

R&S® InstrumentView Spectrum Analyzer Software Manual



1321.1040.02 – 01.00

The software manual describes the following:

- R&S®InstrumentView

The contents of this manual correspond to firmware version 1.00 or higher.

The firmware of the R&S InstrumentView makes use of several valuable open source software packages. For information, see the "Open Source Acknowledgment" on the user documentation CD-ROM (included in delivery).

Rohde & Schwarz would like to thank the open source community for their valuable contribution to embedded computing.

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The following abbreviations are used throughout this manual: R&S®InstrumentView is abbreviated as R&S InstrumentView.

Basic Safety Instructions

Always read through and comply with the following safety instructions!

All plants and locations of the Rohde & Schwarz group of companies make every effort to keep the safety standards of our products up to date and to offer our customers the highest possible degree of safety. Our products and the auxiliary equipment they require are designed, built and tested in accordance with the safety standards that apply in each case. Compliance with these standards is continuously monitored by our quality assurance system. The product described here has been designed, built and tested in accordance with the EC Certificate of Conformity and has left the manufacturer's plant in a condition fully complying with safety standards. To maintain this condition and to ensure safe operation, you must observe all instructions and warnings provided in this manual. If you have any questions regarding these safety instructions, the Rohde & Schwarz group of companies will be happy to answer them.







Furthermore, it is your responsibility to use the product in an appropriate manner. This product is designed for use solely in industrial and laboratory environments or, if expressly permitted, also in the field and must not be used in any way that may cause personal injury or property damage. You are responsible if the product is used for any purpose other than its designated purpose or in disregard of the manufacturer's instructions. The manufacturer shall assume no responsibility for such use of the product.

The product is used for its designated purpose if it is used in accordance with its product documentation and within its performance limits (see data sheet, documentation, the following safety instructions). Using the product requires technical skills and, in some cases, a basic knowledge of English. It is therefore essential that only skilled and specialized staff or thoroughly trained personnel with the required skills be allowed to use the product. If personal safety gear is required for using Rohde & Schwarz products, this will be indicated at the appropriate place in the product documentation. Keep the basic safety instructions and the product documentation in a safe place and pass them on to the subsequent users.








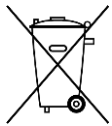

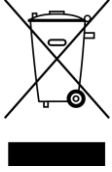

Observing the safety instructions will help prevent personal injury or damage of any kind caused by dangerous situations. Therefore, carefully read through and adhere to the following safety instructions before and when using the product. It is also absolutely essential to observe the additional safety instructions on personal safety, for example, that appear in relevant parts of the product documentation. In these safety instructions, the word "product" refers to all merchandise sold and distributed by the Rohde & Schwarz group of companies, including instruments, systems and all accessories. For product-specific information, see the data sheet and the product documentation.

Safety labels on products

The following safety labels are used on products to warn against risks and dangers.

Symbol	Meaning	Symbol	Meaning
	Notice, general danger location Observe product documentation		ON/OFF Power
	Caution when handling heavy equipment		Standby indication
	Danger of electric shock		Direct current (DC)

Basic Safety Instructions

Symbol	Meaning	Symbol	Meaning
	Caution ! Hot surface		Alternating current (AC)
	Protective conductor terminal To identify any terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal of a protective earth		Direct/alternating current (DC/AC)
	Earth (Ground)		Class II Equipment to identify equipment meeting the safety requirements specified for Class II equipment (device protected by double or reinforced insulation)
	Frame or chassis Ground terminal		EU labeling for batteries and accumulators For additional information, see section "Waste disposal/Environmental protection", item 1.
	Be careful when handling electrostatic sensitive devices		EU labeling for separate collection of electrical and electronic devices For additional information, see section "Waste disposal/Environmental protection", item 2.
	Warning! Laser radiation For additional information, see section "Operation", item 7.		

Signal words and their meaning

The following signal words are used in the product documentation in order to warn the reader about risks and dangers.



Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



Indicates information considered important, but not hazard-related, e.g. messages relating to property damage.

In the product documentation, the word ATTENTION is used synonymously.

These signal words are in accordance with the standard definition for civil applications in the European Economic Area. Definitions that deviate from the standard definition may also exist in other economic areas or military applications. It is therefore essential to make sure that the signal words described here are always used only in connection with the related product documentation and the related product. The use of signal words in connection with unrelated products or documentation can result in misinterpretation and in personal injury or material damage.

Basic Safety Instructions

Operating states and operating positions

The product may be operated only under the operating conditions and in the positions specified by the manufacturer, without the product's ventilation being obstructed. If the manufacturer's specifications are not observed, this can result in electric shock, fire and/or serious personal injury or death. Applicable local or national safety regulations and rules for the prevention of accidents must be observed in all work performed.

1. Unless otherwise specified, the following requirements apply to Rohde & Schwarz products: predefined operating position is always with the housing floor facing down, IP protection 2X, use only indoors, max. operating altitude 2000 m above sea level, max. transport altitude 4500 m above sea level. A tolerance of $\pm 10\%$ shall apply to the nominal voltage and $\pm 5\%$ to the nominal frequency, overvoltage category 2, pollution degree 2.
2. Do not place the product on surfaces, vehicles, cabinets or tables that for reasons of weight or stability are unsuitable for this purpose. Always follow the manufacturer's installation instructions when installing the product and fastening it to objects or structures (e.g. walls and shelves). An installation that is not carried out as described in the product documentation could result in personal injury or even death.
3. Do not place the product on heat-generating devices such as radiators or fan heaters. The ambient temperature must not exceed the maximum temperature specified in the product documentation or in the data sheet. Product overheating can cause electric shock, fire and/or serious personal injury or even death.

Electrical safety

If the information on electrical safety is not observed either at all or to the extent necessary, electric shock, fire and/or serious personal injury or death may occur.

1. Prior to switching on the product, always ensure that the nominal voltage setting on the product matches the nominal voltage of the mains-supply network. If a different voltage is to be set, the power fuse of the product may have to be changed accordingly.
2. In the case of products of safety class I with movable power cord and connector, operation is permitted only on sockets with a protective conductor contact and protective conductor.
3. Intentionally breaking the protective conductor either in the feed line or in the product itself is not permitted. Doing so can result in the danger of an electric shock from the product. If extension cords or connector strips are implemented, they must be checked on a regular basis to ensure that they are safe to use.
4. If there is no power switch for disconnecting the product from the mains, or if the power switch is not suitable for this purpose, use the plug of the connecting cable to disconnect the product from the mains. In such cases, always ensure that the power plug is easily reachable and accessible at all times. For example, if the power plug is the disconnecting device, the length of the connecting cable must not exceed 3 m. Functional or electronic switches are not suitable for providing disconnection from the AC supply network. If products without power switches are integrated into racks or systems, the disconnecting device must be provided at the system level.
5. Never use the product if the power cable is damaged. Check the power cables on a regular basis to ensure that they are in proper operating condition. By taking appropriate safety measures and carefully laying the power cable, ensure that the cable cannot be damaged and that no one can be hurt by, for example, tripping over the cable or suffering an electric shock.

Basic Safety Instructions

6. The product may be operated only from TN/TT supply networks fuse-protected with max. 16 A (higher fuse only after consulting with the Rohde & Schwarz group of companies).
7. Do not insert the plug into sockets that are dusty or dirty. Insert the plug firmly and all the way into the socket provided for this purpose. Otherwise, sparks that result in fire and/or injuries may occur.
8. Do not overload any sockets, extension cords or connector strips; doing so can cause fire or electric shocks.
9. For measurements in circuits with voltages $V_{rms} > 30$ V, suitable measures (e.g. appropriate measuring equipment, fuse protection, current limiting, electrical separation, insulation) should be taken to avoid any hazards.
10. Ensure that the connections with information technology equipment, e.g. PCs or other industrial computers, comply with the IEC 60950-1 / EN 60950-1 or IEC 61010-1 / EN 61010-1 standards that apply in each case.
11. Unless expressly permitted, never remove the cover or any part of the housing while the product is in operation. Doing so will expose circuits and components and can lead to injuries, fire or damage to the product.
12. If a product is to be permanently installed, the connection between the protective conductor terminal on site and the product's protective conductor must be made first before any other connection is made. The product may be installed and connected only by a licensed electrician.
13. For permanently installed equipment without built-in fuses, circuit breakers or similar protective devices, the supply circuit must be fuse-protected in such a way that anyone who has access to the product, as well as the product itself, is adequately protected from injury or damage.
14. Use suitable overvoltage protection to ensure that no overvoltage (such as that caused by a bolt of lightning) can reach the product. Otherwise, the person operating the product will be exposed to the danger of an electric shock.
15. Any object that is not designed to be placed in the openings of the housing must not be used for this purpose. Doing so can cause short circuits inside the product and/or electric shocks, fire or injuries.
16. Unless specified otherwise, products are not liquid-proof (see also section "Operating states and operating positions", item 1). Therefore, the equipment must be protected against penetration by liquids. If the necessary precautions are not taken, the user may suffer electric shock or the product itself may be damaged, which can also lead to personal injury.
17. Never use the product under conditions in which condensation has formed or can form in or on the product, e.g. if the product has been moved from a cold to a warm environment. Penetration by water increases the risk of electric shock.
18. Prior to cleaning the product, disconnect it completely from the power supply (e.g. AC supply network or battery). Use a soft, non-linting cloth to clean the product. Never use chemical cleaning agents such as alcohol, acetone or diluents for cellulose lacquers.

Operation

1. Operating the products requires special training and intense concentration. Make sure that persons who use the products are physically, mentally and emotionally fit enough to do so; otherwise, injuries or material damage may occur. It is the responsibility of the employer/operator to select suitable personnel for operating the products.

Basic Safety Instructions

2. Before you move or transport the product, read and observe the section titled "Transport".
3. As with all industrially manufactured goods, the use of substances that induce an allergic reaction (allergens) such as nickel cannot be generally excluded. If you develop an allergic reaction (such as a skin rash, frequent sneezing, red eyes or respiratory difficulties) when using a Rohde & Schwarz product, consult a physician immediately to determine the cause and to prevent health problems or stress.
4. Before you start processing the product mechanically and/or thermally, or before you take it apart, be sure to read and pay special attention to the section titled "Waste disposal/Environmental protection", item 1.
5. Depending on the function, certain products such as RF radio equipment can produce an elevated level of electromagnetic radiation. Considering that unborn babies require increased protection, pregnant women must be protected by appropriate measures. Persons with pacemakers may also be exposed to risks from electromagnetic radiation. The employer/operator must evaluate workplaces where there is a special risk of exposure to radiation and, if necessary, take measures to avert the potential danger.
6. Should a fire occur, the product may release hazardous substances (gases, fluids, etc.) that can cause health problems. Therefore, suitable measures must be taken, e.g. protective masks and protective clothing must be worn.
7. Laser products are given warning labels that are standardized according to their laser class. Lasers can cause biological harm due to the properties of their radiation and due to their extremely concentrated electromagnetic power. If a laser product (e.g. a CD/DVD drive) is integrated into a Rohde & Schwarz product, absolutely no other settings or functions may be used as described in the product documentation. The objective is to prevent personal injury (e.g. due to laser beams).
8. EMC classes (in line with EN 55011/CISPR 11, and analogously with EN 55022/CISPR 22, EN 55032/CISPR 32)
 - Class A equipment:
Equipment suitable for use in all environments except residential environments and environments that are directly connected to a low-voltage supply network that supplies residential buildings
Note: Class A equipment is intended for use in an industrial environment. This equipment may cause radio disturbances in residential environments, due to possible conducted as well as radiated disturbances. In this case, the operator may be required to take appropriate measures to eliminate these disturbances.
 - Class B equipment:
Equipment suitable for use in residential environments and environments that are directly connected to a low-voltage supply network that supplies residential buildings

Repair and service

1. The product may be opened only by authorized, specially trained personnel. Before any work is performed on the product or before the product is opened, it must be disconnected from the AC supply network. Otherwise, personnel will be exposed to the risk of an electric shock.

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- Adjustments, replacement of parts, maintenance and repair may be performed only by electrical experts authorized by Rohde & Schwarz. Only original parts may be used for replacing parts relevant to safety (e.g. power switches, power transformers, fuses). A safety test must always be performed after parts relevant to safety have been replaced (visual inspection, protective conductor test, insulation resistance measurement, leakage current measurement, functional test). This helps ensure the continued safety of the product.

Batteries and rechargeable batteries/cells

If the information regarding batteries and rechargeable batteries/cells is not observed either at all or to the extent necessary, product users may be exposed to the risk of explosions, fire and/or serious personal injury, and, in some cases, death. Batteries and rechargeable batteries with alkaline electrolytes (e.g. lithium cells) must be handled in accordance with the EN 62133 standard.

- Cells must not be taken apart or crushed.
- Cells or batteries must not be exposed to heat or fire. Storage in direct sunlight must be avoided. Keep cells and batteries clean and dry. Clean soiled connectors using a dry, clean cloth.
- Cells or batteries must not be short-circuited. Cells or batteries must not be stored in a box or in a drawer where they can short-circuit each other, or where they can be short-circuited by other conductive materials. Cells and batteries must not be removed from their original packaging until they are ready to be used.
- Cells and batteries must not be exposed to any mechanical shocks that are stronger than permitted.
- If a cell develops a leak, the fluid must not be allowed to come into contact with the skin or eyes. If contact occurs, wash the affected area with plenty of water and seek medical aid.
- Improperly replacing or charging cells or batteries that contain alkaline electrolytes (e.g. lithium cells) can cause explosions. Replace cells or batteries only with the matching Rohde & Schwarz type (see parts list) in order to ensure the safety of the product.
- Cells and batteries must be recycled and kept separate from residual waste. Rechargeable batteries and normal batteries that contain lead, mercury or cadmium are hazardous waste. Observe the national regulations regarding waste disposal and recycling.

Transport

- The product may be very heavy. Therefore, the product must be handled with care. In some cases, the user may require a suitable means of lifting or moving the product (e.g. with a lift-truck) to avoid back or other physical injuries.
- Handles on the products are designed exclusively to enable personnel to transport the product. It is therefore not permissible to use handles to fasten the product to or on transport equipment such as cranes, fork lifts, wagons, etc. The user is responsible for securely fastening the products to or on the means of transport or lifting. Observe the safety regulations of the manufacturer of the means of transport or lifting. Noncompliance can result in personal injury or material damage.
- If you use the product in a vehicle, it is the sole responsibility of the driver to drive the vehicle safely and properly. The manufacturer assumes no responsibility for accidents or collisions. Never use the product in a moving vehicle if doing so could distract the driver of the vehicle. Adequately secure the product in the vehicle to prevent injuries or other damage in the event of an accident.

Waste disposal/Environmental protection

1. Specially marked equipment has a battery or accumulator that must not be disposed of with unsorted municipal waste, but must be collected separately. It may only be disposed of at a suitable collection point or via a Rohde & Schwarz customer service center.
2. Waste electrical and electronic equipment must not be disposed of with unsorted municipal waste, but must be collected separately.
Rohde & Schwarz GmbH & Co. KG has developed a disposal concept and takes full responsibility for take-back obligations and disposal obligations for manufacturers within the EU. Contact your Rohde & Schwarz customer service center for environmentally responsible disposal of the product.
3. If products or their components are mechanically and/or thermally processed in a manner that goes beyond their intended use, hazardous substances (heavy-metal dust such as lead, beryllium, nickel) may be released. For this reason, the product may only be disassembled by specially trained personnel. Improper disassembly may be hazardous to your health. National waste disposal regulations must be observed.
4. If handling the product releases hazardous substances or fuels that must be disposed of in a special way, e.g. coolants or engine oils that must be replenished regularly, the safety instructions of the manufacturer of the hazardous substances or fuels and the applicable regional waste disposal regulations must be observed. Also observe the relevant safety instructions in the product documentation. The improper disposal of hazardous substances or fuels can cause health problems and lead to environmental damage.

For additional information about environmental protection, visit the Rohde & Schwarz website.

Instrucciones de seguridad elementales

¡Es imprescindible leer y cumplir las siguientes instrucciones e informaciones de seguridad!

El principio del grupo de empresas Rohde & Schwarz consiste en tener nuestros productos siempre al día con los estándares de seguridad y de ofrecer a nuestros clientes el máximo grado de seguridad. Nuestros productos y todos los equipos adicionales son siempre fabricados y examinados según las normas de seguridad vigentes. Nuestro sistema de garantía de calidad controla constantemente que sean cumplidas estas normas. El presente producto ha sido fabricado y examinado según el certificado de conformidad de la UE y ha salido de nuestra planta en estado impecable según los estándares técnicos de seguridad. Para poder preservar este estado y garantizar un funcionamiento libre de peligros, el usuario deberá atenerse a todas las indicaciones, informaciones de seguridad y notas de alerta. El grupo de empresas Rohde & Schwarz está siempre a su disposición en caso de que tengan preguntas referentes a estas informaciones de seguridad.

Además queda en la responsabilidad del usuario utilizar el producto en la forma debida. Este producto está destinado exclusivamente al uso en la industria y el laboratorio o, si ha sido expresamente autorizado, para aplicaciones de campo y de ninguna manera deberá ser utilizado de modo que alguna persona/cosa pueda sufrir daño. El uso del producto fuera de sus fines definidos o sin tener en cuenta las instrucciones del fabricante queda en la responsabilidad del usuario. El fabricante no se hace en ninguna forma responsable de consecuencias a causa del mal uso del producto.















Instrucciones de seguridad elementales

Se parte del uso correcto del producto para los fines definidos si el producto es utilizado conforme a las indicaciones de la correspondiente documentación del producto y dentro del margen de rendimiento definido (ver hoja de datos, documentación, informaciones de seguridad que siguen). El uso del producto hace necesarios conocimientos técnicos y ciertos conocimientos del idioma inglés. Por eso se debe tener en cuenta que el producto solo pueda ser operado por personal especializado o personas instruidas en profundidad con las capacidades correspondientes. Si fuera necesaria indumentaria de seguridad para el uso de productos de Rohde & Schwarz, encontraría la información debida en la documentación del producto en el capítulo correspondiente. Guarde bien las informaciones de seguridad elementales, así como la documentación del producto, y entréguelas a usuarios posteriores.




Tener en cuenta las informaciones de seguridad sirve para evitar en lo posible lesiones o daños por peligros de toda clase. Por eso es imprescindible leer detalladamente y comprender por completo las siguientes informaciones de seguridad antes de usar el producto, y respetarlas durante el uso del producto. Deberán tenerse en cuenta todas las demás informaciones de seguridad, como p. ej. las referentes a la protección de personas, que encontrarán en el capítulo correspondiente de la documentación del producto y que también son de obligado cumplimiento. En las presentes informaciones de seguridad se recogen todos los objetos que distribuye el grupo de empresas Rohde & Schwarz bajo la denominación de "producto", entre ellos también aparatos, instalaciones así como toda clase de accesorios. Los datos específicos del producto figuran en la hoja de datos y en la documentación del producto.

Señalización de seguridad de los productos

Las siguientes señales de seguridad se utilizan en los productos para advertir sobre riesgos y peligros.

Símbolo	Significado	Símbolo	Significado
	Aviso: punto de peligro general Observar la documentación del producto		Tensión de alimentación de PUESTA EN MARCHA / PARADA
	Atención en el manejo de dispositivos de peso elevado		Indicación de estado de espera (standby)
	Peligro de choque eléctrico		Corriente continua (DC)
	Advertencia: superficie caliente		Corriente alterna (AC)
	Conexión a conductor de protección		Corriente continua / Corriente alterna (DC/AC)
	Conexión a tierra		El aparato está protegido en su totalidad por un aislamiento doble (reforzado)
	Conexión a masa		Distintivo de la UE para baterías y acumuladores Más información en la sección "Eliminación/protección del medio ambiente", punto 1.

Instrucciones de seguridad elementales

Símbolo	Significado	Símbolo	Significado
	Aviso: Cuidado en el manejo de dispositivos sensibles a la electrostática (ESD)		Distintivo de la UE para la eliminación por separado de dispositivos eléctricos y electrónicos Más información en la sección "Eliminación/protección del medio ambiente", punto 2.
	Advertencia: rayo láser Más información en la sección "Funcionamiento", punto 7.		

Palabras de señal y su significado

En la documentación del producto se utilizan las siguientes palabras de señal con el fin de advertir contra riesgos y peligros.



Indica una situación de peligro que, si no se evita, causa lesiones graves o incluso la muerte.



Indica una situación de peligro que, si no se evita, puede causar lesiones graves o incluso la muerte.



Indica una situación de peligro que, si no se evita, puede causar lesiones leves o moderadas.



Indica información que se considera importante, pero no en relación con situaciones de peligro; p. ej., avisos sobre posibles daños materiales.

En la documentación del producto se emplea de forma sinónima el término CUIDADO.

Las palabras de señal corresponden a la definición habitual para aplicaciones civiles en el área económica europea. Pueden existir definiciones diferentes a esta definición en otras áreas económicas o en aplicaciones militares. Por eso se deberá tener en cuenta que las palabras de señal aquí descritas sean utilizadas siempre solamente en combinación con la correspondiente documentación del producto y solamente en combinación con el producto correspondiente. La utilización de las palabras de señal en combinación con productos o documentaciones que no les correspondan puede llevar a interpretaciones equivocadas y tener por consecuencia daños en personas u objetos.

Estados operativos y posiciones de funcionamiento

El producto solamente debe ser utilizado según lo indicado por el fabricante respecto a los estados operativos y posiciones de funcionamiento sin que se obstruya la ventilación. Si no se siguen las indicaciones del fabricante, pueden producirse choques eléctricos, incendios y/o lesiones graves con posible consecuencia de muerte. En todos los trabajos deberán ser tenidas en cuenta las normas nacionales y locales de seguridad del trabajo y de prevención de accidentes.

Instrucciones de seguridad elementales

1. Si no se convino de otra manera, es para los productos Rohde & Schwarz válido lo que sigue: como posición de funcionamiento se define por principio la posición con el suelo de la caja para abajo, modo de protección IP 2X, uso solamente en estancias interiores, utilización hasta 2000 m sobre el nivel del mar, transporte hasta 4500 m sobre el nivel del mar. Se aplicará una tolerancia de $\pm 10\%$ sobre el voltaje nominal y de $\pm 5\%$ sobre la frecuencia nominal. Categoría de sobrecarga eléctrica 2, índice de suciedad 2.
2. No sitúe el producto encima de superficies, vehículos, estantes o mesas, que por sus características de peso o de estabilidad no sean aptos para él. Siga siempre las instrucciones de instalación del fabricante cuando instale y asegure el producto en objetos o estructuras (p. ej. paredes y estantes). Si se realiza la instalación de modo distinto al indicado en la documentación del producto, se pueden causar lesiones o, en determinadas circunstancias, incluso la muerte.
3. No ponga el producto sobre aparatos que generen calor (p. ej. radiadores o calefactores). La temperatura ambiente no debe superar la temperatura máxima especificada en la documentación del producto o en la hoja de datos. En caso de sobrecalentamiento del producto, pueden producirse choques eléctricos, incendios y/o lesiones graves con posible consecuencia de muerte.

Seguridad eléctrica

Si no se siguen (o se siguen de modo insuficiente) las indicaciones del fabricante en cuanto a seguridad eléctrica, pueden producirse choques eléctricos, incendios y/o lesiones graves con posible consecuencia de muerte.

1. Antes de la puesta en marcha del producto se deberá comprobar siempre que la tensión preseleccionada en el producto coincida con la de la red de alimentación eléctrica. Si es necesario modificar el ajuste de tensión, también se deberán cambiar en caso dado los fusibles correspondientes del producto.
2. Los productos de la clase de protección I con alimentación móvil y enchufe individual solamente podrán enchufarse a tomas de corriente con contacto de seguridad y con conductor de protección conectado.
3. Queda prohibida la interrupción intencionada del conductor de protección, tanto en la toma de corriente como en el mismo producto. La interrupción puede tener como consecuencia el riesgo de que el producto sea fuente de choques eléctricos. Si se utilizan cables alargadores o regletas de enchufe, deberá garantizarse la realización de un examen regular de los mismos en cuanto a su estado técnico de seguridad.
4. Si el producto no está equipado con un interruptor para desconectarlo de la red, o bien si el interruptor existente no resulta apropiado para la desconexión de la red, el enchufe del cable de conexión se deberá considerar como un dispositivo de desconexión. El dispositivo de desconexión se debe poder alcanzar fácilmente y debe estar siempre bien accesible. Si, p. ej., el enchufe de conexión a la red es el dispositivo de desconexión, la longitud del cable de conexión no debe superar 3 m). Los interruptores selectores o electrónicos no son aptos para el corte de la red eléctrica. Si se integran productos sin interruptor en bastidores o instalaciones, se deberá colocar el interruptor en el nivel de la instalación.
5. No utilice nunca el producto si está dañado el cable de conexión a red. Compruebe regularmente el correcto estado de los cables de conexión a red. Asegúrese, mediante las medidas de protección y de instalación adecuadas, de que el cable de conexión a red no pueda ser dañado o de que nadie pueda ser dañado por él, p. ej. al tropezar o por un choque eléctrico.

Instrucciones de seguridad elementales

6. Solamente está permitido el funcionamiento en redes de alimentación TN/TT aseguradas con fusibles de 16 A como máximo (utilización de fusibles de mayor amperaje solo previa consulta con el grupo de empresas Rohde & Schwarz).
7. Nunca conecte el enchufe en tomas de corriente sucias o llenas de polvo. Introduzca el enchufe por completo y fuertemente en la toma de corriente. La no observación de estas medidas puede provocar chispas, fuego y/o lesiones.
8. No sobrecargue las tomas de corriente, los cables alargadores o las regletas de enchufe ya que esto podría causar fuego o choques eléctricos.
9. En las mediciones en circuitos de corriente con una tensión $U_{\text{eff}} > 30 \text{ V}$ se deberán tomar las medidas apropiadas para impedir cualquier peligro (p. ej. medios de medición adecuados, seguros, limitación de tensión, corte protector, aislamiento etc.).
10. Para la conexión con dispositivos informáticos como un PC o un ordenador industrial, debe comprobarse que éstos cumplan los estándares IEC60950-1/EN60950-1 o IEC61010-1/EN 61010-1 válidos en cada caso.
11. A menos que esté permitido expresamente, no retire nunca la tapa ni componentes de la carcasa mientras el producto esté en servicio. Esto pone a descubierto los cables y componentes eléctricos y puede causar lesiones, fuego o daños en el producto.
12. Si un producto se instala en un lugar fijo, se deberá primero conectar el conductor de protección fijo con el conductor de protección del producto antes de hacer cualquier otra conexión. La instalación y la conexión deberán ser efectuadas por un electricista especializado.
13. En el caso de dispositivos fijos que no estén provistos de fusibles, interruptor automático ni otros mecanismos de seguridad similares, el circuito de alimentación debe estar protegido de modo que todas las personas que puedan acceder al producto, así como el producto mismo, estén a salvo de posibles daños.
14. Todo producto debe estar protegido contra sobretensión (debida p. ej. a una caída del rayo) mediante los correspondientes sistemas de protección. Si no, el personal que lo utilice quedará expuesto al peligro de choque eléctrico.
15. No debe introducirse en los orificios de la caja del aparato ningún objeto que no esté destinado a ello. Esto puede producir cortocircuitos en el producto y/o puede causar choques eléctricos, fuego o lesiones.
16. Salvo indicación contraria, los productos no están impermeabilizados (ver también el capítulo "Estados operativos y posiciones de funcionamiento", punto 1). Por eso es necesario tomar las medidas necesarias para evitar la entrada de líquidos. En caso contrario, existe peligro de choque eléctrico para el usuario o de daños en el producto, que también pueden redundar en peligro para las personas.
17. No utilice el producto en condiciones en las que pueda producirse o ya se hayan producido condensaciones sobre el producto o en el interior de éste, como p. ej. al desplazarlo de un lugar frío a otro caliente. La entrada de agua aumenta el riesgo de choque eléctrico.
18. Antes de la limpieza, desconecte por completo el producto de la alimentación de tensión (p. ej. red de alimentación o batería). Realice la limpieza de los aparatos con un paño suave, que no se deshilache. No utilice bajo ningún concepto productos de limpieza químicos como alcohol, acetona o diluyentes para lacas nitrocelulósicas.

Funcionamiento

1. El uso del producto requiere instrucciones especiales y una alta concentración durante el manejo. Debe asegurarse que las personas que manejen el producto estén a la altura de los requerimientos necesarios en cuanto a aptitudes físicas, psíquicas y emocionales, ya que de otra manera no se pueden excluir lesiones o daños de objetos. El empresario u operador es responsable de seleccionar el personal usuario apto para el manejo del producto.
2. Antes de desplazar o transportar el producto, lea y tenga en cuenta el capítulo "Transporte".
3. Como con todo producto de fabricación industrial no puede quedar excluida en general la posibilidad de que se produzcan alergias provocadas por algunos materiales empleados —los llamados alérgenos (p. ej. el níquel)—. Si durante el manejo de productos Rohde & Schwarz se producen reacciones alérgicas, como p. ej. irritaciones cutáneas, estornudos continuos, enrojecimiento de la conjuntiva o dificultades respiratorias, debe avisarse inmediatamente a un médico para investigar las causas y evitar cualquier molestia o daño a la salud.
4. Antes de la manipulación mecánica y/o térmica o el desmontaje del producto, debe tenerse en cuenta imprescindiblemente el capítulo "Eliminación/protección del medio ambiente", punto 1.
5. Ciertos productos, como p. ej. las instalaciones de radiocomunicación RF, pueden a causa de su función natural, emitir una radiación electromagnética aumentada. Deben tomarse todas las medidas necesarias para la protección de las mujeres embarazadas. También las personas con marcapasos pueden correr peligro a causa de la radiación electromagnética. El empresario/operador tiene la obligación de evaluar y señalizar las áreas de trabajo en las que exista un riesgo elevado de exposición a radiaciones.
6. Tenga en cuenta que en caso de incendio pueden desprenderse del producto sustancias tóxicas (gases, líquidos etc.) que pueden generar daños a la salud. Por eso, en caso de incendio deben usarse medidas adecuadas, como p. ej. máscaras antigás e indumentaria de protección.
7. Los productos con láser están provistos de indicaciones de advertencia normalizadas en función de la clase de láser del que se trate. Los rayos láser pueden provocar daños de tipo biológico a causa de las propiedades de su radiación y debido a su concentración extrema de potencia electromagnética. En caso de que un producto Rohde & Schwarz contenga un producto láser (p. ej. un lector de CD/DVD), no debe usarse ninguna otra configuración o función aparte de las descritas en la documentación del producto, a fin de evitar lesiones (p. ej. debidas a irradiación láser).
8. Clases de compatibilidad electromagnética (conforme a EN 55011 / CISPR 11; y en analogía con EN 55022 / CISPR 22, EN 55032 / CISPR 32)
 - Aparato de clase A:
Aparato adecuado para su uso en todos los entornos excepto en los residenciales y en aquellos conectados directamente a una red de distribución de baja tensión que suministra corriente a edificios residenciales.
Nota: Los aparatos de clase A están destinados al uso en entornos industriales. Estos aparatos pueden causar perturbaciones radioeléctricas en entornos residenciales debido a posibles perturbaciones guiadas o radiadas. En este caso, se le podrá solicitar al operador que tome las medidas adecuadas para eliminar estas perturbaciones.
 - Aparato de clase B:
Aparato adecuado para su uso en entornos residenciales, así como en aquellos conectados directamente a una red de distribución de baja tensión que suministra corriente a edificios residenciales.

Reparación y mantenimiento

1. El producto solamente debe ser abierto por personal especializado con autorización para ello. Antes de manipular el producto o abrirlo, es obligatorio desconectarlo de la tensión de alimentación, para evitar toda posibilidad de choque eléctrico.
2. El ajuste, el cambio de partes, el mantenimiento y la reparación deberán ser efectuadas solamente por electricistas autorizados por Rohde & Schwarz. Si se reponen partes con importancia para los aspectos de seguridad (p. ej. el enchufe, los transformadores o los fusibles), solamente podrán ser sustituidos por partes originales. Después de cada cambio de partes relevantes para la seguridad deberá realizarse un control de seguridad (control a primera vista, control del conductor de protección, medición de resistencia de aislamiento, medición de la corriente de fuga, control de funcionamiento). Con esto queda garantizada la seguridad del producto.

Baterías y acumuladores o celdas

Si no se siguen (o se siguen de modo insuficiente) las indicaciones en cuanto a las baterías y acumuladores o celdas, pueden producirse explosiones, incendios y/o lesiones graves con posible consecuencia de muerte. El manejo de baterías y acumuladores con electrolitos alcalinos (p. ej. celdas de litio) debe seguir el estándar EN 62133.

1. No deben desmontarse, abrirse ni triturarse las celdas.
2. Las celdas o baterías no deben someterse a calor ni fuego. Debe evitarse el almacenamiento a la luz directa del sol. Las celdas y baterías deben mantenerse limpias y secas. Limpiar las conexiones sucias con un paño seco y limpio.
3. Las celdas o baterías no deben cortocircuitarse. Es peligroso almacenar las celdas o baterías en estuches o cajones en cuyo interior puedan cortocircuitarse por contacto recíproco o por contacto con otros materiales conductores. No deben extraerse las celdas o baterías de sus embalajes originales hasta el momento en que vayan a utilizarse.
4. Las celdas o baterías no deben someterse a impactos mecánicos fuertes indebidos.
5. En caso de falta de estanqueidad de una celda, el líquido vertido no debe entrar en contacto con la piel ni los ojos. Si se produce contacto, lavar con agua abundante la zona afectada y avisar a un médico.
6. En caso de cambio o recarga inadecuados, las celdas o baterías que contienen electrolitos alcalinos (p. ej. las celdas de litio) pueden explotar. Para garantizar la seguridad del producto, las celdas o baterías solo deben ser sustituidas por el tipo Rohde & Schwarz correspondiente (ver lista de recambios).
7. Las baterías y celdas deben reciclarse y no deben tirarse a la basura doméstica. Las baterías o acumuladores que contienen plomo, mercurio o cadmio deben tratarse como residuos especiales. Respete en esta relación las normas nacionales de eliminación y reciclaje.

Transporte

1. El producto puede tener un peso elevado. Por eso es necesario desplazarlo o transportarlo con precaución y, si es necesario, usando un sistema de elevación adecuado (p. ej. una carretilla elevadora), a fin de evitar lesiones en la espalda u otros daños personales.

Instrucciones de seguridad elementales

2. Las asas instaladas en los productos sirven solamente de ayuda para el transporte del producto por personas. Por eso no está permitido utilizar las asas para la sujeción en o sobre medios de transporte como p. ej. grúas, carretillas elevadoras de horquilla, carros etc. Es responsabilidad suya fijar los productos de manera segura a los medios de transporte o elevación. Para evitar daños personales o daños en el producto, siga las instrucciones de seguridad del fabricante del medio de transporte o elevación utilizado.
3. Si se utiliza el producto dentro de un vehículo, recae de manera exclusiva en el conductor la responsabilidad de conducir el vehículo de manera segura y adecuada. El fabricante no asumirá ninguna responsabilidad por accidentes o colisiones. No utilice nunca el producto dentro de un vehículo en movimiento si esto pudiera distraer al conductor. Asegure el producto dentro del vehículo debidamente para evitar, en caso de un accidente, lesiones u otra clase de daños.

Eliminación/protección del medio ambiente

1. Los dispositivos marcados contienen una batería o un acumulador que no se debe desechar con los residuos domésticos sin clasificar, sino que debe ser recogido por separado. La eliminación se debe efectuar exclusivamente a través de un punto de recogida apropiado o del servicio de atención al cliente de Rohde & Schwarz.
2. Los dispositivos eléctricos usados no se deben desechar con los residuos domésticos sin clasificar, sino que deben ser recogidos por separado.
Rohde & Schwarz GmbH & Co.KG ha elaborado un concepto de eliminación de residuos y asume plenamente los deberes de recogida y eliminación para los fabricantes dentro de la UE. Para desechar el producto de manera respetuosa con el medio ambiente, dirijase a su servicio de atención al cliente de Rohde & Schwarz.
3. Si se trabaja de manera mecánica y/o térmica cualquier producto o componente más allá del funcionamiento previsto, pueden liberarse sustancias peligrosas (polvos con contenido de metales pesados como p. ej. plomo, berilio o níquel). Por eso el producto solo debe ser desmontado por personal especializado con formación adecuada. Un desmontaje inadecuado puede ocasionar daños para la salud. Se deben tener en cuenta las directivas nacionales referentes a la eliminación de residuos.
4. En caso de que durante el trato del producto se formen sustancias peligrosas o combustibles que deban tratarse como residuos especiales (p. ej. refrigerantes o aceites de motor con intervalos de cambio definidos), deben tenerse en cuenta las indicaciones de seguridad del fabricante de dichas sustancias y las normas regionales de eliminación de residuos. Tenga en cuenta también en caso necesario las indicaciones de seguridad especiales contenidas en la documentación del producto. La eliminación incorrecta de sustancias peligrosas o combustibles puede causar daños a la salud o daños al medio ambiente.

Se puede encontrar más información sobre la protección del medio ambiente en la página web de Rohde & Schwarz.

Safety instructions for rechargeable lithium ion batteries

WARNING

Risk of serious personal injury or even death.

You must fully observe the following instructions in order to avoid serious personal injury – or even death – due to an explosion and/or fire.

1. Do not dismantle, open or crush the batteries or drop them from a great height. If mechanical damage occurs, there is a risk that chemicals may be released. Gases that are released can cause breathing difficulties. Immediately ventilate the area and in serious cases consult a doctor.
Irritation can occur if the chemicals that are released come in contact with the skin or eyes. If this happens, immediately and thoroughly rinse the skin or eyes with water and consult a doctor.
2. Do not expose cells or batteries to heat or fire. Do not store them in direct sunlight. If overheating occurs, there is the risk of an explosion or a fire, which can lead to serious personal injuries.
3. Keep the batteries clean and dry. If the terminals become soiled, clean them with a dry, clean cloth.
4. Charge the batteries prior to using them.
Only use the appropriate Rohde & Schwarz charger to charge the batteries. See the device manual or data sheet for the exact designation of the charger.
If the batteries are improperly charged, there is a risk of explosion, which can cause serious personal injury.
5. The charging temperature must be between 0 °C and 45 °C (see manual for information on possible restrictions).
6. Discharging may take place only at temperatures between 0 °C and 50 °C (see manual for information on possible restrictions).
7. Only charge batteries until they are fully charged. Frequent overcharging can reduce the battery lifetime.
8. Remove the battery from the device when the battery is not being used. Following a longer period of storage, it may be necessary to charge and discharge the battery several times in order to obtain the full capacity.
9. Only use the battery with designated Rohde & Schwarz devices. See the device manual for details.
10. Do not dispose of the batteries with unsorted municipal waste. The batteries must be collected separately. After the end of their life, dispose of the batteries at a suitable collection point or via a Rohde & Schwarz customer service center.



EU labeling for batteries and secondary cells

11. Keep this safety information for future reference.

Instrucciones de seguridad para baterías recargables de ión litio

⚠ ADVERTENCIA

Posibilidad de lesiones graves que en determinadas circunstancias puede causar la muerte.

Tenga en cuenta los siguientes avisos en caso de explosión y/o incendio para impedir lesiones graves en personas que, en determinadas circunstancias, podrían incluso causar la muerte.

1. No desarme las baterías, no las abra, no las triture ni las deje caer desde una gran altura.
En caso de daños mecánicos existe el riesgo de salida de sustancias químicas. En caso de salida de gases pueden producirse dificultades respiratorias. Ventile inmediatamente la habitación y acuda a un médico en casos graves.
Si sustancias químicas provenientes de la batería entran en contacto con la piel o los ojos pueden producirse irritaciones. Enjuague en estos casos la piel y los ojos inmediatamente con abundante agua y acuda a un médico.
2. No exponga las celdas o baterías al calor ni al fuego. No las almacene bajo la luz solar directa. En caso de sobrecalentamiento existe peligro de explosión o de incendio, lo que puede provocar lesiones graves en personas.
3. Mantenga las baterías limpias y secas. Si los conectores están sucios, límpielos con un paño seco y limpio.
4. Cargue las baterías antes de su uso.
Solamente está permitido cargar la batería con el correspondiente cargador de Rohde & Schwarz. Consulte en el manual o en las especificaciones técnicas del equipo la denominación exacta del cargador.
Si las baterías se cargan de forma incorrecta existe peligro de explosión, lo que podría causar lesiones graves en personas.
5. La temperatura de carga debe encontrarse entre 0 °C y 45 °C (consulte el manual para posibles restricciones).
6. La descarga solamente puede efectuarse entre 0 °C y 50°C (consulte el manual para posibles restricciones).
7. Cargue las baterías solamente el tiempo necesario hasta que se hayan cargado por completo. La sobrecarga frecuente reduce la vida útil de la batería.
8. Extraiga la batería del equipo si no se va a utilizar. Después de un periodo de almacenamiento prolongado puede ser necesario cargar y descargar varias veces la batería para recuperar su capacidad completa.
9. Utilice la batería exclusivamente con los equipos Rohde & Schwarz correspondientes. Consulte para ello el manual del equipo.
10. No elimine las baterías junto con los residuos urbanos sin clasificar, sino por separado. Para eliminar la batería una vez finalizada su vida útil, diríjase a un punto de recogida de residuos adecuado o a una oficina de representación de Rohde & Schwarz.



Etiquetado de la UE para baterías y acumuladores

11. Conserve estas instrucciones de seguridad para fines de información y consulta posterior.

Sicherheitshinweise für wiederaufladbare Li-Ion-Batterien

WARNUNG

Mögliche schwere Verletzungen, unter Umständen mit Todesfolge.

Beachten Sie die folgenden Hinweise vollständig, um schwere Verletzungen von Personen - unter Umständen mit Todesfolge - durch Explosion und/oder Brand zu verhindern.

1. Batterien nicht zerlegen, öffnen, zerkleinern oder aus großer Höhe fallen lassen. Bei mechanischer Beschädigung besteht die Gefahr des Austritts von Chemikalien. Austretende Gase können zu Atembeschwerden führen. Sofort lüften, in schweren Fällen einen Arzt konsultieren.
Bei Haut- oder Augenkontakt mit austretenden Chemikalien können Hautirritationen und Reizungen auftreten. In diesen Fällen die Haut oder Augen sofort gründlich mit Wasser ausspülen und einen Arzt konsultieren.
2. Zellen oder Batterien weder Hitze noch Feuer aussetzen. Nicht im direkten Sonnenlicht lagern. Bei Überhitzung besteht die Gefahr einer Explosion oder eines Brandes, was zu schweren Verletzungen bei Personen führen kann.
3. Batterien sauber und trocken halten. Falls die Anschlüsse verschmutzt sind, mit einem trockenen, sauberen Tuch reinigen.
4. Batterien vor dem Gebrauch laden.
Die Batterie darf ausschließlich mit dem entsprechenden Rohde & Schwarz Ladegerät geladen werden. Siehe Handbuch oder Datenblatt des Gerätes für die genaue Bezeichnung des Ladegerätes.
Wenn Batterien unsachgemäß geladen werden, besteht Explosionsgefahr, was zu schweren Verletzungen bei Personen führen kann.
5. Die Ladetemperatur muss zwischen 0 °C und 45 °C betragen (für mögliche Einschränkungen siehe Handbuch).
6. Ein Entladen darf nur zwischen 0 °C und 50 °C erfolgen (für mögliche Einschränkungen siehe Handbuch).
7. Batterien nur so lange laden, bis sie vollständig aufgeladen sind. Ein häufiges Überladen führt zu einer geringeren Lebensdauer der Batterie.
8. Die Batterie aus dem Gerät entfernen, wenn sie nicht benutzt wird. Nach längerer Lagerzeit kann es erforderlich sein, die Batterie mehrmals zu laden und zu entladen, um die volle Leistungsfähigkeit zu erlangen.
9. Die Batterie nur mit dafür vorgesehenen Rohde & Schwarz-Geräten betreiben. Siehe dazu das Handbuch des Gerätes.
10. Die Batterien nicht über unsortierten Siedlungsabfall entsorgen, sondern getrennt sammeln. Nach Ende der Lebensdauer über eine geeignete Sammelstelle oder eine Rohde&Schwarz-Kundendienststelle entsorgen.



EU - Kennzeichnung für Batterien und Akkumulatoren

11. Diese Sicherheitsinformationen für zukünftige Informations- und Nachschlagezwecke aufbewahren.

Consignes de sécurité pour batteries rechargeables lithium-ion

AVERTISSEMENT

Risque de blessures graves pouvant entraîner la mort.

Respecter intégralement les consignes ci-dessous afin d'éliminer tout risque de blessures graves voire mortelles par suite d'explosion et/ou d'incendie.

1. Ne pas démonter, ouvrir ou découper les batteries ni les faire tomber d'une hauteur importante. Des produits chimiques peuvent s'écouler en cas de détérioration mécanique et les gaz libérés peuvent provoquer des difficultés respiratoires. Aérer immédiatement les locaux. Dans les cas graves, consulter un médecin. Si la peau ou les yeux entrent en contact avec les produits chimiques libérés, des irritations peuvent se produire. Rincer immédiatement et abondamment la peau ou les yeux à l'eau claire et consulter un médecin.
2. Ne pas exposer les cellules ou les batteries à la chaleur ou au feu. Ne pas les stocker dans un endroit exposé à la lumière directe du soleil. Toute surchauffe risque de provoquer une explosion ou un incendie, ce qui peut entraîner des blessures graves.
3. Conserver les batteries dans un lieu sec et propre. Nettoyer les points de contact sales à l'aide d'un chiffon sec et propre.
4. Charger les batteries avant utilisation. Utiliser seulement le chargeur Rohde & Schwarz approprié pour recharger les batteries. Les références exactes du chargeur sont indiquées dans le manuel ou la fiche technique de l'appareil. Une recharge incorrecte des batteries peut entraîner des explosions susceptibles de causer des blessures graves.
5. Recharger impérativement à des températures comprises entre 0 °C et 45 °C (restrictions éventuelles : voir le manuel).
6. Décharger impérativement à des températures comprises entre 0 °C et 50 °C (restrictions éventuelles : voir le manuel).
7. Terminer la charge dès que les batteries sont complètement rechargées. Une surcharge répétée diminue la longévité des batteries.
8. Retirer les batteries de l'appareil lorsqu'elles ne sont pas utilisées. Après un stockage prolongé, plusieurs cycles de recharge et de décharge peuvent s'avérer nécessaires pour rétablir la pleine capacité des batteries.
9. Utiliser les batteries exclusivement dans les appareils Rohde & Schwarz auxquels elles sont destinées. Voir le manuel fourni avec chaque appareil.
10. Ne pas éliminer les batteries avec les déchets municipaux non triés mais s'assurer qu'elles soient collectées séparément. Recycler les batteries en fin de vie en les confiant à un point de collecte compétent ou à un point de service après-vente Rohde & Schwarz.



Marquage UE pour batteries et accumulateurs

11. Conserver ces consignes de sécurité de sorte à pouvoir vous y reporter ou vérifier ultérieurement certains points.

Customer Support

Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz equipment, contact one of our Customer Support Centers. A team of highly qualified engineers provides telephone support and will work with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz equipment.

Up-to-date information and upgrades

To keep your instrument up-to-date and to be informed about new application notes related to your instrument, please send an e-mail to the Customer Support Center stating your instrument and your wish. We will take care that you will get the right information.

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Quality management and environmental management

Certified Quality System
ISO 9001

Certified Environmental System
ISO 14001

Sehr geehrter Kunde,

Sie haben sich für den Kauf eines Rohde&Schwarz Produktes entschieden. Sie erhalten damit ein nach modernsten Fertigungsmethoden hergestelltes Produkt. Es wurde nach den Regeln unserer Qualitäts- und Umweltmanagementsysteme entwickelt, gefertigt und geprüft. Rohde&Schwarz ist unter anderem nach den Managementsystemen ISO9001 und ISO 14001 zertifiziert.

Der Umwelt verpflichtet

- Energie-effiziente, RoHS-konforme Produkte
- Kontinuierliche Weiterentwicklung nachhaltiger Umweltkonzepte
- ISO 14001-zertifiziertes Umweltmanagementsystem

Dear customer,

You have decided to buy a Rohde&Schwarz product. This product has been manufactured using the most advanced methods. It was developed, manufactured and tested in compliance with our quality management and environmental management systems. Rohde&Schwarz has been certified, for example, according to the ISO9001 and ISO 14001 management systems.

Environmental commitment

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

Cher client,

Vous avez choisi d'acheter un produit Rohde&Schwarz. Vous disposez donc d'un produit fabriqué d'après les méthodes les plus avancées. Le développement, la fabrication et les tests de ce produit ont été effectués selon nos systèmes de management de qualité et de management environnemental. La société Rohde&Schwarz a été homologuée, entre autres, conformément aux systèmes de management ISO 9001 et ISO 14001.

Engagement écologique

- Produits à efficience énergétique
- Amélioration continue de la durabilité environnementale
- Système de management environnemental certifié selon ISO 14001



R&S® InstrumentView Spectrum Analyzer Software Manual



1321.1040.02 – 01.00

The software manual describes the following:

- R&S®InstrumentView

The contents of this manual correspond to firmware version 1.00 or higher.

The firmware of the R&S InstrumentView makes use of several valuable open source software packages. For information, see the "Open Source Acknowledgment" on the user documentation CD-ROM (included in delivery).

Rohde & Schwarz would like to thank the open source community for their valuable contribution to embedded computing.

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Subject to change – Data without tolerance limits is not binding.

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Trade names are trademarks of the owners.

The following abbreviations are used throughout this manual: R&S®InstrumentView is abbreviated as R&S InstrumentView.

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1 Installing R&S InstrumentView

Installing the R&S InstrumentView Software

The R&S InstrumentView software offers you simple mouse-controlled tools to work with your spectrum analyzer.

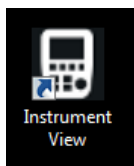
It is a general instrument editor which provides printing service, customize report generation and editorial capacity to edit the different datasets used in the instrument. It also provides post-processing features to edit the trace settings and markers position on the trace measurements. In additionally, it also supports the remote control of the instrument.

The R&S InstrumentView supports a wide range of spectrum analyzer, i.e. R&S FSH4, R&S FSC, R&S ZVH and R&S Spectrum Rider FPH.



The setup program installs the R&S InstrumentView software on PC's running Windows 7, 8 and 10.

To install the software, download the latest software installer from www.rohde-schwarz.com/product/fph.html.

Running the R&S InstrumentView Software



There are a few ways to start the R&S InstrumentView software:

- Double-click the R&S InstrumentView icon  on the desktop of the PC.
- Go to "Start", select "All Programs > Rohde-Schwarz > Instrument View" and click on the application link icon .

About the Software Information

To display the software information for R&S InstrumentView, select the "About" menu item in the "Application" menu. See [Figure 1-1](#).

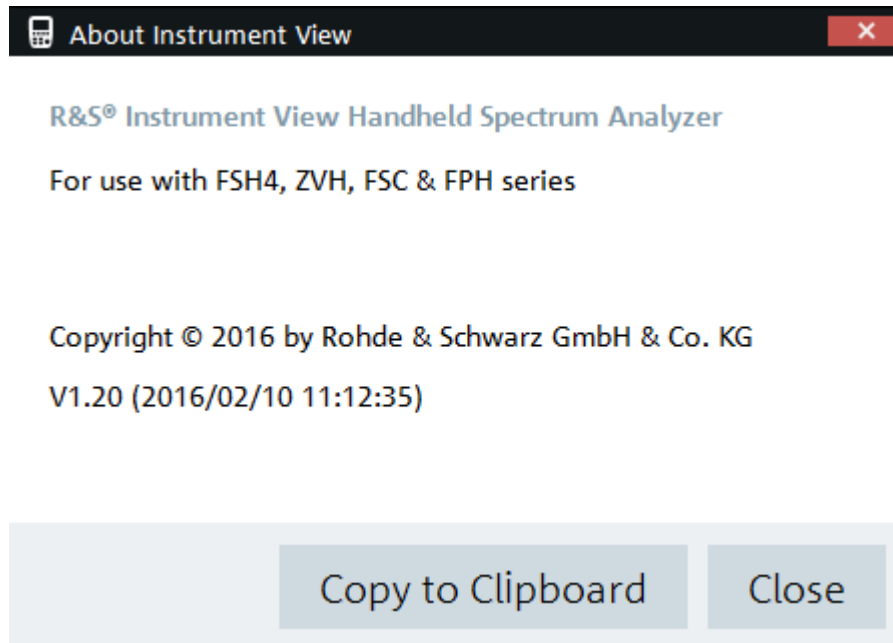


Figure 1-1: About R&S InstrumentView

2 R&S InstrumentView Screen Layout

The following illustrates the display of the R&S InstrumentView screen layout.

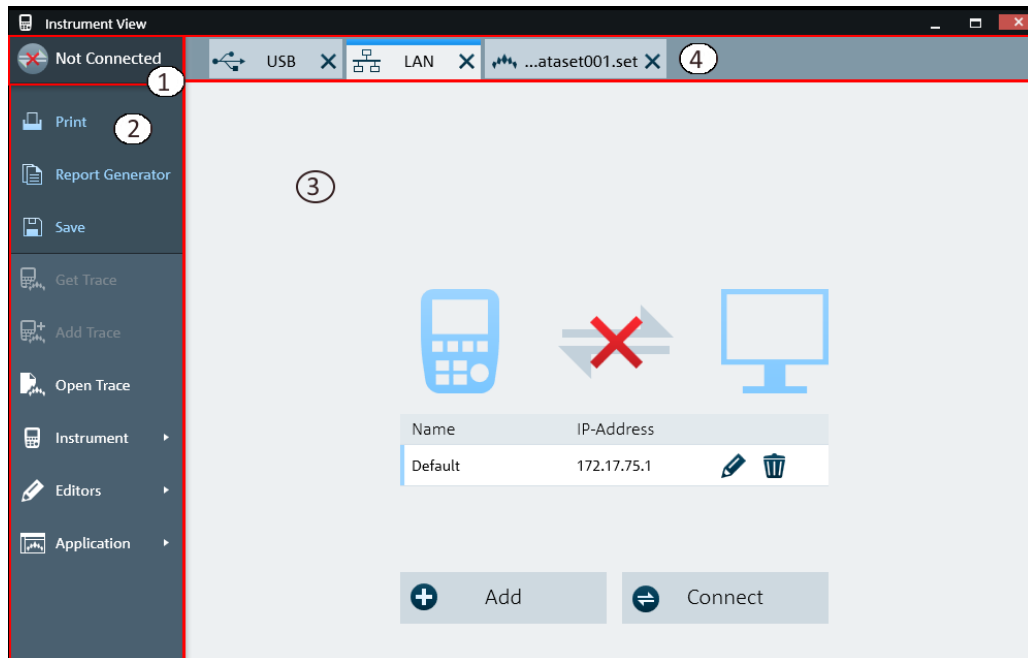











Figure 2-1: R&S InstrumentView screen layout

- 1 = Remote connecting status
- 2 = R&S InstrumentView Menu
- 3 = Display the associated dialog of the selected tab in the "Tab header bar"
- 4 = Tab header bar

Table 2-1: R&S InstrumentView Menu

R&S InstrumentView Functions	Descriptions
 Print	Print and display the print preview of the trace measurements. See Chapter 4.1, "Printing Trace Windows" , on page 12.
 Report Generator	Customize the report generation for the trace measurement results. See Chapter 4.2, "Customizing Test Report" , on page 14.
 Save	Save the trace measurements and dataset. See Chapter 4.3, "Save Instrument" , on page 18.
 Get Trace	Get a trace measurement from the connected instrument. See Chapter 4.4.1, "Get Trace" , on page 19.

R&S InstrumentView Functions	Descriptions
 Add Trace	Add a trace measurement from the connected instrument to the existing trace measurement. See Chapter 4.4.2, "Add Trace" , on page 23.
 Open Trace	Open an existing trace measurement from the PC. See Chapter 4.4.3, "Open Trace" , on page 24.
 Instrument ▶	Remote display and control of the instrument from PC. See Chapter 4.5.1, "Remote Display" , on page 25. File transfer between the instrument and PC. See Chapter 4.5.2, "File Transfer" , on page 26. Multiple transfer of trace measurements from the instrument to PC. See Chapter 4.5.3, "Multi Transfer" , on page 28. Capture a screenshot from the instrument. See Chapter 4.5.4, "Screenshot" , on page 31 Data and time synchronization. See Chapter 4.5.5, "Synchronizing Instrument with PC" , on page 32.
 Editors ▶	Edit the different datasets supported by the instrument family. Chapter 4.6, "Working with Instrument Datasets" , on page 32.
 Application ▶	Provide color settings on the different elements in trace window. Configure the type of instrument family used in the application. Configure the local directory settings for the different types of files used in the application. Display the application software information. See Chapter 4.7, "Application Preference" , on page 51.

Tab header bar

The "USB" and "LAN" tabs are fixed tab in the "Tab header bar" before a connection is established between the instrument and PC. Once a connection is established, these tabs are hidden. To restore back the "USB" and "LAN" tabs, click on the "Remote connecting status".

After the PC is successfully connected to the instrument, new tabs appear in the "Tab header bar" when a menu item is selected from the R&S InstrumentView menu.

Tab selected for usage is highlighted with a horizontal blue line in the tab. See an example in [Figure 2-2](#).





Figure 2-2: Selected tab

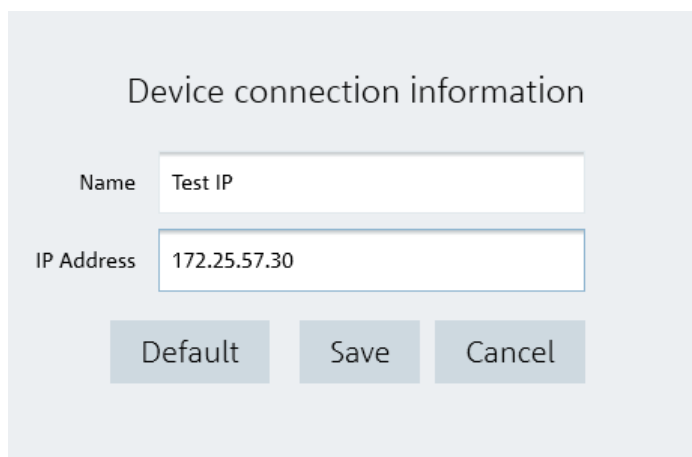
3 Connecting the Instrument

The InstrumentView software communicates with your spectrum analyzer via USB or Ethernet (LAN).

Select the type of connection in the "Tab header bar". See [Figure 2-1](#).

LAN connection

During the initial startup, the IP-Address list is set to default "172.17.75.1". The list can be edited using the icon   or the "Add" button. See [Figure 3-2](#).



Device connection information

Name

IP Address

Figure 3-1: Device connection information

Once the list is set up, select the desired IP address and press "Connect" button to establish the remote connection with the instrument. See [Figure 3-2](#)



Selected IP address is highlighted with a vertical blue line on the "Name" field in [Figure 3-2](#).

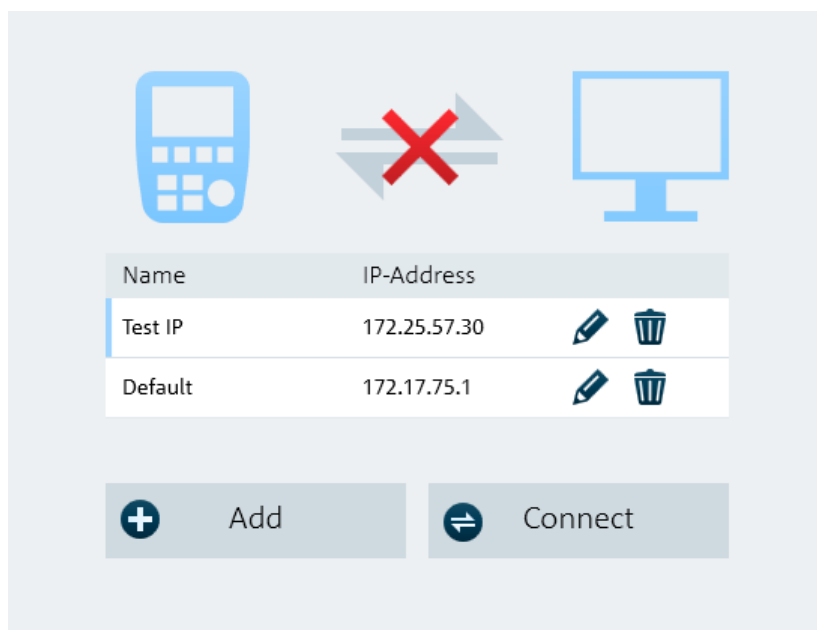


Figure 3-2: LAN connection

If connection is successful, the "successfully Connected!" dialog box is displayed. See [Figure 3-3](#).

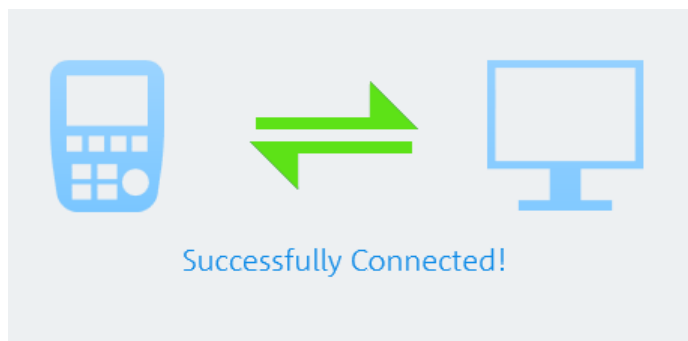


Figure 3-3: LAN connected

USB connection

When the instrument is connected to the PC for the first time, Windows tries to install the new hardware automatically. The required drivers are installed along with the R&S InstrumentView software package.

When the drivers have been found on your system and the hardware has been successfully installed, Windows shows a corresponding message.

There is only one USB instance in the connection list. See [Figure 3-4](#).

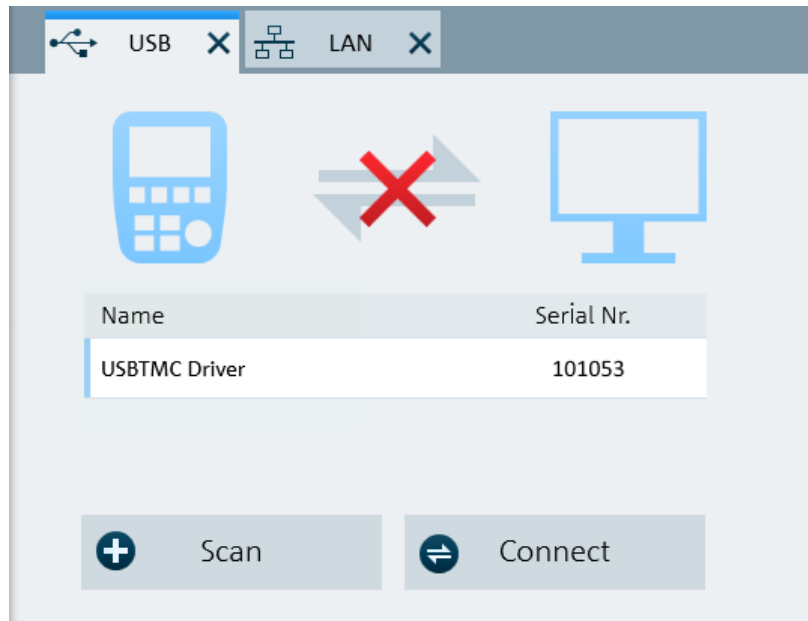


Figure 3-4: US connection

Select the "Scan" button to identify the instrument and confirm the selection with the "Connect" button. If the connection is successful, the "Successfully Connected!" dialog box is displayed. See [Figure 3-3](#).

4 Using R&S InstrumentView

The following chapters illustrate the functionality of R&S InstrumentView in details.

4.1 Printing Trace Windows



Print

The "Print" menu allows you to print out the trace measurements currently loaded in the R&S InstrumentView. It also displays the print preview window on the printed output.

Arrangement of the printing sequence is possible by dragging the trace measurement window in the "Selection" section. See [Figure 4-1](#).

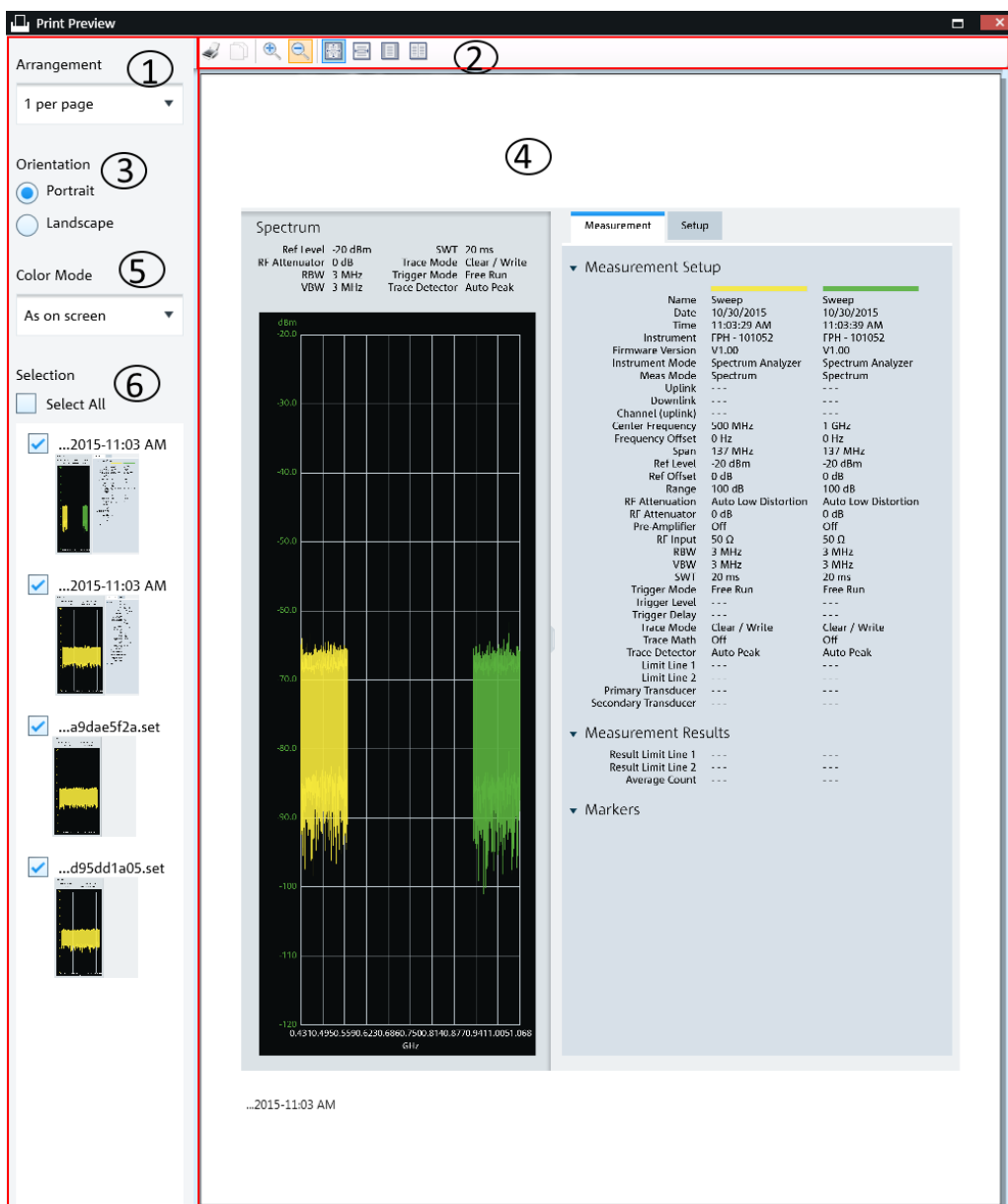










Figure 4-1: Print dialog

- 1 = Arrangement of the number of trace measurement window per page (1, 2, 4, 6, 16 per page)
- 2 = [Print preview tool](#)
- 3 = Orientation on the printed output
- 4 = Preview window
- 5 = "Color mode" defines the window background color as black or white
- 6 = "Selection" displays the printed order of the trace measurement windows

Table 4-1: Print preview tools

Print preview tools	Descriptions
Print or (Ctrl+P) 	Print the preview output.
Copy (Ctrl+C) 	This action is currently not available.
Zoom in (Ctrl+) 	Zoom in the preview details.
Zoom out (Ctrl-) 	Zoom out the preview details.
100% (Ctrl+1) 	Preview the actual print size of the trace measurement window.
Page Width (Ctrl+2) 	Preview the whole width size of the trace measurement window.
Whole Page (Ctrl+3) 	Preview a single page of the trace measurement result in the preview window.
Two Pages (Ctrl+4) 	Preview two pages of trace measurement results on the same row in the preview window.

4.2 Customizing Test Report

Report Generator

The "Report Generator" menu allows you to select logo, report output format and language and selectively display measurements parameters to customize the test report. See [Figure 4-2](#).

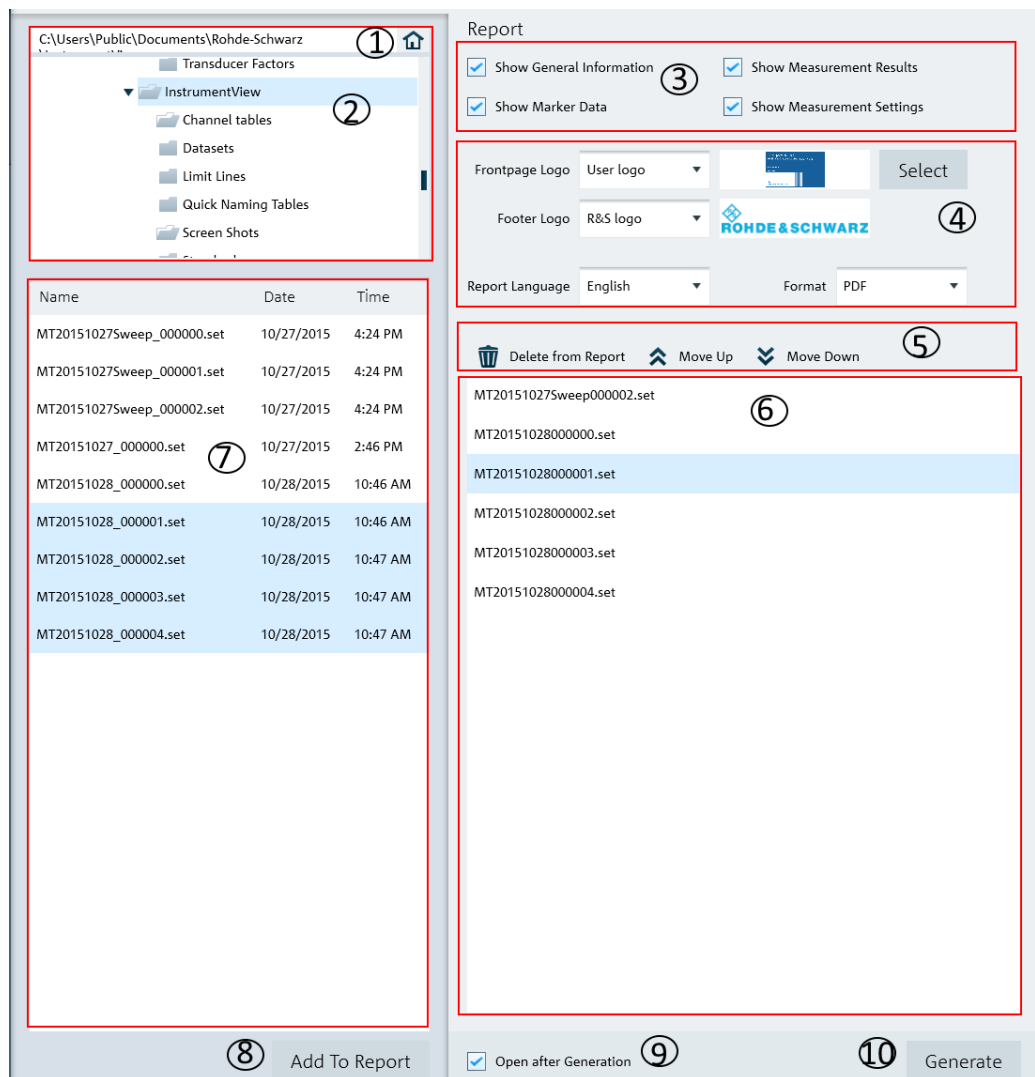





Figure 4-2: Report generation dialog

- 1 = [Homepage](#)
- 2 = Folder directories in the PC
- 3 = [Report parameters](#)
- 4 = User customization for logo and report language and format (PDF, HTML, RTF)
- 5 = [Report tools](#)
- 6 = Report generation window
- 7 = List of datasets of the selected folder in the PC.
- 8 = "Add To Report" button transfers the selected dataset into the report generation window
- 9 = Activate "Open after Generation" checkbox to open the file after report generation
- 10 = Activate "Generate" button to generate the report

Table 4-2: Report tools

Report tools	Descriptions
"Delete from Report" 	Delete the selected dataset from the report generation window.
"Move Up" 	Move forward the selected dataset sequence in the report generation window.
"Move Down" 	Move backward the selected dataset sequence in the report generation window.

Report parameters

The following shows a snapshot of the report generated. See [Figure 4-3](#).

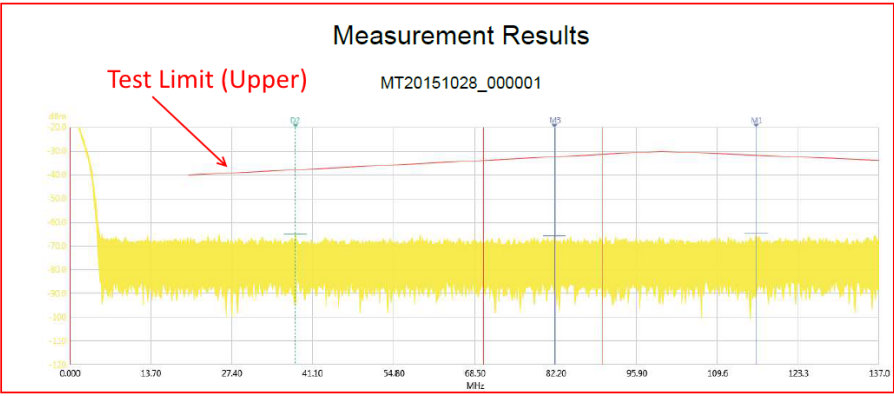
It shows the details parameters in the "General Information", "Measurement Results" and "Measurement Settings" section. These details parameters are configurable for report generation. See index 3 of [Figure 4-2](#).

General Information

Instrument and Measurement Information
 Instrument: FPH - 101052

Test Results

Overall Result	Data Set Name	Result
10/27/2015 4:24:46 PM	MT20151027Sweep_000002.set	Pass
10/28/2015 10:46:47 AM	MT20151028_000000.set	Pass
10/28/2015 10:46:57 AM	MT20151028_000001.set	Pass
10/28/2015 10:47:07 AM	MT20151028_000002.set	Pass
10/28/2015 10:47:17 AM	MT20151028_000003.set	Pass
10/28/2015 10:47:27 AM	MT20151028_000004.set	Pass



Name	Position	Value
M1	116.1605634 MHz	-64.42 dBm
D2	-77.9549296 MHz	-0.43 dB
M3	82.0070423 MHz	-65.63 dBm

Limit Line Results	Result
Test Limit (Upper)	PASS

Measurement Settings

Mode	Spectrum Analyzer	Span:	137 MHz
Center:	68.5 MHz	VBW:	3 MHz
RBW:	3 MHz	Attenuator:	0 dB
Sweep Time:	20 ms	Range:	100 dB
Reference:	-20 dBm		

Trace Settings

Trace Mode:	Clear / Write	Detector:	Auto Peak
-------------	---------------	-----------	-----------

Figure 4-3: Test report generated

4.3 Save Instrument



Depending on the types of dataset or trace windows (e.g. screenshot) that the R&S InstrumentView is working with, the "Save" function saves the files in their respective file format. See [Table 4-3](#).

Table 4-3: File format

Description	File Format
Primary transducer factor, secondary transducer factor and isotropic transducer factor. See Chapter 4.6.1, "Using Transducers" , on page 33.	*.pritrd, *.sectrd, isotrd
Relative limit line and absolute limit line See Chapter 4.6.2, "Using Limit Lines" , on page 35.	*.rellim, *.abslim
Channel table. See Chapter 4.6.3, "Using Channel Table" , on page 37.	*.chnstab
Standards table. See Chapter 4.6.4, "Using Standards" , on page 39.	*.semstd, chpstd, obwstd,
Quick name table See Chapter 4.6.5, "Using Quick Name Table" , on page 42.	*.qnt
Ama AM limits. See Chapter 4.6.6, "Using Analog Modulation Analysis AM Limits" , on page 43.	*.aamlim
Ama FM limits. See Chapter 4.6.7, "Using Analog Modulation Analysis FM Limits" , on page 45.	*.fmlim
Screenshot. See Chapter 4.5.4, "Screenshot" , on page 31.	*.png
Trace measurement with setup configuration details. See Chapter 4.4, "Working with Trace Windows" , on page 18.	*.set
Measurement wizard set. See Chapter 4.6.8, "Wizard Set Editor" , on page 46	*.mdf

4.4 Working with Trace Windows

The following illustrates the way how you can work with the trace measurements in R&S InstrumentView.

4.4.1 Get Trace



Get Trace

The "Get Trace" menu allows you to capture the current trace measurement from the instrument and display it in the trace window. A new tab is formed in the "Tab header bar" for every new trace captured from the instrument. See index 1 in [Figure 4-4](#).

Each trace measurement result consists of two tab:

- "Measurement"
 - "Measurement Setup"
Details of the instrument measurement settings. See user manual of the respective instrument for details of measurement settings.
 - "Measurement Results" (if any)
Pass/Fail result of the limit test.
See index 6 and 7 in [Figure 4-4](#).
 - "Markers" (if any)
Setting of the markers position.
- "Setup"
Trace measurements details captured from the instrument are displayed in the "Setup" tab. You can edit existing setup information or add on additional setup information on the selected trace measurement.
See index 3 in [Figure 4-4](#).
See "[Trace Setup](#)" on page 21.
See "[Marker Setup](#)" on page 22.

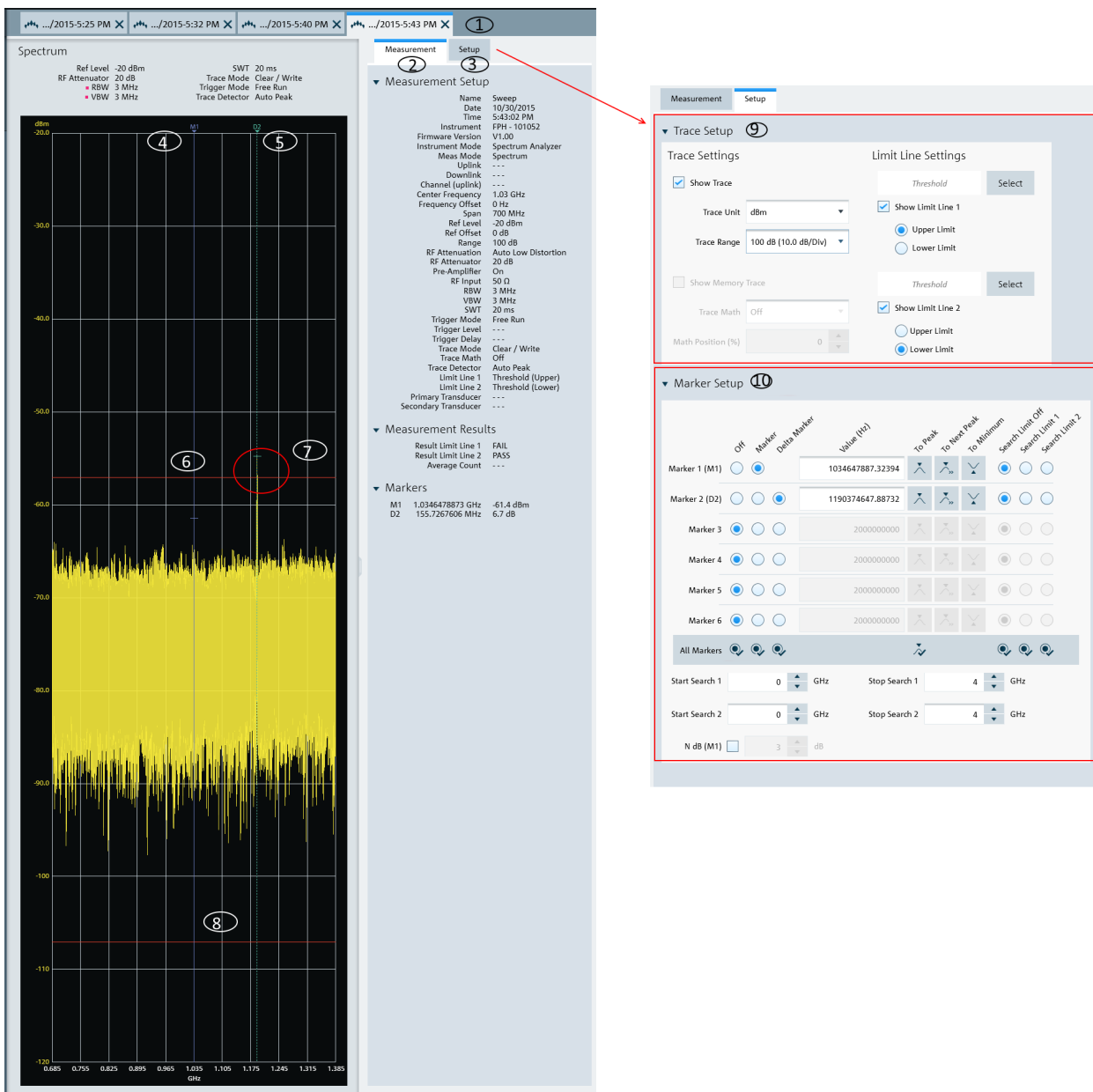


Figure 4-4: Trace measurement window

- 1 = Tab header bar
- 2 = "Measurement" tab
- 3 = "Setup" tab
- 4 = Marker position
- 5 = Delta marker position
- 6 = Upper limit of limit line 1
- 7 = Display show that result failed limit line 1
- 8 = Lower limit of limit line 2
- 9 = Trace Setup
- 10 = Marker Setup

Trace Setup

The "Trace Setup" dialog is divided into three different settings: trace setup, memory trace and limit line settings.

- Each trace is represented with a different trace color. If there are more than one trace in the same trace window, you can go to the individual trace tab to disable or enable the "Show Trace" check box to set the trace display. See [Figure 4-5](#).
The "Trace Unit" ("dBm", "dBmV", "dμV", "V", "W") and "Trace Range" ("150 dB (15.0 dB/Div)", "130 dB (13.0 dB/Div)", "120 dB (12.0 dB/Div)", "100 dB (10.0 dB/Div)", "50 dB (5.0 dB/Div)", "30 dB (3.0 dB/Div)", "20 dB (2.0 dB/Div)", "10 dB (1.0 dB/Div)", "5 dB (0.5 dB/Div)", "3 dB (0.3 dB/Div)", "2 dB (0.2 dB/Div)", "1 dB (0.1 dB/Div)", "Linear 0-100%") are selectable.
- The "Show Memory Trace" is only enabled if the trace measurements captured from the instrument contains the memory trace information. With the memory trace, you can apply "Trace Math" method ("Trace - Memory", "Memory - Trace") between the trace and memory and see the result on the trace window.
The "Math Position" shifts the trace resulted from "Trace Math" to the position defined in the entry box.
For more information on the memory trace, see the respective instrument user manual.
- The "Limit Line Settings" provides two sets of limit line that you can apply on the trace window. Each set of the limit line provides the selection to apply it as "Upper Limit" or "Lower Limit". The test result of the limit line is displayed in the "Measurement" tab. See index 2 in [Figure 4-4](#).
Click "Select" to select the desired limit line from the "Limit Lines" folder directory in the PC. See [Chapter 4.7.3, "Directory Settings"](#), on page 54. You can enable or disable the display of the limit line using the "Show Limit Line 1" or "Show Limit Line 2" check box.

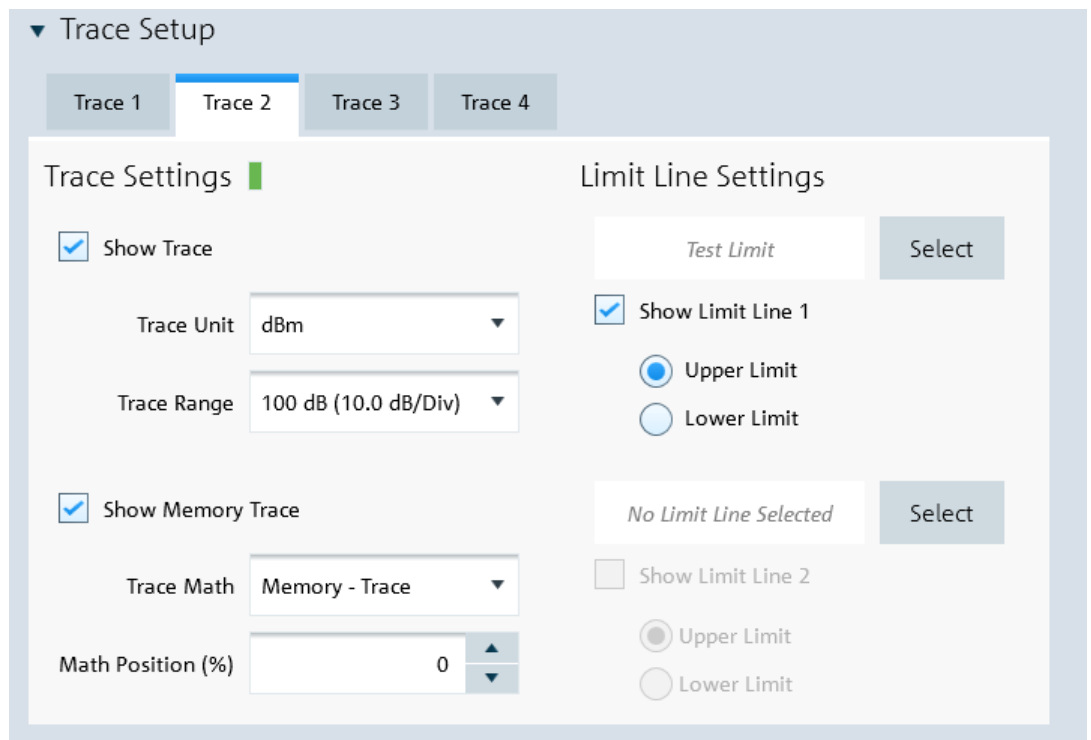


Figure 4-5: Trace setup

Marker Setup

The Marker Setup allows you to label the trace measurement with up to six different markers. For more information on marker details, see the respective instrument user manual.

The first marker will always be set as "M1" with the rest labeled as marker (M2, M3, M4, M5, M6) or delta marker (D2, D3, D4, D5, D6). See [Figure 4-6](#).

The marker value can be individually positioned in the following ways:

- Value (Hz)
Key in the desired frequency value in the entry box.
- "To Peak", "To Next Peak", "To Minimum"
Auto-positioning of the marker value by selecting the peak, next peak or minimum value across the span width of the trace measurement.
- Auto positioning of marker value ("To Peak", "To Next Peak", "To Minimum") in the area defined by the search limit ("Search Limit 1" or "Search Limit 2").
The "Start Search 1", "Start Search 2", "Stop Search 1" and "Stop Search 2" defined the search start and stop limit.
You can also find the auto positioning of the marker value using the "N dB (M1)".
This search function is only restricted to "M1"
- "All Markers"
This section is used to synchronize the criteria of all the marker positions.

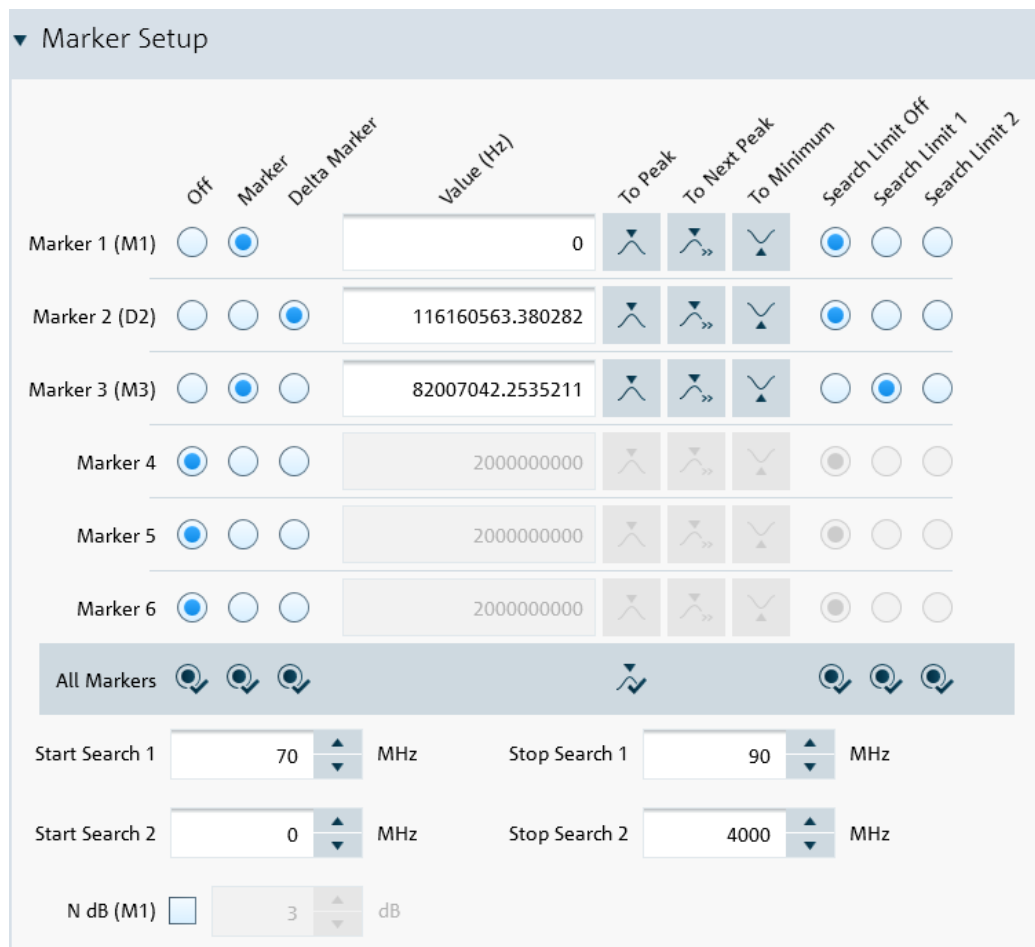


Figure 4-6: Marker setup

4.4.2 Add Trace



Add Trace

The "Get Trace" menu allows you to add an additional trace measurement captured from the instrument to an existing trace measurement displayed in the trace window. Each trace is represented with a different trace color. See [Figure 4-7](#).

See details of "Measurement" tab in index 2 of [Figure 4-4](#).

See details of "Setup" tab in index 3 of [Figure 4-4](#).

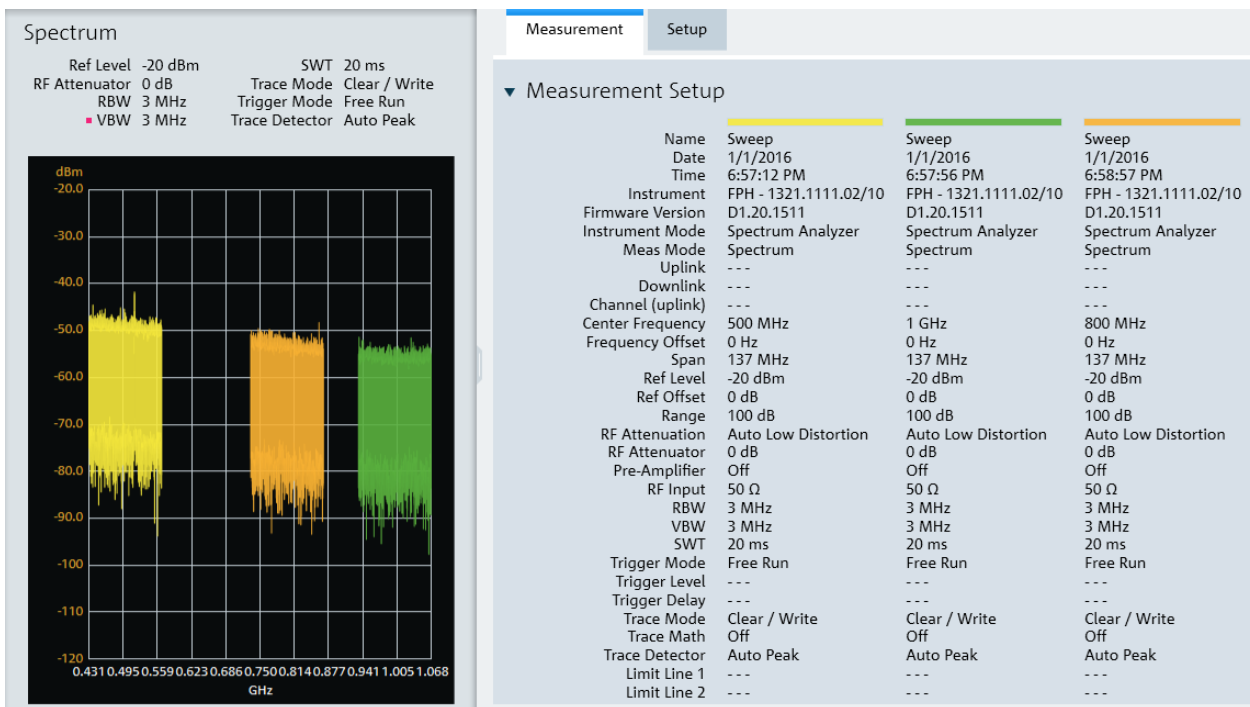
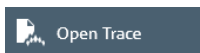


Figure 4-7: Add a trace to an existing trace measurement

4.4.3 Open Trace

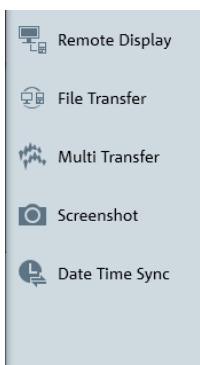


The "Open Trace" menu allows you to open the existing trace measurements from the PC and displayed it in the trace window. A new tab is formed in the "Tab header bar" for each trace opened from the PC. See index 1 in [Figure 4-4](#).

See details of "Measurement" tab in index 2 of [Figure 4-4](#).

See details of "Setup" tab in index 3 of [Figure 4-4](#).

4.5 Working with Instrument






The "Instrument" menu provides the following functions:

- Remote display and control of the instrument
- Files transfer between instrument and PC
- Multiple updates of screenshot from instrument to PC
- Screenshot captured from the instrument
- Date and time synchronisation of the instrument with PC

4.5.1 Remote Display

The "Remote Display" provides the remote display and control of the instrument. You can remotely control and display the instrument via the softkey and hardkey function displayed. See [Figure 4-8](#).

See the respective instrument user manual for details of each of the softkey and hardkey function.

Note: Click on the left side of the rotary knob  to decrease entry value and right side  to increase entry value. Click on the center of the rotary knob  to confirm the entry value.

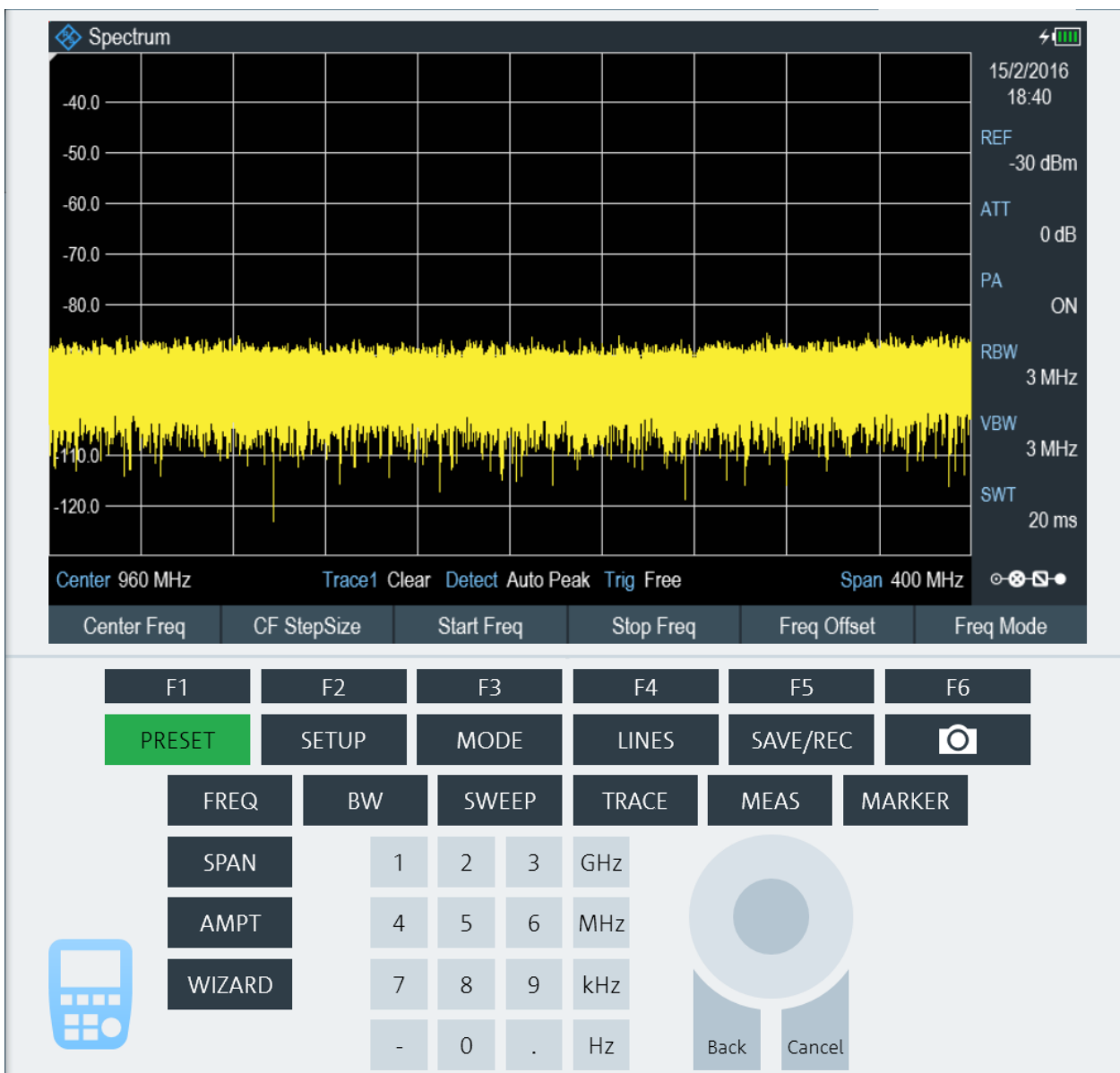


Figure 4-8: Remote display of the instrument

4.5.2 File Transfer

The "File Transfer" provides the file transfer between the instrument and PC. You can make single or multiple files transfer or perform a file synchronization between the instrument and PC. See [Figure 4-9](#).

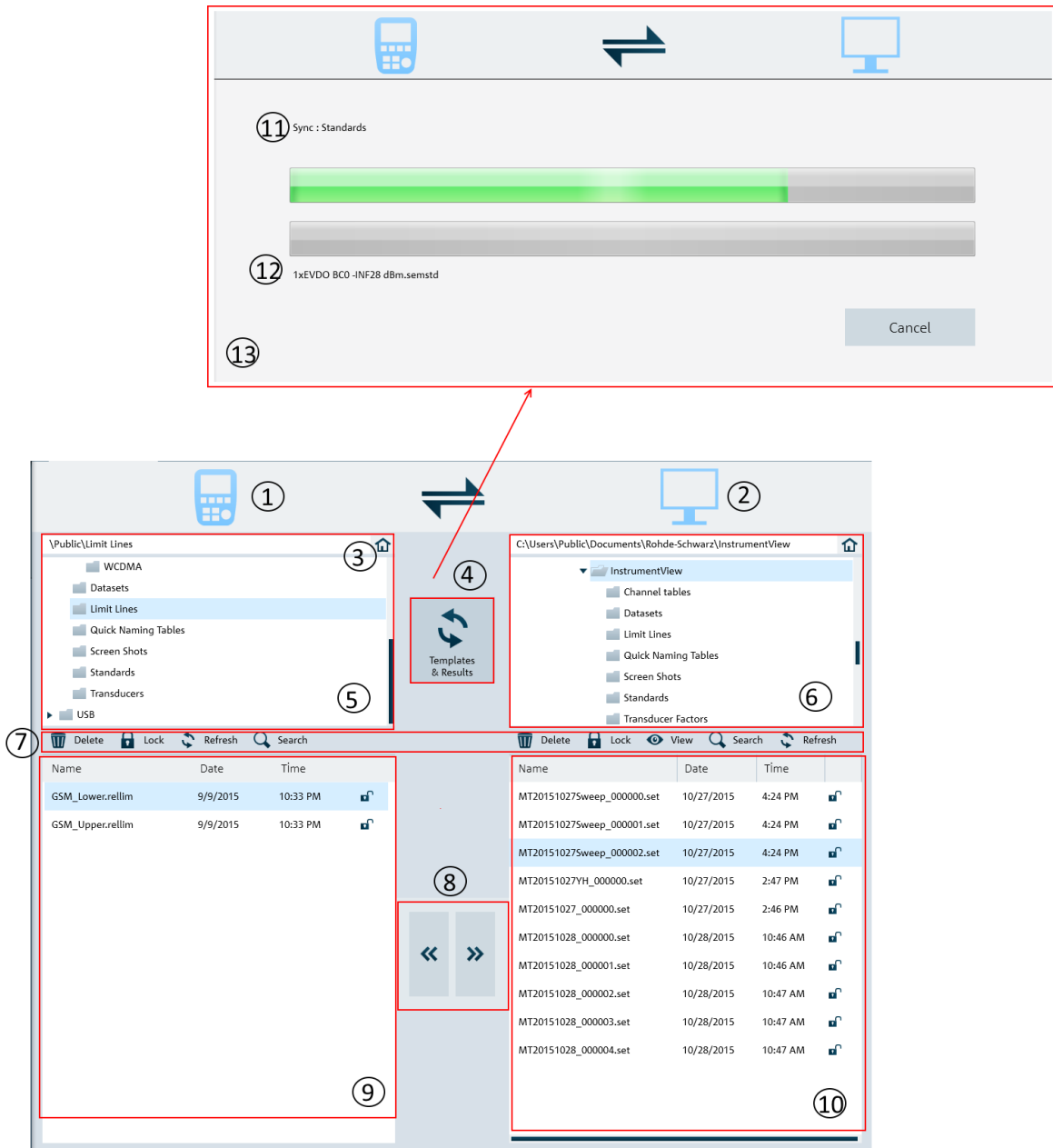








Figure 4-9: File transfer dialog

- 1 = Instrument icon.
- 2 = PC icon.
- 3 = [Homepage](#)

- 4 = [Templates & Result synchronization](#)
- 5 = Instrument's folder directories
- 6 = PC's folder directories
- 7 = [File transfer tools](#)
- 8 = File transfers from the Instrument to PC and vice versa
- 9 = List of selected files from the instrument
- 10 = List of selected files from the PC
- 11 = Progress bar showing the current folder synchronizing between the instrument and PC
- 12 = Progress bar showing the current file synchronizing between the instrument and PC
- 13 = Progress update dialog for "Templates and Results" synchronizing

Table 4-4: File transfer tools

Icon	Description
"Delete" 	Delete the selected file.
"Lock" 	Lock or unlock the selected file. Alternative, you can click on the  icon to unlock or lock the file. Note: A locked file cannot be viewed, deleted or transferred.
"Refresh" 	Refresh the file content in the selected folder directory.
"Search" 	Perform a file search function in the selected folder directory..
"View" 	View the details of the trace measurement file. Only file format with *.set and *.png can be viewed. See index 11 of Figure 4-11 .

Homepage

When activated, the homepage helps you to set the directory path back to the root directory. (i.e. \\\"Public\" for instrument, \"..\\Users\\Public\\Documents\\Rohde-Schwarz\\InstrumentView\" for PC).

See [Chapter 4.7.3, \"Directory Settings\"](#), on page 54.

Templates & Result synchronization

The \"Templates & Result\" synchronizes the different datasets and screenshots between the instrument and PC.

When activated, the file synchronization dialog box is displayed. It shows the progress status of the current folder and file name being synchronized. See index 13 in [Figure 4-9](#).

When a file transfer conflict is detected during the synchronization process, the conflict dialog box is displayed to resolve the conflict. See [Figure 4-10](#)

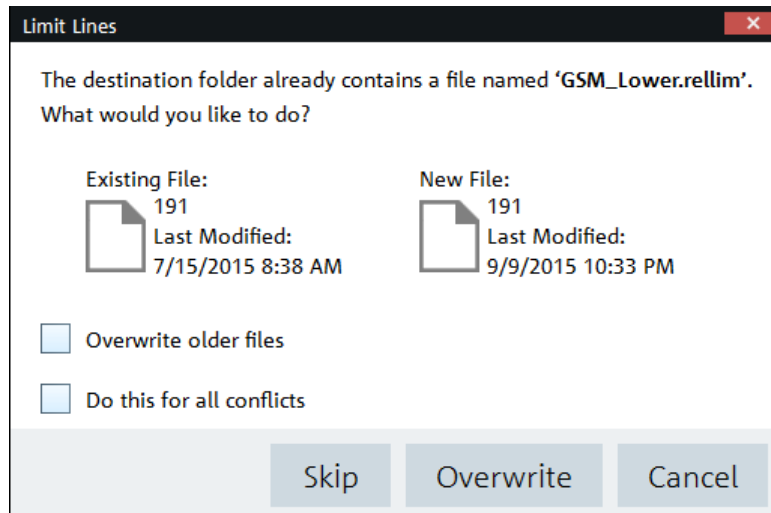


Figure 4-10: Conflict dialog box

Select "Overwrite older files" to overwrite older file with the newer file.

Select "Do this for all conflicts" to perform the "Skip" or "Overwrite" function in the current folder.

4.5.3 Multi Transfer

The "Multi Transfer" menu allows you to capture and save trace measurements from the instrument. See [Figure 4-11](#).

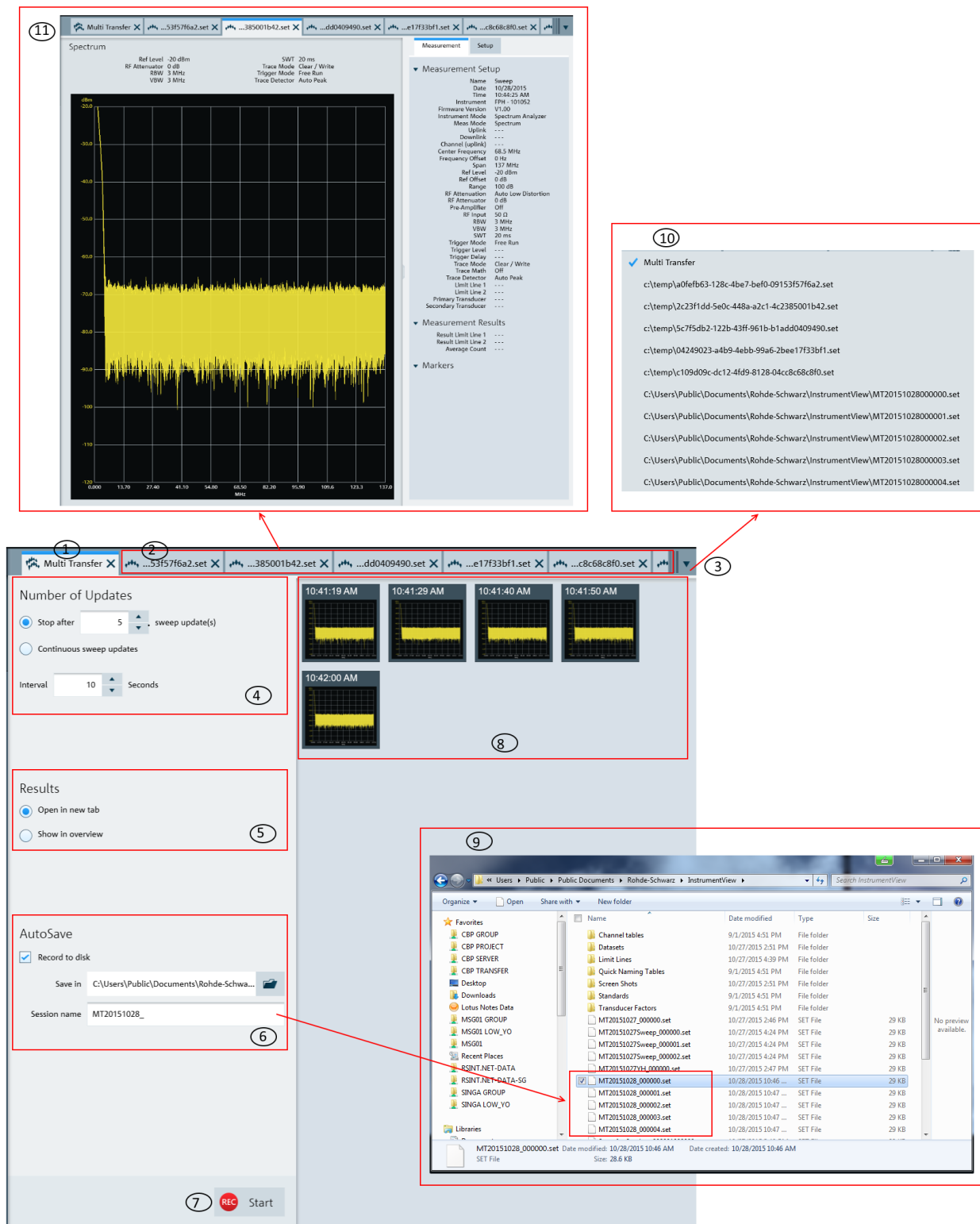


Figure 4-11: Multi transfer dialog

- 1 = "Multi Transfer" tab displays the "Multi Transfer" dialog for settings
- 2 = Measurement results tab (See index 11 in [Figure 4-11](#))
- 3 = Drop down icon to display the tab hidden in the "Tab header bar" (See index 4 in [Figure 2-1](#))
- 4 = [Number of Updates](#)
- 5 = Display settings to configure the display of [results](#) for the trace measurement
- 6 = [Auto Save](#) settings for the auto save function
- 7 = "Start/Stop icon" on page 31 to record or stop the trace measurements captured from instrument
- 8 = Overview display area for trace measurement captured from the instrument
- 9 = File browser to show trace measurement files are captured with a prefix "MT20151028" defined in "Session name"
- 10 = Details of the hidden tab displayed from the drop down icon
- 11 = Details of the selected trace measurement in the "Tab header bar"

Number of Updates

The trace measurement can be updated with the following conditions:

- Single sweep with a fixed number.
Default value is 5. Maximum value is 100000.
- Continuous sweep

The trace measurement is captured with a fixed interval timing defined by "Interval".
Default value is 10. Maximum value is 3600.

Results

There are two ways to display the trace measurements captured from the instrument.

- Display the trace measurement in the overview area. See index 8 in [Figure 4-11](#).
- Display the individual trace measurement result in the "Tab header bar". See index 2 in [Figure 4-11](#).

Click on the individual trace measurement captured in the overview area to display the details information of trace measurement in the "Tab header bar".

See index 11 in [Figure 4-11](#).

See also [Chapter 4.4.1, "Get Trace"](#), on page 19.

Auto Save

The "AutoSave" performs an auto save function on the trace measurement updates from the instrument to PC hard disk.

The trace measurements are saved with a prefixed filename configure in the "Section name" and with an incremental order from "_000001" to "_xxxxxx". The "Save in" defined the file directory where these trace measurements are saved.

See index 9 in [Figure 4-11](#) to view the trace measurements captured in the file directory.

Start/Stop icon



The R&S InstrumentView will prompt you to save unsaved data captured in the last recording session when the "Start" function is activated. See [Figure 4-12](#).

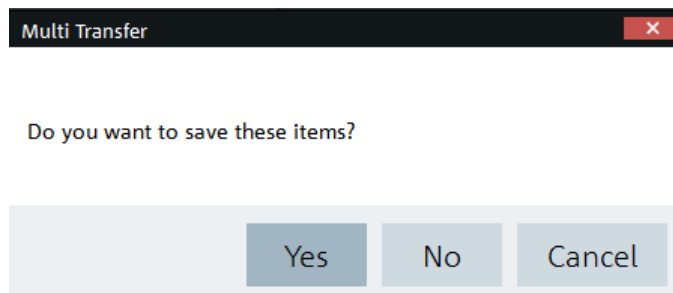




Figure 4-12: Unsaved data user prompt dialog box

The "Start" icon  performs the recording function to capture the trace measurement updates from the instrument.

Depending on the setting in the "Results" section (see index 5 in [Figure 4-11](#)), the trace measurement updates can be displayed in the overview area (see index 8 in [Figure 4-11](#)) or individually displayed as a new tab in the tab header bar (see index 2 in [Figure 4-11](#)).

When the "Start" is activated, the "Start" icon  changes to "Stop" icon . The "Stop" icon allows you to stop the recording process. When the "Stop" is activated, the R&S InstrumentView opens the "Delete" dialog. See [Figure 4-13](#).

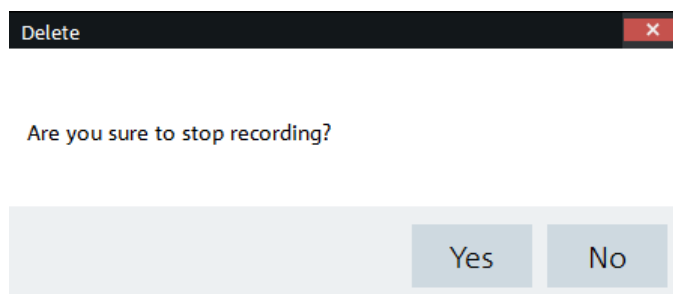


Figure 4-13: Delete dialog

Select "Yes" to stop the recording process.

4.5.4 Screenshot

The "Screenshot" is used to capture the active instrument screen and display it in the trace window. See [Figure 4-14](#).

This trace window can be printed or saved for further editing in the application.

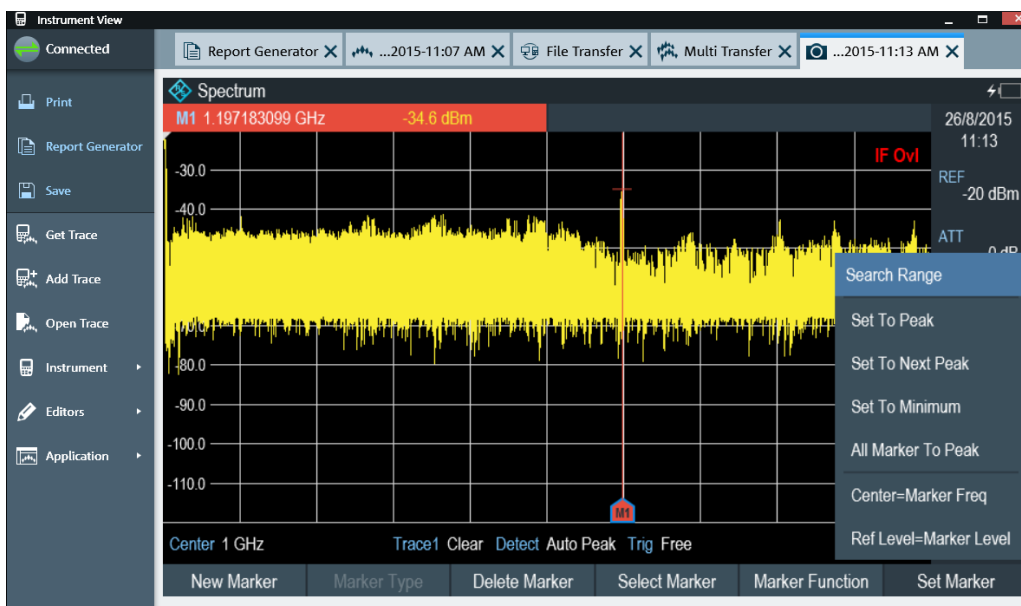


Figure 4-14: Screenshot

4.5.5 Synchronizing Instrument with PC

The "Date and Time" is used to synchronize the date and time of the connected instrument with PC.

Click "OK" to confirm the "Date and Time" synchronization. See Figure 4-15.

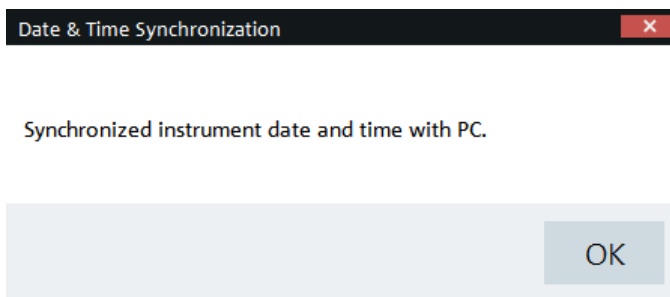
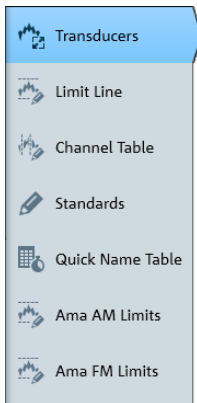


Figure 4-15: Date and Time Synchronization

4.6 Working with Instrument Datasets



The "Editor" menu allows you to configure the different datasets used in the instrument. Availability of the dataset depends on the type of instrument family selected in the "Application" menu. See [Chapter 4.7.2, "Type Selection"](#), on page 53.

4.6.1 Using Transducers

The frequency-dependent transducers table is used to correct the level values of the trace measurement for frequency-dependent components such as antennas, splitters and cables used in the test measurements.

The R&S InstrumentView comes with a list of predefined transducers tables for R&S components such as antennas and matching pad. Using the "Transducers" editor menu, you can customize the transducers table used for the frequency-dependent components introduced in your test measurements. See ["Transducers table"](#) on page 33.

Each transducer table may consist of up to 1000 reference values.

Transducers table

The "Transducers" dialog allows you to open, edit and save the transducers table. See [Figure 4-16](#).

The screenshot shows the 'Transducer table dialog' with the following components:

- Name:** HE200P-HF (1)
- Description:** HE200 passive 9kHz - 30MHz (2)
- Unit:** dB μ V/m (3)
- Type:** Primary (4)
- Data Tab (5):** Shows a table with columns 'Frequency (Hz)' and 'TRD (dB μ V/m)'. The table contains 19 rows of data. A scroll bar (8) is on the right. A circled '7' is over the table header area.
- Preview Tab (6):** Currently inactive.
- Buttons (9-12):** 'New' (9), 'Open' (10), 'Save' (11), and 'Sort' (12).

	Frequency (Hz)	TRD (dB μ V/m)
1	9000	88.7
2	10000	88.7
3	12000	88.4
4	14000	88.1
5	16000	87.7
6	18000	87.1
7	20000	86.5
8	22000	86.1
9	24000	85.7
10	26000	85.4
11	28000	85.1
12	30000	84.7
13	32000	84.4
14	34000	84.1
15	36000	83.8
16	38000	83.5
17	40000	83.2
18	42000	82.8
19	44000	82.5

Figure 4-16: Transducer table dialog

- 1 = Name of the transducers table
- 2 = Description of the transducers table
- 3 = "Unit" defines the level unit used in the transducers table ("dB μ V/m", "dB μ A/m")
- 4 = "Type" defines the type of transducer factor ("Primary", "Secondary", "Isotopic") used for the transducer table
- 5 = "Data" tab shows the details of the transducers table
- 6 = "Preview" tab displays the transducers table in a chart (See ["Preview transducer table"](#) on page 35)
- 7 = Editor of the transducers table
- 8 = Scroll bar
- 9 = "New" button creates a new transducer table for entry
- 10 = "Open" button loads an existing transducers table
- 11 = "Save" button saves the current transducers table
- 12 = "Sort" button sorts the "Frequency (Hz)" of the transducers table in ascending order

Preview transducer table

The "Preview" tab displays the transducer table in a chart. It provides an overview of the frequency response of transducer table. See [Figure 4-17](#).

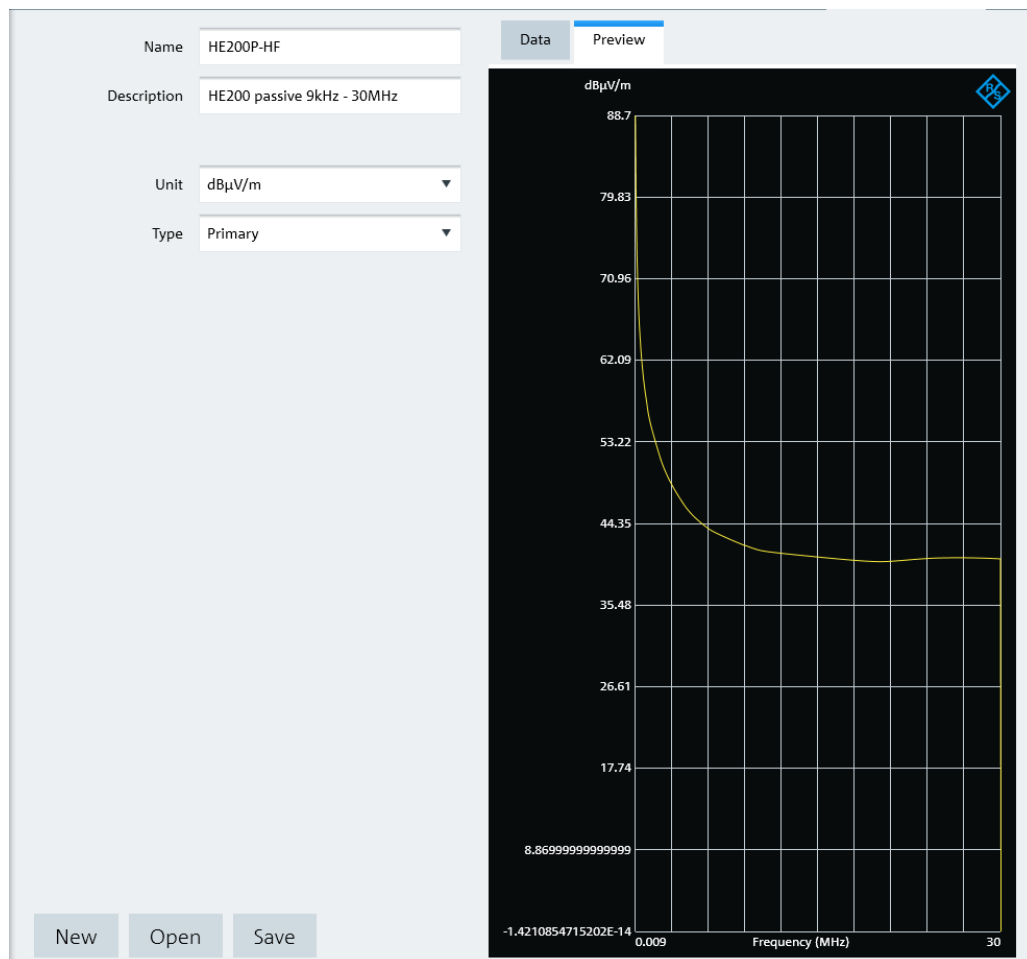


Figure 4-17: Preview transducer table dialog

4.6.2 Using Limit Lines

The limit line is used to identify if a signal complies with a certain level of characteristics. It is made up of two or more points that are connected to a line and each of the point that defines the shape of the limit line consist of two coordinates. One coordinate defines the absolute or relative value of the X-Unit position ("Hz", "s", "m") and the other coordinate is the Y-Unit position ("dB", "dBm", "dBµV", "dBmV", "dBµA/m", "V", "V/m", "W", "W/m²", "VSWR"). See ["Limit Lines Table"](#) on page 36.

The R&S InstrumentView comes with a list of limit lines table which is according to the test transmission standards. Using the "Limit Line" editor menu, you can customize the limit lines table which are deviated from the test transmission standards. See ["Limit Lines Table"](#) on page 36.

Limit Lines Table

The "Limit Line" dialog allows you to open, edit and save the limit lines table. See [Figure 4-18](#).

The dialog shows the following configuration and data:

Name: GSM_Lower
Description: Lower test limits of GSM
X-Unit: s
Y-Unit: dB

	Time (s)	dB
1	-0.00027139	-100
2	-0.00027139	-5
3	0.00027139	-5
4	0.00027139	-100
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		

Buttons: New, Open, Save, Sort

Figure 4-18: Limit lines table dialog

- 1 = Name of the limit lines table
- 2 = Description of the limit lines table
- 3 = "X-Unit" defines the unit used on the x axis of the limit lines table
- 4 = "Y-Unit" defines the unit used on the y axis of the limit lines table
- 5 = "Data" tab shows the details of the limit lines table
- 6 = "Preview" tab displays the limit lines in a chart (See ["Preview limit lines table"](#) on page 37)
- 7 = Editor of the limit lines table
- 8 = Scroll bar
- 9 = "New" button creates a new limit line table for entry

- 10 = "Open" button loads an existing limit lines table
- 11 = "Save" button saves the current limit lines table
- 12 = "Sort" button sorts the x axis of the limit lines table in ascending order

Preview limit lines table

The "Preview" tab displays the limit lines in a chart. It provides an overview of the frequency response of the limit lines. See [Figure 4-19](#).

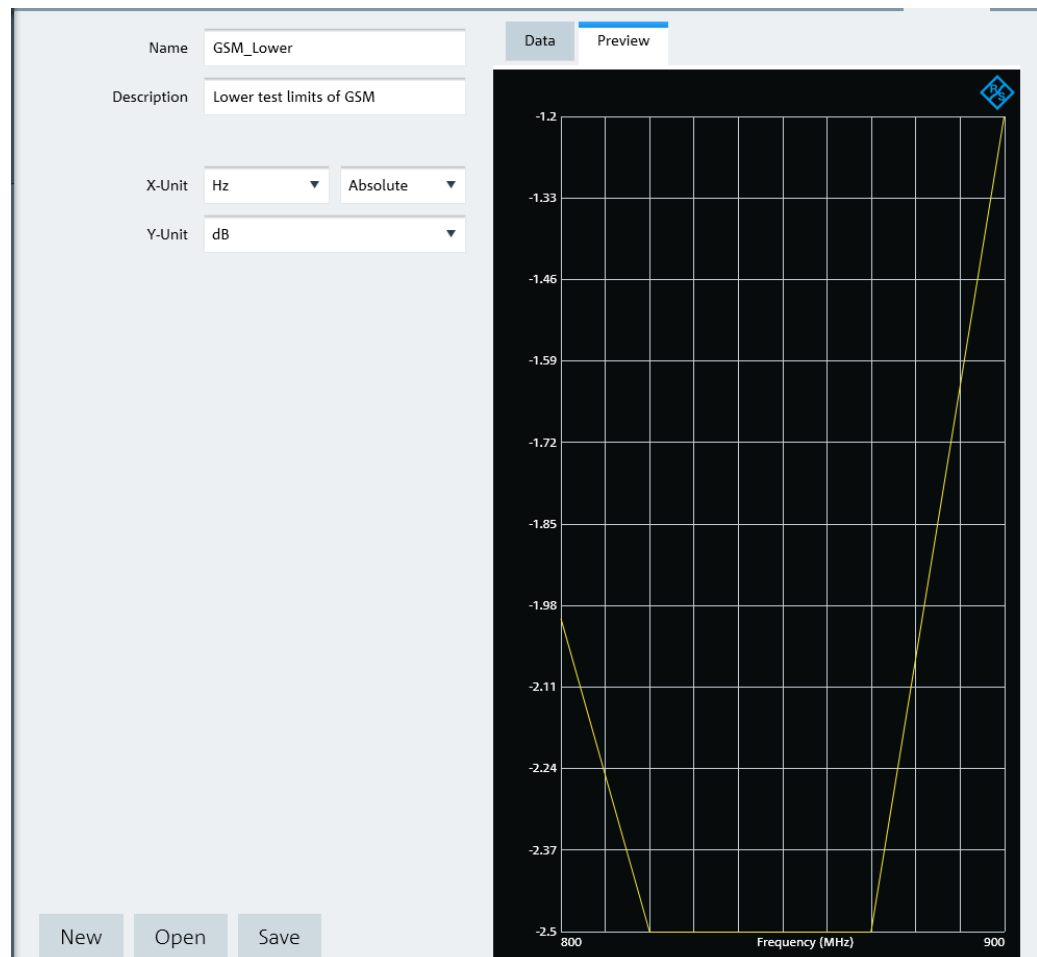


Figure 4-19: Preview limit lines dialog

4.6.3 Using Channel Table

The R&S InstrumentView comes with a list of channel tables which are according to the test transmission standards. Using the "Channel Table" editor menu, you can customize the channel table which is deviated from the test transmission standards. See ["Channel Table"](#) on page 38.

Channel Table

The "Channel Tables" dialog allows you to open, edit and save the channel table. See [Figure 4-20](#).

Name: cdma2k_10 (Sec 800 MHz Band) ①

Description: cdma2k_10 (Sec 800 MHz Band) ②

Band Name ③	1st Ch ④	f(1st Ch) (MHz) ⑤	# of Chs ⑥	Spacing (MHz) ⑦
1 cdma2k(Sec 800)	0	851	720	0.025
2 cdma2k(Sec 800)	720	935	200	0.025
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Buttons: ⑨ New, ⑩ Open, ⑪ Save, ⑫ Sort

Figure 4-20: Channel table dialog

- 1 = Name of the channel table
- 2 = Description of the channel table
- 3 = Band name in the channel table
- 4 = Starting channel number in the frequency band
- 5 = Starting frequency of the "1st Ch" channel
- 6 = Number of channels in the frequency band
- 7 = Channel spacing between two channels
- 8 = Editor of the channel table
- 9 = "New" button creates a new channel table for entry

- 10 = "Open" button loads an existing channel table
- 11 = "Save" button saves the current channel table
- 12 = "Sort" button sorts the "1st Ch" of the channel table in ascending order

4.6.4 Using Standards

The R&S InstrumentView comes with a list of mobile radio standards with predefined test measurement settings according to the standard's requirements. Using the "Standards" editor menu, you can customize the test measurement settings which are deviated from the standards. See [Chapter 4.6.4.1, "Standards Table"](#), on page 39.

4.6.4.1 Standards Table

The "Standards" dialog allows you to open, edit and save the measurement settings for a test standard. See [Figure 4-21](#).

See the respective instrument user manual for details of each of the measurement settings in the dialog.

The screenshot shows the 'Standard table dialog' with the following fields and settings:

- ① Name: cdma2000 1x
- ② Description: cdma2000 1x
- ③ Measurement Type: Channel Power
- ④ Settings: Channel Power Adjacent Settings
- ⑤ Resolution Bandwidth: 10000 Hz, Auto
- Trace Detector: RMS
- Video Bandwidth: 300000 Hz, Auto
- Channel Bandwidth: 1228800 Hz
- Sweep Time: 0.1 s, Auto
- Power Unit: dBm
- Span: 1474560 Hz, Auto

Buttons at the bottom: ⑥ New, ⑦ Open, ⑧ Save

Figure 4-21: Standard table dialog

- 1 = Name of the standard table
- 2 = Description of the standard table
- 3 = **Measurement Type** ("Channel Power", "Occupied Bandwidth", "TDMA", "Spectrum Emission Mask")
- 4 = Details of the "Settings" tab is associated with the "Measurement Type" selected (See [Chapter 4.6.4.2, "Measurement Type"](#), on page 40)
- 5 = Details of the secondary tab is associated with the **Measurement Type** selected
- 8 = "New" button creates a new standard table for entry
- 9 = "Open" button loads an existing standard table
- 10 = "Save" button saves the current standard table

4.6.4.2 Measurement Type

Depending on the mobile radio standard used in the test measurements, there are four different types of "Measurement Type" which you can select to customize your measurement settings.

See the respective instrument user manual for details of each of the measurement type.

Channel Power

The channel power measurement selectively measures the power of a specified transmission channel and adjacent channels. The following dialog provides the required measurement settings in the "Settings" tab as well as the TX channels and adjacent channels configuration in the "Channel Power Adjacent Settings" tab.

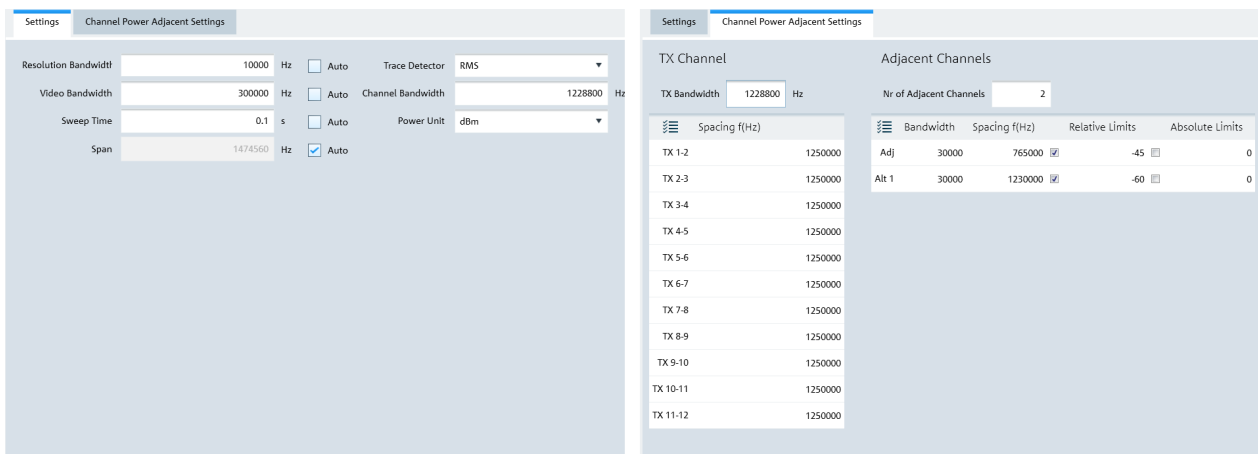


Figure 4-22: Channel power settings

Occupied Bandwidth

The occupied bandwidth is defined as the bandwidth that contains a specified percentage of the entire power of the transmitter. Default occupied bandwidth for the entire power of the transmitter is predefined at 99%. The following dialog provides the required measurement settings in the "Settings" tabs.

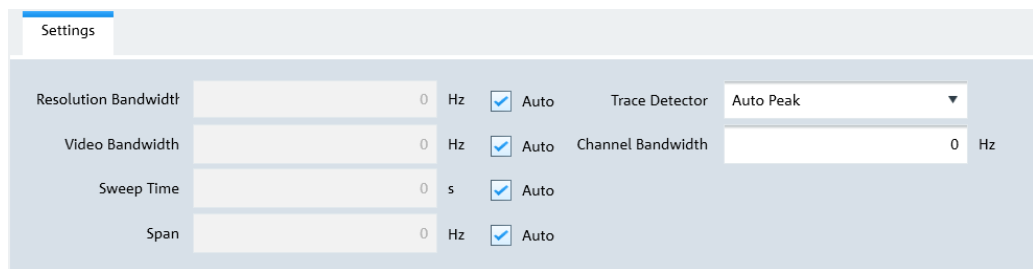


Figure 4-23: Occupied bandwidth settings

TDMA Power

The TDMA (time division multiple access) power is measured in the time domain of the instrument. In the mobile radio standard like, e.g. GSM, several users share a channel and each user is assigned a period of time or timeslot for usage. With TDMA power measurement, you can determine the power over one of the timeslot. The following dialog provides the required measurement settings in the "Settings" tabs.

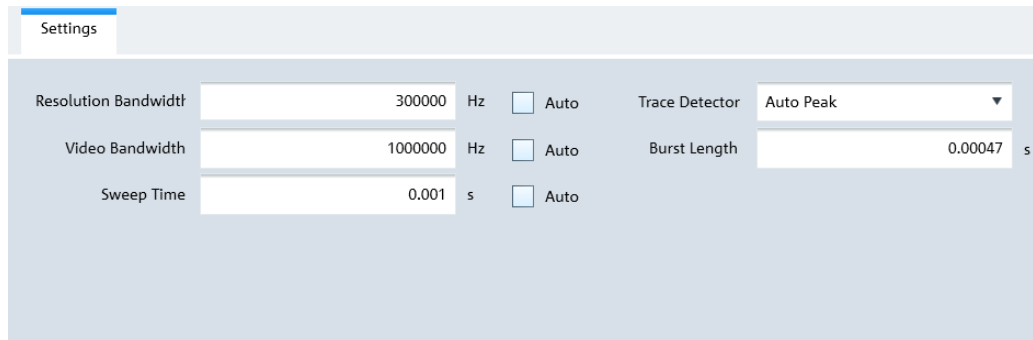


Figure 4-24: TDMA settings

Spectrum Emission Mask

The Spectrum Emission Mask (SEM) measurement is a method used to detect the spurious emissions or intermodulation products of a signal. When performing the SEM measurement, the instrument checks the signal against a spectral mask to determine whether the signal complies with a specific standard. The following dialog provides the required settings to define the spectral mask in the "SEM" tab. The "Preview" tab illustrates the spectral mask defined in the "SEM" tab.

SEM		Preview					
Limit Check Mode	Range Start	Range Stop	RBW	Limit Start Abs (dBm)	Limit Stop Abs (dBm)	Limit Start Rel	
1 Absolute	-12750000	-8500000	1000000	-49	-49		
2 Absolute	-8500000	-7500000	1000000	-49	-39		
3 Absolute	-7500000	-3500000	1000000	-39	-35		
4 Absolute	-3500000	-2500000	30000	-50	-35		
5 Ref Chan Power	-2500000	2500000	30000				
6 Absolute	2500000	3500000	30000	-35	-50		
7 Absolute	3500000	7500000	1000000	-35	-39		
8 Absolute	7500000	8500000	1000000	-39	-49		
9 Absolute	8500000	12750000	1000000	-49	-49		
10 None							
11 None							
12 None							
13 None							
14 None							

Figure 4-25: SEM settings

4.6.5 Using Quick Name Table

The R&S InstrumentView comes with a predefined quick name table which provides a set of naming elements that can be used to create meaningful name in a faster and convenient manner. Using the "Quick Name Table" editor menu, you can customize the frequently used terms when compiling a file name. See ["Quick Name Table"](#) on page 42.

Quick Name Table

The "Quick Name Table" dialog allows you to open, edit and save the quick name table. See [Figure 4-26](#).

1	2	3	4	5	6	
1	Location	Site	RL	Sector	UL	450
2			IL	A	DL	700
3			VSWR	B		850
4			DTF	C	GSM	900
5			ISOL	D	UMTS	1800
6			POW	E	CDMA2000	1900
7			SPECTR		EVDO	2100
8			ACLR		LTE	
9					TD-SCDMA	
10						
11						
12		①				
13						
14						
15						
16						
17						
18						
19						
20						

② New ③ Open ④ Save

Figure 4-26: Quick name table

- 1 = Editor of the "Quick Name Table"
- 2 = "New" button creates a new quick name table for entry
- 3 = "Open" button loads an existing quick name table
- 4 = "Save" button saves the current quick name table

4.6.6 Using Analog Modulation Analysis AM Limits

Using the "Ama AM Limits" editor menu, you can customize the "Ama AM Limits" table which is used to evaluate the performance of the amplitude modulated signal. See [Figure 4-27](#).

Ama AM Limits Table

The "Ama AM Limits" dialog allows you to open, edit and save the Ama AM limits table . See [Figure 4-27](#).

☰	Type	Enable	Upper limit	Unit	Enable	Lower Limit	Unit
	CarrierFreq	<input checked="" type="checkbox"/>	200000000000	Hertz	<input checked="" type="checkbox"/>	-200000000000	Hertz
	CarrierPower	<input checked="" type="checkbox"/>	200	dBm	<input checked="" type="checkbox"/>	-200	dBm
	CarrierOffset	<input checked="" type="checkbox"/>	200000000000	Hertz	<input checked="" type="checkbox"/>	-200000000000	Hertz
	ModDepth	<input checked="" type="checkbox"/>	100	Percent	<input checked="" type="checkbox"/>	0	Percent
	PosPeak	<input checked="" type="checkbox"/>	100	Percent	<input checked="" type="checkbox"/>	0	Percent
	NegPeak	<input checked="" type="checkbox"/>	0	Percent	<input checked="" type="checkbox"/>	-100	Percent
	PosNegPeak	<input checked="" type="checkbox"/>	① 100	Percent	<input checked="" type="checkbox"/>	0	Percent
	RMS	<input checked="" type="checkbox"/>	100	Percent	<input checked="" type="checkbox"/>	0	Percent
	ModulationFreq	<input checked="" type="checkbox"/>	2000	Hertz	<input checked="" type="checkbox"/>	0	Hertz
	SINAD	<input checked="" type="checkbox"/>	0	dB	<input checked="" type="checkbox"/>	-100	dB
	THD	<input checked="" type="checkbox"/>	0	dB	<input checked="" type="checkbox"/>	-100	dB

② ③ ④

New Open Save

Figure 4-27: Ama AM limits dialog

- 1 = Editor of the "Ama AM Limits" table
- 2 = "New" button creates a new Ama AM limits table for entry
- 3 = "Open" button loads an existing Ama AM limits table
- 4 = "Save" button saves the current Ama AM limits table

4.6.7 Using Analog Modulation Analysis FM Limits

Using the "Ama FM Limits" editor menu, you can customize the "Ama FM Limits" table which is used to evaluate the performance of the frequency modulated signal. See [Figure 4-28](#).

Ama FM Limits Table

The "Ama FM Limits " dialog allows you to open, edit and save the Ama FM limit table . See [Figure 4-28](#).

☰	Type	Enable	Upper limit	Unit	Enable	Lower Limit	Unit
	CarrierFreq	<input checked="" type="checkbox"/>	200000000000	Hertz	<input checked="" type="checkbox"/>	-200000000000	Hertz
	CarrierPower	<input checked="" type="checkbox"/>	200	dBm	<input checked="" type="checkbox"/>	-200	dBm
	CarrierOffset	<input checked="" type="checkbox"/>	200000000000	Hertz	<input checked="" type="checkbox"/>	-200000000000	Hertz
	FreqDiv	<input checked="" type="checkbox"/>	2000000	Hertz	<input checked="" type="checkbox"/>	0	Hertz
	PosPeak	<input checked="" type="checkbox"/>	2000000	Hertz	<input checked="" type="checkbox"/>	0	Hertz
	NegPeak	<input checked="" type="checkbox"/>	0	Hertz	<input checked="" type="checkbox"/>	-2000000	Hertz
	PosNegPeak	<input checked="" type="checkbox"/>	2000000	Hertz	<input checked="" type="checkbox"/>	0	Hertz
	RMS	<input checked="" type="checkbox"/>	① 100	Percent	<input checked="" type="checkbox"/>	0	Percent
	ModulationFreq	<input checked="" type="checkbox"/>	2000000	Hertz	<input checked="" type="checkbox"/>	0	Hertz
	SINAD	<input checked="" type="checkbox"/>	0	dB	<input checked="" type="checkbox"/>	-100	dB
	THD	<input checked="" type="checkbox"/>	0	dB	<input checked="" type="checkbox"/>	-100	dB

②
New

③
Open

④
Save

Figure 4-28: Ama FM limits dialog

- 1 = Editor of the "Ama FM Limits" table
- 2 = "New" button creates a new Ama FM limits table for entry
- 3 = "Open" button loads an existing Ama FM limits table
- 4 = "Save" button saves the current Ama FM limits table

4.6.8 Wizard Set Editor

Using the "Wizard Set Editor" menu, you can customize the measurement table list which consists of several dataset used to perform a specific instrument settings and measurements, for example frequency setting, power meter measurement, analog modulation measurement etc. To acquire a dataset, set up the instrument as per your requirement and save the configuration. You can also use one of the predefined dataset to customize the measurement table list.

The measurement table list forms the measurement sequence in the wizard set.

For more information on dataset, see [Chapter 4.3, "Save Instrument"](#), on page 18.

Wizard

The "Wizard " dialog allows you to open, edit and save the measurement wizard set. See [Figure 4-29](#).

To arrange the measurement sequence in the wizard set, double clicked or "Add" the desired dataset from the PC folder directory to the measurement table list. See index 4 and 5 of [Figure 4-29](#).

Note: File selected in the wizard set editor are highlighted in blue i.e. 101053

The screenshot displays the 'Wizard dialog' in R&S InstrumentView, divided into two main sections: 'Datasets on PC' and 'Measurement Settings'.

Datasets on PC: A table lists available datasets with columns for Name, Date, and Time. A navigation bar below the table includes icons for View, Up, Down, and Remove. A 'Measurements' table below shows a list of measurement entries with columns for Name, Instructions, and Hardware Setting.






Measurement Settings: This section is divided into 'Wizard Settings' and 'Measurement Settings' tabs. The 'Global' section includes fields for 'Measurement Set Name' (Simple RF Measurement), 'Description (Optional)' (Measurement using Power meter), and 'Description / Measurement Font' (Instrument). It also features checkboxes for 'Allow Variable Number of Sequence Steps' and 'Allow Skip Measurements & Finish Wizard Sequence'. The 'Encryption' section has an 'Encryption Enabled' checkbox. The 'Authentication' section includes 'Password' and 'Confirm Password' fields. There is a checkbox for 'Use all Instrument Serial Numbers' and a 'Specific Serial Numbers' section with an 'Add new Serial Number' field and 'Add'/'Remove' buttons. A list of 'Stored Serial Numbers' (101055, 101054, 101053) is shown. At the bottom, there are 'New', 'Open', and 'Save' buttons.

Numbered callouts (1-11) indicate specific UI elements: 1 (Homepage icon), 2 (PC window explorer icon), 3 (Dataset list), 4 (Navigation icons), 5 (Measurement table), 6 (Measurement Settings tab), 7 (Global section), 8 (Encryption section), 9 (New button), 10 (Open button), and 11 (Save button).

Figure 4-29: Wizard dialog

- 1 = [Homepage icon](#)
- 2 = Opens the PC window explorer
- 3 = List of datasets that are available in the PC
- 4 = [Navigation icon](#) to preview, add, navigate and remove dataset in the measurement table list
- 5 = List of selected datasets used in the measurement table list. The "Name", "Instructions" and "Hardware_Setting" column are defined in the [Measurement Settings dialog](#).
- 6 = [Measurement settings tab](#)
- 7 = [Global dialog](#)
- 8 = [Encryption dialog](#)
- 9 = "New" button creates a new wizard set for entry
- 10 = "Open" button loads an existing wizard set entry
- 11 = "Save" button saves the current wizard set entry

Navigation icon

Navigation icon	Descriptions
 View	Preview a selected dataset in the measurement table list.
 Add	Add a selected dataset from the PC dataset list into the measurement table list.
 Up	Navigate upward in the measurement table list.
 Down	Navigate downward in the measurement table list.
 Remove	Remove a selected dataset from the wizard set.

Global

The "Global" dialog provides the following settings that configure the wizard set:

- "Measurement Set Name"
Name of the measurement wizard set. This field is displayed in the instrument as a read-only parameter.
- "Description (Optional)"
Description of the measurement task. This field is displayed in the instrument as a read-only parameter.
- "Description / Measurement Font"
Font type for on-screen instructions (Latin, Chinese/Japanese and Korean fonts are supported).
- "Allow Variable Number of Sequence Steps"
If enabled, this field is configurable in the instrument and it allows you to remove steps from the measurement wizard set.
If not enabled, this field is displayed in the instrument as a read-only parameter.
- "Allow Skip Measurements & Finish Wizard Sequence"
If enabled, this field is configurable in the instrument and it allows you to skip the measurement step or finished the measurement wizard set.
If not enabled, this field is displayed in the instrument as a read-only parameter.

Encryption dialog

The "Encryption" dialog provides the encryption function to secure the edited measurement wizard set.

The encrypted wizard set is only visible in the instrument with serial number configured in the "Encryption" dialog.

To enable the "encryption" dialog, activate the "Encryption Enabled " check box.

To limit the usage of the wizard set on a selective number of instruments, add the instrument serial number defined in the field of "Specific Serial Numbers".

Measurement Settings

The "Measurement" dialog configures the individual dataset used in the measurement table list.

Navigate from the list of datasets in the measurement table list (see index 5 of [Figure 4-29](#)) and select the desired dataset for configuration.

Define the "Measurement Name" and describes the "Instructions" necessary for the measurement step.

Note: The description defined in the "Instructions" is displayed in the wizard message box during the execution of the wizard set. See index 2 of [Figure 4-31](#).



Figure 4-30: Measurement settings dialog

- 1 = Define the measurement name of the selected dataset
- 2 = Identify the dataset filename that the measurement setting is linked to
- 3 = Define the instruction description displayed in the wizard message box
- 4 = Preview the configured measurement wizard dialog
- 5 = [Instruction picture dialog](#)
- 6 = Hardware setting to configure the instrument's BNC input ("Trigger Input" or "reference Input")

Instruction Picture dialog

The "Instruction Picture" dialog allows you to display a graphical image during the execution of the measurement wizard set. See [Figure 4-31](#).

To select the desired picture, select "Browse" button to open the PC window explorer and select the graphic image to use.

The "View" button allows you to preview the selected graphical image.

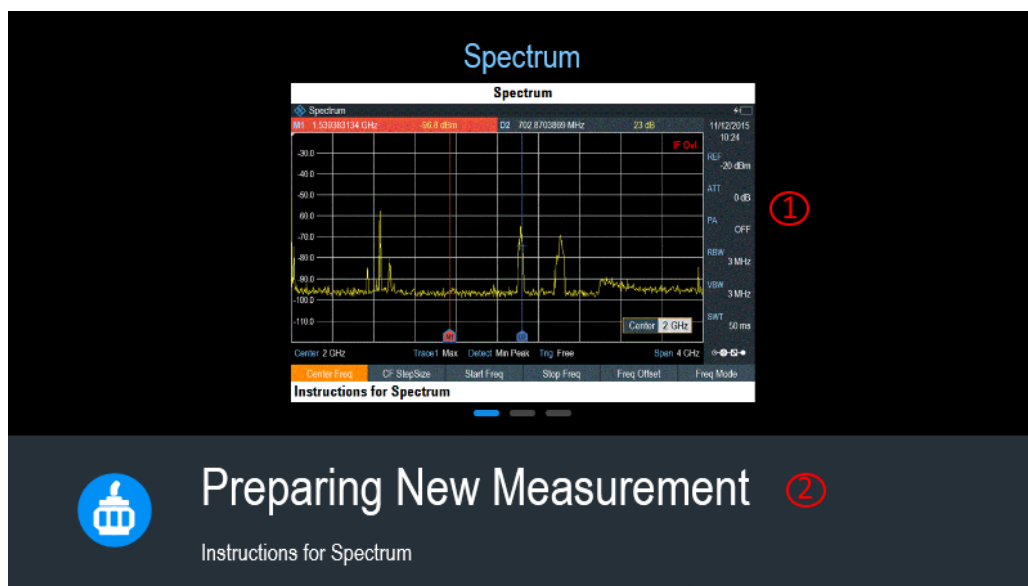
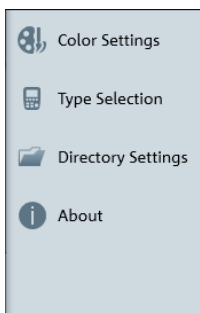


Figure 4-31: Wizard dialog

- 1 = Instruction picture image
- 2 = wizard message box

4.7 Application Preference



The "Application" menu allows you to configure the application preference such as the color settings of the trace element, selection of the type of instrument family, setting of the directory path and display the software information.

4.7.1 Color Settings

The "Color Settings" dialog provides settings for the color displayed on the different trace elements in the trace window. See [Figure 4-32](#).

It provides settings on the following:

- Background
- Grid line
- Text display on the trace window
- Up to four trace lines
- Up to four memory trace lines
- Indicator line

- Display line
- Marker and delta marker line
- Upper and lower limit line
- Tx and adjacent channel indicator

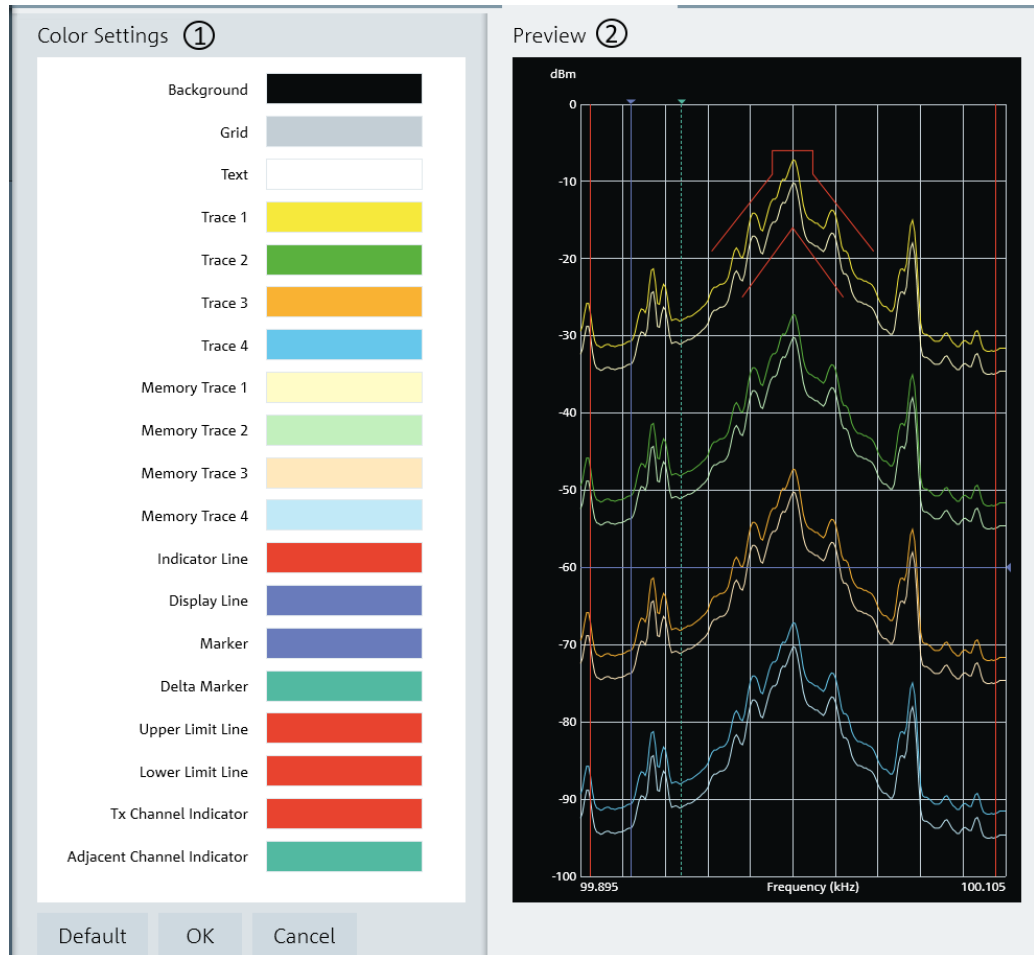


Figure 4-32: Color settings dialog

1 = "Color Settings" menu displays each trace element color in the trace window

2 = "Preview" window displays each trace element color in the trace window

Select the desired trace element in the "Color Settings" menu and the "Color selection" dialog is displayed for configuration. See [Figure 4-33](#).

There are a few ways to change the color settings in the "Color Selection" dialog:

- Select the desired color settings in the color display area
- Select the desired brightness setting in the brightness level indicator
- Change the RGB color codes
- Change the Hex color codes

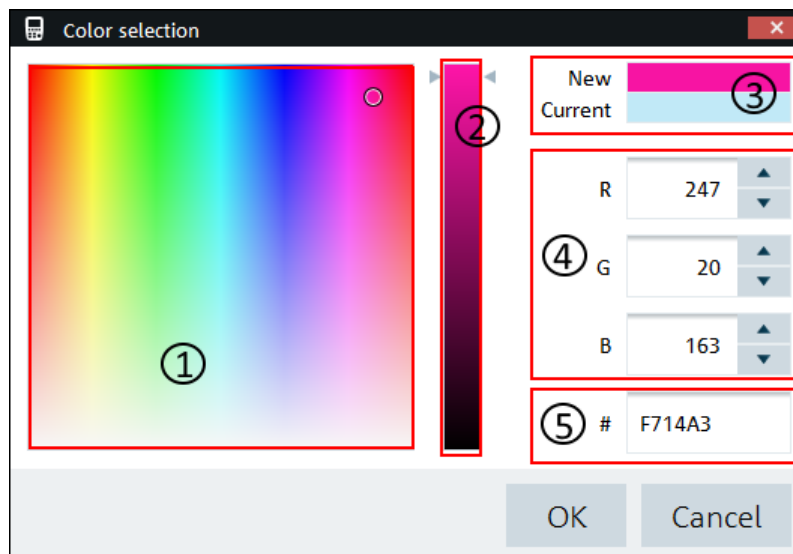


Figure 4-33: Color selection dialog

- 1 = Color display area
- 2 = Brightness settings indicator
- 3 = Color preview area
- 4 = RGB color codes
- 5 = HEX color codes

Select the "Default" button to restore the default settings of the trace element color. See [Figure 4-32](#).

4.7.2 Type Selection

The "Type Selection" dialog provides the setting to select the instrument family: "FSH4" and "FPH". See [Figure 4-34](#).

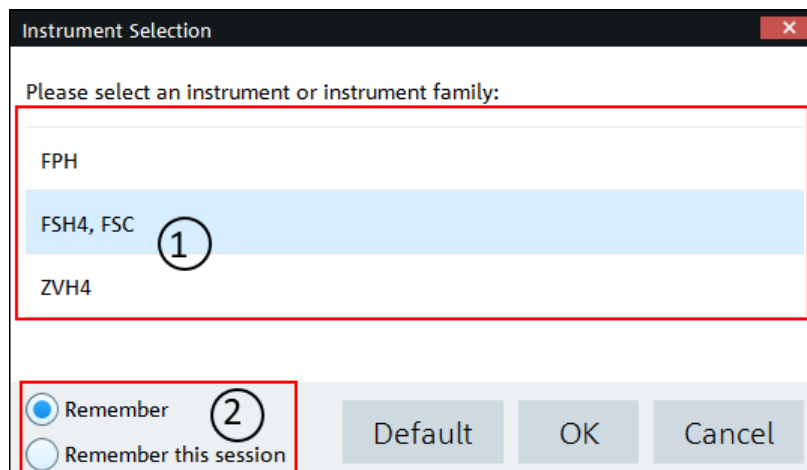


Figure 4-34: Type selection dialog

- 1 = Selection of instrument family
- 2 = Session check box

The session check box allows you to save the instrument selection permanently for every session or in between single session.

By default, the application selects "FPH" and does not save the settings in the session check box.

4.7.3 Directory Settings

The "Directory Settings" dialog provides the list of default path directories setting for the different type of files used in the application.

To change the path directories setting, double-clicked on the desired file type to configure the directory setting.

Upon selection, the "Browse For Folder" dialog is displayed to configure the path directory setting. See [Figure 4-35](#).

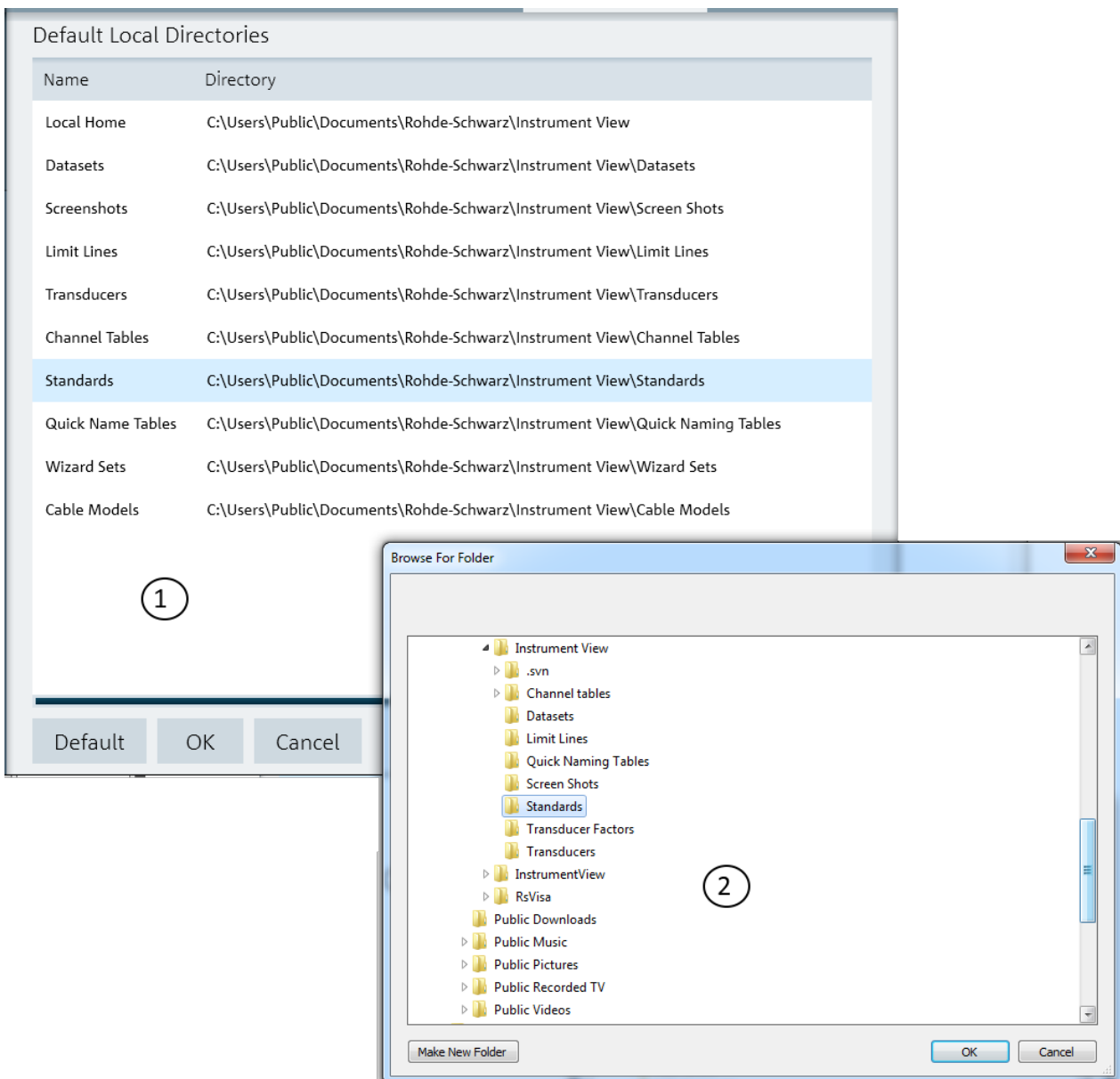


Figure 4-35: Directory settings dialog

- 1 = List of the different files type directory setting
 2 = File browser for path directory selection

4.7.4 About

See ["About the Software Information"](#) on page 5.