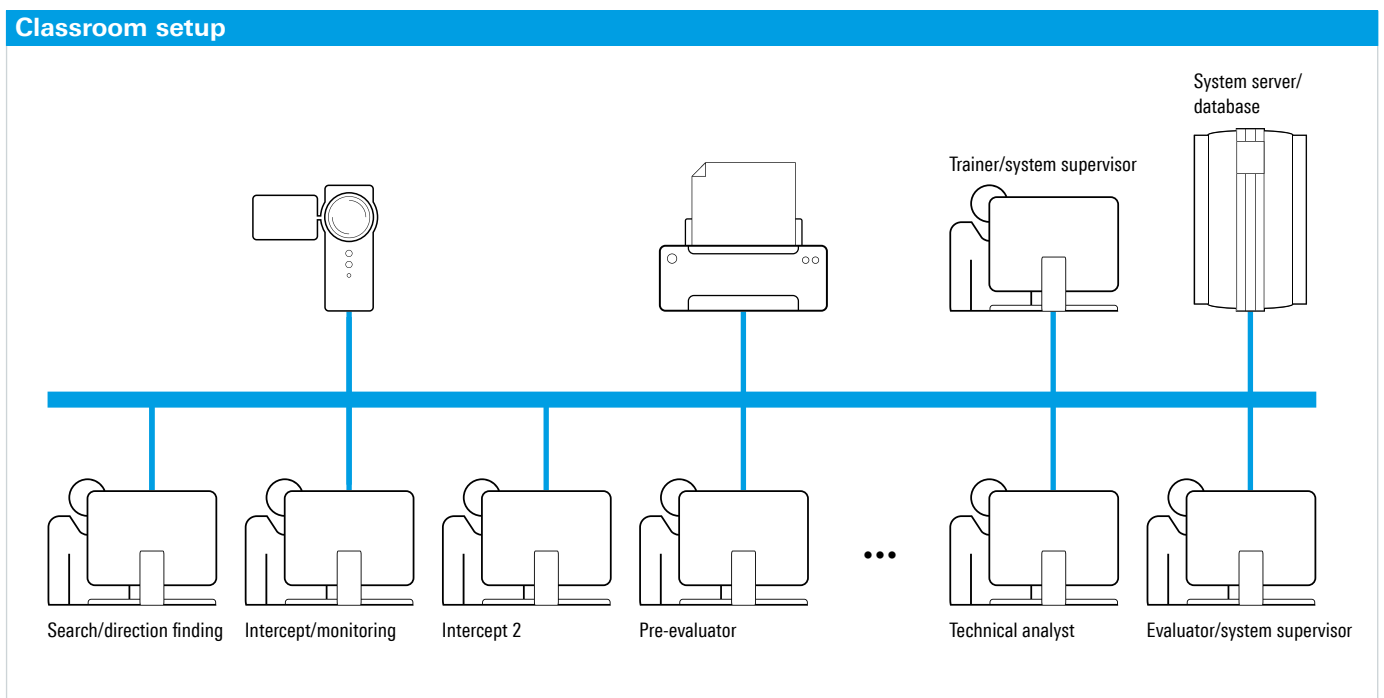
The signal packages contain all the necessary information for realistically displaying them on the user's GUI.

Straightforward, flexible operational training

Training in operational sequences as in the productive system

All operational sequences can be trained using R&S®SRTS in a classroom setup such as the one shown below. In a setup of this kind, R&S®ReportEdit can be used to teach trainees how to operate the GUI and how to handle operational monitoring/interception and the order/report workflow. The order/report workflow could look like the one in the sample system shown on the next page.

The trainer creates a general order and forwards it to the system supervisor, who evaluates the order and creates individual orders for the different users. These users now have time to fulfill their intercept order. They use the R&S®RAMON system software to search for unknown signals or monitor known frequencies or radio networks. Since the basic scenario data is the same for all simulated locations, the evaluation yields consistent results and a comprehensive situation picture.



R&S®SRTS in a classroom setup with various trainee workstations, the central system server for hardware and software simulation, the trainer's workstation and a projector for the trainee workstations to evaluate the training.

At the end of the required ordering/reporting period, the users collect all the new knowledge and send it back to the system supervisor as a report. The system supervisor creates an overall report from the incoming individual reports, which is used by the trainer to monitor success.

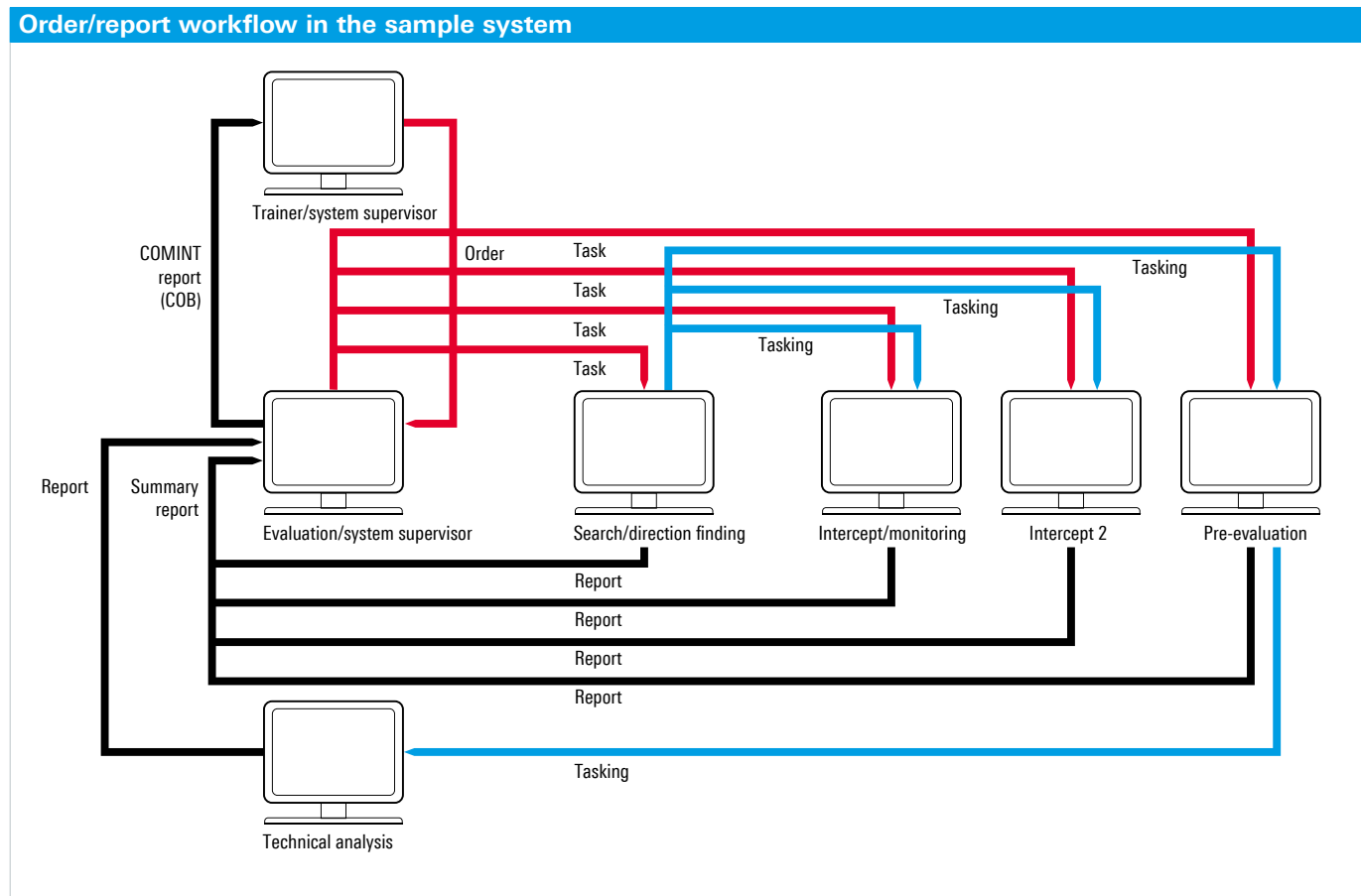
The trainer can stop the simulation at any time or interrupt training to intervene and take control. If necessary, the trainer can also project each user workstation onto a screen and control it in order to explain situations and sequences more effectively.

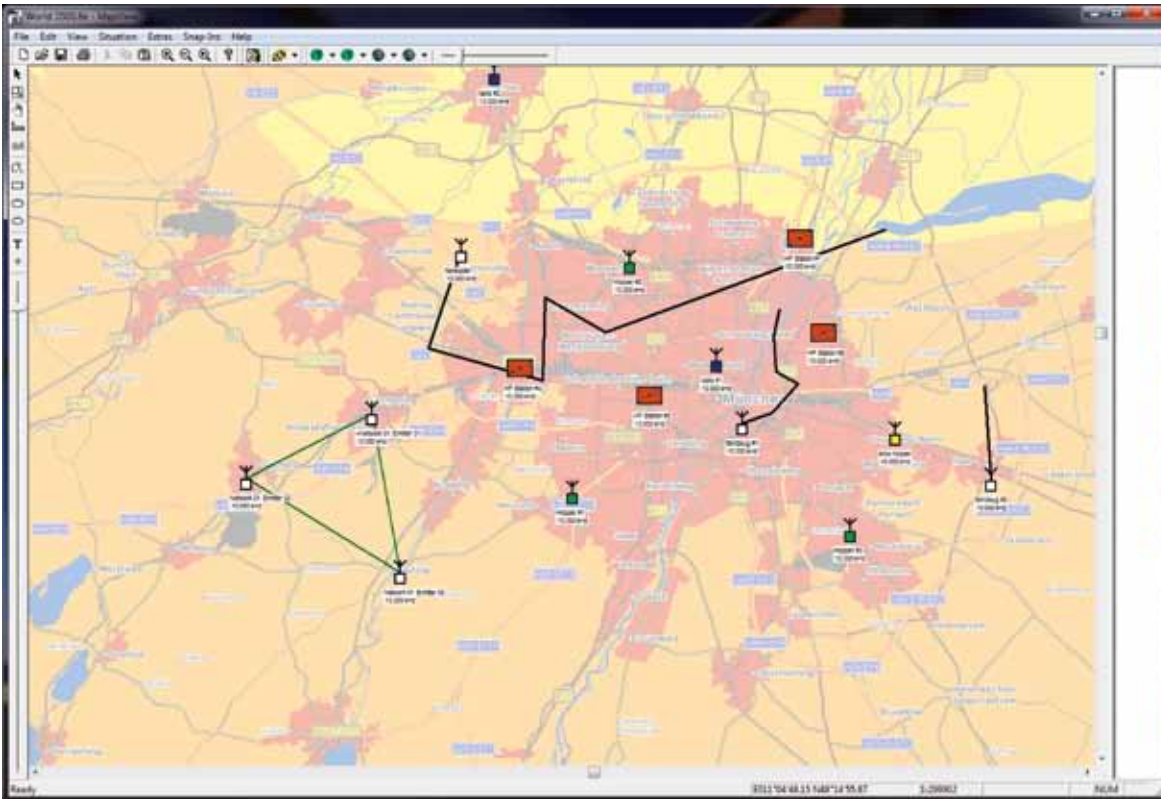
Easy and fast creation of signal scenarios in any desired complexity

The signal scenario is generated with the aid of a powerful editor that supports the R&S®MapView geographic information software. This software makes it possible to distribute all virtual transmitter and monitoring/DF stations on the digital map simply by shifting the symbols. The position coordinates are automatically transferred to the editor.

In the editor, the transmitters are assigned all necessary parameters. The range of parameters that can be selected includes type of transmitter (e.g. fixed frequency, frequency hopper), technical parameters (frequency, modulation, content) and transmit behavior (permanent, start/stop times).

To simplify work, the trainer can clone individual transmitters or radio networks and edit them. In addition, the trainer can view the time sequence of the scenario before it is uploaded to the server. This works even with a signal scenario that is already running. In other words, the trainer can create new scenarios while a training session is still in progress.





Display of the current signal scenario in R&S®MapView. The symbols indicate the positions of the transmitter stations. It is also possible to define transmitter routes on which the transmitters move at the speed specified by the trainer.

Ordering information

Designation	Type	Order No.
R&S®SRTS Simulation Server	R&S®RA-SIMSRV	3025.3102.02
R&S®SRTS Signal Package Generation	R&S®RA-SIMSIG	3025.3119.02
R&S®SRTS Device Simulation	R&S®RA-SIMDEV	3025.3125.02
R&S®SRTS Simulation Editor	R&S®RA-SIMED	3025.3131.02

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- | Uncompromising quality
- | Long-term dependability

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Environmental commitment

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

Certified Quality System
ISO 9001

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