R&S®NESTOR CELLULAR NETWORK ANALYSIS SOFTWARE

Accurate multitechnology RF measurements for deep network insights

Product Brochure
Version 15.00

ROHDE&SCHWARZ
Make ideas real

AT A GLANCE

R&S®NESTOR is a Windows based software for analyzing cellular networks over the air interface. It is widely deployed by law enforcement agencies, intelligence services, armed forces and regulatory authorities. R&S®NESTOR is used with Rohde&Schwarz mobile network scanners and QualiPoc smartphones, which offer the most advanced technology worldwide. The software supports all of the applications that public authorities and security organizations need to gather information about cellular networks. R&S®NESTOR is used in vehicles, trains, aircraft, drones, on ships and on foot.

R&S®NESTOR combines a cutting-edge touchscreen software architecture with top-of-the-line mobile radio acquisition equipment from Rohde&Schwarz. In addition to direct acquisition, visualization and real-time analysis of all measurement data (online), the software enables users to carry out in-depth postprocessing and long-term analysis (offline).

The R&S®TSME6, R&S®TSMA6 and R&S®TSMA6B mobile network scanners perform parallel measurements of GSM, UMTS, LTE (TDD and FDD), 5G NR (mmWave and sub 6 GHz), CDMA2000® and EV-DO signals in all frequency bands, while the R&S®TSME mobile network scanner carries out parallel measurements of GSM, UMTS, LTE (TDD and FDD), CDMA2000® and EV-DO signals in all frequency bands.

R&S®NESTOR supports the following applications:

- Automatic detection of all GSM, UMTS, LTE (TDD and FDD), 5G NR, CDMA2000® and EV-DO networks, bands and channels
- Autonomous acquisition of cell information, signal power and signal quality
- Mobile radio coverage measurements and determination of cell boundaries
- Creation and management of cell lists including geographic positions
- Retrieval of coverage data for forensic investigations
- Detection and analysis of misconfigured cells (mobile and stationary applications)
- Spectrum analysis in downlink bands

R&S®NESTOR architecture supports direct (live), autonomous (offline) and networked operations as well as client/server operation over IP based links.

KEY FACTS

- Cellular network analysis to measure parameters and read out network data
- Parallel measurements of all supported technologies and bands to generate comprehensive, reliable measurement data
- Real-time analyses during data acquisition
- Data postprocessing for in-depth analysis
- Intuitive operation for complex tasks
- Free map data (OpenStreetMap)
- User interface available in multiple languages

CONTENTS

EASY OPERATION FOR COMPLEX TASKS

User-friendly interface for easy customization

R&S®NESTOR is simple and consistent to operate, allowing even inexperienced users to achieve fast, conclusive results.

Since R&S®NESTOR has just a few, uniformly designed control elements, both experienced and inexperienced users can quickly learn how to use the software.
Only minimal training is needed to efficiently acquire information.

Touchscreen and/or mouse and keyboard operation

R&S®NESTOR is optimized for Windows 10 touchscreen operation – a plus for mobile users, who often work on foot with a tablet or smartphone.

The software can also be operated with a mouse and keyboard – when installed in vehicles, for example – and for offline analysis of larger amounts of data.

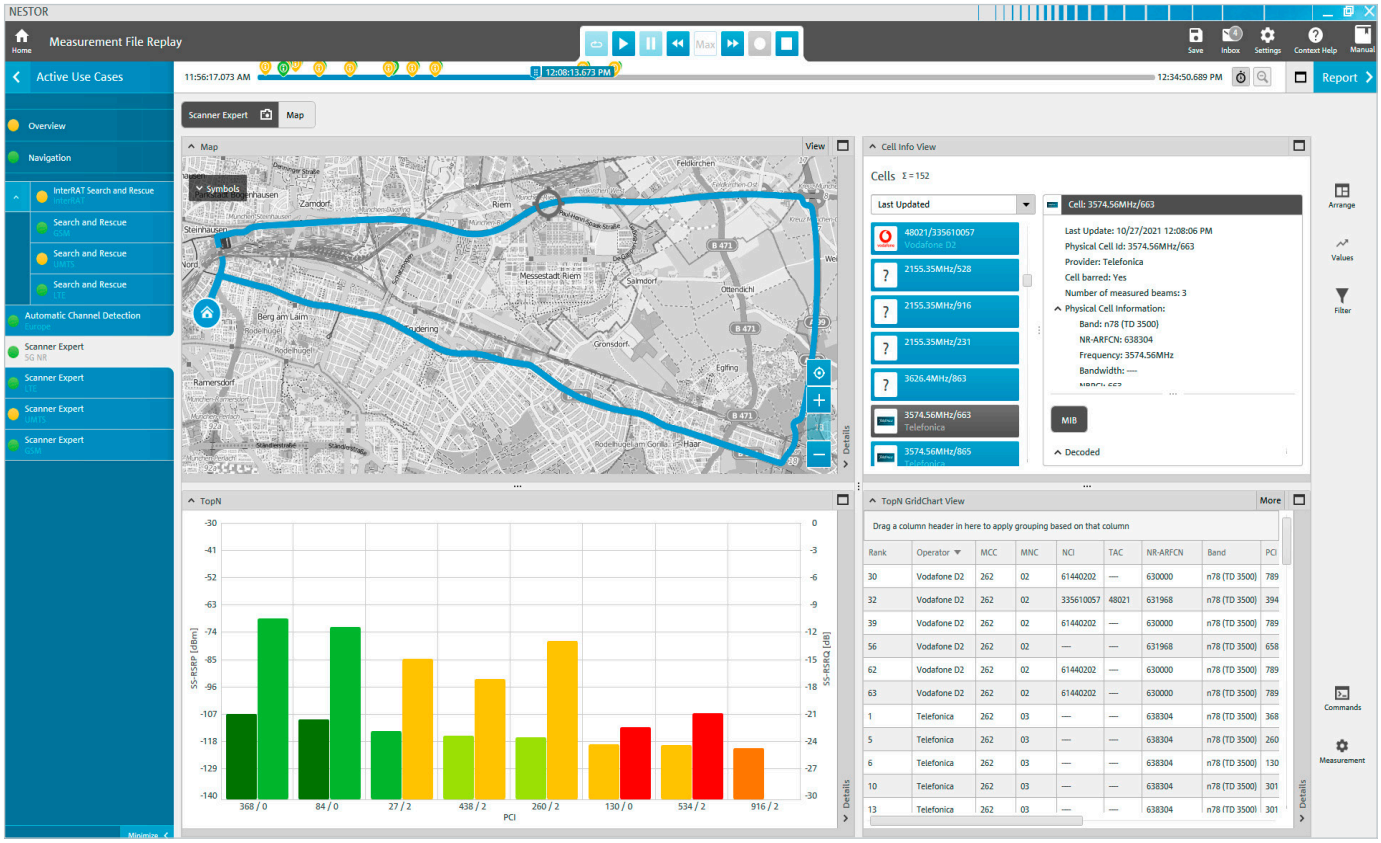
Automatic hardware configuration

The scanners, QualiPoc smartphones and navigation hardware connected to the PC or tablet are automatically detected and configured by R&S®NESTOR as soon as the software is started, and a standard measurement is performed immediately. Status displays continuously inform the user about the status of all connected devices. Predefined workspaces can be loaded or started automatically. No other system inputs are required for preconfigured measurements.

Straightforward display of all measurements

Each workspace contains one or more use cases, each one of which fulfills a specific task (e.g. GSM cell position estimation). Each use case has a standard display with several views for the measurement task. The user can change the standard display, but this is usually not necessary.

Display of measurement results



Simultaneous use of any number of use cases

A significant feature of the R&S®NESTOR is its ability to compile all available use cases as often as desired and in any combination.

Use cases with overlapping scanner measurements intelligently ensure that the scanner carries out such measurements only once. As a result, combining an LTE scanner measurement, a coverage analysis and a scanner cell position estimation generally requires just one set of measurement data instead of three.

All available parameters are synchronized across all use cases (coupled focus on time axis and geographic position) to display measurement and analysis results in the correct combination during measurement and replays.

Settings modifiable during measurements

Flexibility is a key characteristic of R&S®NESTOR. All devices, settings and views can be changed online during measurement, recording or analysis without interrupting the measurement.

Changes are also documented in the measurement results and can be seen during replays and analysis.

Convenient filter options for displaying and processing measurement data

The comprehensive filter concept is an important feature of R&S®NESTOR. The software uses a mobile network scanner to acquire extensive measurement data that it can filter and display as needed. Filters are used for the following applications:

- Individual views
- Use cases
- Data exports
- Reports

R&S®NESTOR includes standard filters for the most common measurement data, technologies, network operators, geographic locations and (groups of) cellular network cells. All associated views are immediately updated when filters are activated or deactivated.

Multilingual

R&S®NESTOR is available in English, German, Spanish, Russian, French, Chinese, Turkish, Italian, Dutch, Romanian, Swedish, Portuguese (Brazilian) and Arabic.

New versions every three months

A new version of R&S®NESTOR will be available for download via an FTP server in the middle of every quarter. Users registered on the Rohde&Schwarz customer support website are automatically notified of the new version.

QualiPoc smartphone

EVERYTHING THAT CELLULAR NETWORK ANALYSIS SOFTWARE NEEDS

OpenStreetMap (OSM)

OpenStreetMap (OSM) is a user-editable world map that is available at the following internet address: www.openstreetmap.org

OSM is a wiki project in which users upload and edit geographical information such as GPS tracking data or the course of a road or river. This world map is growing daily.

OpenStreetMap data is available for free under the terms of the Creative Commons Attribution-ShareAlike 2.0 license.

Supports R&S®TSME6, R&S®TSMA6, R&S®TSMA6B and R&S®TSME mobile network scanners

R&S®NESTOR supports the second, third and fourth generation Rohde&Schwarz mobile network scanners.

Parallel measurements in all GSM, UMTS, LTE (TDD and FDD), 5G NR, CDMA2000® and EV-DO bands

R&S®NESTOR uses one or more mobile network scanners to carry out parallel and synchronous measurements, ensuring that every GSM, UMTS, LTE (TDD and FDD), 5G NR, CDMA2000® and EV-DO cell is measured within the same fixed time interval. It also measures IEEE 802.11a/b/g/n/ac in parallel with dedicated hardware.

OpenStreetMap compatibility

R&S®NESTOR uses the free OpenStreetMap system. Maps are accessed via the internet for online use and saved on the control computer for offline work.

Support of cell databases

Cellular network cells are central components for R&S®NESTOR. This means that creating and processing cell lists associated with measurements and analyses are very important.

Cell databases are either imported as existing lists in a configurable text format (e.g. CSV) or created by the system via measurements and position estimations. Individual cells and lists can either be processed directly through the GUI or exported, processed with a spreadsheet program and reimported into R&S®NESTOR, depending on the requirements. Technologies and network operators are clearly separated on the maps. Use-case views involving cellular network cells include information on those cells. Filter functions relating to cellular network cells indicate measurement data and analyses for the selected cells only.

Status displays for all connected devices, use cases and workspaces

Status displays provide information on the status of all connected devices. Status information for all use cases, use case groups and workspaces is displayed in separate windows. All connected devices can be activated and deactivated, even during measurements.

A higher-level reporting system saves all system messages and displays them in a mailbox.

Preconfigured templates for use cases and workspaces

Straightforward operation is one of the key features of R&S®NESTOR. This is why even the basic version includes a large number of templates for complete workspaces, displaying use cases and configuring measurements. All templates can be edited and saved.

Live analysis and data export during measurements

All settings, views, analyses and data exports can be modified online during measurement data acquisition. All of the information from ongoing measurements is used as a basis for further operations.

Analysis and export of all measurements during data postprocessing

All measurements can be analyzed and exported during postprocessing.

License-free replay versions

R&S®NESTOR can be installed without a license as often as desired, making it possible to replay each measurement exactly as recorded.

R&S®NESTOR installed on an R&S®TSMA6B mobile network scanner remotely controlled via a tablet

AUTOMATIC CHANNEL DETECTION

Automatic detection of all occupied GSM, UMTS, LTE (TDD and FDD), 5G NR, CDMA2000® and EV-DO RF channels

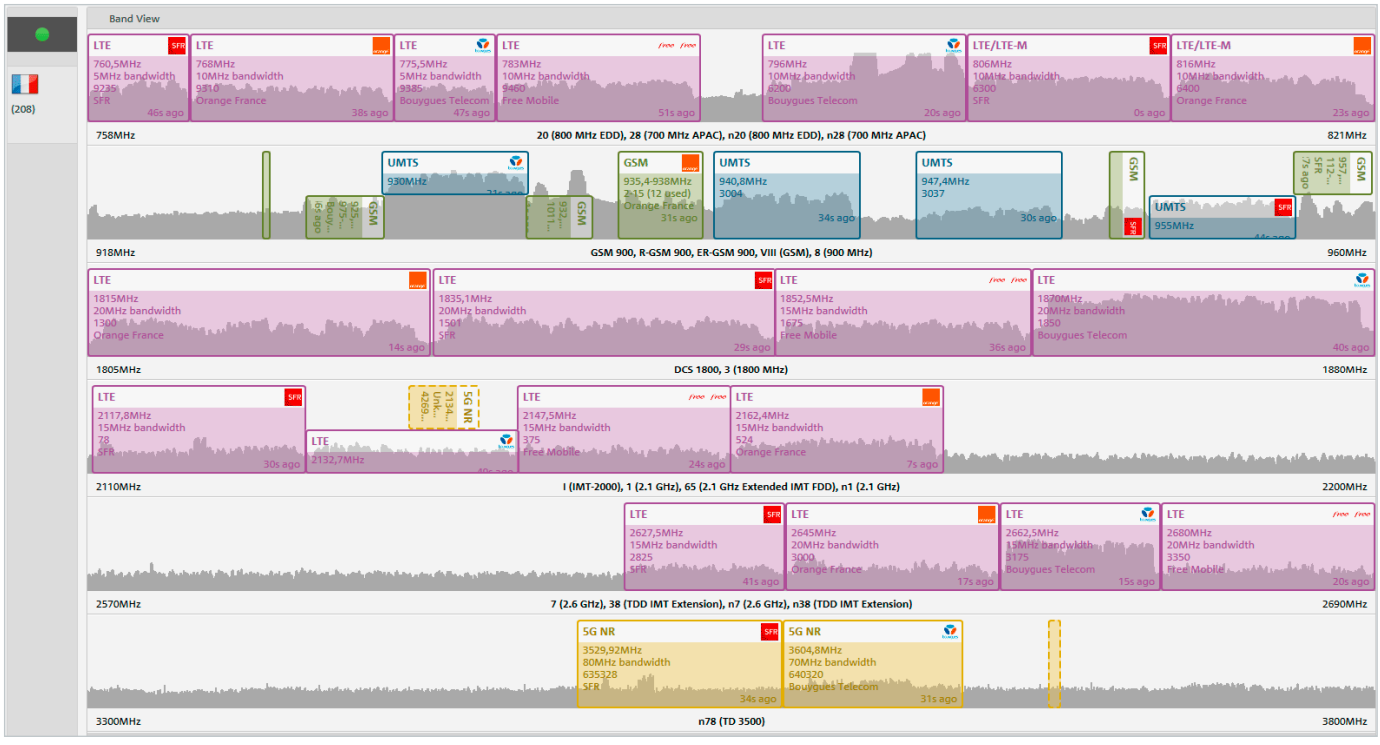
R&S®NESTOR detects deployed technologies and occupied bands and channels in unknown terrain. It identifies which technologies can be measured via the air interface and finds the associated channels and bands in all frequency ranges covered by the scanner in use.

This process couples sophisticated spectrum analysis with background technology information and a brute force approach to enable the fastest possible acquisition of the cells that are visible on the air interface.

If there is no or not enough information about the cellular network environment, the software searches the entire frequency range covered by the connected scanner.

R&S®NESTOR measures known bands and technologies very quickly and returns the channel numbers for all occupied channels. The software provides a graphic display of occupied frequency bands along with a list of channel numbers where signals were measured.

Automatic channel detection (ACD) for GSM, UMTS, LTE and 5G NR



Automatic forwarding of detected channels to all use cases for seamless measurement of all cellular network signals

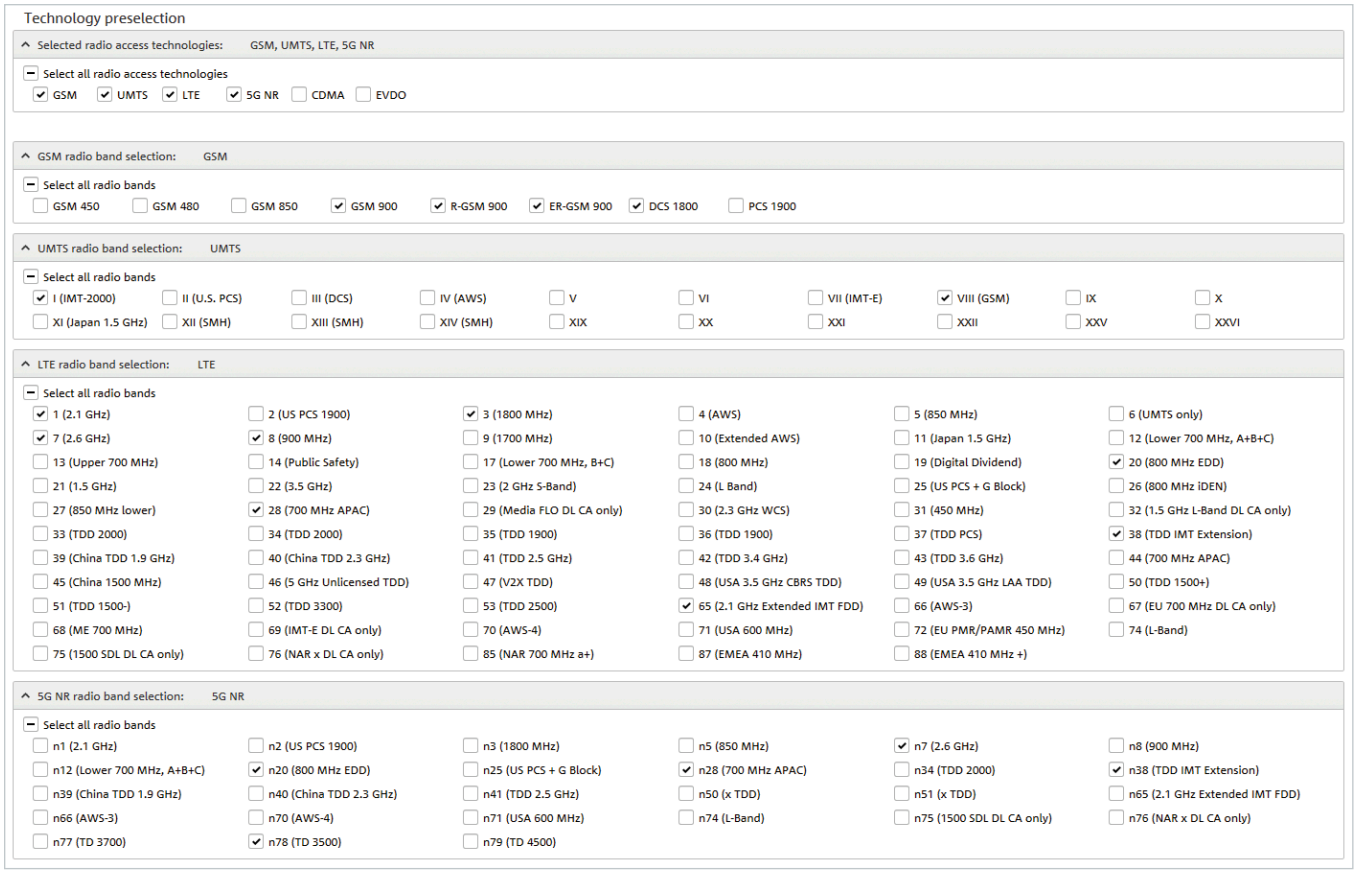
During automatic channel detection, the bands found to carry cellular network signals are forwarded to all other use cases for further analysis. The system seamlessly proceeds from initial channel detection to a long-term cellular network analysis of the detected channels.

During regular scanner measurements (acquisition of cell parameters, signal power and signal quality), cell position estimation and cellular network coverage analysis are carried out.

Creation of use case templates for easy configuration of future measurements

A template for scanner settings (use cases) is automatically created with the channel detection results for each technology and band. The templates can be used directly for future measurements without automatic channel detection.

Preselection of cellular radio bands for automatic channel detection (ACD)



CELLULAR NETWORK SCANNING

Simultaneous cellular network analysis in all GSM, UMTS, LTE (TDD and FDD), 5G NR, CDMA2000® and EV-DO bands

GSM, UMTS, LTE (TDD and FDD), 5G NR, CDMA2000® and EV-DO scanner measurements can be configured for entire bands or individual channels. Each use case can be configured individually and in detail. Other use cases in the workspace access measured data in real time for further processing.

Top N chart and list display for all measured cells

A Top N chart is generated for specific use cases. It displays all relevant parameters for each cell in both graphic and tabular form and can be weighted according to signal power, signal quality or UE emulation (signal power as perceived by the smartphone).

Demodulation of system information

All system information (protocol data units, PDU) from acquired non-encrypted cells is demodulated, displayed in a separate window and can be exported.

Automatic measurement rate settings for synchronous measurements of all technologies

R&S®NESTOR automatically sets all measurement rates so that all GSM, UMTS, LTE (TDD and FDD), 5G NR, CDMA2000® and EV-DO cellular network cells are measured at identical time and space intervals.

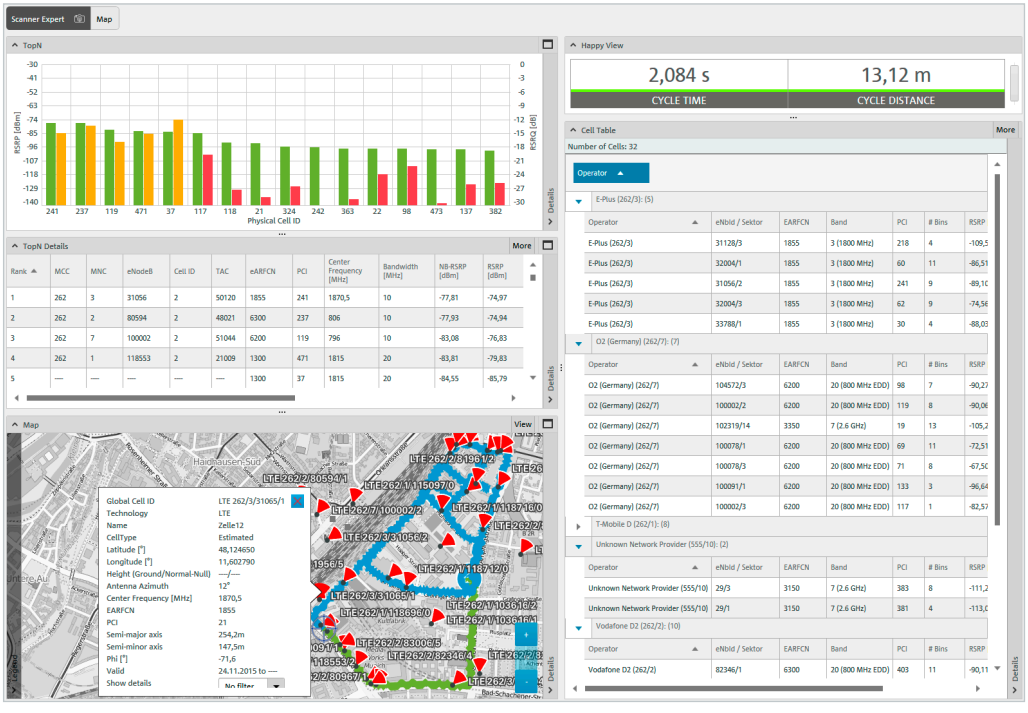
Map display of route and dedicated maps for specific measurements

The route traveled is displayed on a higher-level map. Individual maps are generated for specific use cases and use case groups, with each map displaying relevant use case content. The cellular network coverage analysis map shows information such as the aggregated power values of measured cells, while the cell position estimation map displays detected cells along with positions and error ellipses.

Intuitive, high-performance display and processing filters

A set of data and display filters is available for every R&S®NESTOR use case. If one or more filters are active, the system behaves as if exclusively the filtered data was collected or as if only the filtered cells were present; as can seen when measurement results for analysis and export are displayed. The most important filters are for network operators, location areas, towers, cells and geographic areas (defined by polygon geofencing).

Expert scan (SCN)



CELLULAR NETWORK COVERAGE ANALYSIS

Generation of geographically aggregated (binned) GSM, UMTS, LTE (TDD and FDD), 5G NR, CDMA2000®, EV-DO and IEEE 802.11a/b/g/n/ac coverage data

Cellular network coverage analysis aggregates signal power, signal quality and UE emulation (signal power as perceived by the smartphone) into geographic bins based on UTM MGRS squares. The measured values are highly volatile, so they are aggregated into bins and a single value for each bin is displayed on the map. Users can select a bin size between 1 m × 1 m in built-up/indoor areas and 1000 m × 1000 m in rural areas.

Top N chart, list and map display for all aggregated data

Aggregated measurement data for signal power, signal quality and UE emulation is displayed in a variety of formats, including the Top N chart, list and map display. This measurement data can be exported and processed externally with planning software.

Live summary of cellular network coverage analysis

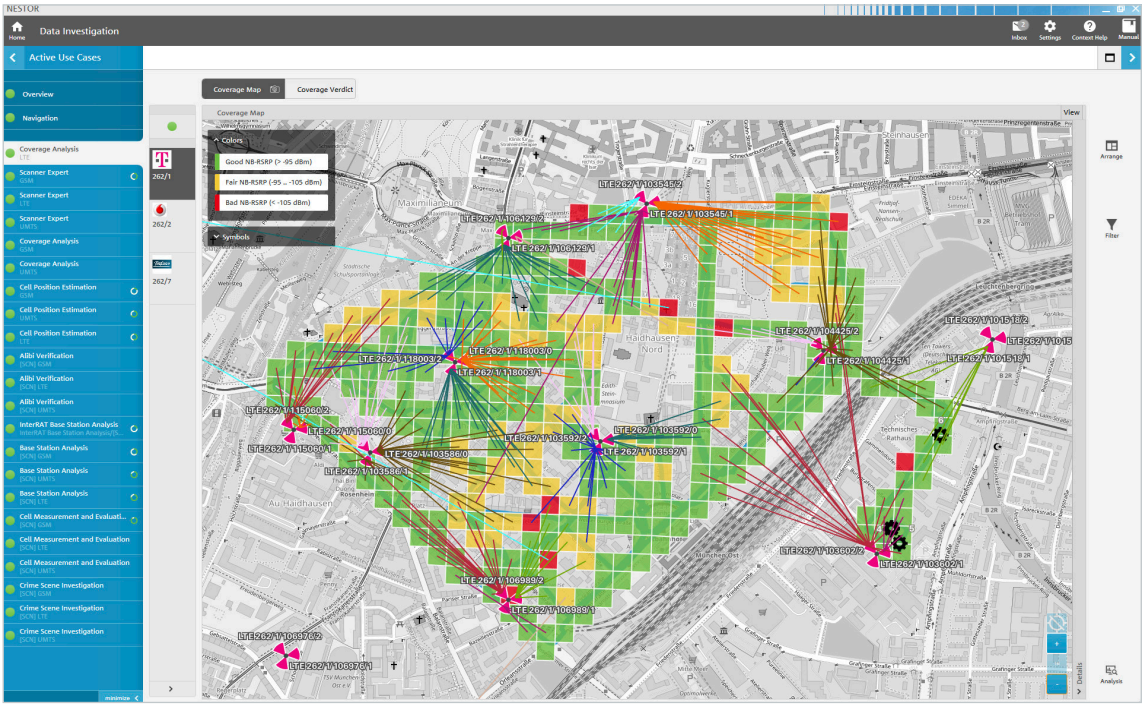
During network coverage analysis, geographic bins are generated, displayed and updated live with each new data set. The R&S®NESTOR filter options are essential to efficient network coverage analysis. In conjunction with scanner measurements, they quickly provide information for the statistical and geographical analyses of network operators, selected areas, individual cells and cell groups.

Best server plot for selected areas

Aggregated cellular network coverage data is represented in a variety of ways. The best server plot illustrates one of the most important analyses, showing the cell best suited for a cellular radio link on a map.

Cell measurement and evaluation (CME)

Coverage analysis (COV)



CELL POSITION ESTIMATION

Geographic position determination for all GSM, UMTS, LTE (TDD and FDD), 5G NR, CDMA2000® and EV-DO cells as well as WLAN access points

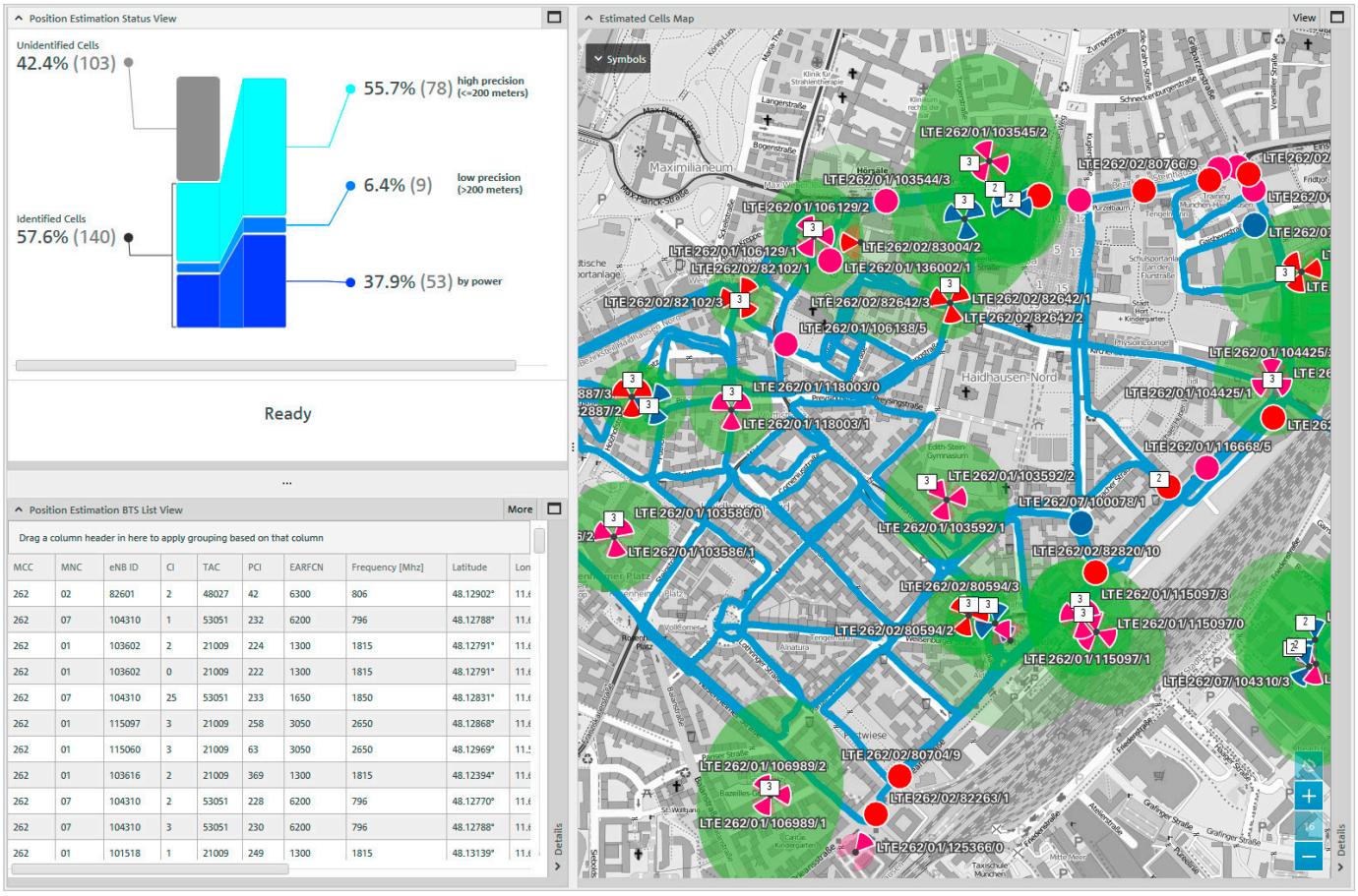
Cell position estimation is used to determine the geographic positions and sector azimuths of all measured cells during scanner measurements. Measurement data acquisition must take place while the system is in motion. Positions and sector azimuths are estimated in quick succession using advanced signal separation algorithms. This approach delivers excellent results even in difficult environments with weak signals, multipath propagation and fading.

A special algorithm recognizes whether measured sectors can be assigned to a single tower. This information is used to correlate signal processing for these sectors and obtain more accurate results. All cells are measured almost simultaneously in all bands and for all technologies.

Live map display of all position-estimated cells

Maps and lists are used to display all position-estimated cells and sectors. Fast signal processing enables high update rates so that the estimated cell positions are displayed online in the maps with continuously increasing accuracy. The position estimation error ellipses and sector confidence representations are also displayed and allow users to assess the position estimation and sector azimuth accuracy for each cell.

Cell position estimation (CPE)



Export of position-estimated cells for further processing

Position-estimated cellular network cells are not only included in R&S®NESTOR cell lists, they can also be exported for further processing. This makes it possible to create new cell lists and update existing lists. Cell lists contain channel numbers, cell positions, error ellipses, MCC, MNC, LAC, cell identities (CID), neighbor lists and other system information.

Intuitive, high-performance display and processing filters

The comprehensive R&S®NESTOR filter options for cell position estimation make it possible to carry out extensive analyses for a broad range of cellular network analysis and cell position estimation use cases.

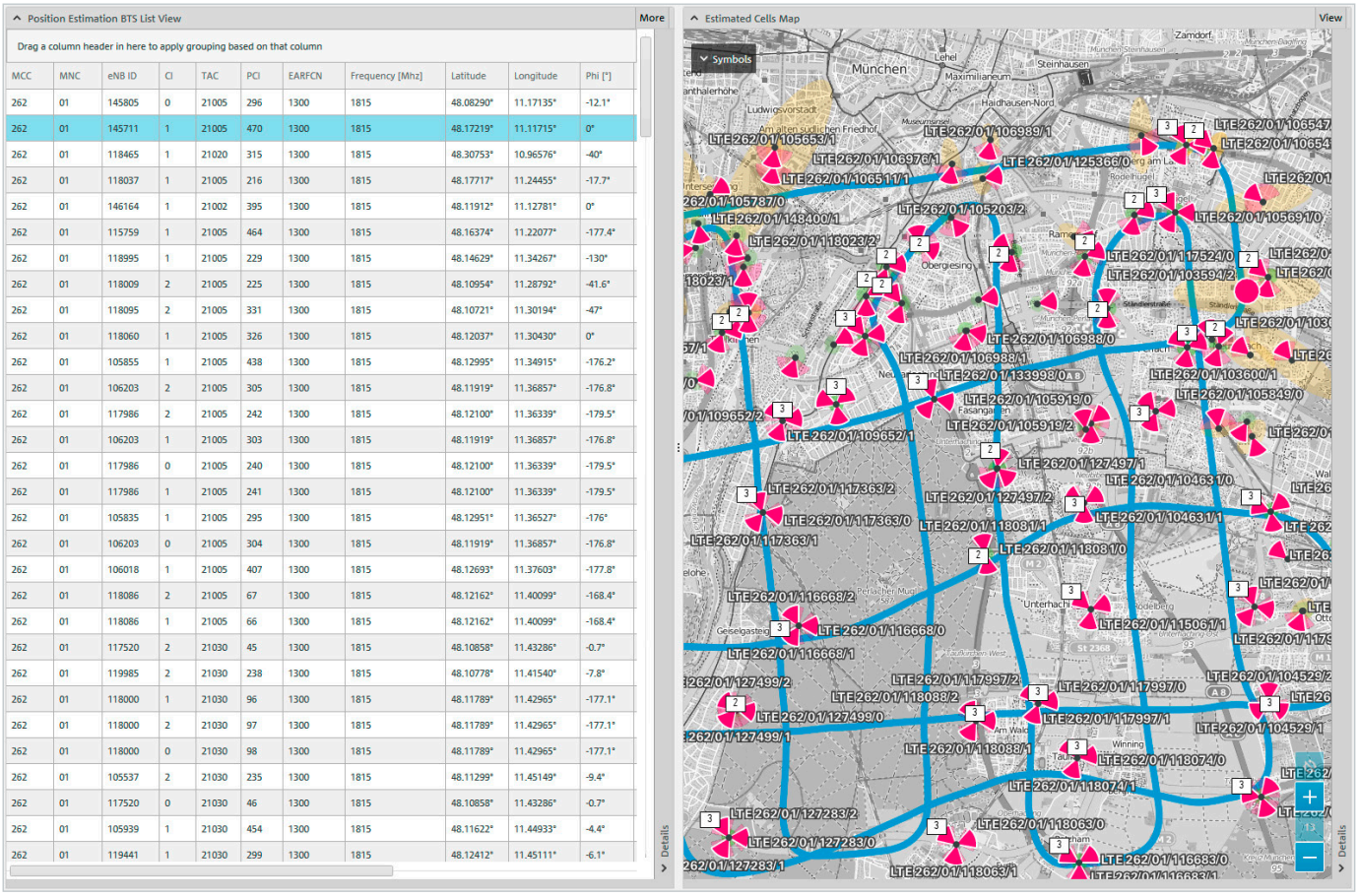
Airborne cell position estimation using airplanes, helicopters and commercial drones

The cell position estimation use case can be extended for airborne estimation up to an altitude of 20 000 feet for cellular network technologies.

A directional mobile radio antenna is used on the aircraft to minimize interference. Stored NASA altitude profile data provided by Rohde&Schwarz is used to determine the height above ground. An algorithm calculates cell positions, taking the height above ground into account.

Cell position estimation accuracy is approximately the same for airborne and ground based estimations: typically 50 m for GSM and LTE, and 100 m for UMTS.

Airborne position estimation (APE)



DETECTION AND MONITORING OF SUSPICIOUS CELLS

Monitoring and detecting irregular and interfering cellular radio cells in GSM, UMTS, LTE and 5G NR

A growing problem in cellular radiocommunications is the deployment of non-conforming base stations that were not included in the original network operator network.

R&S®NESTOR can:

- Search for non-conforming cells in vehicles or on foot
- Permanently monitor large areas or the areas near buildings to detect activity in non-conforming cells

Analysis of cells that deviate from operators' usual network settings

Cells that deviate from regular network settings are categorized and displayed separately with a detailed description of detected deviations. This includes unknown cells not found in the network operator reference database, as well as cells with settings that deviate from the information stored in the system.

These differences can vary in significance depending on the configuration of the conspicuous cell. There might be just one significant deviation or many deviations. An algorithm weights the deviations and a score is calculated for each cell. The score indicates the probability of a misconfigured cell. Based on this analysis, the user can decide whether a measured cell should be classified as a misconfigured cell and store this information in the system.

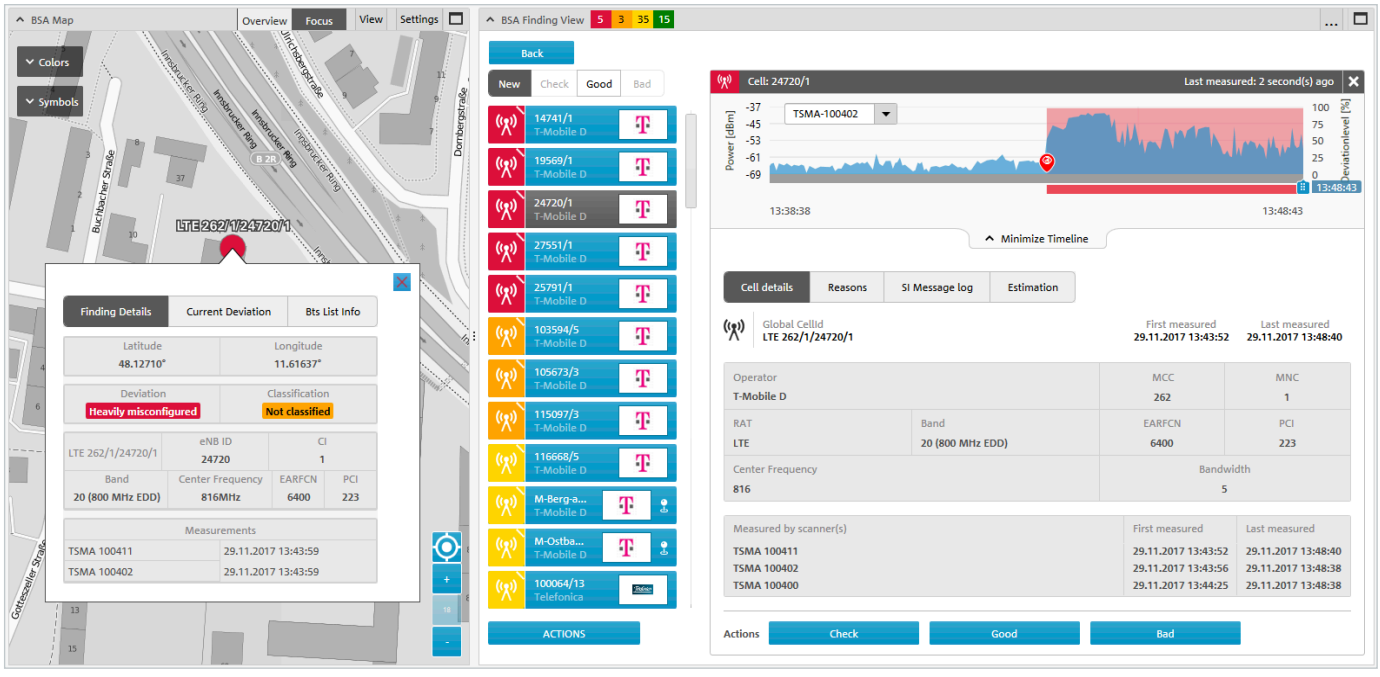
Determination of broadcast system information messages, dedicated layer 3 messages and geographic positions of suspicious cells

All measured cells are analyzed in detail using R&S®NESTOR measurement functions. Their system information is demodulated and the position and coverage of the cells are determined.

In addition, a connected QualiPoc smartphone allows analysis of dedicated layer 3 procedures for unexpected behavior (e.g. IMSI request during a location update procedure).

This information is used to immediately create a report exported to a CSV file for further processing or transmitted live through a dedicated interface – to a centralized monitoring center, for instance.

Searching for and monitoring non-conforming cells (base station monitoring, BSM)



Live map display

All cells contained in the network operators' reference database and all measured cells are displayed on a map. Cells not included in the reference database and suspicious cells are highlighted in color.

Smart configuration of suspicious cell criteria

The user sets most of the cell misconfiguration criteria. These take into account the local network operator conditions. A set of criteria describing a network operator network can be used to train the system and show any deviations from suspicious cells.

Deployment in mobile and stationary applications

Both mobile and stationary measurements and analyses are possible.

Stationary measurements are used to monitor the network situation near critical infrastructure or special facilities over an extended period of time. Here, R&S®NESTOR is permanently installed and carries out cell measurements in the vicinity of the facility 24/7. R&S®NESTOR triggers an alarm or emails a description of any irregularities as soon as they are detected.

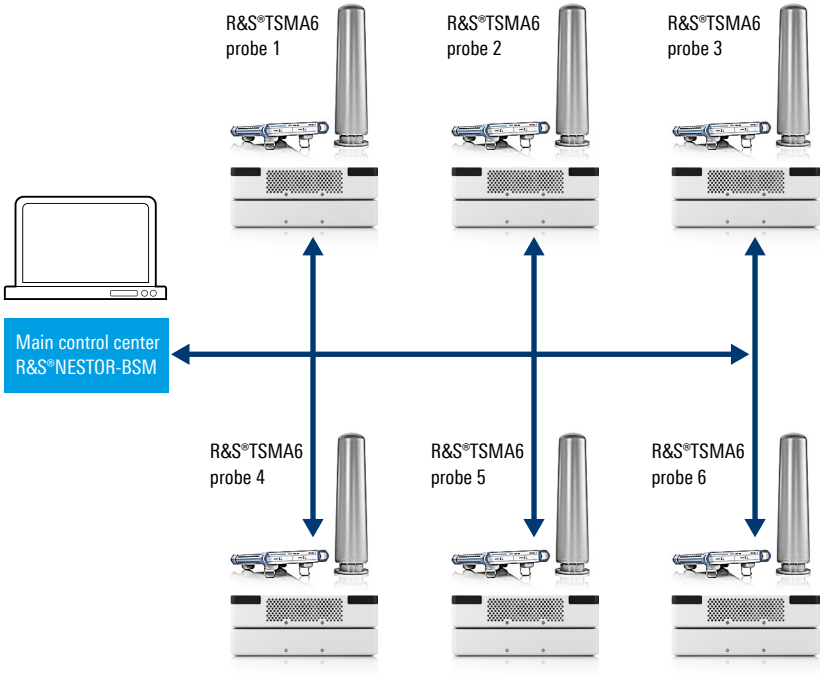
Mobile measurements can identify suspicious cells at any location. These measurements are more dynamic, and other criteria are used to detect misconfigured cells.

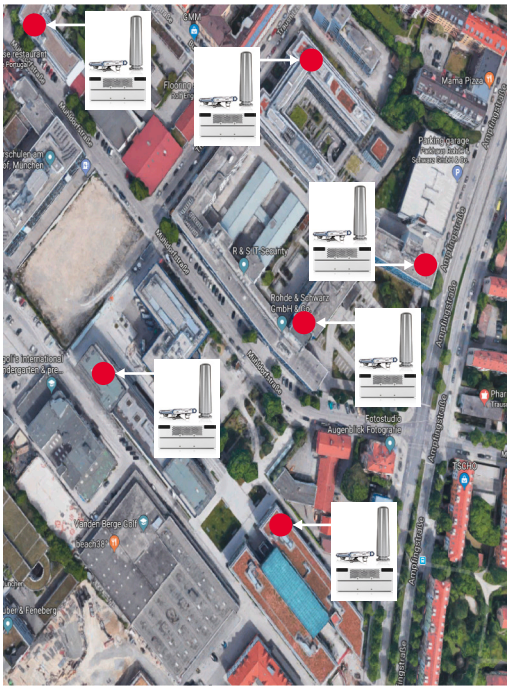
Online and offline analysis

All measurements can be performed live on site from a vehicle, airplane, helicopter, drone, ship or on foot.

Comprehensive, previously stored measurement data is used to perform subsequent offline analysis.

Example of base station monitoring on the Rohde&Schwarz campus





SEARCH AND RESCUE

Finding the location of a mobile phone of interest with a mobile network trace

Search and rescue activities are vital to helping people in distress (people lost, injured or in danger) as well as people in difficult terrain (forests or mountains, for instance).

Once the communications logs for a target mobile phone are retrieved from the cellular network operator, search and rescue analysis quickly determines the area where the search activity should start.

Network coverage data from previously measured data or a Rohde&Schwarz mobile network scanner determine the area of interest. The coverage of the detected cells in the area is displayed graphically to help evaluate the situation (e.g. whether the target is on the move or stationary).

Smart visualization of cells of interest

Cell of interest footprints can be combined to find likely locations of a target mobile phone and the time sequence for likely locations can be used to guess possible movements of the target.

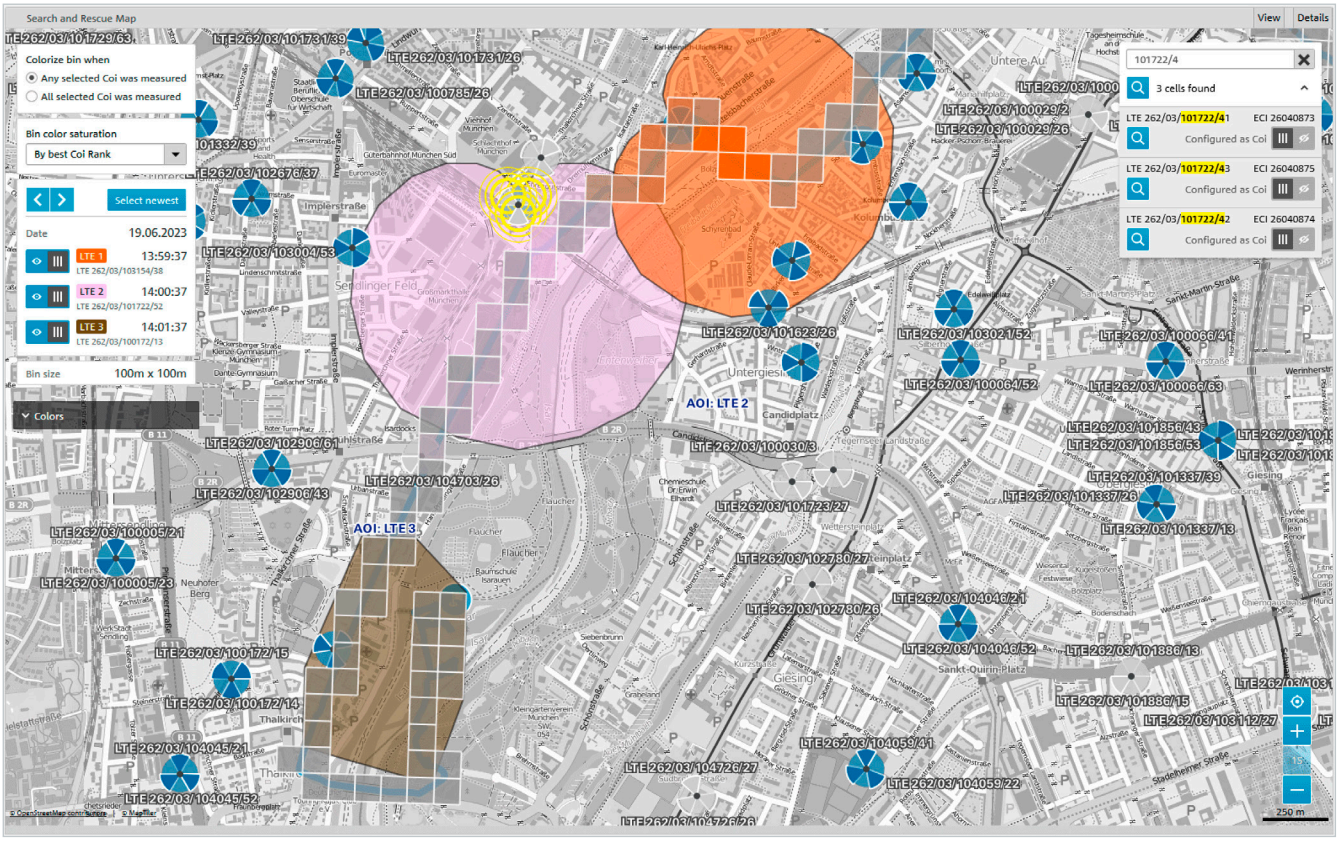
Live map display

During measurement, analysis results and cells are displayed live on a map. The user can then add extra cells of interest to fine tune analysis should the network provider make live information available.

Online and offline analysis

Comprehensive, previously stored measurement data is used for offline analysis before system deployment. Subsequent live measurements can be performed on site to help law enforcement or emergency services.

Search and rescue (SAR)



INSTALLATION OF NEW CELL SITES

Configuring GSM, UMTS and LTE cells to be added to a network environment

The increasing complexity of network topologies (more technologies and frequency bands, macro and femtocell sites, etc.) make deploying new cells in existing mobile operator networks more complicated. Moreover, these networks often need quick integration to cope with higher capacity requirements, e.g. for special events at a specific location for a limited duration.

R&S®NESTOR offers unique capabilities to:

- Analyze existing network topologies
- Determine optimal cell parameters for a network
- Output this set of parameters for configuration and new cell activation

Analysis of existing network operator cells

Before deploying new cells in a network, an accurate overview is critical. The R&S®NESTOR measuring functions allow demodulation of system information for existing cells to analyze network configurations of logical and physical parameters as well as additional settings such as the use of barred cells or topology-specific features, e.g. femtocells. Comprehensive, previously stored measurement data is used for subsequent offline analysis.

Determination of optimized cell parameters

Based on previous analysis, R&S®NESTOR can automatically determine a set of suitable physical and logical parameters, channels and neighbor lists that match the current environment. This information is used immediately, exported to other tools or saved for future use.

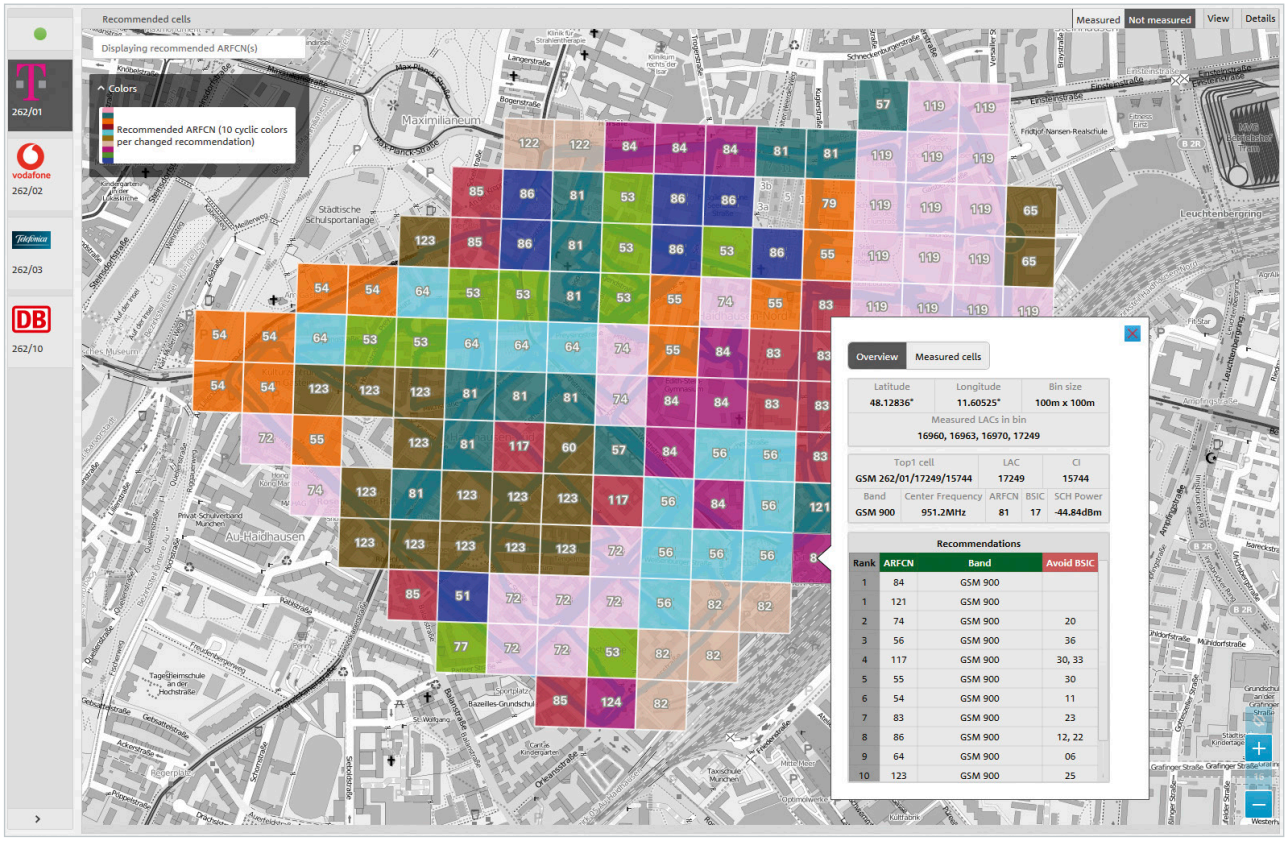
Live map display of best cell for selected areas

The infill cell planning (ICP) map automatically displays the cells that are best suited for a cellular radio link in the measured area. For each network operator in a known region that selects such an area, an overview is created of the parameters that the new cells should use to suit the environment.

Online and offline analysis

The user may perform analysis before cell deployment, if measurements from the area of interest are already available, or live during the deployment of the cells to be added.

Infill cell planning (ICP)



FORENSIC INVESTIGATIONS

Retrieval of cell coverage data for confined areas (crime scene investigation)

It is often necessary to determine all the cells from all network operators that could have been used for communications in a certain area, such as where a crime was committed. If the area is known, this analysis makes it possible to quickly identify the cells that were most likely used for communications at a specific time in a specific location or area.

In addition, connected QualiPoc smartphones make it possible to fine tune the analysis by providing information about any cells relevant to the investigation.

This information is used to immediately create a report or is exported for further processing.

With a list of cells in hand, law enforcement can contact network operators to request a list of subscribers who were in a specific location or area at a specific time. This can significantly benefit a criminal investigation.

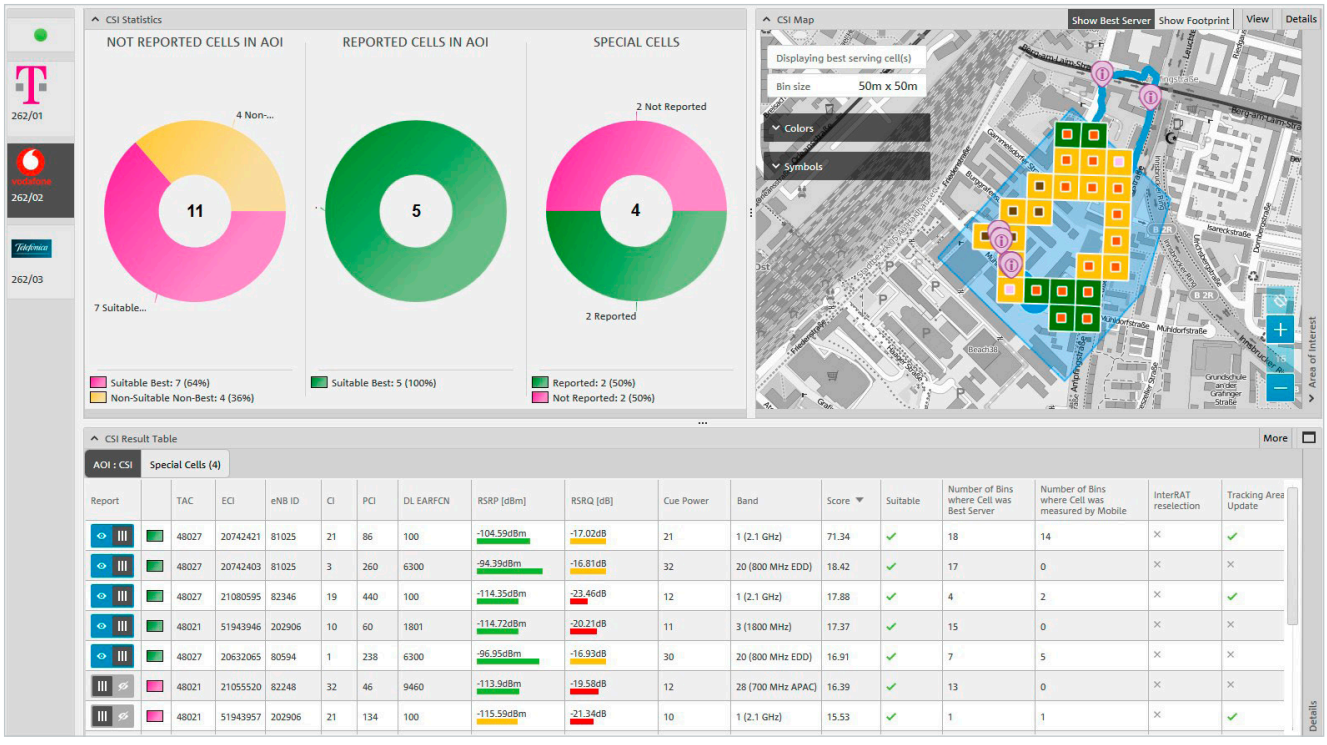
Retrieval of cell coverage data for confined areas (alibi verification)

If communications logs of a suspect's mobile phone have been retrieved from the cellular network operator, alibi analysis can quickly determine whether the suspect's mobile phone was in a specific location or area at a specific time. This communications data can also be used to determine any other location where a suspect might have been instead.

Network coverage is determined using previously measured data or a Rohde&Schwarz mobile network scanner. (QualiPoc smartphones can also be used to fine tune the analysis.) The coverage of the detected cells in the area in question is displayed both graphically and in a table.

Results are classified and describe whether and where the detected cells are best servers and how adjacent cells behave relative to a best server. The probability of a suspect actually having been in the area in question can be displayed quickly and clearly once the cell log information for the suspect's mobile phone is retrieved from the network operator. This information is used to immediately create a report or is exported for further processing.

Crime scene investigation (CSI)



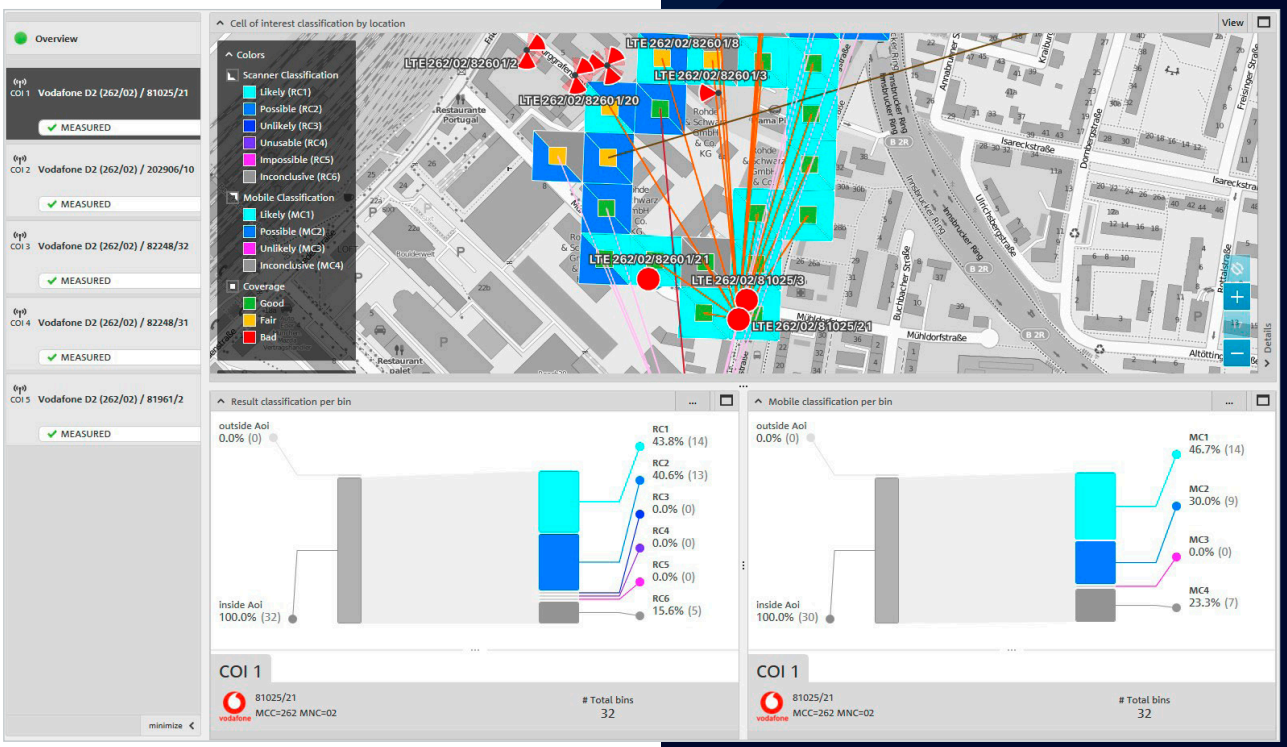
Live map display

During measurement, analysis results and relevant cells are displayed live on a map.

Online and offline analysis

All measurements can be performed live on site from a vehicle, airplane, helicopter, drone, ship or on foot to support law enforcement or any emergency measures. Comprehensive, previously stored measurement data is used to perform subsequent offline analysis.

Result of alibi verification measurement (ALI)



DETECTING NETWORK CONGESTION

Monitoring and detecting network congestion in cellular networks

Congestion can have a big impact on the general performance of cellular networks (lower speeds, dropped connections, higher latency, etc.) and can have several causes (high load, cross technology, external interferers, etc.).

While most issues are temporary, they can have severe consequences when they compromise secure critical communications. Such issues must be detected and identified as quickly as possible.

Analyzing downlink bands, R&S®NESTOR can detect and identify:

- RAT internal congestion
- RAT external congestion/interference
- External wideband interference

Technology independent analysis

In addition to analyzing the impact of congestion on cells, R&S®NESTOR can evaluate the overall spectrum (huge noise scenarios when no cells are left), observe multiple channel bandwidths and generate a graphic display of occupied frequency bands along with a list of channel numbers where signals were detected.

Smart configuration of congestion criteria

The R&S®NESTOR algorithm automatically detects and classifies congestion according to severity; from significant decreases in the number of detected cells to analysis of spectra, signal power and quality. The software also notifies users of critical situations to help resolve them.

Mobile and stationary deployments

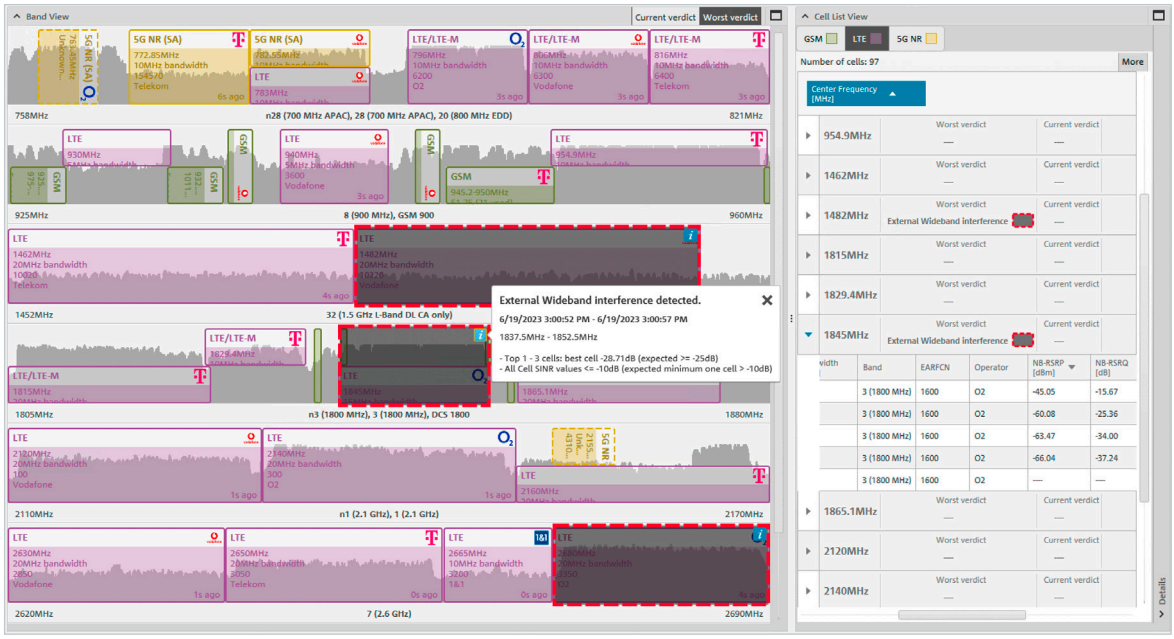
R&S®NESTOR can be used for mobile and stationary measurements and analyses.

While mobile measurements can identify congestion at any location for any period of time, stationary measurements are primarily used to monitor networks near critical infrastructure or in special facilities for extended time periods. R&S®NESTOR can be permanently installed and perform cell measurements 24/7. R&S®NESTOR triggers an alarm when anomalies are detected.

Online and offline analysis

All measurements can be performed on site from a vehicle, airplane, helicopter, drone, ship or on foot. Offline analysis of stored measurement data provides a comprehensive overview of all the channels where congestion was detected.

Congestion detection (COD)



CONFIGURATIONS FOR MOBILE USE

R&S®NESTOR and connected hardware components (Rohde&Schwarz mobile network scanner, dead reckoning, GPS) are used in the following configurations:

- Customized configuration
- Carrying bag system
- Backpack system (open or closed)
- Test vehicle

R&S®NESTOR for outdoor use in a test vehicle

R&S®TSMA6 with carrying bag and Windows tablet

R&S®NESTOR with the R&S®FR4 Freerider 4 backpack system

SYSTEM REQUIREMENTS

R&S®NESTOR system requirements	
Minimum recommended equipment	► PC, notebook or tablet with a quad core CPU (8 threads) ► 16 Gbyte RAM ► 256 Gbyte SSD ► 1 Gbit LAN interface, support of 9k jumbo frames for R&S®TSME6 and R&S®TSME ► Display resolution: 1440 × 900 pixel ► Windows 10, 64 bit ► DirectX 11 compatibility

ORDERING INFORMATION

Designation	Type	Order No.
Cellular network analysis software	R&S®NESTOR	1522.8870.02
Accessories supplied: DVD, microSD card with USB adapter		
Software options		
Driver for Rohde&Schwarz mobile network scanners	R&S®NESTOR-SCN	1521.5031.02
Automatic cell detection	R&S®NESTOR-ACD	1521.5048.02
Coverage analysis	R&S®NESTOR-COV	1521.5077.02
Cell position estimation	R&S®NESTOR-CPE	1521.5054.02
Airborne cell position estimation	R&S®NESTOR-APE	1527.1709.02
Forensic analysis	R&S®NESTOR-FOR	1521.5060.02
Base station analysis	R&S®NESTOR-BSA	1521.5354.02
Base station monitoring	R&S®NESTOR-BSM	4900.3155.02
Indoor	R&S®NESTOR-IND	4900.3103.02
Infill cell planning	R&S®NESTOR-ICP	1521.5102.02
Driver for WLAN hardware	R&S®NESTOR-WLN	4900.3126.02
Driver for QualiPoc smartphone	R&S®NESTOR-QPD	4900.3161.02
Search and rescue	R&S®NESTOR-SAR	4900.3132.02
Congestion detection	R&S®NESTOR-COD	4900.3178.02
Service options		
Multiversion license, one year	R&S®NESTOR-1Y	1522.8870.82
Multiversion license, two years	R&S®NESTOR-2Y	1522.8870.84
Multiversion license, three years	R&S®NESTOR-3Y	1522.8870.83
Multiversion license, five years	R&S®NESTOR-5Y	1522.8870.85
Hardware		
High performance notebook	R&S®RMS-FX-N2	3059.2550.05
Tablet laptop	R&S®RMS-FX-T1	3060.5889.05
WLAN sensor case	R&S®WLM-SCR	4112.8314.03
Dead reckoning GPS with PPS	R&S®TSMX-PPS2	1515.7120.02
Mobile network scanners		
Autonomous mobile network scanner	R&S®TSMA6B	4900.8005.20
Ultracompact drive test scanner	R&S®TSME6	1514.6520.02
Ultracompact downconverter, 24 GHz to 30 GHz	R&S®TSME30DC	4901.1004.02
Ultracompact downconverter, 24 GHz to 44 GHz	R&S®TSME44DC	4901.2600.02
Ultracompact downconverter, 17 GHz to 53 GHz	R&S®TSMS53DC	4902.0001.02

For more information, see Rohde&Schwarz mobile network scanner data sheets.

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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.

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Sustainable product design

- Environmental compatibility and eco-footprint
- Energy efficiency and low emissions
- Longevity and optimized total cost of ownership

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ISO 9001

Certified Environmental Management
ISO 14001

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PD 3607.1907.12 | Version 15.00 | June 2023 (ch)
R&S®NESTOR Cellular Network Analysis Software
Data without tolerance limits is not binding | Subject to change

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