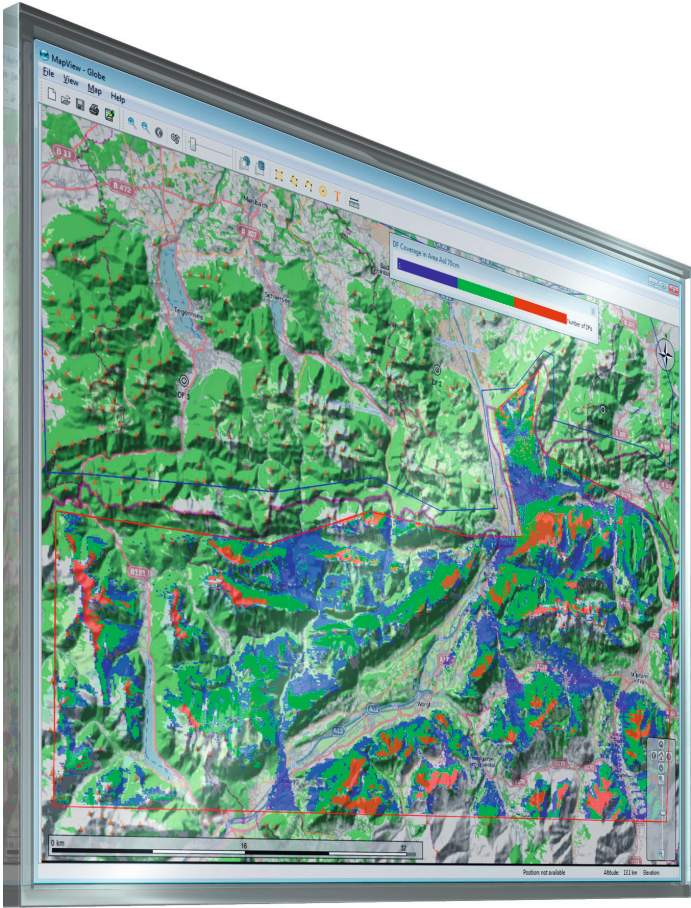


R&S®PCT

Propagation Calculation Tool

Site planning for radiomonitoring systems



R&S®PCT

Propagation

Calculation Tool

At a glance

The R&S®PCT propagation calculation tool helps operators to rapidly and easily plan the sites for setting up their radiomonitoring systems. In addition to selecting the best installation sites for the direction finding and monitoring sensors, the tool supports the planning of the radiocommunications links required to network these systems.

A key factor in the deployment of radiomonitoring systems is the selection of the right sites. This applies equally to stationary, mobile and transportable systems. Operators require a reliable tool for calculating the coverage of the area of interest for their radiomonitoring systems.

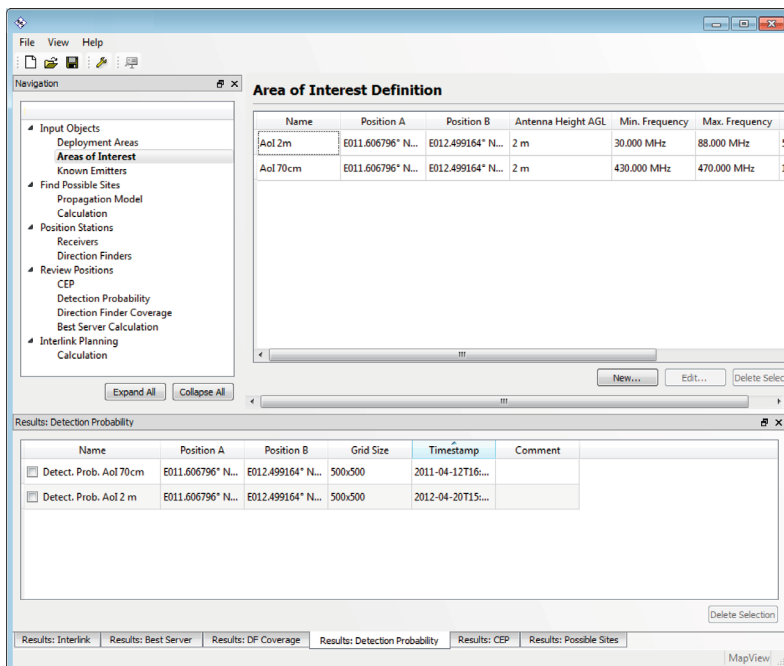
The R&S®PCT propagation calculation tool offers operators full support, allowing them to optimally deploy their radiomonitoring systems. In order to cover a defined area of interest, the tool relies on topographic data of the terrain (terrain profiling data) to calculate the best reception sites within a particular sector. Results are displayed on a digital map in the R&S®MapView geographic information software. Operators can thus select the best possible installation sites for their radiomonitoring systems.

The suitability of the selected installation sites is verified in a second step, which also takes into account the radio-location errors to be expected due to the geometrical arrangement of the sites. As an option, the tool can also be used to plan the radiocommunications links required between the individual radiomonitoring systems, or between unattended sensors and an attended station.

Key facts

- ▀ Rapid calculation to determine possible sites for radiomonitoring systems, taking into account the propagation conditions
- ▀ Support in radio network planning
- ▀ Easy to operate, even for less experienced users
- ▀ Support of numerous elevation data formats
- ▀ Interfaces to other Rohde & Schwarz radiomonitoring software products (R&S®RAMON, R&S®ARGUS)

R&S®PCT propagation calculation tool.



R&S®PCT

Propagation Calculation Tool

Benefits and key features

Selection of optimum sites for radiomonitoring systems

- ▮ Graphical support for convenient definition of area of interest
- ▮ Easy import of known transmitters and radio networks
- ▮ Recalculation to verify site suitability
- ▮ Fast results when frequently changing the site of a radiomonitoring system
- ▮ Support in planning radio networks for monitoring systems
- ▮ Support in evaluating intercepted radio signals

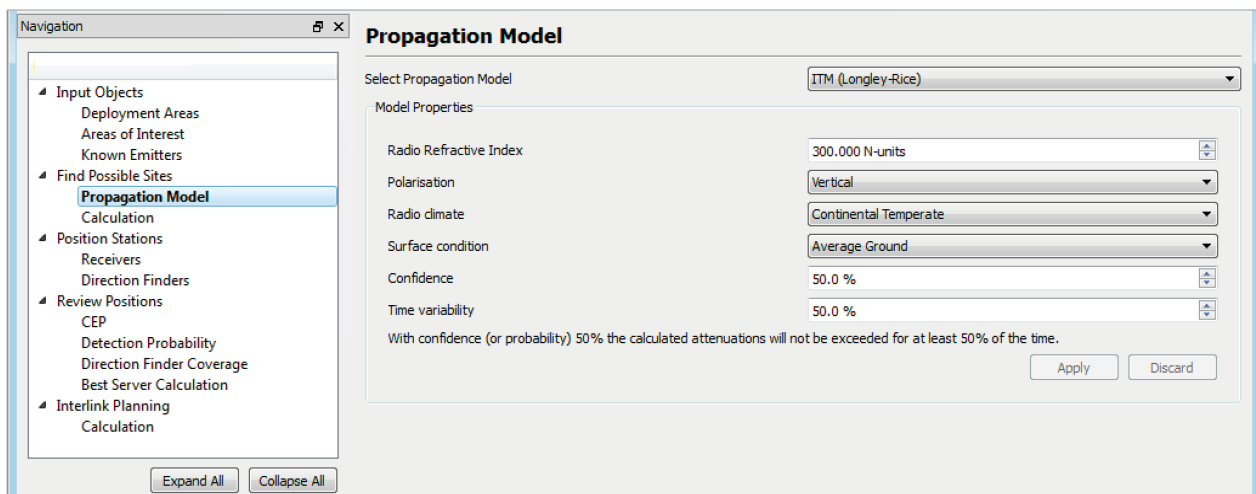
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Out-of-the-box solution

- ▮ Intuitive, menu-guided operation even for less experienced users
- ▮ Immediate deployment with publicly available elevation data
- ▮ Single-source solution: interfaces to other Rohde&Schwarz software products
- ▮ Propagation models for every application

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Navigation tree with the various operational steps.



Selection of optimum sites for radiomonitoring systems

A vital factor in the successful deployment of radiomonitoring systems is the selection of appropriate sites. This applies to the planning of stationary systems and is even more important when setting up transportable or mobile systems. R&S®PCT optimally supports the user in choosing the right sites. In conjunction with the R&S®MapView geographic information software, R&S®PCT gives operators a quick overview of suitable installation sites.

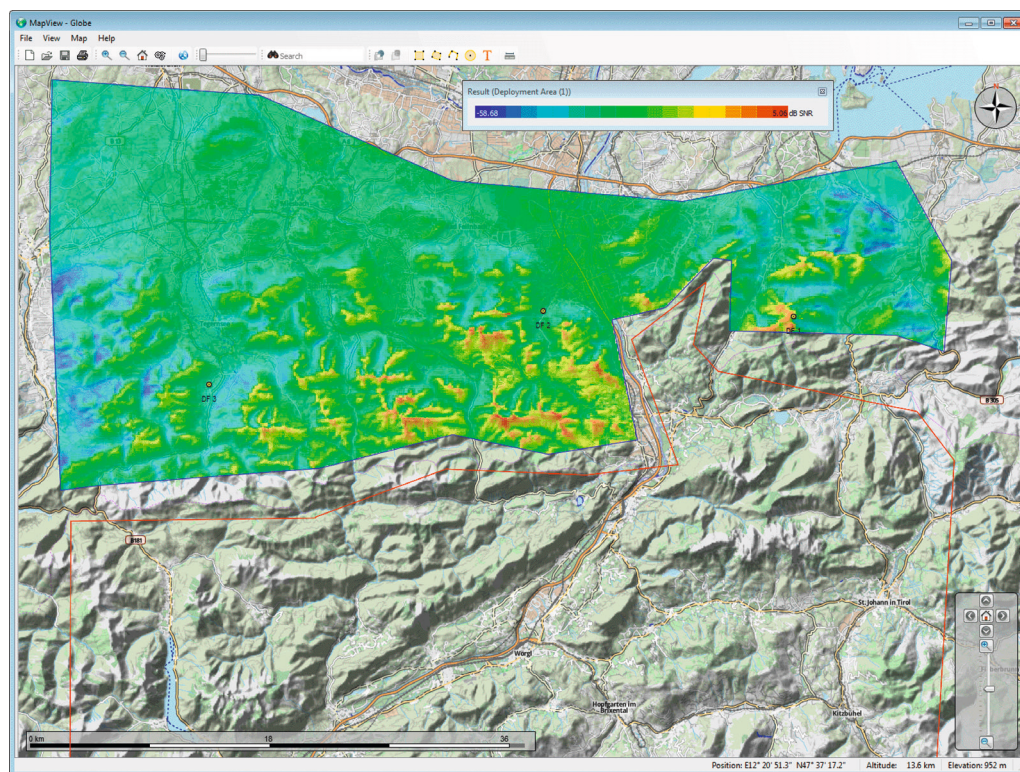
Graphical support for convenient definition of area of interest

The operator defines both the area in which radiomonitoring systems can be installed and the area where the transmitters to be monitored are located. This is done with graphical tools on a digital map. Based on the selected propagation model, R&S®PCT calculates the RF coverage and displays the result on the digital map, the coloring reflecting the degree of coverage. The operator can now conveniently select suitable sites.

Easy import of known transmitters and radio networks

In some cases, the radio transmitters and/or networks to be monitored are known. Because they were previously monitored, their latest geographic positions are stored in a database. R&S®PCT has an interface to the R&S®RAMON signal database. This makes it easy to import the positions of known networks. The tool uses this information to determine potential radiomonitoring sites from which these networks can be received. If there are no known radio transmitters or networks, the tool uses internally simulated transmitters whose parameters need to be defined by the operator.

Coloring in the map in proportion to the expected coverage.



Recalculation to verify site suitability

In a second step, the suitability of the selected sites is verified. The tool calculates the receive field strength at which the radiomonitoring sensors can potentially detect transmitters with defined transmit parameters.

Fast results when frequently changing the site of a radiomonitoring system

If calculations have to be performed repeatedly because a radiomonitoring system is rapidly changing sites, quick results are needed. R&S®PCT is the ideal solution in this case. The operator can also perform a calculation based purely on line of sight or radio horizon. For calculation models that include terrain data, the calculation speed can be optimized by selecting an appropriate resolution for the display of results.

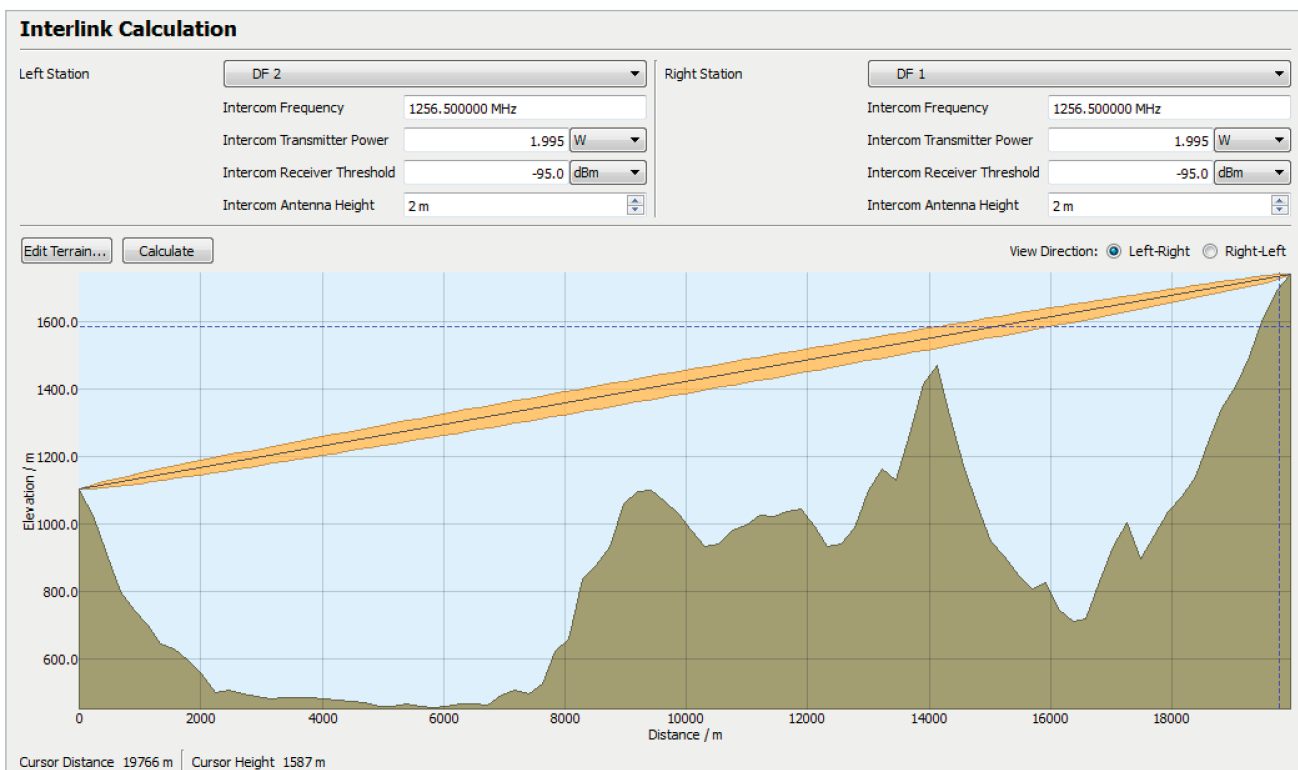
Support in planning radio networks for monitoring systems

Radiomonitoring systems frequently require radios for networking the systems in order to control remote sensors or for exchanging data between attended stations. The R&S®PCT-P2P option calculates the link budget for the point-to-point connections between the radiomonitoring systems.

Support in evaluating intercepted radio signals

The R&S®PCT-P2P option can also be used to verify potential networking between located transmitters, i.e. whether a radiocommunications link between two or more transmitters with the located sites is physically possible. In the shortwave range in particular, this “crosscheck” helps to analyze a radio scenario.

Point-to-point calculation for a radio data link between two sensor stations.



Out-of-the-box solution

Intuitive, menu-guided operation even for less experienced users

R&S®PCT is designed to support operators in estimating radio wave propagation. The extremely easy-to-use tool allows operators to reliably and quickly select the optimum installation sites for their monitoring systems.

R&S®PCT does this by guiding the operator step by step through the required calculations. The tool is therefore suitable not only for persons responsible for planning radiomonitoring and radiolocation operations. It can also be used by on-site operators of mobile or semi-mobile systems whose positions may have to be rapidly changed.

Immediate deployment with publicly available elevation data

R&S®PCT uses elevation data that is publicly available on the Internet and provides a wide coverage of the earth. The elevation data is readily available, so that operators can download the required data and immediately start calculations, no matter where their geographic area of interest is located. The publicly available elevation data has a horizontal resolution of 90 meters. R&S®PCT is compatible with established DEM data formats worldwide, allowing data sets with higher resolutions to be used if required for specific operations.

Single-source solution: interfaces to other Rohde & Schwarz software products

R&S®PCT is part of the R&S®RAMON software family. It therefore has the interfaces required for integration into Rohde & Schwarz radiomonitoring systems. This includes importing data from the signal database and linking to the order/report database, via which the operating sequences of the radiomonitoring systems are controlled and monitored. R&S®PCT can also be integrated in R&S®ARGUS based radiomonitoring systems.

Propagation models for every application

In its basic configuration, R&S®PCT includes the essential propagation models for the VHF/UHF/SHF frequency ranges. The R&S®PCT-ME option adds further propagation models for these frequency ranges. A separate option, R&S®PCT-FE, is available for calculating the wave propagation in the HF range.

Specifications

Specifications		
Integrated propagation models		
ITM (Longley Rice)		20 MHz to 20 GHz
Okumura Hata	terrain data not taken into account	150 MHz to 1.5 GHz
ITU-R P.452-13	terrain data not taken into account	700 MHz to 50 GHz
Optical line of sight		
Free space (ITU-R P.525-2 point-to-point)		
ITU-R P.1546	with R&S®PCT-ME option	30 MHz to 3 GHz
ITU-R P.526	with R&S®PCT-ME option	20 MHz to 15 GHz
ITU-R P.533	with R&S®PCT-FE option	2 MHz to 30 MHz
Interfaces		
To R&S®RAMON, radiomonitoring and radiolocation software		more information at www.rohde-schwarz.com/product/ramon
To R&S®ARGUS, radiomonitoring software for spectrum monitoring and management		more information at www.argus.rohde-schwarz.com
Elevation data formats		
DTED		digital terrain elevation model
USGS-SRTM		data from shuttle radar topography mission, prepared by United States Geological Survey
SRTM 1/3/30 (GOTOPO30)		data from shuttle radar topography mission with resolution of 1, 3 or 30 arc seconds
MapInfo grid		elevation data in MapInfo format

Ordering information

Designation	Type	Order No.
Propagation Calculation Tool, for radiomonitoring systems: site planning for sensor stations based on wave propagation calculation and circular error probability (CEP)	R&S®PCT-COV	3028.0562.02
Options		
Propagation Calculation Tool, for radiocommunications networks: planning of radio-communications links between attended and remote sensor stations based on wave propagation calculation; requires R&S®PCT-COV	R&S®PCT-P2P	3028.0579.02
Additional Propagation Models for R&S®PCT: ITU-R P.1546, ITU-R P.526; requires R&S®PCT-COV	R&S®PCT-ME	3028.0585.02
Radio propagation model for sky waves in the HF frequency range. Requires PCT-COV und MapView	R&S®PCT-FE	3028.0604.02
Radio propagation coverage calculation for transmission systems. Planning of spatial distribution of such stations. Requires PCT-COV and MapView	R&S®PCT-TX	3028.0591.02
Additional software required		
R&S®RAMON Basic Module (required for any PC running R&S®RAMON software): configuration management and licensing of R&S®RAMON software modules	R&S®RA-BASIC	3020.9490.02 (softlock) 3020.9490.03 (hardlock)
Basic Module of R&S®MapView Geographic Information Software: display of raster and vector maps, DTED, situation display editor	R&S®MapView	4046.1205.02 (softlock) 4046.1205.03 (hardlock)
Map options for R&S®MapView Geographic Information Software		
R&S®MapView MapInfo Server: display of vector maps in MapInfo format	R&S®MV-MINF	4046.1434.02
R&S®MapView ESRI Server: display of vector and raster maps in the following formats: ESRI Shape, ESRI Grid, ESRI Coverage Tables, ArcInfo World File, ADRG Image Layer, CADRG Image Layer, ERDAS Image Layer	R&S®MV-ESRI	3029.8273.02

Service that adds value

- ▮ 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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