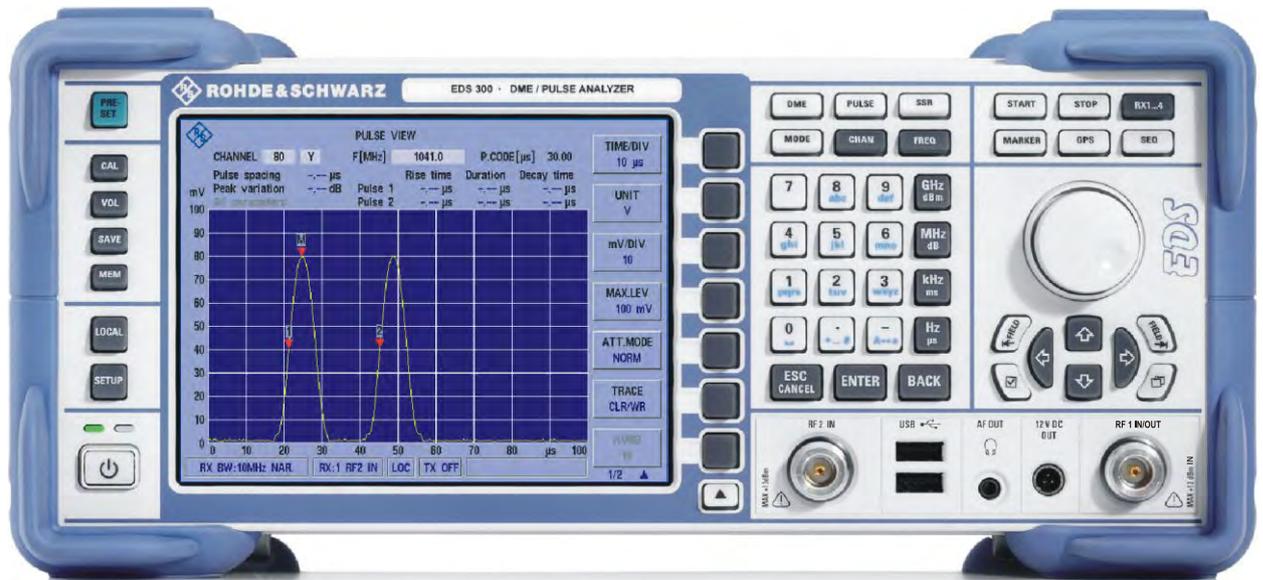


R&S® EDS300 DME/PULSE Analyzer User Manual



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Muehldorfstr. 15, 81671 Munich, Germany

Phone: +49 89 41 29 - 0

Fax: +49 89 41 29 12 164

E-mail: info@rohde-schwarz.com

Internet: <http://www.rohde-schwarz.com>

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R&S[®] is a registered trademark of Rohde & Schwarz GmbH & Co. KG.

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The following abbreviations are used throughout this manual:

R&S[®]EDS300 is abbreviated as R&S EDS300

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 supply voltage
	Caution when handling heavy equipment	⏻	Standby indication
	Danger of electric shock	— — —	Direct current (DC)

Basic Safety Instructions

Symbol	Meaning	Symbol	Meaning
	Warning! Hot surface		Alternating current (AC)
	Protective conductor terminal		Direct/alternating current (DC/AC)
	Ground		Device fully protected by double (reinforced) insulation
	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 severity 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 AC 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 AC supply network, or if the power switch is not suitable for this purpose, use the plug of the connecting cable to disconnect the product from the AC supply network. 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 IEC60950-1/EN60950-1 or IEC61010-1/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.

Basic Safety Instructions

- 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.

Instrucciones de seguridad elementales

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.

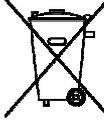
Tener en cuenta las informaciones de seguridad sirve para evitar en lo posible lesiones o daños por peligros de toda clase. Por eso es imprescindible leer detalladamente y comprender por completo las siguientes informaciones de seguridad antes de usar el producto, y respetarlas durante el uso del producto. 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.

Instrucciones de seguridad elementales**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.

Instrucciones de seguridad elementales

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 (povos 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.

Quality management and environmental management

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 ISO9001 et ISO 14001.

Engagement écologique

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



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.

Europe, Africa, Middle East

Phone +49 89 4129 12345
customersupport@rohde-schwarz.com

North America

Phone 1-888-TEST-RSA (1-888-837-8772)
customer.support@rsa.rohde-schwarz.com

Latin America

Phone +1-410-910-7988
customersupport.la@rohde-schwarz.com

Asia/Pacific

Phone +65 65 13 04 88
customersupport.asia@rohde-schwarz.com

China

Phone +86-800-810-8228 /
+86-400-650-5896
customersupport.china@rohde-schwarz.com



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1 General Information

1.1 General

⚠ WARNING

The making of all connections necessary for operation must only be done by authorized persons; otherwise damage may be caused to the equipment!

During a thunderstorm, the device must not be operated using a hand held antenna.

⚠ CAUTION

This device is equipped with a firmly installed battery containing hazardous substances. Once the service life of the device has expired, it may be disposed of only via the Rohde & Schwarz Customer Service or at an appropriate collecting point!

Lithium/NiMH batteries are suitable for environmentally friendly disposal or specialized recycling. They may only be disposed of in designated containers. Do not short-circuit the battery, fire hazard!

This device is classified as a device of the class A (EN 55011). Class A equipment is intended for use in an industrial environment. It may be potential difficulties in ensuring electromagnetic compatibility in other environments, due to conducted as well as radiated disturbances.

1.2 Unpacking the R&S EDS300 DME/PULSE Analyzer

1. Unpack the R&S EDS300 DME/PULSE Analyzer.



2. Examine the equipment for obvious damages.

3. Test the accessories supplied!
 - Table Power pack with cable
 - Operating Manual



We recommend that you recycle the packaging material. If you have questions regarding service or other problems with the equipment, you can contact us by telephone or fax.

 ROHDE & SCHWARZ Service Operations West	
	(49) / 2203 / 49-51406 (49) / 2203 / 49-51402
	(49) / 2203 / 49-51642

1.3 Application and Features of the R&S EDS300 DME/PULSE Analyzer

1.3.1 Applications of the R&S EDS300 DME/PULSE Analyzer

The **R&S EDS300 DME/PULSE Analyzer** is used to test terrestrial DME radio navigation equipment. Due to its extremely high input sensitivity and its receive bandwidth of 960 MHz ... 1215 MHz, ground-based DME systems at airports as well as airborne DME equipment in the aircraft can be tested based on the N DME standards.

The **R&S EDS300 DME/PULSE Analyzer** facilitates accurate level measurements, pulse form analysis and the identification of DME stations. Measuring functions for other terrestrial navigation signals (e.g TACAN analysis) can be integrated as an optional expansion.

- Main characteristics:
 - Compatible with ICAO Doc. 8071 and ICAO Annex 10
 - High input sensitivity of -90 dBm
 - Excellent protection against interference (inside and outside the band being used)
 - Very precise level measurement
 - Pulse form analysis
 - Measurement of DME/N systems
 - Analysis of stationary and mobile TACAN stations
 - Various synchronization options (GPS, trigger and remote control options)

Examples of metrological fields of application:

- Verification of terrestrial radio navigation equipment (DME-N systems)
 - Ground-based DME equipment
 - Airborne DME equipment
- Measurement and evaluation of all the parameters in the case of high interference field strengths

1.3.2 Features of the R&S EDS300 DME/PULSE Analyzer

The **R&S EDS300 DME/PULSE Analyzer** is characterized by the following features:

- Compact housing design and lightweight construction
- High-resolution 6.4" TFT display (VGA, 640x480), can also be read easily in direct sunlight
- Remote control of the device via the LAN interface
- Measurement data transfer via the interfaces (LAN, USB)

- High long-term stability and reproducibility due to digital signal processing
- All measurement data of a mode:
 - DME**,
 - Multi DME** (Option EDS-K5)
 - TACAN** (Option EDS-K1),
 - PULSE View** (Option EDS-K2),
 - GPS** (Option EDS-K3),are shown simultaneously on the display.
- Expandable to up to two receive channels, option EDS-B1
- Scanning mode (option) of multiple DME stations when two receive channels are available (Option EDS-B1)
- Interrogator function in 20 W / 500 W power category with the transmitter modules (Low Power Interrogator, Option EDS-B2 (20 W) and (High Power Interrogator, Option EDS-B4 (500 W))
- Measurement of the carrier frequency and the modulation frequencies with the accuracy of the reference oscillator
- Automatic allocation of the receive channels in compliance with ICAO Annex 10
- High level measurement accuracy
- Position data recording (GPS, Option EDS-K3) via NMEA-0183 and customer-specific protocols
- Built-in speaker and headphone output
- Interfaces:
 - Trigger IN / OUT,
 - Analog IN / OUT,
 - Suppressor input,
 - 4 x USB 2,0, 1 x eSATA*, 1 x LAN, 1 x RS232
 - 1 x DVI-D (24+1)
- * Option

1.4 Views of the Device

1.4.1 Front View

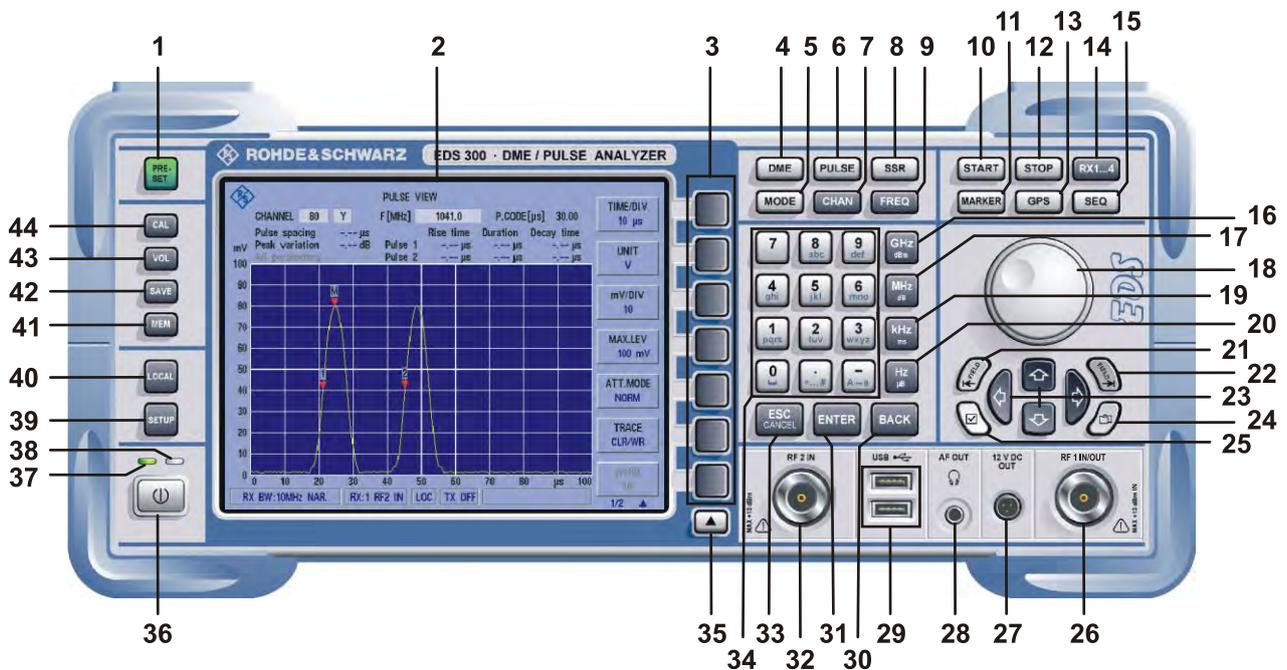


Figure 1-1: shows the front view of the R&S EDS300 DME/PULSE Analyzer

1	PRESET button
2	TFT Colour Display (640 x 480 Pixels)
3	Softkeys (Program-dependent function keys)
4	DME mode button (selection of DME mode)
5	MODE button (no function)
6	PULSE mode button (selection of Pulse view mode, option)
7	CHAN editor button (Channel input)
8	SSR mode button (no function)
9	FREQ editor button (Frequency input)
10	START button (USB Data-Loggerr)
11	Marker button (Marker function)
12	STOP button (USB Data-Loggerr)
13	GPS button (selection of GPS function, option)
14	RX1 / RX2 (selection of Receiving Unit, RX2 option)
15	SEQ mode button (selection of Multi DME mode, Option EDS-K5)

16	GHz button (Frequency input in GHz)
17	MHz button (Frequency input in MHz)
18	Rollkey with ENTER function
19	kHz button (Frequency input in kHz)
20	Hz button (Frequency input in Hz)
21	Not set
22	Not set
23	Arrow (cursor) buttons
24	Screenshot button (Stored image of a current display)
25	Not set
26	RF 1 IN (Antenna input 1, N plug) Note: If equipped with the interrogator options EDS-B2 / EDS-B4, the RF1 IN/OUT is simultaneously used as HF output when in operation.
27	12 V DC OUT (DC output for active receiving antenna)
28	AF OUT (Headphone output)
29	USB (2x USB 2.0 ports)
30	BACK button (Backspace button)
31	ENTER button (Confirmation button)
32	RF 2 IN (adjustable over the setup)
33	ESC button (Cancel input)
34	Numeric keypad (numerical input)
35	Softkey extension (active in several menu windows, indication in the display 1/2▲ resp. 2/2▲)
36	POWER button (ON / OFF switch)
37	Operating LED, green (Power "ON")
38	Standby LED, orange
39	SETUP button (selection of SETUP menu)
40	LOCAL button (Switch between Local / Remote)
41	MEM button (no function)
42	SAVE button (no function)
43	VOL button (Volume setting)
44	CAL button (Calibrate service function)

1.4.2 Rear View

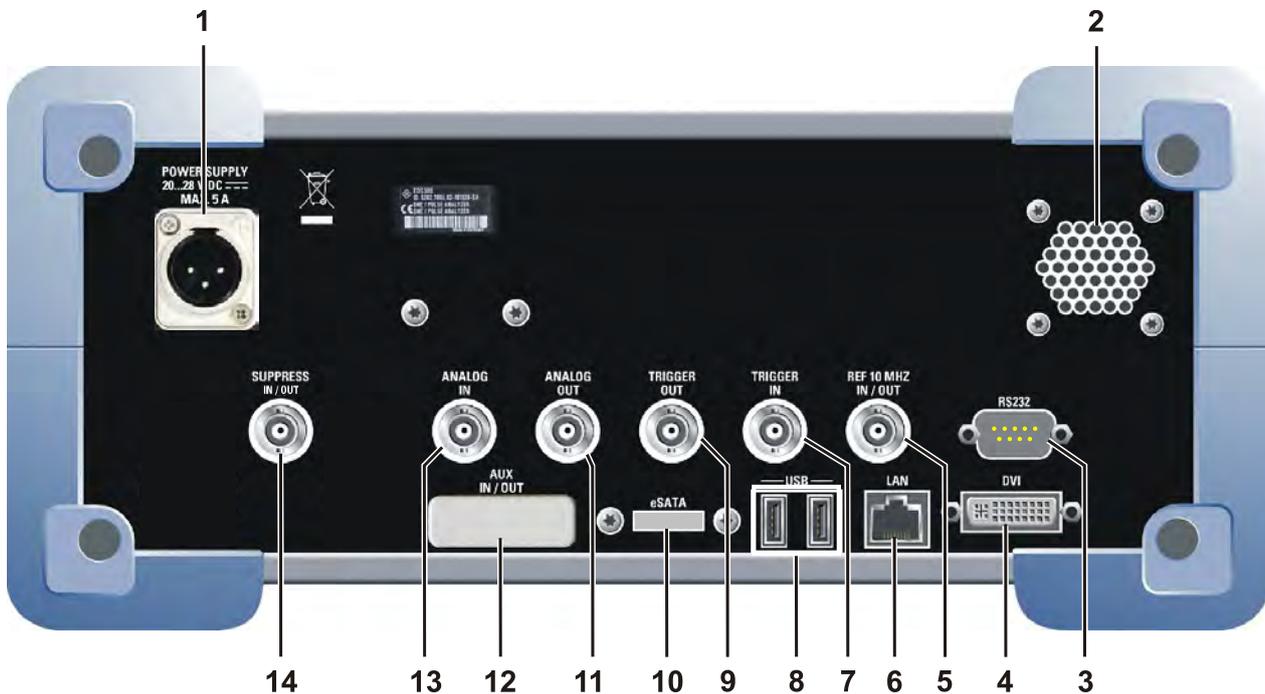


Figure 1-2: shows the rear view of the R&S EDS300 DME/PULSE Analyzer

1	POWER SUPPLY (24 VDC) power supply connection for table power pack/external feed
2	Speaker
3	RS232 interface
4	DVI-D interface (Interface connection of an external monitor)
5	REF 10 MHZ IN/OUT (10 MHz Reference Frequency IN / Out)
6	NETWORK 100 BASE-T (LAN interface)
7	TRIGGER IN, 100 k Ω
8	USB (2x USB 2.0 ports)
9	TRIGGER OUT, 50 Ω
10	eSATA (no function)
11	ANALOG OUT, 50 Ω (Output for the analog signal, selection through setup)
12	AUX IN/OUT (no function)
13	ANALOG IN, 50 Ω (Input for the analog signal, selection through setup)
14	SUPPRESS IN/OUT, (Input and Output for the "Suppressor Line")

2 Preparation

2.1 Setting up the Equipment

The **R&S EDS300 DME/PULSE Analyzer** can be operated in a variety of places without detrimental effects on its features. Even the movement caused by transportation or mobile use will not impair its functioning.

NOTICE

Ensure sufficient circulation of the ambient air so as not to impair the device functions!



The device operates at ambient temperatures between +5 ... +40 °C.
Storage temperature range -20 ... +70 °C.

2.1.1 Power Supply connection

2.1.1.1 General

To ensure high mobility and flexibility in the use of the **R&S EDS300 DME/PULSE Analyzer** the device must be operated only on DC power (20 ... 28 VDC). This can be supplied from the table power pack or from external DC power sources (with the corresponding technical data (20 ... 28 VDC, 5.0 A).

NOTICE

The power connection plug (table power pack) must only be plugged into a two-pin grounded socket! The length of the DC cable must be <3 m. The device must not be connected to available direct voltage networks.

2.1.1.2 Table Power Pack connection

NOTICE

When operating on the 230 V AC power supply only the supplied table power pack must be used!

The **R&S EDS300 DME/PULSE Analyzer** is to be connected to the table power pack as follows:

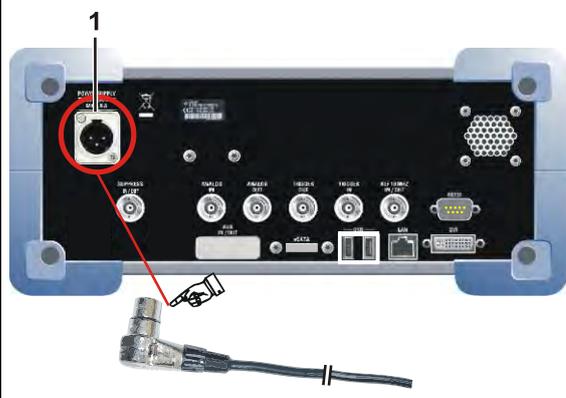
1. Connect the power cable to the table power pack and to a main power socket.



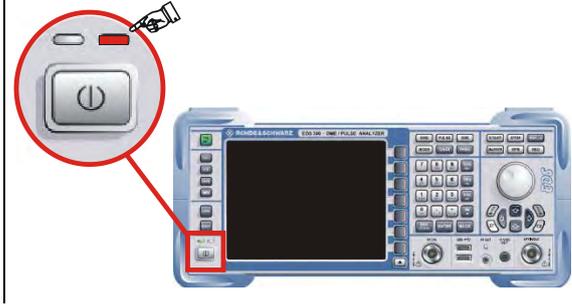
2. The green operating LED of the table power pack will light up.



3. Connect the DC connector of the table power pack to the POWER supply connection (1) on the back of the device.



4. The orange standby LED of the device will light up.



2.1.1.3 12 / 28-DC / DC-Converter

To facilitate mobile operation, a 12-V to 28-Volt converter can be interconnected.

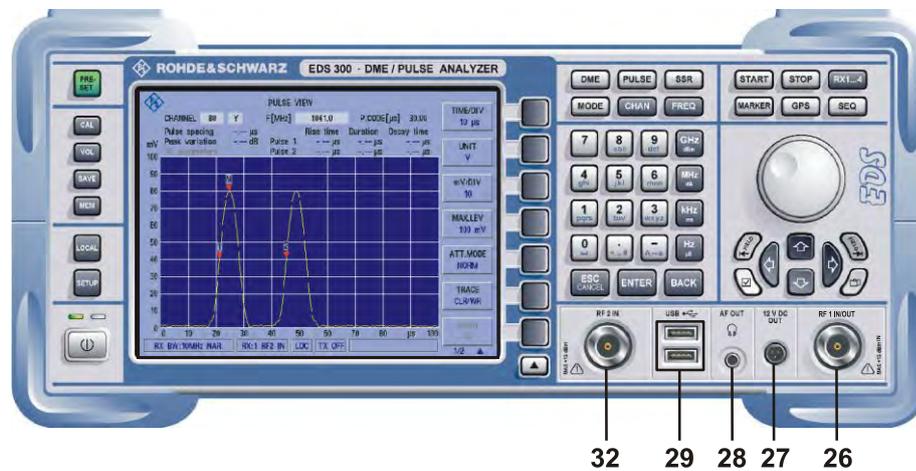


This converter is available as an accessories.

2.1.1.4 Internal clock

The **R&S EDS300 DME/PULSE Analyzer** contains an internal clock. A Lithium battery supplies this clock with the necessary voltage when the unit is switched off. If the Lithium battery is empty (life-span is approximately 5 years), the time and date will be lost. To exchange the Lithium battery the unit has to be opened, which may only be done by a competent service authority.

2.1.2 Connection of the Signal / Control-In / Outputs on the front of the device



2.1.2.1 Receiving antenna connection (26)

On the **RF-input (RF1 IN (26))** the **R&S® EDS300 DME/PULSE Analyzer** is connected with one of the receiving antennae (max. +13 dBm) corresponding to the frequency range.



If equipped with the interrogator options EDS-B2 / EDS-B4, the RF1 IN/OUT is simultaneously used as HF output when in operation. For this, the R&S® EDS 300 DME / PULSE Analyzer must be connected to a transmitter antenna of equivalent frequency range and power range (low power mode (20 W), high power mode (500 W)).

NOTICE

Normal operation:

To prevent destruction of the transmitter modules, transmission is only permissible with termination.

Laboratory operation:

To prevent destruction of laboratory equipment in laboratory operation, it is essential to interconnect a 30 dB attenuation element in low power mode and a 40 dB attenuation element in high power mode.

2.1.2.2 Voltage supply for external consumers (27)

Via the port 12 V DC OUT (27), DC voltage (12 VDC, 300 mA) to supply an active receiving antenna with power, for example, is output permanently.

2.1.2.3 Headphone connection (28)

Connection of a headphone with a 3.5 mm jack plug into AF OUT plug (28).

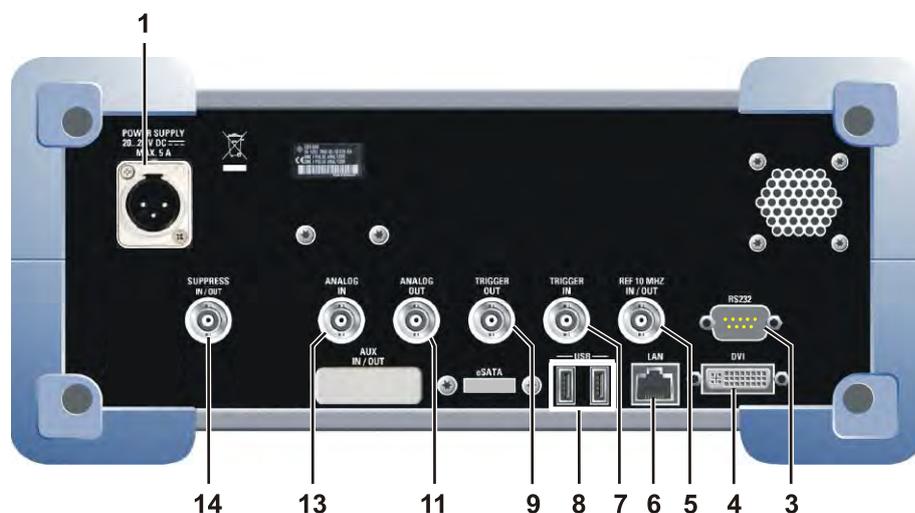
2.1.2.4 USB port connection (Twin-Port, 29)

USB 2.0 ports for measurement data transfer for storage media, e.g. USB memory stick, USB hard disks.



Only USB sticks with the FAT / FAT32 file system are supported!

2.1.3 Connection of the Signal/Control-In/Outputs on the back of the device



2.1.3.1 Power Supply connection (1)

Through the power supply connection (POWER SUPPLY, 1), the table power pack or an external DC power source (20 ... 28 VDC) is connected.

NOTICE

When connecting the device to an external direct voltage source, a 5-A fuse protection must be provided! The length of the DC cable must be <3 m. The device must not be connected to available direct voltage networks.

2.1.3.2 RS232 interface(3)

Through the RS232 interface (3), a GPS receiver is connected. The NMEA protocol data is read in and displayed in GPS mode (option EDS-K3). The baud rate is adjustable over the GPS menu.

2.1.3.3 DVI interface (4)

An external monitor (TFT) can be operated via the **DVI (1*) interface (4)**.

*1 DVI (Digital Visual Interface)

2.1.3.4 10-MHz Reference frequency IN / OUT (5)

Via the port **REF 10 MHZ IN/OUT (5)** an internal reference frequency can be output for synchronization, or 10 MHz can be supplied externally. The setting is made in the setup.

2.1.3.5 LAN connection (6)

Through the **LAN connection (Fast Ethernet) (9)**, all functions of the device and the data transfer of the measurement data of the **R&S® EDS300 DME/PULSE Analyzer** can be remotely operated from a PC / network. IP Addresses and subnet mask identifier are set in the setup menu. The data transfer rate is 100 Mbit/s.

2.1.3.6 Trigger input (7)

Via the **TRIGGER IN (7)** input, digital trigger signals, e.g. from the DME transmission system. can be fed in PULSE View mode for external triggering.

2.1.3.7 USB Ports (Twin-Port, 8)

USB 2.0 ports for measurement data transfer for storage media, e.g. USB memory stick or USB hard disks.

2.1.3.8 Trigger output (9)

Via the output **TRIGGER OUT** (9), digital trigger signals can be output, e.g. pulse triggers for controlling the DME transmission system. The corresponding settings of the trigger output are made in the setup.

2.1.3.9 Signal output ANALOG OUT (11)

The analog signal output **ANALOG OUT** (11) can be used as an output for the analog baseband signal, the 15-Hz / 135-Hz signals or the audio signal. The corresponding setting of the signal type is made in the setup.

2.1.3.10 Signal input ANALOG IN (13)

Via the **ANALOG IN** (13) input, an analog baseband signal can be fed to the **R&S® EDS300 DME/PULSE Analyzer** for analysis. The selection as well as settings for the input are made in the setup.

2.1.3.11 SUPPRESS signal in- / output (15)

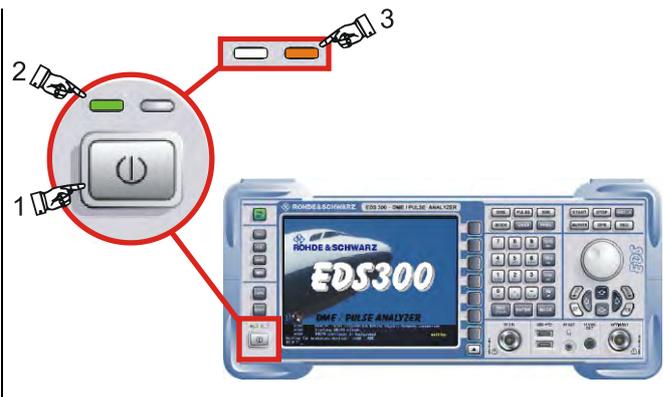
Switch signal in- / output (Suppressor Line, effects temporary switch-off of the on-board receiver in aircraft), also serves as a protection function for receivers when FIS (Flight Inspection Systems) is used.

3 Operation

3.1 Switching the R&S EDS300 DME/PULSE Analyzer (ON / OFF)

To switch on or off the device press the "Power" (1) button.

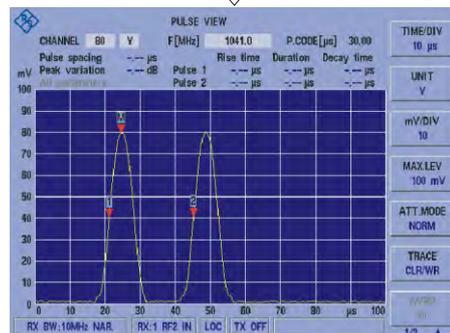
When switching the device on, the operation LED (2, green) lights up instead of the standby LED (3, orange).



3.1.1 Power-Up Process

The boot process of the **R&S EDS300 DME/PULSE Analyzer** and its progress is indicated. Then the device switches over automatically into the last using measurement mode.

Note: When switched on, the device is generally in the measurement mode that was active when the device was switched off.

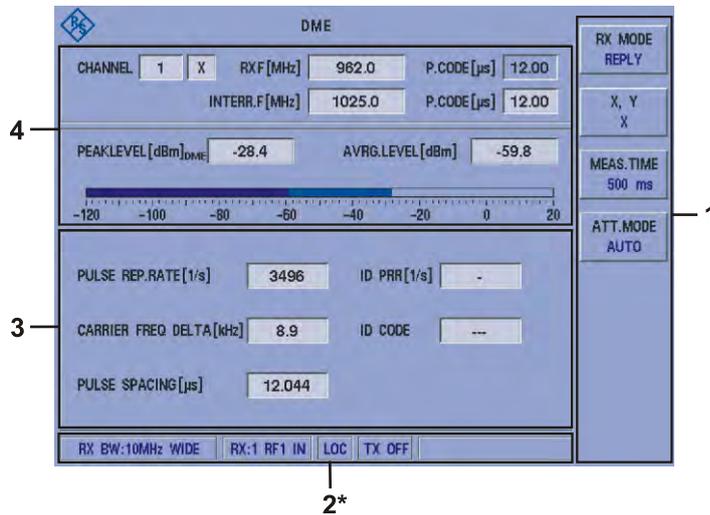


If a failure occurs when booting the device, switch it off and make a restart after a few seconds. If a failure occurs again we recommend to contact Rohde & Schwarz.

3.2 Description of the Display and the Controls

3.2.1 Display Layout

General example of the display layout in DME mode.



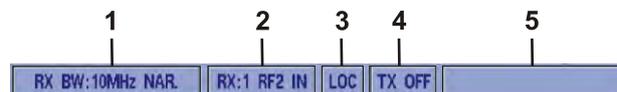
Example: DME mode

Item	Function
1	Softkeys
2*	Status section
3	Measured values section
4	RF Parameter section

3.2.1.1 Status section (2*)



In all modes, the status section shows just general specific device information exception is the mode display.



Item	Display	Function	Indication
1	Options and status section	Display e. g. of the set RF- and demodulation bandwidth.	e. g. RX BW:0.5MHz NAR.

Item	Display	Function	Indication
2	RX:	Display of the set receiver unit (RX 1 / RX 2) to select the RF input (RX 2 = option)	RX 1 / RX 2
3	LOC / REM / RLC	LOC "LOCAL"= local operation REM "REMOTE"= remote operation (the function can be switched off over the button "LOC") RLC "REMOTELock" = the local operation is locked by remote control (also see control command "REMOTELock")	LOC / REM / RLC
4	TX ON / TX OFF	Display of the transmitting status, when the transmitter is switched on the display "TX ON" will appear in yellow colour.	TX ON, TX OFF
5	Info Statusfeld	Diverse displays on the current USB status and VSWR status. Display e. g. Mount USB-Stick, Can't mount USB-Stick, Mount USB-Stick: OK, Unmount USB-Stick: OK, USB LOGGING ON, LOGGING STOPPED, VSWR (Vswr too big, red colour)	see function

NOTICE

The status display VSWR signals an excessive standing wave ratio; for safety reasons (destruction of the interrogator module), transmission operation should be switched off and the fault should be identified and corrected!

3.2.2 Controls

Settings on the R&S EDS300 DME/PULSE Analyzer can be made as well with the rollkey as with the arrow buttons / Numeric keypad.

3.2.2.1 Numeric keypad

The numeric keypad is used for numerical entries into the device. The relating edit windows can be activated either by the softkeys or by the "FREQ" button. An entry can

be confirmed with the "Enter" button (e.g. the entered value is accepted) or it can be aborted with the "ESC" button. If the entry is aborted the old value is automatically reactivated. In addition, when using the "BACK" (backspace) button, the last input character can be deleted. If alphanumeric input is required, the numeric keypad can be switched automatically to alpha input. The respective letter of a button is selected via a toggle switch.



A set receiving frequency can be confirmed as well with the "ENTER" button as with the corresponding dimension button (Hz ... GHz)!

Example: Frequency modification

	Control	Operation	Function
1.		Press the "FREQ" (9) button.	Activating the frequency input, the frequency section is activated and behind the last digit the cursor appears. 
2.	 ... 	Direct entry of the desired receiving frequency.	The frequency should be entered with the corresponding decimal place. 
3.	 /  	Confirm	Changeover to the new set frequency. 

3.2.2.2 Rollkey

The rollkey is a universal control element for value changes and to confirm them by its push function. The rollkey can also be used for navigation purposes in the setup or in the scroll listings. To change a value the relating edit function must be active.

Example: Changing a numerical value

	Control	Operation	Function
1.		Press the "FREQ" (9) button.	Activating the frequency input, the frequency section is activated and behind the last digit the cursor appears. 

	Control	Operation	Function
2.		Turn the rollkey until the right value is displayed. 	- = value decreases + = value increases
3.		Confirm (push rollkey)	Changeover to the new set frequency. 

Example: Setup navigation (change setting of the receiver unit RX Board 1)

	Control	Operation	Function
1.		Press the "SETUP" (39) button.	Activates the setup menu.
2.		Press the "SIGNAL IN" softkey	Changeover the menu window "SIGNAL IN" settings.
3.		Selecting the menu point "RX Board 1".	- = move ↑ + = move ↓
4.		Confirm (push rollkey)	Now changes can be concluded.
5.		Select 	- = move ↑ + = move ↓
6.		Confirm (push rollkey)	Acceptance of the new changes.

3.2.2.3 Arrow buttons

The arrow buttons are for changing values or it can for navigation in the setup. To change a value the relating edit function must be active. Always the entry must be confirmed with the "Enter" button or by pushing the rollkey.

Example: Changing a numerical value:

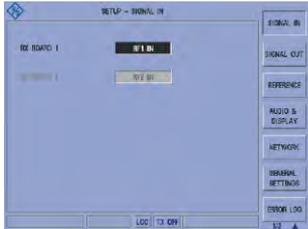
	Control	Operation	Function
1.		Press the "FREQ" (9) button.	Activating the frequency input, the frequency field is highlighted in white and behind the last digit the cursor appears. 
2.		Hold the arrow button depressed until the wanted cursor position is reached. Use the up/down arrows to change the value. 	← = Cursor moves to the left → = Cursor moves to the right ↑ = value increases ↓ = value decreases
3.		Press the Enter button / push rollkey.	Changeover to the new set value. 

Example: Setup navigation (change setting of the receiver unit RX Board 1)

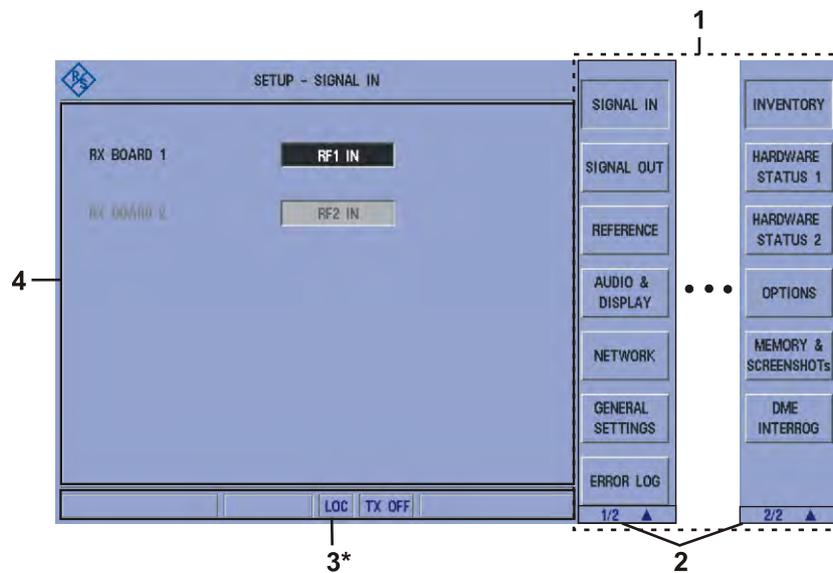
	Control	Operation	Function
1.		Press the "SETUP" (39) button.	Activates the setup menu.
2.		Press the "SIGNAL IN" softkey	Changeover the menu window "SIGNAL IN" settings.
3.		Selecting the menu point "RX Board 1".	↑ = Move up ↓ = Move down
4.		Press the Enter button / push rollkey.	Now changes can be concluded.
5.		Select 	↑ = Move up ↓ = Move down
6.		Press the Enter button / push rollkey.	Acceptance of the new changes.

3.3 Settings in the Setup menu

3.3.1 Activates the setup menu

	Control	Operation	Function
1.		Press the "SETUP" (39) button.	The R&S EVS300 switches over into the setup menu. 

3.3.2 General



3* for general description of the status section, refer to 3.2.1.1



Due to the multitude of settings offered, two softkey bars(1) are available. The currently displayed softkey bar (2) will be identified with the 1/2▲ e.g. 2/2▲ -symbol (3). Use the "☐" -button to switch back and forth between the softkey bars.

In the setup menu the following menu windows can be opened by the softkeys:

Softkey bar 1

- Menu window; SIGNAL IN (signal input settings),
- Menu window; SIGNAL OUT (signal output settings),

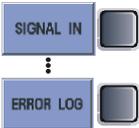
- Menu window; REFERENCE (reference frequency settings)
- Menu window; AUDIO & DISPLAY (Display and audio setting),
- Menu window; NETWORK (LAN-interface setting),
- Menu window; GENERAL SETTINGS (Base setting of the device),
- Menu window; ERROR LOG (Call-up the Error Log).

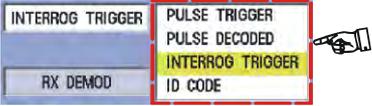
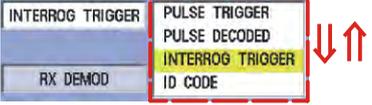
Softkey bar 2

- Menu window, INVENTORY (Call-up the Inventory)
- Menu window; HARDWARE STATUS 1 (device operating parameters for the mainboard, DU board and power supply),
- Menu window; HARDWARE STATUS 2 (device operating parameters for the receiver units, low power interrogator and high power interrogator),
- Menu window; OPTIONS (Call-up the optional upgrading),
- Menu window; MEMORY & SCREENSHOTS.
- Menu window; DME INTERROG (interrogator function settings)

3.3.3 General operating steps in the setup menu

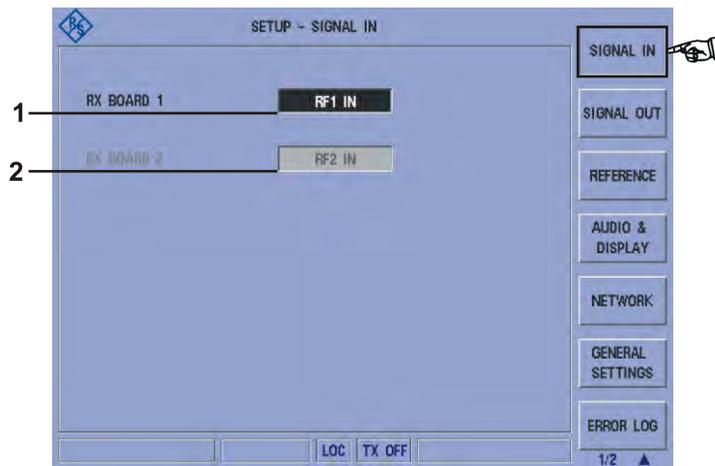
The general operating steps are described below. They explain the repeating operation steps, which are necessary for navigation and setting changes. For further setup operation these steps are required.

	Control	Operation	Function
1.		<p>Press the softkey to open the menu.</p> 	<p>The activated softkey is displayed pressed.</p> 
2.		<p>Navigate to the individual selection window.</p> <p>- = move ↑ + = move ↓</p>	<p>In the active menu window a selection window is always shown black shadowed. From here on you can navigate with the rollkey.</p> 

	Control	Operation	Function
Selection window with edit function			
3.		Press the Enter button / push rollkey.	Activates the edit function in the selection window. 
4.		Turn the rollkey repeatedly until the required value appears.	- = value decreases + = value increases 
5.		Press the Enter button / push rollkey.	Acceptance of the new set value. The setting is immediately active. 
Selection-list			
6.		Press the Enter button / push rollkey.	Activates the selection-list. 
7.		Turn the rollkey repeatedly until the required value appears.	
8.		Press the Enter button / push rollkey.	Acceptance of the new set value. The setting is immediately active.

3.3.4 Settings for the Signal Inputs

	Control	Operation	Function
1.		Press the softkey "SIGNAL IN".	Changeover into the "SIGNAL IN" menu window.



Item	Display	Function	Indication
1	RX BOARD 1 (2*)	Selection of the RF input (RF 1 / 2 IN) or switchover to the baseband signal at the analog input to receiving unit RX 1.	RF 1 IN RF 2 IN BB IN
2	RX BOARD 2 (1*, 2*)	Selection of the antenna input (RF 1 / 2 IN) or switchover to the baseband signal at the analog input to receiving unit RX 2.	RF 2 IN RF 1 IN BB IN

1* can be set only when equipped with option EDS-B1

2* in Multi DME mode (option EDS K-5) the selection for the RX Board 1 will be used also for RX Board 2

3.3.4.1 Analysis Selection of Receiving Unit RX1 / RX2

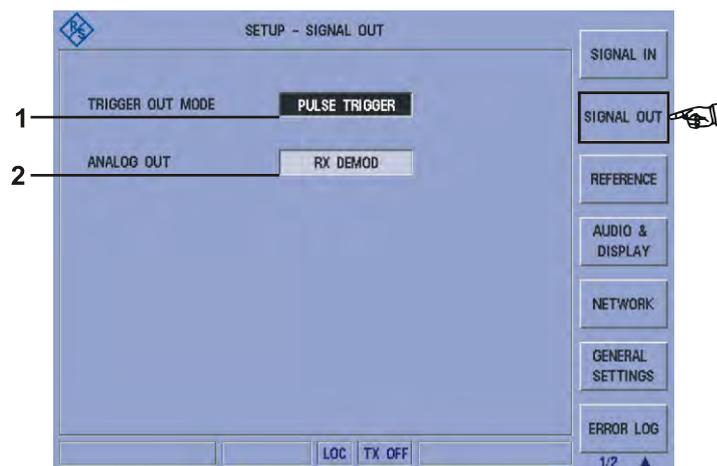


The following settings can be made individually for any available unit (RX 2 optional).

	Control	Operation	Function
1.		Selection of the "RX BOARD 1 / 2" selection window according to section 3.3.2.	
2.		Turn the rollkey repeatedly until the required selection appears.	Selection of the RF input signal (RF 1 / RF 2) or switchover to the baseband signal at the analog input for further analysis in the device. Selection: RF 1 IN / RF2 IN, BB IN
3.		Press the Enter button / push rollkey.	Acceptance of the new set selection.

3.3.5 Settings for the Signal Outputs

	Control	Operation	Function
1.		Press the softkey "SIGNAL OUT".	Changeover into the "SIGNAL OUT" menu window.



Item	Display	Function	Indication
1	TRIGGER OUT MODE	Selection of the trigger signal for the trigger output "TRIGGER OUT" Indication: PULSE_TRIGGER, PULSE DECODED, INTERROG TRIGGER, ID_CODE, MRB_TRGGER (1*), ARB_TRIGGER (1*) MDME SLOT (2*)	see function
2	ANALOG OUT	Signal selection for the analog output "ANALOG OUT"	RX_DEMOD, DET ENVELOPE, DET 15HZ (1*), DET 135HZ (1*) DET ID

1* can only be selected for the option EDS-K1 TACAN analysis

2* can only be selected for the option EDS-K5 Multi DME

3.3.5.1 Setting of the Trigger Type

	Control	Operation	Function
1.	Selection of the "TRIGGER OUT MODE" selection window according to section 3.3.2.		
2.		Turn the rollkey repeatedly until the required selection appears.	Selection of the trigger type for controlling a DME transmission system. Selection: PULSE_TRIGGER, PULSE DECODED, INTERROG TRIGGER, ID_CODE, ARB_TRGGER (1*), MRB_TRIGGER (1*) MDME SLOT (2*)
3.		Press the Enter button / push rollkey.	Acceptance of the new set selection.

1* can only be selected for the option EDS-K1 TACAN analysis

2* can only be selected for the option EDS-K5 Multi DME

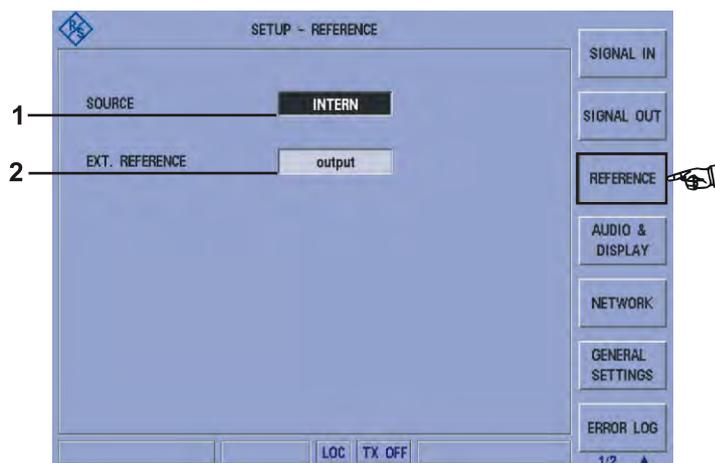
3.3.5.2 Settings for the Analog Signal Output

	Control	Operation	Function
1.		Selection of the "ANALOG OUT" selection window according to section 3.3.2.	
2.		Turn the rollkey repeatedly until the required selection appears.	Selecting a signal from the analog device signals that are output at the analog signal output "ANALOG OUT". Selection: RX_DEMOD, DET ENVELOPE, DET 15HZ (1*), DET 135HZ (1*) DET ID
3.		Press the Enter button / push rollkey.	Acceptance of the new set selection.

1* can only be selected for the option EDS-K1 TACAN analysis

3.3.6 Settings for the Reference Frequency Output

	Control	Operation	Function
1.		Press the softkey "REFERENCE".	Changeover into the "REFERENCE" menu window.



Item	Display	Function	Indication
1	SOURCE	Assignment as to whether the reference	INTERN,

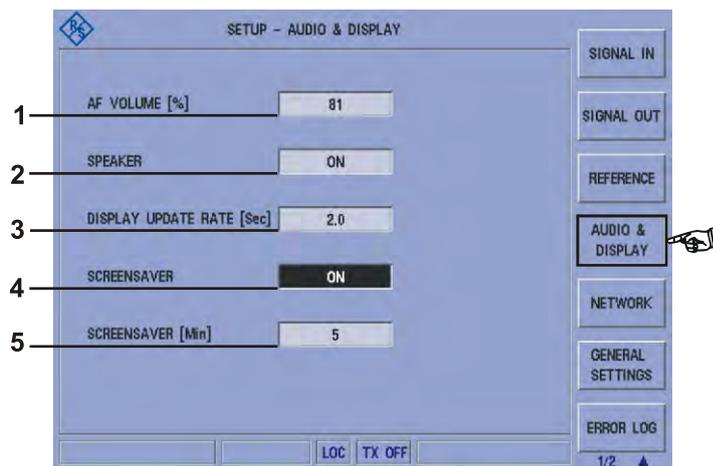
Item	Display	Function	Indication
		frequency port "REF 10 MHZ IN/OUT" is set as an input or an output.	EXTERN
2	EXT. REFERENCE	Indication as to whether an external 10-MHz reference signal is applied or whether the internal 10-MHz reference signal is being output.	Present, not present, output

3.3.6.1 Settings for the 10-MHz Reference Frequency Port

	Control	Operation	Function
1.		Selection of the "SOURCE" selection window according to section 3.3.2.	
2.		<p>Turn the rollkey repeatedly until the required selection appears.</p> <p>If "INTERN" is set, the reference frequency port acts as an output. In this case, the internal 10-MHz reference frequency signal is applied for synchronizing other devices. In the "EXT. REFERENCE" display, "output" confirms the setting.</p> <p>If "EXTERN" is set, the reference frequency port acts as an input. In this case, an external 10-MHz reference frequency signal can be fed for synchronizing the device. In the "EXT. REFERENCE" display, "present" confirms the setting if an external reference signal is applied. If a reference signal is not applied, "not present" will be displayed and the internal reference will automatically be selected.</p>	<p>Setting defining whether the reference frequency port "REF 10 MHZ IN/OUT" is set as an input or an output.</p> <p>Selection: EXTERN /INTERN</p>
3.		Press the Enter button / push rollkey.	Acceptance of the new set selection.

3.3.7 Setting the Audio- und Display characteristics

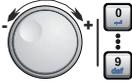
	Control	Operation	Function
1.		Press the softkey "AUDIO & DISPLAY".	Changeover into the "AUDIO & DISPLAY" menu window.



Item	Display	Function	Indication
1	AF VOLUME [%]	Setting of the AF-output level (loudspeaker)	0 ... 100 %
2	SPEAKER	Switch ON / OFF the loudspeaker	ON / OFF
3	DISPLAY UPDATE RATE [Sec]	Setting of the display update time	0.1 s ... 2 s
4	SCREENSAYER	Switching the display saver ON/OFF. If the display saver is activated, it is possible to set a switch-off period using the "SCREENSAYER [Min]" setting.	ON / OFF
5	SCREENSAYER [Min]	Setting the switch-off period of the display saver.	1 ... 60 Min

3.3.7.1 Setting the AF Volume

	Control	Operation	Function
1.		Selection of the "AF VOLUME" selection window according to section 3.3.2.	

	Control	Operation	Function
2.		Setting the corresponding value with rollkey / keyboard.	Setting the AF-volume, this will affect the headset and loudspeaker output volume Setting value: 0 ... 100 %
3.		Press the Enter button / push rollkey.	Acceptance of the new set value.

3.3.7.2 Setting the Display Update Rate

	Control	Operation	Function
1.		Selection of the "DISPLAY UPDATE RATE" selection window according to section 3.3.2.	
2.		Setting the corresponding value with rollkey / keyboard.	Display update rate setting (measurement values DME-, PULSE VIEW-Mode) update in the display. Setting value: 0.1 ... 2 s
3.		Press the Enter button / push rollkey.	Acceptance of the new set value.

3.3.7.3 Setting the Loudspeaker (ON / OFF)

	Control	Operation	Function
1.		Selection of the "SPEAKER" selection window according to section 3.3.2.	
2.		Select	ON / OFF sound of the loudspeaker. Selection: ON / OFF
3.		Press the Enter button / push rollkey.	Acceptance of the new set function.

3.3.7.4 Switching the display saver (ON / OFF)

	Control	Operation	Function
1.	Selection of the "SCREENSAVER" selection window according to section 3.3.2.		
2.		Select	Switching the display saver ON/OFF. If the function is activated, the display background lighting is switched off upon expiry of the time set under the Screensaver [min] Timer. Recording of measurement values is still active Selection: ON / OFF
3.		Press the Enter button / push rollkey.	Acceptance of the new set function.



If the screen saver is activated, it is possible to set a switch-off period using the "SCREENSAVER [Min]" setting! The display is switched on by pressing a button / rotating the rollkey. The "POWER " button (36) may not be used for switching on the display as this will switch the unit off!

3.3.7.5 Setting the display turn-off time

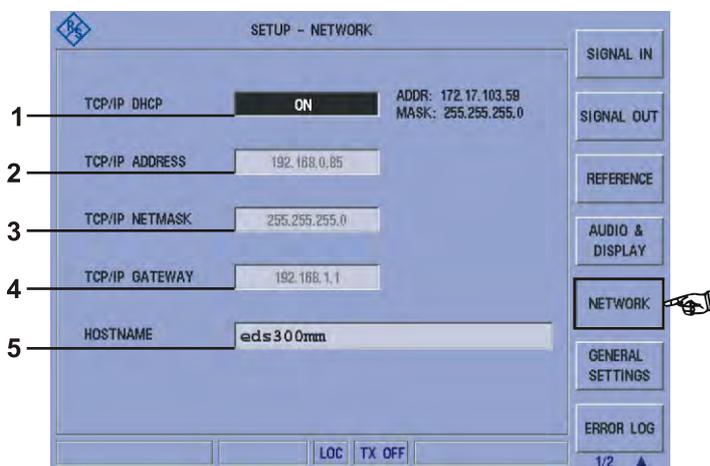
	Control	Operation	Function
1.	Selection of the "SCREENSAVER [Min]" selection window according to section 3.3.2.		
2.		Select	Switching the display saver ON/OFF. If the function is activated, the display background lighting is switched off upon expiry of the time set under the Screensaver [min] Timer. Recording of measurement values is still active Setting value: 1 ... 60 Min
3.		Press the Enter button / push rollkey.	Acceptance of the new set value.



The display can be switched on again by pressing any button. The "POWER" button (36) may not be used for switching on the display as this will switch the unit off!

3.3.8 Setting the Communication interface

	Control	Operation	Function
1.		Press the softkey "NETWORK".	Changeover into the "NETWORK" menu window.



Item	Display	Function	Indication
1	TCP / IP DHCP	Setting of the Dynamic Host Configuration Protocol (DHCP)	ON / OFF
2	TCP / IP ADDRESS	Setting of the device IP-address	xxx.xx.xx.xxx
3	TCP / IP NETMASK	Setting of the IP Netmask	xxx.xxx.xxx.x
4	TCP / IP GATEWAY	Setting of the IP Gateway	xxx.xx.x.x
5	HOSTNAME	Enter any desired device name (host name) "EDS300" (default).	e.g. "EDS300"

3.3.8.1 Setting of the Dynamic Host Configuration Protocol (DHCP)

	Control	Operation	Function
1.	Selection of the "TCP / IP DHCP" selection window according to section 3.3.2.		
2.		Select	Using the Dynamic Host Configuration Protocol (DHCP), the dynamic configuration of the IP address will be initiated. After the activation, the IP address and the submask address will be displayed next to the selection window. <div style="border: 1px solid red; padding: 2px; display: inline-block;"> ADDR: 172.17.210.191 MASK: 255.255.0.0 </div>  Selection: ON / OFF
3.		Press the Enter button / push rollkey.	Acceptance of the new set function.



If the Dynamic Host Configuration Protocol is used, all other protocol settings become inactive!

3.3.8.2 IP Address setting

	Control	Operation	Function
1.	Selection of the "TCP / IP ADDRESS" selection window according to section 3.3.2.		
2.		Enter the decimal number	Setting of the IP address to run the device in a LAN-network. e.g. 172.17.40.139
3.		Press the Enter button / push rollkey.	Acceptance of the new set IP address.

3.3.8.3 Netmask ID setting

	Control	Operation	Function
1.	Selection of the "TCP / IP NETMASK" selection window according to section 3.3.2.		
2.		Enter the decimal number	Setting of the netmask ID to run the device in a LAN-network. e.g. 255.255.255.0
3.		Press the Enter button / push rollkey.	Acceptance of the new set Netmask ID.

3.3.8.4 Gateway ID setting

	Control	Operation	Function
1.	Selection of the "TCP / IP GATEWAY" selection window according to section 3.3.2.		
2.		Enter the decimal number	Setting of the Gateway ID to run the device in a LAN-network. e.g. 192.168.1.1
3.		Press the Enter button / push rollkey.	Acceptance of the new set Gateway ID.

3.3.8.5 Assigning a Hostname

	Control	Operation	Function
1.	Selection of the "HOSTNAME" selection window according to section 3.3.2.		
2.		Enter the decimal number	Assign a device name (host name). The default name is "EDS300".
3.		Press the Enter button / push rollkey.	Acceptance of the new set device name (host name).

3.3.9 Setting the General features

	Control	Operation	Function
1.		Press the softkey "GENERAL SETTINGS".	Changeover into the "GENERAL SETTINGS" menu window.



Item	Display	Function	Indication
1	DATE [dd.mm.yyyy]	Date setting	dd.mm.yyyy
2	TIME [hh:mm:ss]	Time setting	hh:mm:ss

3.3.9.1 Date setting

	Control	Operation	Function
1.	Selection of the "DATE" selection window according to section 3.3.2.		
2.	 ... 	Enter the date.	Enter the date in the format shown (dd.mm.yyyy). e.g. 01.01.2010
3.		Press the Enter button / push rollkey.	Acceptance of the new set date.

3.3.9.2 Time setting

	Control	Operation	Function
1.		Selection of the "TIME" selection window according to section 3.3.2.	
2.	 ... 	Enter the real time.	Enter the time in the format shown (hh:mm:ss). e.g. 08:59:00
3.		Press the Enter button / push rollkey.	Acceptance of the new set time.

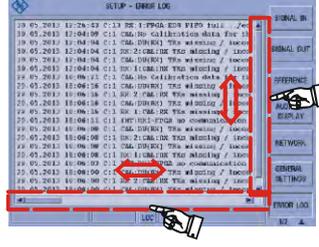
3.3.10 Call-up the Error Logbook



The error logbook contains only service information!

	Control	Operation	Function
1.		Press the Softkey "ERROR LOG".	Changeover to the "ERROR LOG" menu window. General notes pertaining to the status of the device will be entered into the error logbook. In case of a malfunction, the cause of the error can be viewed here.

The screenshot shows the 'SETUP - ERROR LOG' window. The main area contains a list of error messages with timestamps and codes, such as '30.05.2013 12:26:43 C:13 RX:1:FPGA:EDS FIFO full ./ed' and '30.05.2013 12:04:09 C:1 CAL:No Calibration data for th'. On the right side, there is a vertical menu with buttons for 'SIGNAL IN', 'SIGNAL OUT', 'REFERENCE', 'AUDIO & DISPLAY', 'NETWORK', 'GENERAL SETTINGS', and 'ERROR LOG'. A hand icon points to the 'ERROR LOG' button. At the bottom, there are 'LOC' and 'TX OFF' buttons and a '1/2' indicator.

	Control	Operation	Function
2.		With the rollkey / arrow buttons can navigate in the Error Logbook.	

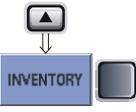


The entries can be deleted irrevocably over the button "ESC / Cancel"! Confirm the dialog " Delete all error messages from EDS300's memory?" with ENTER.

3.3.11 Call-up the Hardware / Software inventory list



The hardware / software inventory list provides information about the hardware version of the device (integrated modules, options etc.) and about the current software versions being used. This information is necessary for service purposes. Furthermore, if using a USB-memory stick (available with current software update), a software update can be processed.

	Control	Operation	Function
1.		Switch to the second menu window of the setup function and press the softkey "INVENTORY".	Changeover to the "INVENTORY" menu window. In this hardware / software inventory list the following information is displayed. Hardware: article code., serial number and revision number of the built-in modules Software: software version number. for the: Release and the relevant firmware of the built-in modules

Control	Operation	Function

3.3.11.1 Software Update

Click on the following website to receive the latest software update for your R&S EDS300 DME/PULSE Analyzer:

<http://www.rohde-schwarz.com/product/eds300>



Implementation of how to update the software is described in section 5.3!

3.3.12 Call-up the Device operating parameters



The hardware status includes the most important device operating parameters. This may contain information about possible causes of error!

Control	Operation	Function
<p>1.</p>	<p>Switch to the second menu window of the setup function and press the softkey "HARDWARE STATUS 1 / 2".</p>	<p>Changeover to the "HARDWARE STATUS 1 / 2" menu window.</p>

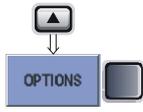
Control	Operation	Function
	<p>The "HARDWARE STATUS 1" menu window provides information about various test voltages and temperatures of the mainboard, the power pack and the antenna distributing unit (DU board).</p> <p>The "HARDWARE STATUS 2" menu window provides information about various test voltages and temperatures of the integrated receiver modules.</p> <p>Display "Status" indicates the sum of all test voltages.</p>	
	<p>HARDWARE STATUS 1</p>	<p>HARDWARE STATUS 2</p>

3.3.13 Software options

Through the menu window "Options", all software options, which are installed in the device may be displayed. Rohde & Schwarz offers the following software features as an option:

- DME-TACAN (EDS-K1, TACAN Signal Analysis),
- PULSE VIEW (EDS-K2, Pulse Shape Analysis),
- GPS (EDS-K3: GPS mode).
- DISTANCE MEASUREMENT (EDS-K4)
- MULTI DME (EDS-K5)

A licence is purchased for each respective option. The options window can be used to activate the option purchased.

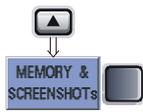
	Control	Operation	Function
1.		Switch to the second menu window of the setup function and press the softkey "OPTIONS".	Changeover to the "OPTIONS" menu window. This function displays the device-specific optional extensions.
<p>As soon as an option is activated, it will be identified as "available", otherwise, "not available" will be displayed. In addition, the device-internal MAC address of the network adapter is displayed; this information is required, since the option selection is dependant on the MAC address.</p> 			

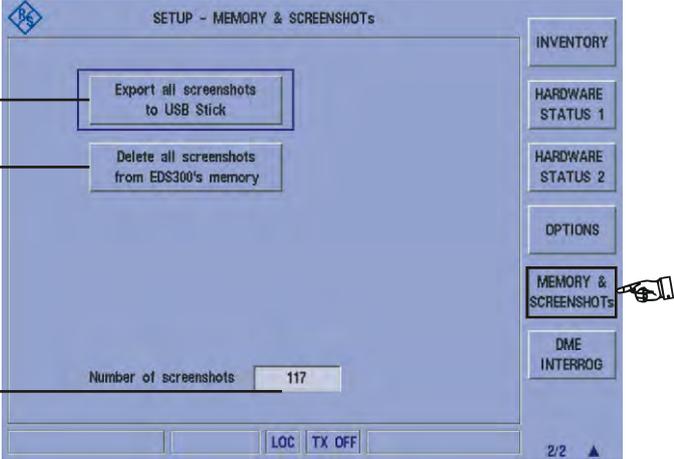


The activation of the software option is described in Section 3.12!

3.3.14 Memory & Screenshots

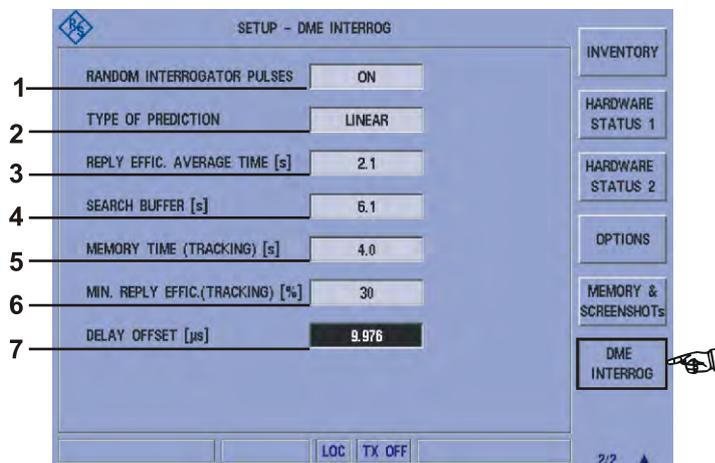
When using the menu window "Memory & Screenshots", the screenshots of the EVS memory can be deleted or copied to the USB-memory stick. They will be stored in PNG-image format (Portable Network Graphics).

	Control	Operation	Function
1.		Switch to the second menu window of the setup function and press the softkey "MEMORY & SCREENSHOTS".	Changeover to the "MEMORY & SCREENSHOTS" menu window.

	Control	Operation	Function
			
2.		<p>When using the rollkey / arrow buttons, the respective function keys 1 / 2 can be selected, and by using the Enter button / push rollkey, the function can be activated.</p>	<p>Once the appropriate function has been selected, any further process can be controlled via the dialog box.</p>

3.3.15 Settings of the DME Interrogator function

	Control	Operation	Function
1.		<p>Press the softkey "DME INTERROG".</p>	<p>Changeover to the " DME INTERROG " menu window.</p>



Item	Display	Function	Indication
1	RANDOM INTERROGATOR PULSES	Switching on / off of randomly generated squitter pulses of the internal interrogator.	ON / OFF
2	TYPE OF PREDICTION	Setting for the calculation basis of the expected reply pulse.	STATIC / LINEAR
3	REPLY EFFIC. AVERAGE TIME [s]	Setting of the average request pulse: reply pulse time ratio.	0.1 s ... 10.0 s
4	SEARCH BUFFER [s]	Setting for the storage time of the reply pulse.	0.1 s ... 50 s
5	MEMORY TIME (TRACKING) [s]	Setting for the storage time until the next search phase.	0.1 s ... 50 s
6	MIN. REPLY EFFIC. (TRACKING) [%]	Setting of the ratio for switching between track, search and memory mode.	1 ... 99 %
7	DELAY OFFSET [μ s]	Setting of the delay offset time.	-100 μ s ... 100 μ s

3.3.15.1 Generate of a Random Interrogator Pulse

	Control	Operation	Function
1.		Selection of the " RANDOM INTERROGATOR PULSES " selection window according to section 3.3.2.	
2.		Select	ON / OFF the function. Selection: ON / OFF
.		To prevent the sending of identical pulse rates from two DME interrogators, for example, a jitter is added to the pulse rate via the internal interrogator with activated function to generate a unique pulse pattern.	
3.		Press the Enter button / push rollkey.	Acceptance of the new set function.

3.3.15.2 Setting to "Type of Prediction"

	Control	Operation	Function
1.		Selection of the "TYPE OF PREDICTION" selection window according to section 3.3.2.	
2.		Select	Setting for the calculation basis of the expected reply pulse. Selection: STATIC / LINEAR
.		During the search on a DME ground station, a time of arrival of the reply pulse is calculated. For this time estimate, the relative speed between DME ground station and device is calculated. The time delay for the subsequent pulse is linearly derived from the previously measured delay. For the static setting, the relative speed is assumed to be equal zero; the time delay for the subsequent pulse is thus calculated from the mean of previous time delays.	
3.		Press the Enter button / push rollkey.	Acceptance of the new set function.

3.3.15.3 Setting to "Reply Efficiency Average Time"

	Control	Operation	Function
1.		Selection of the "REPLY EFFIC. AVERAGE TIME [s]" selection window according to section 3.3.2.	
2.		Select	Setting of the average request pulse: reply pulse time ratio. Setting value: 0.1 s ... 10.0 s
.		When setting a low average time and a small pulse repetition rate, only a very inaccurate reply efficiency can be calculated. Example: Setting reply efficiency average time 1s and pulse repetition rate 5/s, then the accuracy will be between 0 %, 20 %, 40 %, 60 %, 80 %, 100 %.	
3.		Press the Enter button / push rollkey.	Acceptance of the new set value.

3.3.15.4 Setting to "Search Buffer Time"

	Control	Operation	Function
1.		Selection of the "SEARCH BUFFER [s]" selection window according to section 3.3.2.	
2.		Select	Setting for the storage time of the reply pulse. Setting value: 0.1 s ... 50 s
.		During the search phase, all reply pulses are stored in a buffer. Reply pulses that are older than the set time are deleted. The set value should be equivalent to the value of the set reply efficiency average time.	
3.		Press the Enter button / push rollkey.	Acceptance of the new set value.

3.3.15.5 Setting to "Memory Time"

	Control	Operation	Function
1.		Selection of the "MEMORY TIME (TRACKING) [s]" selection window according to section 3.3.2.	
2.		Select	Setting for the storage time until the next search phase. Setting value: 0.1 s ... 50 s
.		The set time is the maximum storage time of the data; when this time has expired, a new search phase is triggered. The set time should at least be sufficiently long to finalise the ID transmission.	
3.		Press the Enter button / push rollkey.	Acceptance of the new set value.

3.3.15.6 Setting to "Min. Reply Efficiency"

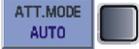
	Control	Operation	Function
1.		Selection of the "MIN. REPLY EFFIC. (TRACKING) [%]" selection window according to section 3.3.2.	
2.		Select	Setting of the ratio for switching between track, search and memory mode. Setting value: 1 ... 99 %
.		The set value represents the criterion for switching between track, search and memory mode.	
3.		Press the Enter button / push rollkey.	Acceptance of the new set value.

3.3.15.7 Setting to "Delay Offset"

	Control	Operation	Function
1.		Selection of the "DELAY OFFSET [μ s]" selection window according to section 3.3.2.	
2.		Select	Setting of the delay offset time. Setting value: -100 μ s ... 100 μ s
.		This setting allows for compensating delay times caused by cable lengths, for example.	
3.		Press the Enter button / push rollkey.	Acceptance of the new set value.

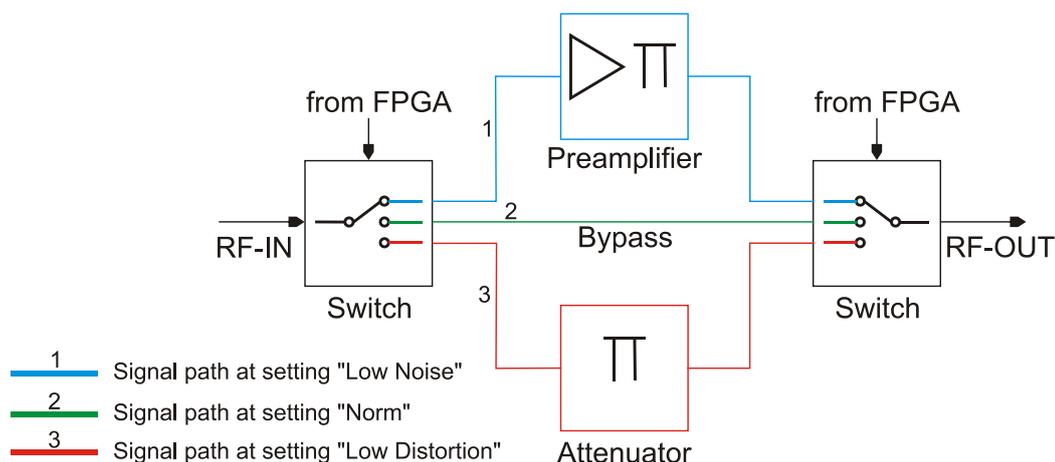
3.4 Setting of the RF-Signal Adjustment

The RF signal adjustment is available in the modes DME and PULSE VIEW.

	Control	Operation	Function
1.		Press the softkey "ATT MODE" repeatedly until the wanted mode is set.	<p>The set mode will be updated in the softkey and is then immediately active.</p>  <p>The following modes are available:</p> <ul style="list-style-type: none"> - LOW NOISE - NORM - LOW DIST (Low Distortion) - AUTO (automatic setting)

By the setting in the ATT mode the RF level can be influenced individually. As shown in the block diagram corresponding signal paths will be switched for the different functions, which effects the RF signal either with an amplification (Preamplifier), an attenuation (Attenuator) or has no influences to the signal (Bypass). For data safety on measurement the methods of the ATT mode on the following receive levels can be used:

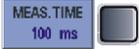
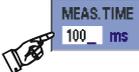
	Average Level	Peak Level
Low Noise	-110 ... -10 dBm	-100 ... -10 dBm
Norm	-100 ... +5 dBm	-90 ... +0 dBm
Low Distortion	-85 ... +12 dBm	-75 ... +12 dBm
Auto	-110 ... +12 dBm	-100 ... +12 dBm



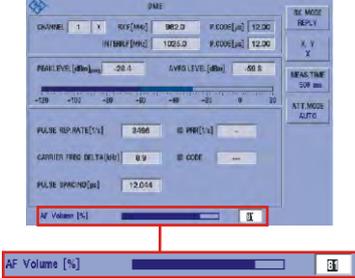
The max. input level is +13 dBm!

3.5 Setting the Measurement Interval Time

The setting of a measurement time interval is available in DME mode. The measurement time setting defines the time period, for which the measured values are averaged.

	Control	Operation	Function
1.		Press the softkey "MEAS.TIME".	Change to the editing function for setting the measurement period. The value field in the softkey will be highlighted by a different background. 
2.		Setting the corresponding measurement period using the rollkey.	The current measuring time will be carried along numerically in the softkey. Setting range: 7 ... 10000 ms 
3.		Press the Enter button / push rollkey.	Acceptance of the new set measuring time. 

3.6 AF-Volume setting

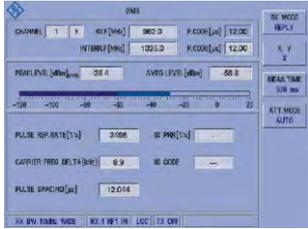
	Control	Operation	Function
1.		Press the "VOL" (43) button.	In the respective mode (e.g. ILS) the status display switches to editing function to enable the volume to be set. The change will be displayed numerically and graphically on the bargraph. Once the setting procedure has been completed, the display will return to the status indication. 
2.		Setting the AF-volume with rollkey.	Setting of the AF-volume level at the speaker. Setting range: 0 ... 100 %
3.		Press the Enter button / push rollkey.	Acceptance of the new set AF-volume level.

3.7 DME mode operation

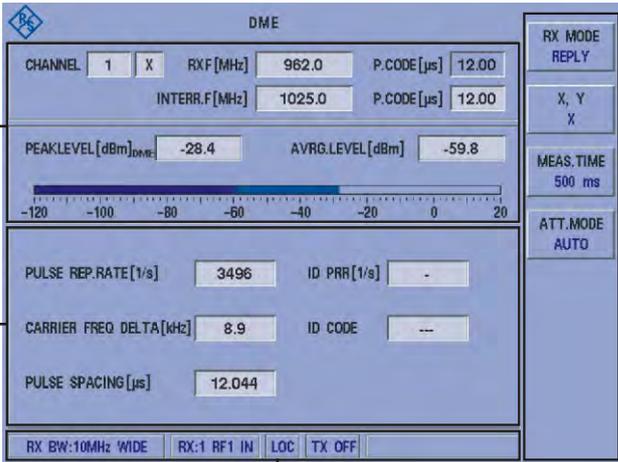


The DME mode can also perform distance measurements through optional hard- and software extensions. The relevant information can be found in the description in Section 3.8.

3.7.1 Activates the DME mode

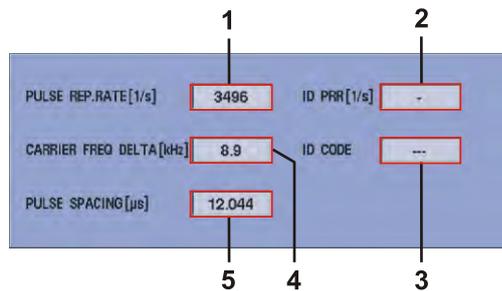
	Control	Operation	Function
1.		Press the "DME" (6) button.	The R&S EDS300 switches over into the DME mode. 

3.7.2 Signal Parameters and Display in the DME mode



2* for general description of the status section, refer to 3.2.1.1

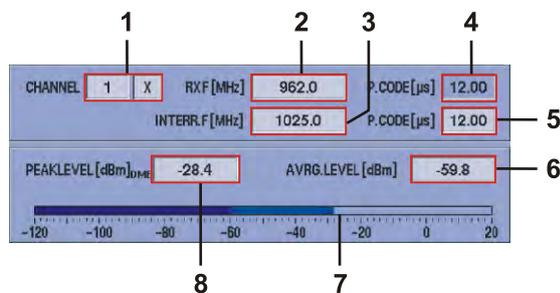
3.7.2.1 Measured Values Section (3)



Item	Display	Function	Indication
1	PULSE REPETITION RATE [1/s]	The measured pulse repetition rate of the DME signal (number of pulse pairs/s)	1/s
2	ID PRR [1/s]	The pulse repetition rate of the identifier	1/s
3	ID-CODE	The decoded code of the identifier	e.g. "IKOW"
4	CARRIER FREQ DELTA [kHz]	Display of the measured deviation relative to the set channel frequency	kHz
5	PULSE SPACING [µs]	Display of the measured pulse spacing between the pulses of a pulse pair	µs

* Measurement accuracies are given in the Technical Data!

3.7.2.2 RF Parameter Section (4)



Item	Display	Function	Indication
1	CHANNEL	Display and setting of the receiving frequency (receiving frequency setting via the channel setting according to the ICAO frequency list, channel number extension directly selectable).	e.g. 1X
2	RX F [MHz]	Display and setting of the receiver frequency for the reply pulses of the ground station (reply pulse).	MHz

Item	Display	Function	Indication
3	INTERR.F [MHz]	Display and setting of the interrogator frequency, according to the ICAO frequency list with 63 MHz frequency offset relative to the receiver frequency.	MHz
4	P.CODE [μs]	Display of the reply pulse code (distance of the double pulses), according to the ICAO frequency list. The value is set by default when setting the channel code X and Y.	μs
5	P.CODE [μs]	Display and setting of the interrogator pulse code (distance of the double pulses), according to the ICAO frequency list. Display and setting of the interrogator pulse code (distance of the double pulses), according to the ICAO frequency list.	μs
6	AVRG.LEVEL [dBm]	Display of the measured average level of the received signal.	dBm
7	Bargraph	Graphics (bargraph) of the measured received signal level. In this case, the dark blue bar indicates the average level and the light blue bar indicates the peak level.	dBm
8	PEAKLEVEL [dBm]	Display of the measured peak level of the received signal.	dBm

3.7.2.3 Softkeys (1)

Display	Function
	Changeover between the receive modes "REPLY" and "INTERROGATOR", the mode set is displayed in the softkey: <ul style="list-style-type: none"> – REPLY (signal measurement of the DME ground station) – INTERROG. (signal measurement of the DME on-board transmitter)
	Changeover between the channel codes X and Y according to the ICAO frequency list
	Activates the measurement time. Setting value: 7 ... 10000 ms (10 ms step width) Note: Setting of the measurement time is described in section 3.5!

Display	Function		
	Changeover of the RF-attenuation, set range is displayed in the softkey:		
		Average Level	Peak Level
	Low Noise	-110 ... -10 dBm	-100 ... -10 dBm
	Norm	-100 ... +5 dBm	-90 ... +0 dBm
	Low Distortion	-85 ... +12 dBm	-75 ... +12 dBm
Auto	-110 ... +12 dBm	-100 ... +12 dBm	
<p>Note: The max. input level is +13 dBm. The Setting of the RF-Signal Adjustment is described in section 3.4!</p>			

3.7.3 Selection of the Receive Mode (Reply / Interrogator)

Reply (signal measurement of the DME ground station)

Interrogator (signal measurement of the DME on-board transmitter)



When switching to the receive mode "Reply / Interrogator", the channel/frequency ranges typical for the respective mode according to the ICAO frequency list (section 3.7.5.1) will automatically be switched!

	Control	Operation	Function
1.		Switch the receive mode using the "RX MODE" softkey.	Changeover between the receive modes Reply / Interrogator, the mode set will be displayed in the softkey. 



When switching between the receive modes "Reply / Interrogator", the current channel/frequency settings will be kept.

3.7.4 Setting the Receiving Frequency in DME mode



DME frequency range: 960 MHz ... 1215 MHz, observe the ICAO frequency list in section 3.7.5.1!

	Control	Operation	Function
1.		Press the "FREQ" (9) button.	The cursor will be displayed in the frequency section to the right of the last figure. (frequency assignment according to the ICAO frequency list, 3.7.5.1)
2.		Setting the corresponding frequency with rollkey / keyboard.	Enter the frequency including the corresponding decimal place. If the frequency corresponds to a defined channel (ICAO frequency list, 3.7.5.1), the channel number in the channel display will be updated.
3.		Confirm with the corresponding unit or press the Enter button / push rollkey.	Changeover to the new receiving frequency set.
4.		Press the softkey repeatedly until the channel code (X, Y) assigned to the frequency has been set.	Setting of the corresponding channel code (X, Y), the code set will be displayed in the softkey and the related pulse code in the "P.CODE" display section. The corresponding channel code that can be set is directly dependent on the set frequency and the receive mode (Reply / Interrogator).

1. When the frequency is entered via the keyboard, the channel display will be updated only after the setting procedure has been confirmed.

DME: 960 MHz ... 1215 MHz



If this frequency range is exceeded/the value drops below this frequency range, the figures in the frequency section will be displayed in red and cannot be stored!

2. The function can be aborted at any time by pressing the "ESC" key. In this case, the value set up to that time will be restored!
3. If the frequency setting is made using the control dial / cursor keys, the corresponding channels hit according to the ICAO frequency list will be displayed in the channel window immediately.

3.7.5 Setting the Receive Channel in DME mode



DME channel range: 1X ... 126Y, observe the ICAO frequency list in section 3.7.5.1!

	Control	Operation	Function
1.		Press the "CHAN" (7) button.	Change to the editing function for entering the channel (frequency assignment according to the ICAO frequency list, 3.7.5.1). The channel section is highlighted by means of a different background and the cursor is displayed to the right of the last digit. 
2.		Setting the corresponding channel using the rollkey / keyboard.	Only enter the numeric parts (also refer to ILS frequency / channel list). The frequency assigned to the channel (ICAO frequency list, 3.7.5.1) is displayed in the frequency section. 

	Control	Operation	Function
3.		Press the Enter button / push rollkey.	Changeover to the new receiving channel set. 
4.		Press the softkey repeatedly until the channel code (X, Y) assigned to the frequency has been set.	Setting of the corresponding channel code (X, Y), the code set will be displayed in the softkey and the related pulse code in the "P.CODE" display section.  The corresponding channel code that can be set is directly dependent on the set frequency and the receive mode (Reply / Interrogator).

1. When entering the channel via the decimal keyboard, the channel range typical for the mode must be complied with:

DME: 1X ... 126Y



If this channel range is exceeded/the value drops below this channel range, the figures in the frequency section will be displayed in red and cannot be stored!

2. The function can be aborted at any time by pressing the "ESC" key. In this case, the value set up to that time will be restored!
3. If the channel is set using the control dial / cursor keys, the mode-specific channels will be displayed during the setting procedure!

3.7.5.1 DME Channel Frequency List

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
1X	1025	12	-	-	962	12
1Y	1025	36	-	-	1088	30
2X	1026	12	-	-	963	12
2Y	1026	36	-	-	1089	30
3X	1027	12	-	-	964	12
3Y	1027	36	-	-	1090	30
4X	1028	12	-	-	965	12
4Y	1028	36	-	-	1091	30
5X	1029	12	-	-	966	12
5Y	1029	36	-	-	1092	30
6X	1030	12	-	-	967	12
6Y	1030	36	-	-	1093	30
7X	1031	12	-	-	968	12
7Y	1031	36	-	-	1094	30
8X	1032	12	-	-	969	12
8Y	1032	36	-	-	1095	30
9X	1033	12	-	-	970	12
9Y	1033	36	-	-	1096	30

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
10X	1034	12	-	-	971	12
10Y	1034	36	-	-	1097	30
11X	1035	12	-	-	972	12
11Y	1035	36	-	-	1098	30
12X	1036	12	-	-	973	12
12Y	1036	36	-	-	1099	30
13X	1037	12	-	-	974	12
13Y	1037	36	-	-	1100	30
14X	1038	12	-	-	975	12
14Y	1038	36	-	-	1101	30
15X	1039	12	-	-	976	12
15Y	1039	36	-	-	1102	30
16X	1040	12	-	-	977	12
16Y	1040	36	-	-	1103	30
17X	1041	12	-	-	978	12
17Y	1041	36	36	42	1104	30
17Z	1041	-	21	27	1104	15
18X	1042	12	12	18	979	12
18W	1042	-	24	30	979	24
18Y	1042	36	36	42	1105	30

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
18Z	1042	-	21	27	1105	15
19X	1043	12	-	-	980	12
19Y	1043	36	36	42	1106	30
19Z	1043	-	21	27	1106	15
20X	1044	12	12	18	981	12
20W	1044	-	24	30	981	24
20Y	1044	36	36	42	1107	30
20Z	1044	-	21	27	1107	15
21X	1045	12	-	-	982	12
21Y	1045	36	36	42	1108	30
21Z	1045	-	21	27	1108	15
22X	1046	12	12	18	983	12
22W	1046	-	24	30	983	24
22Y	1046	36	36	42	1109	30
22Z	1046	-	21	27	1109	15
23X	1047	12	-	-	984	12
23Y	1047	36	36	42	1110	30
23Z	1047	-	21	27	1110	15
24X	1048	12	12	18	985	12
24W	1048	-	24	30	985	24
24Y	1048	36	36	42	1111	30
24Z	1048	-	21	27	1111	15

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
25X	1049	12	-	-	986	12
25Y	1049	36	36	42	1112	30
25Z	1049	-	21	27	1112	15
26X	1050	12	12	18	987	12
26W	1050	-	24	30	987	24
26Y	1050	36	36	42	1113	30
26Z	1050	-	21	27	1113	15
27X	1051	12	-	-	988	12
27Y	1051	36	36	42	1114	30
27Z	1051	-	21	27	1114	15
28X	1052	12	12	18	989	12
28W	1052	-	24	30	989	24
28Y	1052	36	36	42	1115	30
28Z	1052	-	21	27	1115	15
29X	1053	12	-	-	990	12
29Y	1053	36	36	42	1116	30
29Z	1053	-	21	27	1116	15
30X	1054	12	12	18	991	12
30W	1054	-	24	30	991	24
30Y	1054	36	36	42	1117	30
30Z	1054	-	21	27	1117	15
31X	1055	12	-	-	992	12

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
31Y	1055	36	36	42	1118	30
31Z	1055	-	21	27	1118	15
32X	1056	12	12	18	993	12
32W	1056	-	24	30	993	24
32Y	1056	36	36	42	1119	30
32Z	1056	-	21	27	1119	15
33X	1057	12	-	-	994	12
33Y	1057	36	36	42	1120	30
33Z	1057	-	21	27	1120	15
34X	1058	12	12	18	995	12
34W	1058	-	24	30	995	24
34Y	1058	36	36	42	1121	30
34Z	1058	-	21	27	1121	15
35X	1059	12	-	-	996	12
35Y	1059	36	36	42	1122	30
35Z	1059	-	21	27	1122	15
36X	1060	12	12	18	997	12
36W	1060	-	24	30	997	24
36Y	1060	36	36	42	1123	30
36Z	1060	-	21	27	1123	15
37X	1061	12	-	-	998	12
37Y	1061	36	36	42	1124	30

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
37Z	1061	-	21	27	1124	15
38X	1062	12	12	18	999	12
38W	1062	-	24	30	999	24
38Y	1062	36	36	42	1125	30
38Z	1062	-	21	27	1125	15
39X	1063	12	-	-	1000	12
39Y	1063	36	36	42	1126	30
39Z	1063	-	21	27	1126	15
40X	1064	12	12	18	1001	12
40W	1064	-	24	30	1001	24
40Y	1064	36	36	42	1127	30
40Z	1064	-	21	27	1127	15
41X	1065	12	-	-	1002	12
41Y	1065	36	36	42	1128	30
41Z	1065	-	21	27	1128	15
42X	1065	12	12	18	1003	12
42W	1066	-	24	30	1003	24
42Y	1066	36	36	42	1129	30
42Y	1066	-	21	27	1129	15
43X	1067	12	-	-	1004	12
43Y	1067	36	36	42	1130	30
43Z	1067	-	21	27	1130	15

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
44X	1068	12	12	18	1005	12
44W	1068	-	24	30	1005	24
44Y	1068	36	36	42	1131	30
44Z	1068	-	21	27	1131	15
45X	1069	12	-	-	1006	12
45Y	1069	36	36	42	1132	30
45Z	1069	-	21	27	1132	15
46X	1070	12	12	18	1007	12
46W	1070	-	24	30	1007	24
46Y	1070	36	36	42	1133	30
46Z	1070	-	21	27	1133	15
47X	1071	12	-	-	1008	12
47Y	1071	36	36	42	1134	30
47Z	1071	-	21	27	1134	15
48X	1072	12	12	18	1009	12
48W	1072	-	24	30	1009	24
48Y	1072	36	36	42	1135	30
48Z	1072	-	21	27	1135	15
49X	1073	12	-	-	1010	12
49Y	1073	36	36	42	1136	30
49Z	1073	-	21	27	1136	15
50X	1074	12	12	18	1011	12

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
50W	1074	-	24	30	1011	24
50Y	1074	36	36	42	1137	30
50Z	1074	-	21	27	1137	15
51X	1075	12	-	-	1012	12
51Y	1075	36	36	42	1138	30
51Z	1075	-	21	27	1138	15
52X	1076	12	12	18	1013	12
52W	1076	-	24	30	1013	24
52Y	1076	36	36	42	1139	30
52Z	1076	-	21	27	1139	15
53X	1077	12	-	-	1014	12
53Y	1077	36	36	42	1140	30
53Z	1077	-	21	27	1140	15
54X	1078	12	12	18	1015	12
54W	1078	-	24	30	1015	24
54Y	1078	36	36	42	1141	30
54Z	1078	-	21	27	1141	15
55X	1079	12	-	-	1016	12
55Y	1079	36	36	42	1142	30
55Z	1079	-	21	27	1142	15
56X	1080	12	12	18	1017	12
56W	1080	-	24	30	1017	24

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
56Y	1080	36	36	42	1143	30
56Z	1080	-	21	27	1143	15
57X	1081	12	-	-	1018	12
57Y	1081	36	-	-	1144	30
58X	1082	12	-	-	1019	12
58Y	1082	36	-	-	1145	30
59X	1083	12	-	-	1020	12
59Y	1083	36	-	-	1146	30
60X	1084	12	-	-	1021	12
60Y	1084	36	-	-	1147	30
61X	1085	12	-	-	1022	12
61Y	1085	36	-	-	1148	30
62X	1086	12	-	-	1023	12
62Y	1086	36	-	-	1149	30
63X	1087	12	-	-	1024	12
63Y	1087	36	-	-	1150	30
64X	1088	12	-	-	1151	12
64Y	1088	36	-	-	1025	30
65X	1089	12	-	-	1152	12

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
65Y	1089	36	-	-	1026	30
66X	1090	12	-	-	1153	12
66Y	1090	36	-	-	1027	30
67X	1091	12	-	-	1154	12
67Y	1091	36	-	-	1028	30
68X	1092	12	-	-	1155	12
68Y	1092	36	-	-	1029	30
69X	1093	12	-	-	1156	12
69Y	1093	36	-	-	1030	30
70X	1094	12	-	-	1157	12
70Y	1094	36	-	-	1031	30
71X	1095	12	-	-	1158	12
71Y	1095	36	-	-	1032	30
72X	1096	12	-	-	1159	12
72Y	1096	36	-	-	1033	30
73X	1097	12	-	-	1160	12
73Y	1097	36	-	-	1034	30
74X	1098	12	-	-	1161	12
74Y	1098	36	-	-	1035	30

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
75X	1099	12	-	-	1162	12
75Y	1099	36	-	-	1036	30
76X	1100	12	-	-	1163	12
76Y	1100	36	-	-	1037	30
77X	1101	12	-	-	1164	12
77Y	1101	36	-	-	1038	30
78X	1102	12	-	-	1165	12
78Y	1102	36	-	-	1039	30
79X	1103	12	-	-	1166	12
79Y	1103	36	-	-	1040	30
80X	1104	12	-	-	1167	12
80Y	1104	36	36	42	1041	30
80Z	1104	-	21	27	1041	15
81X	1105	12	-	-	1168	12
81Y	1105	36	36	42	1042	30
81Z	1105	-	21	27	1042	15
82X	1106	12	-	-	1169	12
82Y	1106	36	36	42	1043	30
82Z	1106	-	21	27	1043	15
83X	1107	12	-	-	1170	12

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
83Y	1107	36	36	42	1044	30
83Z	1107	-	21	27	1044	15
84X	1108	12	-	-	1171	12
84Y	1108	36	36	42	1045	30
84Z	1108	-	21	27	1045	15
85X	1109	12	-	-	1172	12
85Y	1109	36	36	42	1046	30
85Z	1109		21	27	1046	15
86X	1110	12	-	-	1173	12
86Y	1110	36	36	42	1047	30
86Z	1110	-	21	27	1047	15
87X	1111	12	-	-	1174	12
87Y	1111	36	36	42	1048	30
87Z	1111	-	21	27	1048	15
88X	1112	12	-	-	1175	12
88Y	1112	36	36	42	1049	30
88Z	1112	-	21	27	1049	15
89X	1113	12	-	-	1176	12
89Y	1113	36	36	42	1050	30
89Z	1113	-	21	27	1050	15
90X	1114	12	-	-	1177	12

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
90Y	1114	36	36	42	1051	30
90Z	1114	-	21	27	1051	15
91X	1115	12	-	-	1178	12
91Y	1115	36	36	42	1052	30
91Z	1115	-	21	27	1052	15
92X	1116	12	-	-	1179	12
92Y	1116	36	36	42	1053	30
92Z	1116	-	21	27	1053	15
93X	1117	12	-	-	1180	12
93Y	1117	36	36	42	1054	30
93Z	1117	-	21	27	1054	15
94X	1118	12	-	-	1181	12
94Y	1118	36	36	42	1055	30
94Z	1118	-	21	27	1055	15
95X	1119	12	-	-	1182	12
95Y	1119	36	36	42	1056	30
95Z	1119	-	21	27	1056	15
96X	1120	12	-	-	1183	12
96Y	1120	36	36	42	1057	30
96Z	1120	-	21	27	1057	15
97X	1121	12	-	-	1184	12

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
97Y	1121	36	36	42	1058	30
97Z	1121	-	21	27	1058	15
98X	1122	12	-	-	1185	12
98Y	1122	36	36	42	1059	30
98Z	1122	-	21	27	1059	15
99X	1123	12	-	-	1186	12
99Y	1123	36	36	42	1060	30
99Z	1123	-	21	27	1060	15
100X	1124	12	-	-	1187	12
100Y	1124	36	36	42	1061	30
100Z	1124	-	21	27	1061	15
101X	1125	12	-	-	1188	12
101Y	1125	36	36	42	1062	30
101Z	1125	-	21	27	1062	15
102X	1126	12	-	-	1189	12
102Y	1126	36	36	42	1063	30
102Z	1126	-	21	27	1063	15
103X	1127	12	-	-	1190	12
103Y	1127	36	36	42	1064	30
103Z	1127	-	21	27	1064	15
104X	1128	12	-	-	1191	12

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
104Y	1128	36	36	42	1065	30
104Z	1128	-	21	27	1065	15
105X	1129	12	-	-	1192	12
105Y	1129	36	36	42	1066	30
105Z	1129	-	21	27	1066	15
106X	1130	12	-	-	1193	12
106Y	1130	36	36	42	1067	30
106Z	1130	-	21	27	1067	15
107X	1131	12	-	-	1194	12
107Y	1131	36	36	42	1068	30
107Z	1131	-	21	27	1068	15
108X	1132	12	-	-	1195	12
108Y	1132	36	36	42	1069	30
108Z	1132	-	21	27	1069	15
109X	1133	12	-	-	1196	12
109Y	1133	36	36	42	1070	30
109Z	1133	-	21	27	1070	15
110X	1134	12	-	-	1197	12
110Y	1134	36	36	42	1071	30
110Z	1134	-	21	27	1071	15
111X	1135	12	-	-	1198	12

DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
111Y	1135	36	36	42	1072	30
111Z	1135	-	21	27	1072	15
112X	1136	12	-	-	1199	12
112Y	1136	36	36	42	1073	30
112Z	1136	-	21	27	1073	15
113X	1137	12	-	-	1200	12
113Y	1137	36	36	42	1074	30
113Z	1137	-	21	27	1074	15
114X	1138	12	-	-	1201	12
114Y	1138	36	36	42	1075	30
114Z	1138	-	21	27	1075	15
115X	1139	12	-	-	1202	12
115Y	1139	36	36	42	1076	30
115Z	1139	-	21	27	1076	15
116X	1140	12	-	-	1203	12
116Y	1140	36	36	42	1077	30
116Z	1140	-	21	27	1077	15
117X	1141	12	-	-	1204	12
117Y	1141	36	36	42	1078	30
117Z	1141	-	21	27	1078	15
118X	1142	12	-	-	1205	12

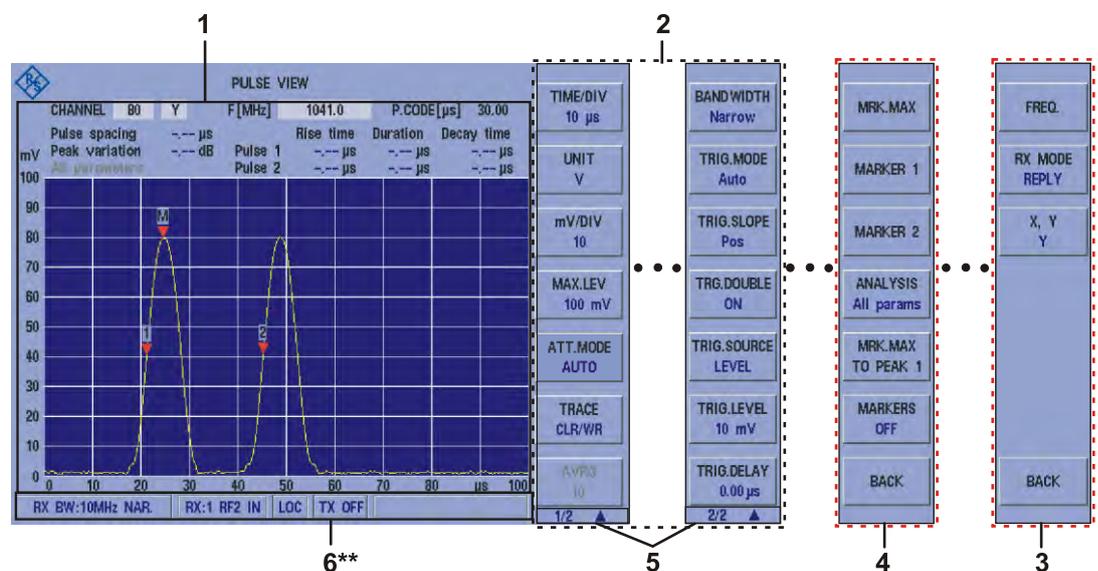
DME channel Number	Interrogation				Reply	
	Frequency MHz	DME/N μ s	IA Initial approach μ s	FA Final approach μ s	Frequency MHz	Pulse codes μ s
118Y	1142	36	36	42	1079	30
118Z	1142	-	21	27	1079	15
119X	1143	12	-	-	1206	12
119Y	1143	36	36	42	1080	30
119Z	1143	-	21	27	1080	15
120X	1144	12	-	-	1207	12
120Y	1144	36	-	-	1081	30
121X	1145	12	-	-	1208	12
121Y	1145	36	-	-	1082	30
122X	1146	12	-	-	1209	12
122Y	1146	36	-	-	1083	30
123X	1147	12	-	-	1210	12
123Y	1147	36	-	-	1084	30
124X	1148	12	-	-	1211	12
124Y	1148	36	-	-	1085	30
125X	1149	12	-	-	1212	12
125Y	1149	36	-	-	1086	30
126X	1150	12	-	-	1213	12
126Y	1150	36	-	-	1087	30

3.7.6 DME Pulse Analysis "PULSE VIEW" (Option, EDS-K2)

The DME pulse analysis is used for testing the RF output signal of DME- / TACAN ground stations und transponders.

- Pulse amplitude of the transmission pulse
- Pulse form (rise time, fall time and pulse duration)
- Pulse spacing

3.7.6.1 Signal Parameters and Displays in PULSE VIEW mode

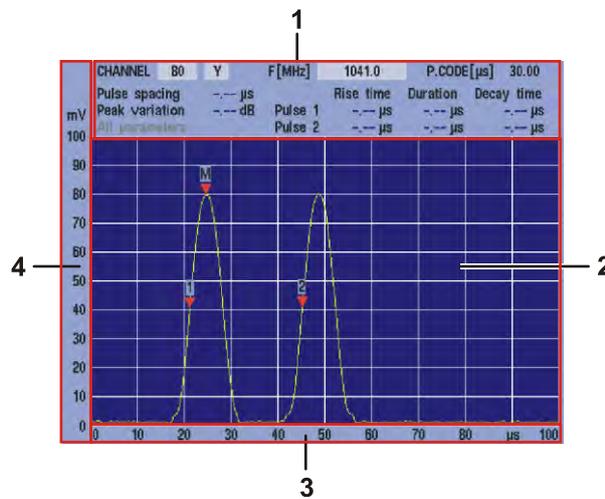


6** for general description of the status section, refer to 3.2.1.1



Due to the multitude of settings offered, two softkey bars are available. The currently displayed softkey bar will be identified with the 1/2 ▲ e.g. 2/2 ▲ -symbol (5). Use the "▲" -button to switch back and forth between the softkey bars. The softkey bar (3) for the PULSE VIEW Frequency function is called via the "FREQ" device button. The frequency function is described in Section 3.7.6.4. The softkey bar (4) for the PULSE VIEW Marker function is called via the "FREQ" device button. The marker function is described in Section 3.7.6.10.

3.7.6.2 Parameter and Measured Value section (1)



Item	Display	Function	Indication
1	Parameter display	<p>Display and setting of general parameters such as:</p> <ul style="list-style-type: none"> Channel, frequency and pulse code <p>Display and setting of the following parameters as a factor of the unit set for "UNIT":</p> <p>Mmax Display and setting of the Marker Max position, i.e. the marker is automatically set to the peak (Peak 100%) of a pulse in the function (MRK.MAX TO PEAK) or positioned manually. Display of the chronological position in µs and of the pulse amplitude in V (V, mV, µV, mW, µW, nW, pW, dBm) and %.</p> <p>Mark1 Display and setting of the position of Marker 1. Display of the chronological position in µs and of the pulse amplitude in V (V, mV, µV, mW, µW, nW, pW, dBm) and %.</p> <p>Mark2 Display and setting of the position of Marker 2. Display of the chronological position in µs and of the pulse amplitude in V (V, mV, µV, mW, µW, nW, pW, dBm) and %.</p>	

Item	Display	Function	Indication
		M2-M1 Display of the difference between Marker 1 and Marker 2 in μs and V (V, mV, μV , mW, μW , nW, pW, dBm).	
2	Display	Graphic display of the frequency spectrum, display of the level over time. Y-axis = amplitude X-axis = time axis	
3	X-axis	Time axis	μs
4	Y-axis	Amplitude scale	dBm, mW, μW , nW, pW, V, mV, μV

3.7.6.3 Softkeys (5) of the PULSE VIEW Mode



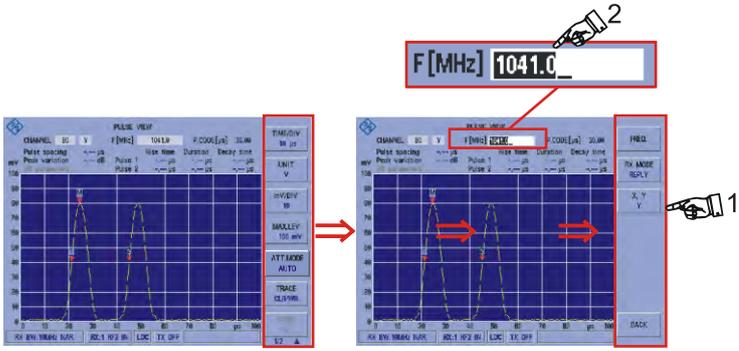
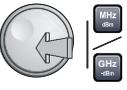
The softkeys (3, frequency function) and (4, marker function) are described in section 3.7.6.10.

Display	Function
Softkey bar 1	
	Setting of the time base (X-axis): Setting range: 0.5 μs ... 50 μs
	Dimension setting of the level axis (Y-axis) of the graphic display. Choose between a linear (V), quadratic (W) and logarithmic (dBm) display. Selection: dBm, W, V
	Scaling of the Y-axis selectable in fixed steps, the setting range depends on the unit set for "UNIT": Selection: bei "UNIT, dBm" = 1, 2, 5, 10 dB / DIV bei "UNIT, W" = 0,1 pW ... 20 mW / DIV bei "UNIT, V" = 1 μV ... 1 V / DIV
	Setting of the Y-axis maximum value; the setting range and the softkey depend on the unit set for "UNIT": Selection: for "UNIT, dBm" = -70 dBm ... 30 dBm for "UNIT, W" = 1 pW ... 200 mW for "UNIT, V" = 10 μV ... 10 V

Display	Function															
ATT.MODE NORM	<p>Changeover of the RF-attenuation, set range is displayed in the softkey:</p> <table border="1"> <thead> <tr> <th></th> <th>Average Level</th> <th>Peak Level</th> </tr> </thead> <tbody> <tr> <td>Low Noise</td> <td>-110 ... -10 dBm</td> <td>-100 ... -10 dBm</td> </tr> <tr> <td>Norm</td> <td>-100 ... +5 dBm</td> <td>-90 ... +0 dBm</td> </tr> <tr> <td>Low Distortion</td> <td>-85 ... +12 dBm</td> <td>-75 ... +12 dBm</td> </tr> <tr> <td>Auto</td> <td>-110 ... +12 dBm</td> <td>-100 ... +12 dBm</td> </tr> </tbody> </table> <p>Note: The max. input level is +13 dBm. The Setting of the RF-Signal Adjustment is described in section 3.4!</p>		Average Level	Peak Level	Low Noise	-110 ... -10 dBm	-100 ... -10 dBm	Norm	-100 ... +5 dBm	-90 ... +0 dBm	Low Distortion	-85 ... +12 dBm	-75 ... +12 dBm	Auto	-110 ... +12 dBm	-100 ... +12 dBm
	Average Level	Peak Level														
Low Noise	-110 ... -10 dBm	-100 ... -10 dBm														
Norm	-100 ... +5 dBm	-90 ... +0 dBm														
Low Distortion	-85 ... +12 dBm	-75 ... +12 dBm														
Auto	-110 ... +12 dBm	-100 ... +12 dBm														
TRACE AVRG	<p>Changeover of the Trace functions, set function is displayed in the softkey :</p> <ul style="list-style-type: none"> - AVRG (Average) - MAX HOLD - CLR / WR (Clear / Write) 															
AVRG 1	<p>Setting of after how many measuring events a message will be displayed (only active at TRACE "AVRG"):</p> <p>Selection: 1 ... 100</p>															
Softkey bar 2																
TRIG.MODE Single shot	<p>Selection of the trigger function:</p> <p>Normal: permanent refreshing of a value set with a valid trigger</p> <p>Single shot: after manual confirmation with the "Enter" - button, this is confirmed with "ACQUIRE..." and with the occurrence of a valid trigger a value set is taken up.</p> <p>Auto: continuous recording of measurement values</p>															
TRIG.SLOPE Neg	<p>Setting of the trigger slope:</p> <p>Selection: Positive / Negative</p>															
TRG.DOUBLE OFF	<p>Settings for the Trigger Double function; when the function is enabled, triggering for double pulses is always performed on the first pulse:</p> <p>Selection: ON / OFF</p>															
TRIG.SOURCE Level	<p>Selection of the trigger source; the following trigger sources can be set:</p> <p>Level: Triggering is made when the trigger threshold set for "TR.LEVEL" has been reached</p> <p>Extern: external trigger source (trigger level setting not possible). In the different modes, triggering takes place as follows:</p> <p>DME mode: triggering on DME pulse</p> <p>INTERROG. mode: triggering on interrogator pulse</p> <p>TACAN mode: TAC_MRB, triggering on MRB TAC_ARB, triggering on ARB</p>															

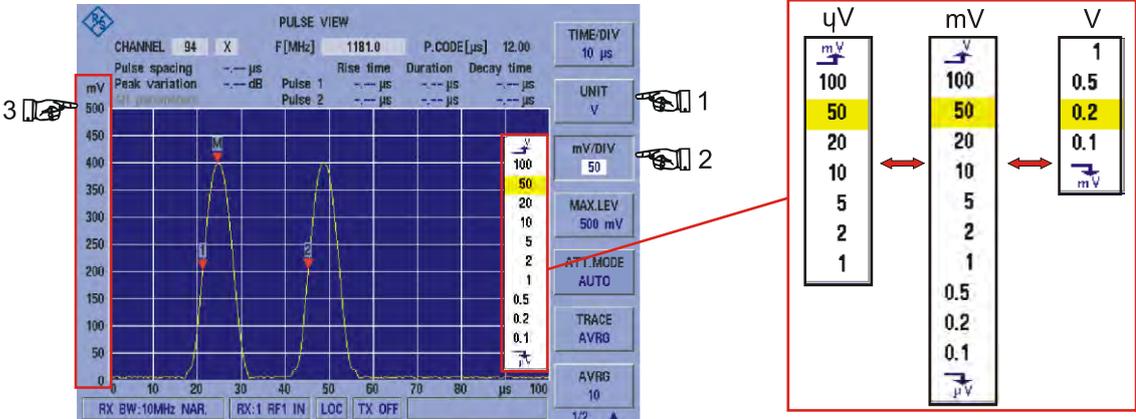
Display	Function
	Setting of the trigger level; the setting range depends on the unit set for "UNIT" and the selected "MAX. Level": Range for unit V: 0.0 μ V ... 2.0 V Range for unit W: 0 ... 80 mW Range for unit dBm: -121 ... 19 dBm
	Setting for Trigger Delay Time (time delay after trigger event, trigger circuit will be locked for the set time). The setting range depends on the time unit set for "TIME/DIV": Setting range: -500 μ s ... 8000.00 μ s

3.7.6.4 Setting the Receiving Frequency

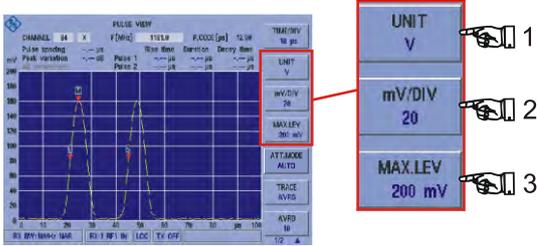
	Control	Operation	Function
1.		Press the "FREQ" (9) button.	Softkey bar (1) for the frequency function is displayed and in the cursor is displayed to the right of the last digit in the frequency field (2).  <p style="text-align: center;">Frequency setting view</p>
Apart from setting the frequency, the typical DME settings for the RX / DME mode can be made according to section 3.7.			
2.		Setting the corresponding frequency using the rollkey / keyboard.	Enter the frequency including the corresponding decimal place.
3.		Confirm in the corresponding unit or press the Enter button / push rollkey.	Changeover to the new receiving frequency set.

	Control	Operation	Function
4.		Press the softkey "BACK".	Return to the softkey bar of the PULSE VIEW mode used last.

3.7.6.5 Setting the Resolution (Y-Axis)

	Control	Operation	Function
1.		Press the softkey "XX/DIV". The display of the unit in the softkey depends on the unit set for "UNIT" and the setting range.	The selection list for changing the resolution of the Y-axis according to the set unit will be displayed.
<p>Scaling of the Y-axis (3) is selectable in fixed steps, the setting range depends on the unit set for "UNIT" (1). Cross-unit scrolling in the selection lists is possible.</p> <p>Selection (2): for "UNIT, dBm" = 1, 2, 5, 10 dB / DIV for "UNIT, W" = 0,1 pW ... 20 mW / DIV for "UNIT, V" = 1 μV ... 1 V / DIV</p>			
<div style="display: flex; align-items: center;">  </div> <p style="text-align: center;">Example of a selection list ("UNIT, V"), ranges μV ... V</p>			
2.		Turn the rollkey until the required value is set.	Changes the resolution of the Y-axis by the value entered.
3.		Press the Enter button / push rollkey.	Acceptance of the actually set new resolution.

3.7.6.6 Setting the Maximum Level (Y-Axis)

	Control	Operation	Function
1.		Press the Softkey "MAX.LEV".	Activation of the edit function for changing the maximum level or the reference level. 
<p>The selection of the unit (1) as well as the resolution setting (xx/Div, 2) influence the setting range of the maximum level (3) as follows:</p> <p>Selection: for "UNIT, dBm" = -70 ... 30 dBm for "UNIT, W" = 1 pW ... 200 mW / DIV for "UNIT, V" = 10 μV ... 10 V / DIV</p> 			
<p>The setting ranges for the maximum level and the reference level are listed in the following table.</p>			
2.		Turn the rollkey until the required value is set.	Changes the resolution of the Y-axis by the value entered.
3.		Press the Enter button / push rollkey.	Acceptance of the actually set new resolution.

Unit	Setting range	Unit	Setting range	Unit	Setting range
"W"	Max. Level	"V"	Max. Level	"dBm"	Max. Level
	mW / Div		V / Div		dB / Div
20 mW	200 mW	1 V	10 V	10 dB	-70 ... 30 dBm
10 mW	100 ... 200 mW	0.5 V	5 ... 10 V	5 dB	-70 ... 30 dBm
5 mW	50 ... 200 mW	0.2 V	2 ... 10 V	2 dB	-70 ... 30 dBm
2 mW	20 ... 200 mW	0.1 V	1 ... 10 V	1 dB	-70 ... 30 dBm
1 mW	10 ... 100 mW		mV / Div		
0.5 mW	5 ... 50 mW	100 mV	1000 mV		
0.2 mW	2 ... 20 mW	50 mV	500 ... 1000 mV		

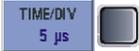
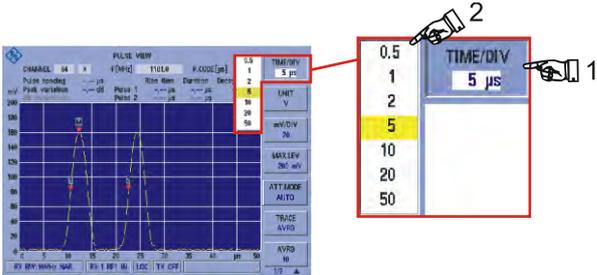
Unit	Setting range	Unit	Setting range	Unit	Setting range
"W"	Max. Level	"V"	Max. Level	"dBm"	Max. Level
0.1 mW	1 ... 10 mW	20 mV	200 ... 1000 mV		
	$\mu\text{W} / \text{Div}$	10 mV	100 ... 1000 mV		
100 μW	1000 μW	5 mV	50 ... 500 mV		
50 μW	500 ... 1000 μW	2 mV	20 ... 200 mV		
20 μW	200 ... 1000 μW	1 mV	10 ... 100 mV		
10 μW	100 ... 1000 μW	0.5 mV	5 ... 50 mV		
5 μW	50 ... 500 μW	0.2 mV	2 ... 20 mV		
2 μW	20 ... 200 μW	0.1 mV	1 ... 10 mV		
1 μW	10 ... 100 μW		$\mu\text{V} / \text{Div}$		
0.5 μW	5 ... 50 μW	100 μV	1000 μV		
0.2 μW	2 ... 20 μW	50 μV	500 ... 1000 μV		
0.1 μW	1 ... 10 μW	20 μV	200 ... 1000 μV		
	nW / Div	10 μV	100 ... 1000 μV		
100 nW	1000 nW	5 μV	50 ... 500 μV		
50 nW	500 ... 1000 nW	2 μV	20 ... 200 μV		
20 nW	200 ... 1000 nW	1 μV	10 ... 100 μV		
10 nW	100 ... 1000 nW				
5 nW	50 ... 500 nW				
2 nW	20 ... 200 nW				
1 nW	10 ... 100 nW				
0.5 nW	5 ... 50 nW				
0.2 nW	2 ... 20 nW				
0.1 nW	1 ... 10 nW				
	pW / Div				
100 pW	1000 pW				
50 pW	500 ... 1000 pW				
20 pW	200 ... 1000 pW				
10 pW	100 ... 1000 pW				
5 pW	50 ... 500 pW				
2 pW	20 ... 200 pW				

Unit	Setting range	Unit	Setting range	Unit	Setting range
"W"	Max. Level	"V"	Max. Level	"dBm"	Max. Level
1 pW	10 ... 100 pW				
0.5 pW	5 ... 50 pW				
0.2 pW	2 ... 20 pW				
0.1 pW	1 ... 10 pW				

Table: Setting ranges for the maximum level

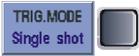
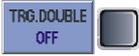
3.7.6.7 Setting the Time base

To analyze very small portions of a signal, the scaling of the X-axis (time base) can be set in increments.

	Control	Operation	Function
1.		Press the Softkey "TIME/DIV".	The selection list for changing the time base of the X-axis will be enabled. 
2.		Select	Select the corresponding time base according to the selection list (2). The current selection will be carried along numerically in the softkey (1). 
3.		Press the Enter button / push rollkey.	Acceptance of the actually set new time base.

3.7.6.8 Settings for triggering in DME mode

	Control	Operation	Function																
Set the Trigger Source as follows (Softkey bar 2):																			
1.		Press the softkey "TR.SOURC" repeatedly until the wanted trigger source is set.	Selection of the trigger source, set value is displayed in the softkey.  Selection: Level, Extern																
<p>Level: Triggering is made when the trigger threshold set for "TR.LEVEL" has been reached</p> <p>Extern: external trigger source (trigger level setting not possible) In the different modes, triggering takes place as follows:</p> <p>DME mode: triggering on DME pulse</p> <p>INTERROG. mode: triggering on interrogator pulse</p> <p>TACAN mode: TAC_MRB, triggering on MRB TAC_ARB, triggering on ARB</p>																			
Set the Trigger Delay Time as follows:																			
2.		Press the softkey "TR.DELAY".	Activation of the edit function for changing the Trigger Delay Time, set value is displayed in the softkey. 																
3.		Setting the corresponding value with rollkey / keyboard..	Setting the Trigger Delay Time. Setting range: -500 µs ... 8000.00 µs																
The setting range depends on the time unit set for "TIME/DIV".																			
<table border="1"> <thead> <tr> <th><u>TIME/DIV</u></th> <th><u>TRIG. DELAY</u></th> </tr> </thead> <tbody> <tr> <td>0,5 µs</td> <td>-20 µs ... 320 µs</td> </tr> <tr> <td>1 µs</td> <td>-20 µs ... 320 µs</td> </tr> <tr> <td>2 µs</td> <td>-20 µs ... 320 µs</td> </tr> <tr> <td>5 µs</td> <td>-50 µs ... 800 µs</td> </tr> <tr> <td>10 µs</td> <td>-100 µs ... 1600 µs</td> </tr> <tr> <td>20 µs</td> <td>-500 µs ... 3200 µs</td> </tr> <tr> <td>50 µs</td> <td>-500 µs ... 8000 µs</td> </tr> </tbody> </table>				<u>TIME/DIV</u>	<u>TRIG. DELAY</u>	0,5 µs	-20 µs ... 320 µs	1 µs	-20 µs ... 320 µs	2 µs	-20 µs ... 320 µs	5 µs	-50 µs ... 800 µs	10 µs	-100 µs ... 1600 µs	20 µs	-500 µs ... 3200 µs	50 µs	-500 µs ... 8000 µs
<u>TIME/DIV</u>	<u>TRIG. DELAY</u>																		
0,5 µs	-20 µs ... 320 µs																		
1 µs	-20 µs ... 320 µs																		
2 µs	-20 µs ... 320 µs																		
5 µs	-50 µs ... 800 µs																		
10 µs	-100 µs ... 1600 µs																		
20 µs	-500 µs ... 3200 µs																		
50 µs	-500 µs ... 8000 µs																		
4.		Press the Enter button / push rollkey.	Acceptance of the actually set new Trigger Delay Time.																

	Control	Operation	Function
Set the Trigger mode as follows (Softkey bar 2):			
5.		Press the softkey "TRIG.Mode".	<p>Changeover between the trigger modes. The set mode will be displayed in the softkey.</p>  <p>Selection: Normal, Single shot, Auto</p> <p>Normal: permanent refreshing of a value set with a valid trigger</p> <p>Single shot: after manual confirmation with the "Enter" - button, this is confirmed with "ACQUIRE..." and with the occurrence of a valid trigger a value set is taken up.</p> <p>Auto: continuous recording of measurement values. If with the current trigger level can be triggered, the signal will be triggered. If no triggering exists the non triggered puls process will be displayed.</p>
Set the Trigger Slope as follows (Softkey bar 2):			
6.		Press the softkey "TRIG.SLOPE".	<p>Switching to the signal slope to be triggered. The set property will be displayed in the softkey.</p>  <p>Selection: Pos (positive) / Neg (negative)</p>
Set the Trigger Double as follows (Softkey bar 2):			
7.		Press the softkey "TRIG.DOUBLE".	<p>Switch on / off the Trigger Double function. The set property will be displayed in the softkey.</p>  <p>Selection: ON / OFF</p> <p>When the function is enabled, triggering for double pulses is always performed on the first pulse.</p>
Set the Trigger Level as follows:			
		<p>Note: The trigger level can only be set when "Level" has been selected as the trigger source.</p>	

	Control	Operation	Function
8.		Press the softkey "TRIG.LEVEL".	Activation of the edit function for changing the Trigger Level, set value is displayed in the softkey. 
9.		Setting the corresponding value with rollkey / keyboard.	Enter the trigger level including the corresponding decimal place. Range for unit V: 0.0 μ V ... 2.0 V Range for unit W: 0 ... 80 mW Range for unit dBm: -121 ... 19 dBm
The setting range depends on the unit set for "UNIT" and the selected "MAX. Level". The range is independent for the unit dBm only. The setting ranges for the trigger level are listed in the following table.			
10.		Press the Enter button / push rollkey.	Acceptance of the actually set new Trigger Level.

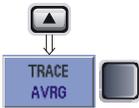
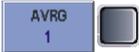
Range	Setting range	Range	Setting range
Max. level	TRIGGER level	Max. level	TRIGGER level
Unit "W"	Unit "W"	Unit "V"	Unit "V"
mW		V	
200 mW	80 mW	10 V	0 ... 2 V
100 ... 200 mW	0 ... 80 mW	5 ... 10 V	0 ... 2 V
50 ... 200 mW	0 ... 80 mW	2 ... 10 V	0 ... 2 V
20 ... 200 mW	0 ... 80 mW	1 ... 10 V	0 ... 2 V
10 ... 100 mW	0 ... 80 mW	mV	
5 ... 50 mW	0 ... 50 mW	1000 mV	0 ... 2000 mV
2 ... 20 mW	0 ... 20 mW	500 ... 1000 mV	0 ... 2000 mV
1 ... 10 mW	0 ... 10 mW	200 ... 1000 mV	0 ... 2000 mV
		100 ... 1000 mV	0 ... 1000 mV
μW		50 ... 500 mV	0 ... 500 mV
1000 μ W	0 ... 10000 μ W	20 ... 200 mV	0 ... 200 mV

Range	Setting range	Range	Setting range
Max. level	TRIGGER level	Max. level	TRIGGER level
Unit "W"	Unit "W"	Unit "V"	Unit "V"
500 ... 1000 μ W	0 ... 5000 μ W	10 ... 100 mV	0 ... 100 mV
200 ... 1000 μ W	0 ... 2000 μ W	5 ... 50 mV	0 ... 50 mV
100 ... 1000 μ W	0 ... 1000 μ W	2 ... 20 mV	0 ... 20 mV
50 ... 500 μ W	0 ... 500 μ W	1 ... 10 mV	0 ... 10 mV
20 ... 200 μ W	0 ... 200 μ W	μ V	
10 ... 100 μ W	0 ... 100 μ W	1000 μ V	0 ... 10000 μ V
5 ... 50 μ W	0 ... 50 μ W	500 ... 1000 μ V	0 ... 5000 μ V
2 ... 20 μ W	0 ... 20 μ W	200 ... 1000 μ V	0 ... 2000 μ V
1 ... 10 μ W	0 ... 10 μ W	100 ... 1000 μ V	0 ... 1000 μ V
n W		50 ... 500 μ V	0 ... 500 μ V
1000 nW	0 ... 10000 nW	20 ... 200 μ V	0 ... 200 μ V
500 ... 1000 nW	0 ... 5000 nW	10 ... 100 μ V	0 ... 100 μ V
200 ... 1000 nW	0 ... 2000 nW		
100 ... 1000 nW	0 ... 1000 nW		
50 ... 500 nW	0 ... 500 nW		
20 ... 200 nW	0 ... 200 nW		
10 ... 100 nW	0 ... 100 nW		
5 ... 50 nW	0 ... 50 nW		
2 ... 20 nW	0 ... 20 nW		
1 ... 10 nW	0 ... 10 nW		
p W			
1000 pW	0 ... 10000 pW		
500 ... 1000 pW	0 ... 5000 pW		
200 ... 1000 pW	0 ... 2000 pW		
100 ... 1000 pW	0 ... 1000 pW		
50 ... 500 pW	0 ... 500 pW		
20 ... 200 pW	0 ... 200 pW		
10 ... 100 pW	0 ... 100 pW		
5 ... 50 pW	0 ... 50 pW		

Range	Setting range	Range	Setting range
Max. level	TRIGGER level	Max. level	TRIGGER level
Unit "W"	Unit "W"	Unit "V"	Unit "V"
2 ... 20 pW	0 ... 20 pW		
1 ... 10 pW	0 ... 10 pW		

Table: Setting ranges for the trigger level

3.7.6.9 Setting Trace function

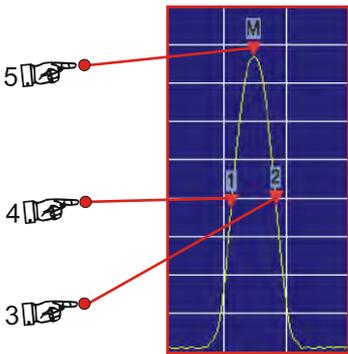
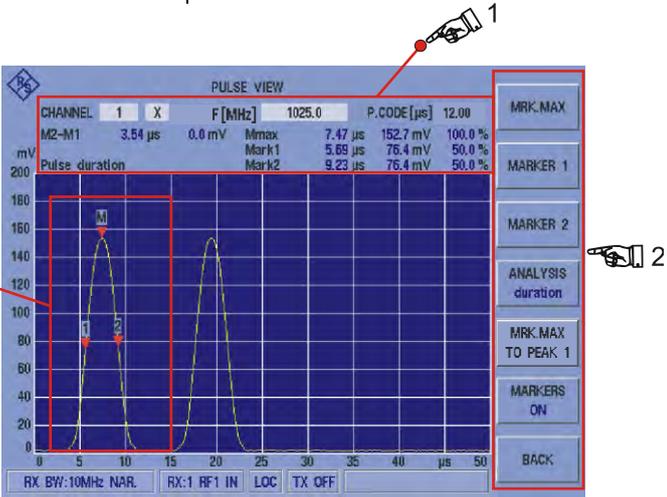
	Control	Operation	Function
1.		Switch to the second menu window and select with the softkey "TRACE".	Setting at Trace function, set function is displayed in the softkey.  Selection: AVRG MAX HOLD, CLR / WR (Clear / Write)
Explanation of the "Trace" functions: Average: In the Average function, the mean value of several sweeps will be calculated and displayed. This is a floating message, i.e. after each sweep, the display is updated, showing the mean value of a number of previous sweeps. The number of these sweeps can be set via the "Samples" softkey. When starting the "Average" function, or when changing the number of samples, all available sweeps are determined first, until a sufficient number of test samples are available in the memory and a floating message can be used. Max Hold: When using the "Max Hold" function, the peak values of the captured spectrum can be stored automatically. With each sweep, the display is being updated. However, the displayed curve will only be overwritten in those areas, where the currently captured data is larger than the previously displayed value in the same location. Clear / Write: In the Clear / Write function, the display of the measured spectrum is continuously updated, i.e. the Trace memory is rewritten with each sweep.			
2.		Press the softkey "AVRG".	Setting the number of samples to the Trace "Average" function, set number of samples is displayed in the softkey.  Setting range: 1 ... 100 (samples)



The "AVRG" softkey is only activated during the "Average" function!

3.7.6.10 Calling the Marker functions in DME mode

The different marker functions are an important part of the DME pulse analysis. Apart from the marker functions (M1, M2, Mmax), the Pulse rise time, Pulse duration, Pulse decay time and Pulse spacing time analysis functions can be used.

	Control	Operation	Function
1.		Press the "Marker" (11) button.	The softkeys (2) for marker settings in DME mode will be displayed.
			
		<p>Parameter display (1):</p> <p>Mmax: Display and setting of the position of Marker Max, display of the chronological position in μs and of the pulse amplitude in V (V, mV, μV, mW, μW, nW, pW, dBm) und %.</p> <p>Mark1 Display and setting of the position of Marker 1, display of the chronological position in μs and of the pulse amplitude in V (V, mV, μV, mW, μW, nW, pW, dBm) und %.</p> <p>Mark2 Display and setting of the position of Marker 2, display of the chronological position in μs and of the pulse amplitude in V (V, mV, μV, mW, μW, nW, pW, dBm) und %.</p> <p>M2-M1 Display of the difference between Marker 1 and Marker 2 in μs and V (V, mV, μV, mW, μW, nW, pW, dBm).</p> <p>Softkeys (2):</p> <p>Marker (4): Example, set marker M1</p> <p>Marker (3): Example, set marker M2</p> <p>Marker (5): Example, set marker Mmax</p>	

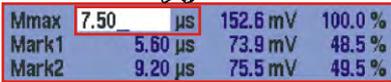
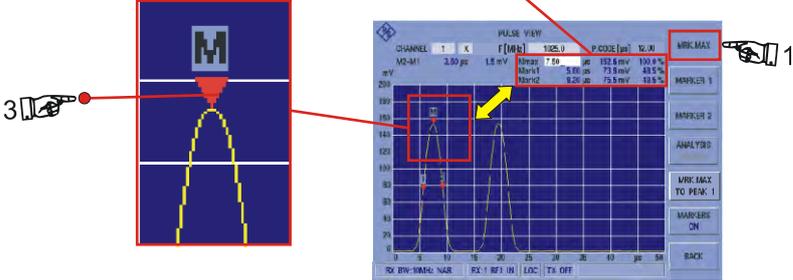
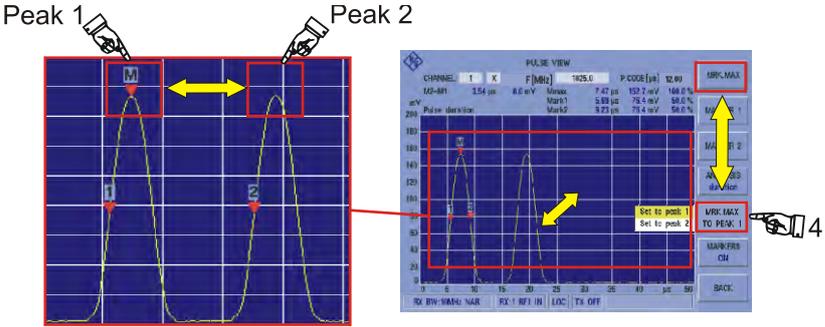
3.7.6.11 Softkeys (2) of the Marker function

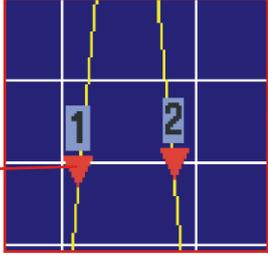
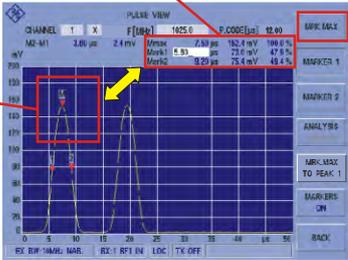
Display	Function																												
	This function facilitates manual positioning of the marker Mmax to the peak of a pulse. Automatic positioning can be selected via the "MRK.MAX TO PEAK" function. Setting and display in the parameter display.																												
 	This function facilitates manual positioning of marker 1. Setting and display in the parameter display. This function facilitates manual positioning of marker 2. Setting and display in the parameter display.																												
	<p>Selection of the analysis function for DME pulses (DME single pulse, DME double pulse). This function can only be selected for the unit (UNIT = V) and the scaling ($\mu\text{V} / \text{DIV} \dots \text{V} / \text{DIV}$). The actual selected analysis function is indicated in the soft key.</p> <p>Selection: Pulse rise time (M1 auf 10% aufsteigend, M2 auf 90% aufsteigend, M2-M1 = Rise time)</p> <p>Pulse duration (M1 to 50 % ascending, M2 to 50 % descending, M2-M1 = Duration)</p> <p>Pulse decay time (M1 to 90 % descending M2 to 10 % descending, M2-M1 = Decay time)</p> <p>Pulse spacing time (M1 to 50 % ascending first pulse, M2 to 50 % ascending second pulse, M2-M1 = Spacing time)</p> <p>"All parameters" represents in the parameter display (1) the characteristic numbers of all analysis functions described above at the same time:</p> <table border="1" data-bbox="657 1406 1382 1518"> <thead> <tr> <th>CHANNEL</th> <th>1</th> <th>X</th> <th>F [MHz]</th> <th>1025.0</th> <th>P.CODE [μs]</th> <th>12.00</th> </tr> </thead> <tbody> <tr> <td>Pulse spacing</td> <td>12.00 μs</td> <td></td> <td>Rise time</td> <td>1.96 μs</td> <td>3.55 μs</td> <td>2.03 μs</td> </tr> <tr> <td>Peak variation</td> <td>-0.03 dB</td> <td></td> <td>Pulse 1</td> <td>1.96 μs</td> <td>3.55 μs</td> <td>2.03 μs</td> </tr> <tr> <td>All parameters</td> <td></td> <td></td> <td>Pulse 2</td> <td>1.96 μs</td> <td>3.55 μs</td> <td>2.03 μs</td> </tr> </tbody> </table>	CHANNEL	1	X	F [MHz]	1025.0	P.CODE [μs]	12.00	Pulse spacing	12.00 μs		Rise time	1.96 μs	3.55 μs	2.03 μs	Peak variation	-0.03 dB		Pulse 1	1.96 μs	3.55 μs	2.03 μs	All parameters			Pulse 2	1.96 μs	3.55 μs	2.03 μs
CHANNEL	1	X	F [MHz]	1025.0	P.CODE [μs]	12.00																							
Pulse spacing	12.00 μs		Rise time	1.96 μs	3.55 μs	2.03 μs																							
Peak variation	-0.03 dB		Pulse 1	1.96 μs	3.55 μs	2.03 μs																							
All parameters			Pulse 2	1.96 μs	3.55 μs	2.03 μs																							
	Automatic positioning of Marker Max to the first (Peak 1) or second (Peak 2) pulse in the display area.																												
	Showing/hiding of the markers. Selection: ON / OFF																												
	Return to the softkey bar of the PULSE VIEW mode used last.																												

3.7.6.12 Different Marker functions

In the following, the different marker functions are described in an example sequence. These are:

- Marker Max with Peak marker function,
- Marker 1 and Marker 2.

	Control	Operation	Function
Marker Max with peak marker function:			
1.		Press the softkey "MRK.MAX".	The setting (2) for manual positioning of the marker (3) is enabled.
<p>The marker position can be set manually via the rollkey / keyboard. Another actuation of the "MRK.MAX" (1) softkey will save the settings (level values will be updated). Via the Peak marker function (softkey "MRK.MAX TO PEAK, 4), Marker Max can automatically be set to the peak (Peak 100%) of a DME pulse. In the case of a DME double pulse, e.g. it is thus possible to select one of the two pulse peaks (Peak1 / Peak2) to which the marker is to be set.</p>			
			
 <p>Figure shows the manual positioning of marker "Max".</p>			
 <p>Figure shows the automatic positioning of marker "Max" via the Peak marker function by selecting Peak 1 or Peak 2.</p>			

	Control	Operation	Function
Marker 1 and Marker 2 function:			
Since the operation of this marker function is identical for the two marker functions, it will only be described with the example of Marker 1.			
2.		Press the softkey "Marker 1".	<p>The setting (2) for manual positioning of the marker 1 (3) is enabled. The marker position can be set manually via the rollkey / keyboard. Another actuation of the "Marker 1" (1) softkey will save the settings (level values will be updated).</p>   
<p>The figure shows the manual positioning Marker 1.</p>			

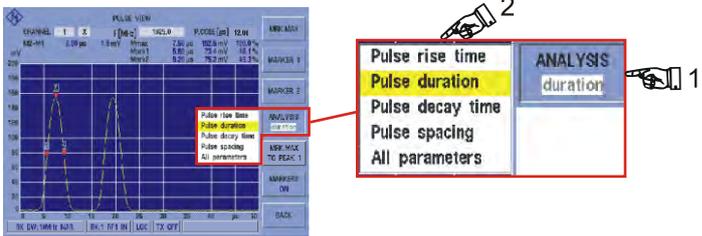
3.7.6.13 DME Analysis function

In the DME analysis, the data visible on the display area (DME single or double pulse) will automatically be analyzed. Following the analysis, the markers will be set to exactly 10 %, 50 % or 90 % according to the analysis function selected. The parameters corresponding to the marker position (time, level) are interpolated. The following analysis functions can be selected:

- Pulse rise time (analysis of the rising pulse slope)
- Pulse decay time (analysis of the falling pulse slope)
- Pulse duration (analysis of the pulse width)
- Pulse spacing time (analysis of the pulse spacing for a DME double pulse)
- "All parameters" (Summary of all characteristic numbers of the functions described above)

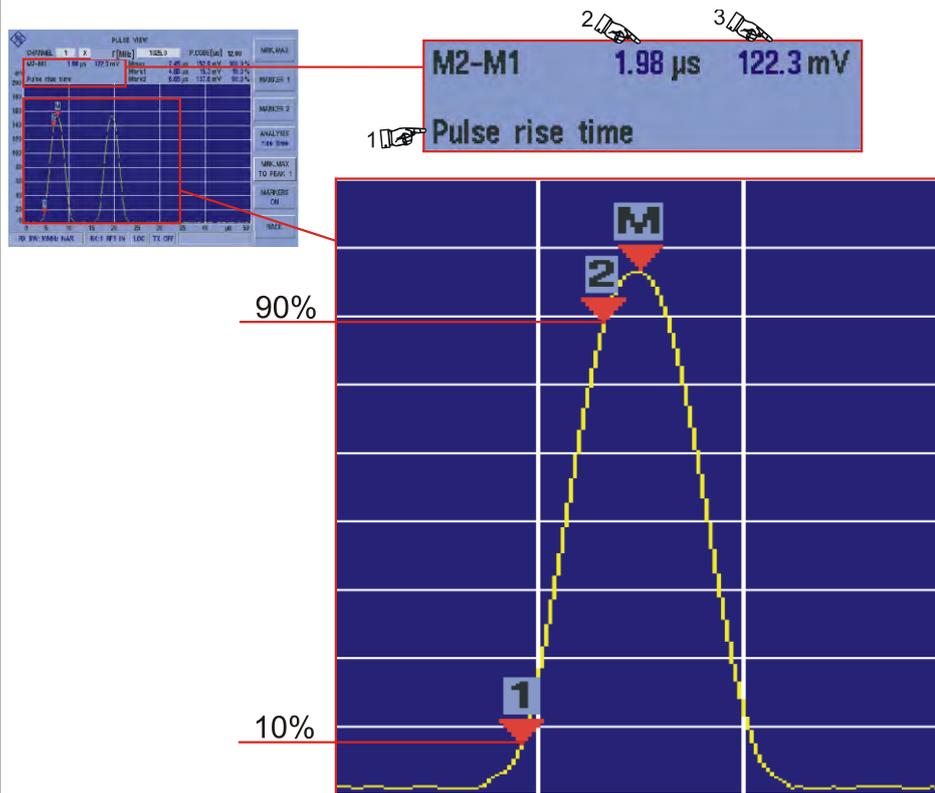


Before a pulse analysis is started, the marker "Max" must be set to the peak of a pulse. In addition, the unit (UNIT = V) and the scaling ($\mu\text{V} / \text{DIV} \dots \text{V} / \text{DIV}$) must be set.

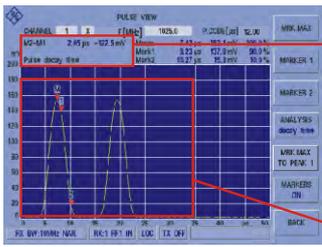
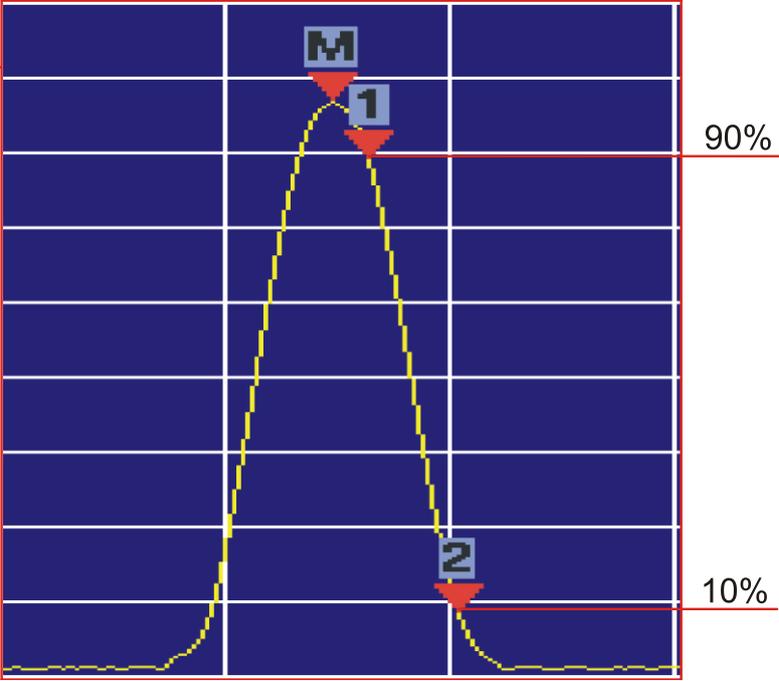
	Control	Operation	Function
Select and start an analysis function as follows:			
1.		Press the softkey "ANALYSIS".	The selection list (2) of the analysis function will be opened.
2.		Select an analysis function using the rollkey and enable it by pressing the Enter button or pushing the rollkey.	The analysis will be started. The current selection will be carried along in the softkey (1).
			
<p>see on the following sides the markers functions for:</p> <ul style="list-style-type: none"> – "Pulse rise time" analysis – "Pulse decay time" analysis – "Pulse duration" analysis – "Pulse spacing time" analysis 			

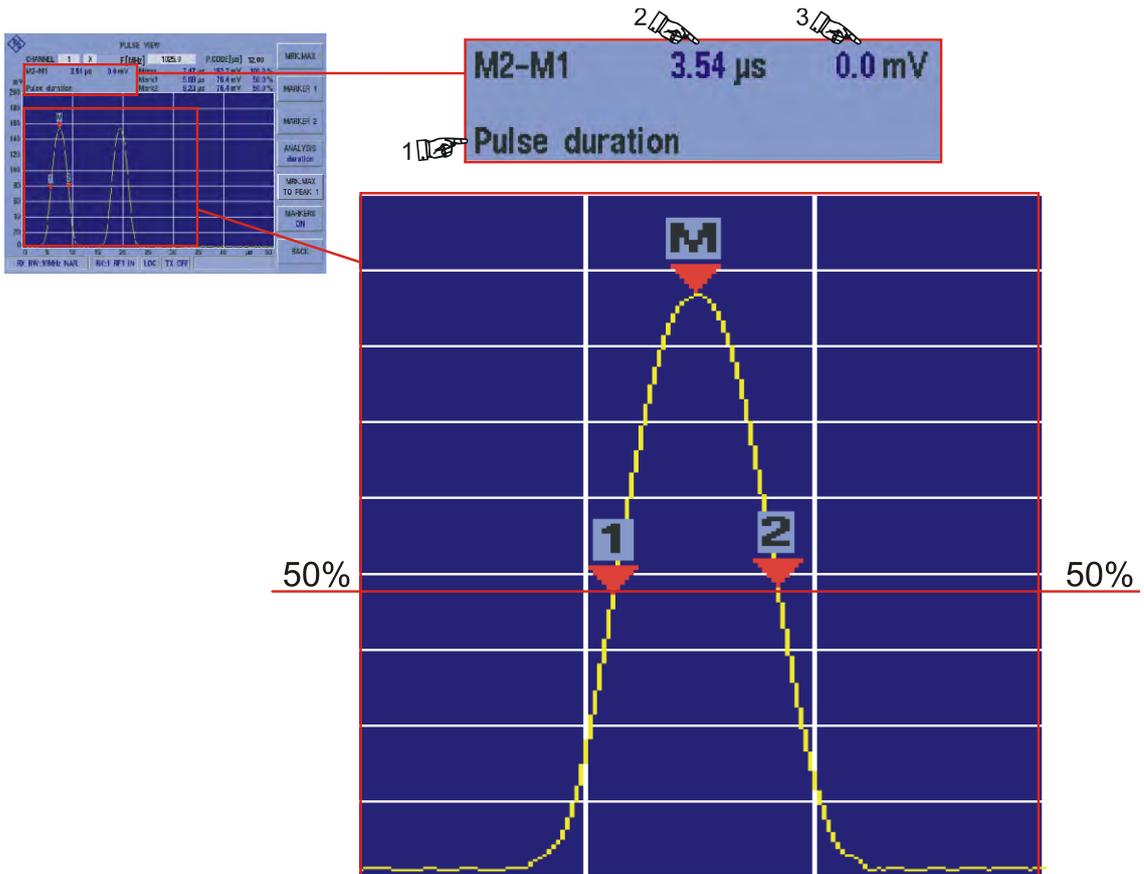
"Pulse rise time" analysis function:

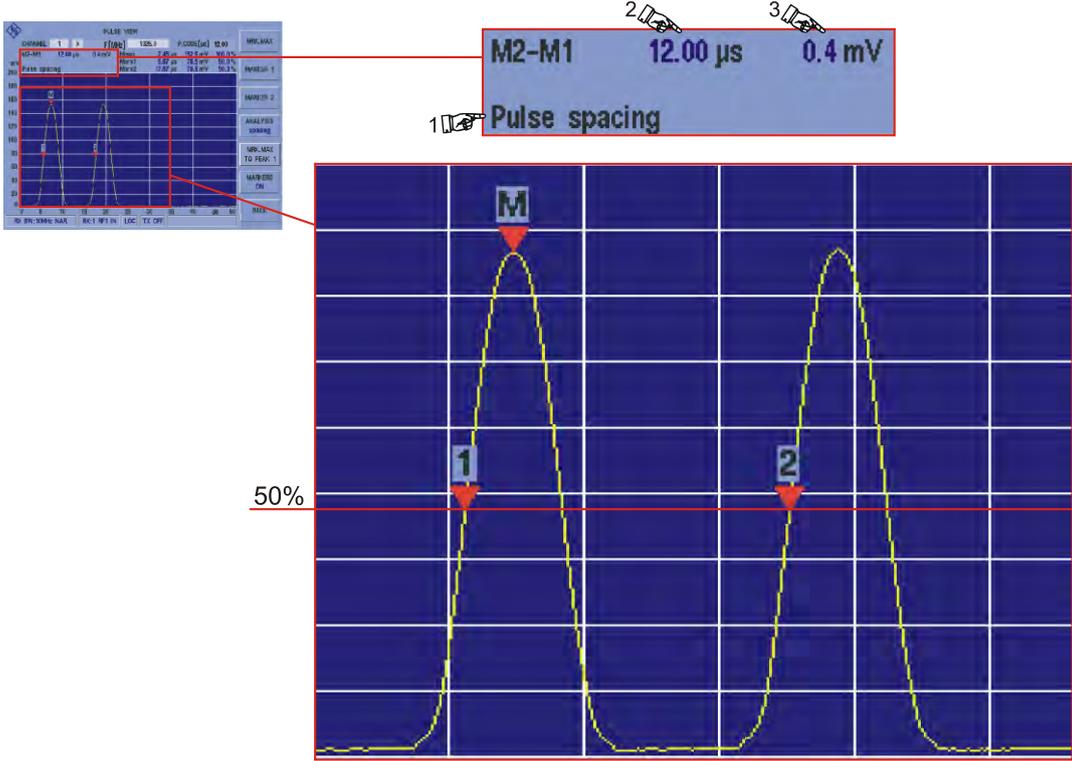
In the "Pulse rise time" analysis function, marker 1 is set to exactly 10 % of the rising pulse slope and marker 2 to exactly 90 % of the rising pulse slope. The resulting difference (M2-M1) between the two marker positions is output in the parameter field in time (2) and level (3). Provided the analysis was successful, "Pulse rise time" (1) will be shown in **black**. If it is shown in **grey**, the marker positions must be checked.



Example of the "Pulse rise time" analysis function

	Control	Operation	Function
"Pulse decay time" analysis function:			
<p>In the "Pulse decay time" analysis function, marker 1 is set to exactly 90 % of the falling pulse slope and marker 2 to exactly 10 % of the falling pulse slope. The resulting difference (M2-M1) between the two marker positions is output in the parameter field in time (2) and level (3). Provided the analysis was successful, "Pulse decay time" (1) will be shown in black. If it is shown in grey, the marker positions must be checked.</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>2.  </p> <p>1.  M2-M1 2.05 μs -122.5 mV</p> <p>Pulse decay time</p> </div> </div>  <p style="text-align: center;">Example of the "Pulse decay time" analysis function</p>			

	Control	Operation	Function
"Pulse duration" analysis function:			
<p>In the "Pulse duration" analysis function, marker 1 is set to exactly 50 % of the rising pulse slope and marker 2 to exactly 50 % of the falling pulse slope. The resulting difference (M2-M1) between the two marker positions is output in the parameter field in time (2) and level (3). Provided the analysis was successful, "Pulse duration" (1) will be shown in black. If it is shown in grey, the marker positions must be checked.</p>			 <p>Example of the "Pulse duration" analysis function</p>

	Control	Operation	Function
"Pulse spacing time" analysis function:			
<p>In the "Pulse spacing time" analysis function, marker 1 is set to exactly 50 % of the rising pulse slope and marker 2 to exactly 50 % of the rising pulse slope of the second pulse. The resulting difference (M2-M1) between the two marker positions is output in the parameter field in time (2) and level (3). Provided the analysis was successful, "Pulse spacing" (1) will be shown in black. If it is shown in grey, the marker positions must be checked.</p>  <p>Example of the "Pulse spacing time" analysis function</p>			

3.8 Distance Measurement mode (Option, EDS-K4) operation

For measuring the distance to a DME / TACAN ground station, an interrogator is required in addition to the software option EDS-K4 that generates the request pulses to the DME / Tacan ground station. The interrogator has been integrated as module into the **R&S EDS300**. Depending on the application, a Low Power Interrogator (option, EDS-B2) with adjustable pulse output power of 20 W maximum is available for the local area (testing of DME / TACAN ground stations, range 5.4 NM) or a High Power Interrogator (option, EDS-B4) with a fixed pulse output rate of 500 W nominal is available for distance measurements (Flight Inspection, up to 200 NM).

3.8.1 General

In SEARCH mode, the interrogator sends request pulses on a specific channel to a ground station and searches the corresponding reply pulses in the output pulses of the ground station. Once the synchronisation to the reply pulses has been completed, the **R&S EDS300** changes to TRACK mode and reduces the reply pulse rate according to the settings in the SETUP. In TRACK mode, the slant range to the ground station is displayed (indicated in nautical miles and metres). If the **R&S EDS300** loses the synchronisation, it changes to MEMORY mode and attempts to restore the synchronisation based on the set request rate. If this is successful, the **R&S EDS300** changes back to TRACK mode, otherwise it will return to SEARCH mode increasing the number of request pulses to restore the synchronisation.

DANGER

The generally valid safety requirements must be observed in transmitter mode, such as not to look into the focal point of the transmitter antenna, among others.

In addition, the following precautions regarding HF radiation protection for people wearing a medical device must be observed:



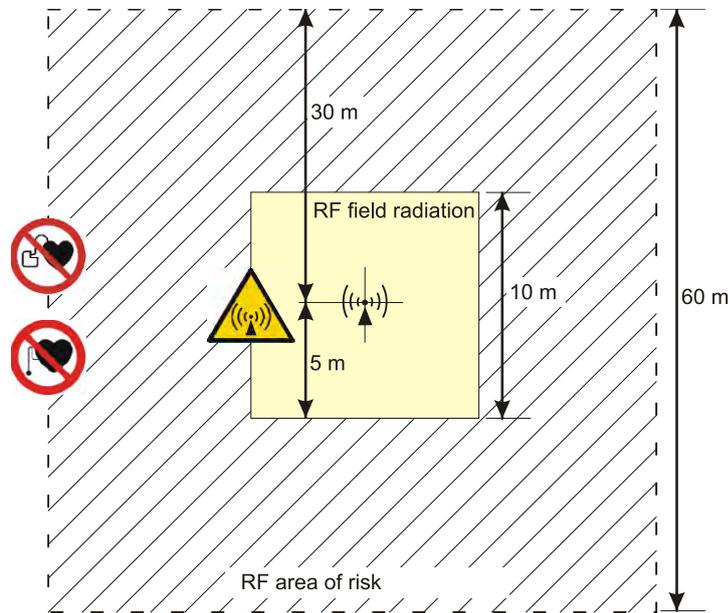
No access for people wearing a pacemaker!



No access for people wearing an implanted defibrillator!

⚠ DANGER

The following HF radiation ranges must be observed!



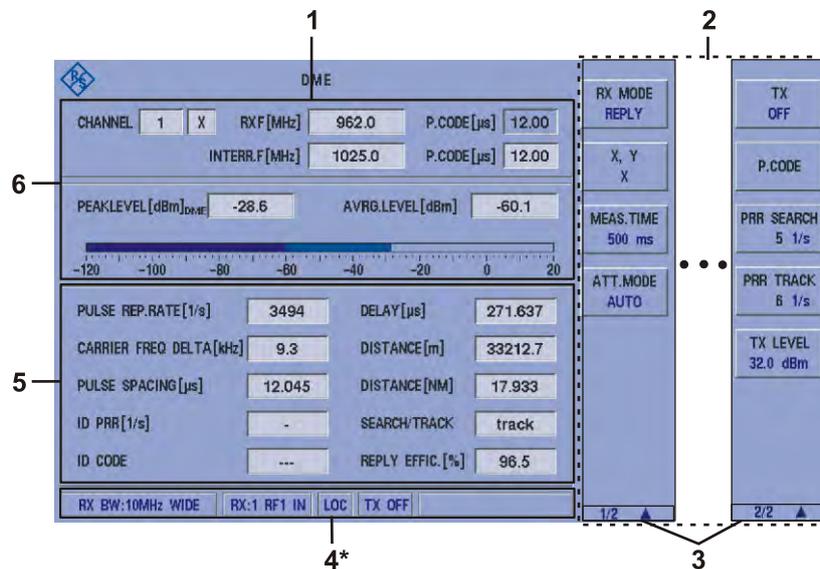
3.8.2 Activates the Distance Measurement mode (Option, EDS-K4)



The corresponding basic settings for the interrogator are described in Section 3.3.14 of the setup. Settings such as the frequency / channel setting and the setting of the receive mode are described in Sections 3.7.2 to 3.7.4. Only the mode-typical settings deviating from the normal DME mode are described below.

	Control	Operation	Function
1.		Press the "DME" (6) button.	The R&S EDS300 switches over into the DME Distance Measurement mode.

3.8.3 Signal Parameters and Display in the Distance Measurement mode (Option, EDS-K4)

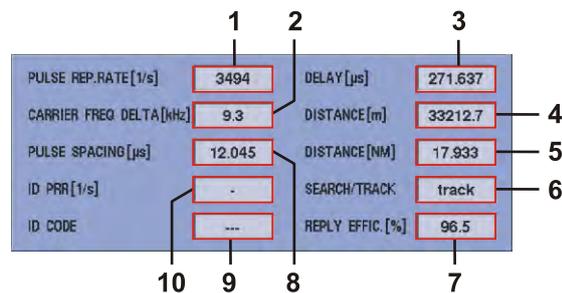


2* for general description of the status section, refer to 3.2.1.1



Due to the multitude of settings offered, two softkey bars (2) are available. The currently displayed softkey bar will be identified with the 1/2 ▲ e.g. 2/2 ▲ -symbol (3). Use the "▲" -button to switch back and forth between the softkey bars.

3.8.3.1 Measured Values Section (5)

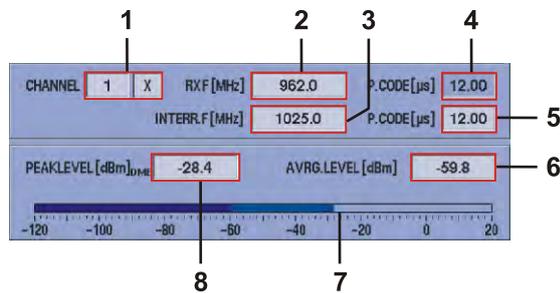


Item	Display	Function	Indication
1	PULSE REPETITION RATE [1/s]	The measured pulse repetition rate of the DME signal (number of pulse pairs/s) is updated once per second.	1/s

Item	Display	Function	Indication
2	CARRIER FREQ DELTA [kHz]	Display of the measured deviation relative to the set channel frequency.	kHz
3	DELAY [μ s]	Display of the reply delay time, delay time transmitter and reply pulse, including ground station delay (50 μ s in x mode / 56 μ s in y mode).	μ s
4	DISTANCE [m]	Display of the measured distance in metres; the delay time (main delay) of the ground station (50 μ s in x mode / 56 μ s in y mode) is considered when converting the time to slant range.	m
5	DISTANCE [NM]	Display of the measured distance in nautical miles; the delay time (main delay) of the ground station (50 μ s in x mode / 56 μ s in y mode) is considered when converting the time to slant range.	NM
6	SEARCH/TRACK	Display of the current mode of the interrogator. If the interrogator is in search mode for 30 seconds, the pulse rate is reduced to 30 pulses. "search(30)" is displayed in the display. After that, change to track mode. If there is no synchronisation it changes to MEMORY mode and attempts to restore the synchronisation based on the set request rate.	search, search(30), memory track
7	REPLY EFFIC. [%]	Display of the reply efficiency, rating of the valid reply pulses relative to the transmitted request pulses in percent.	%
8	PULSE SPACING [μ s]	Display of the measured pulse spacing between the pulses of a pulse pair.	μ s
9	ID-CODE	The decoded code of the identifier; as the ID is normally sent only every 40 s it remains in the display for 60 s.	z.B. "IKOW"
10	ID PRR [1/s]	The Pulse repetition rate of the identifier during ID transmission; when ID is detected, the display field will flash yellow and will indicate the measured frequency.	1/s

* Measurement accuracies are given in the Technical Data!

3.8.3.2 RF Parameter Section (6)

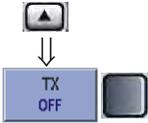
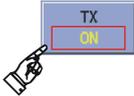
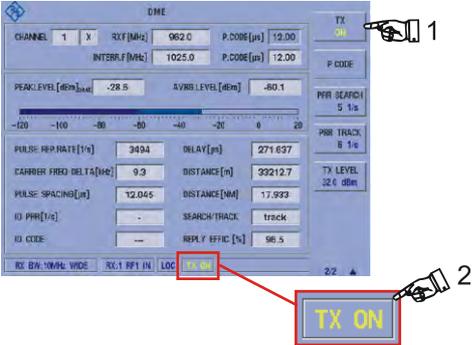


Item	Display	Function	Indication
1	CHANNEL	Display and setting of the receiving frequency (receiving frequency setting via the channel setting according to the ICAO frequency list, channel number extension directly selectable)	e.g.1X
2	RX F [MHz]	Display and setting of the receiver frequency for the reply pulses of the ground station (reply pulse).	MHz
3	INTERR.F [MHz]	Display and setting of the interrogator frequency, according to the ICAO frequency list with 63 MHz frequency offset relative to the receiver frequency.	MHz
4	P.CODE [µs]	Display of the reply pulse code (distance of the double pulses), according to the ICAO frequency list. The value is set by default when setting the channel code X and Y.	µs
5	P.CODE [µs]	Display and setting of the interrogator pulse code (distance of the double pulses), according to the ICAO frequency list. Display and setting of the interrogator pulse code (distance of the double pulses), according to the ICAO frequency list.	µs
6	AVRG.LEVEL [dBm]	Display of the measured average level of the received signal.	dBm
7	Bargraph	Graphics (bargraph) of the measured received signal level. In this case, the dark blue bar indicates the average level and the light blue bar indicates the peak level.	dBm
8	PEAKLEVEL [dBm]	Display of the measured peak level of the received signal.	dBm

3.8.3.3 Softkeys (1)

Display	Function															
Softkey bar 1																
	Changeover between the receive modes "REPLY" and "INTERROGATOR", the mode set is displayed in the softkey: <ul style="list-style-type: none"> – REPLY (signal measurement of the DME ground station) – INTERROG. (signal measurement of the DME on-board transmitter) 															
	Changeover between the channel codes X and Y according to the ICAO frequency list															
	Activates the measurement time. Setting value: 7 ... 10000 ms (10 ms step width) Note: Setting of the measurement time is described in section 3.5!															
	Changeover of the RF-attenuation, set range is displayed in the softkey: <table border="1" data-bbox="491 958 1369 1214"> <thead> <tr> <th></th> <th>Average Level</th> <th>Peak Level</th> </tr> </thead> <tbody> <tr> <td>Low Noise</td> <td>-110 ... -10 dBm</td> <td>-100 ... -10 dBm</td> </tr> <tr> <td>Norm</td> <td>-100 ... +5 dBm</td> <td>-90 ... +0 dBm</td> </tr> <tr> <td>Low Distortion</td> <td>-85 ... +12 dBm</td> <td>-75 ... +12 dBm</td> </tr> <tr> <td>Auto</td> <td>-110 ... +12 dBm</td> <td>-100 ... +12 dBm</td> </tr> </tbody> </table> <p>Note: The max. input level is +13 dBm. The Setting of the RF-Signal Adjustment is described in section 3.4!</p>		Average Level	Peak Level	Low Noise	-110 ... -10 dBm	-100 ... -10 dBm	Norm	-100 ... +5 dBm	-90 ... +0 dBm	Low Distortion	-85 ... +12 dBm	-75 ... +12 dBm	Auto	-110 ... +12 dBm	-100 ... +12 dBm
	Average Level	Peak Level														
Low Noise	-110 ... -10 dBm	-100 ... -10 dBm														
Norm	-100 ... +5 dBm	-90 ... +0 dBm														
Low Distortion	-85 ... +12 dBm	-75 ... +12 dBm														
Auto	-110 ... +12 dBm	-100 ... +12 dBm														
Softkey bar 2																
	Switching the interrogator ON/OFF for distance measurement.															
	Setting of the interrogator pulse code (spacing) in μ s. Setting value: 11 μ s ... 42 μ s															
	Setting of the pulse repetition rate in search mode (PRR, Pulse Repetition Rate). Setting value: 5 ... 150 1/s															
	Setting of the pulse repetition rate in track mode (PRR, Pulse Repetition Rate). Setting value: 5 ... 30 1/s															
	Entry of the transmission TX output for the Low Power Interrogator; for combination with the High Power Interrogator, this setting falls away as transmission takes place at fixed pulse output rate (500 W nominal). Setting value: -30 ... +43 dBm (max. 20 W)															

3.8.3.4 Switching the distance measurement (ON / OFF)

	Control	Operation	Function
1.		<p>Switch to the second menu window and select with the softkey (1) "TX".</p>	<p>Switching ON / OFF of the distance measurement, set function is displayed in the softkey (1). When transmitting mode is switched on, the status will be marked in yellow.</p>  <p>Selection: ON / OFF</p> 

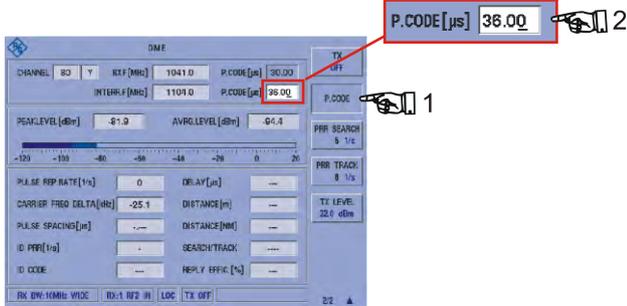
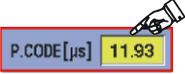
⚠ WARNING

The generally valid safety requirements and Section 3.8.1 must be observed in transmitter mode.

3.8.3.5 Setting of the pulse spacing (pulse code)

NOTICE

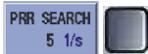
Only adjust settings when TX mode is switched off!

	Control	Operation	Function
1.		Press the softkey (1) "P.Code".	The editing function for changing the pulse spacing (interrogator pulse spacing, 2) is enabled.
			
2.		Setting the corresponding value with rollkey / keyboard.	Setting the corresponding value. When setting the value, the interrogator frequency is not adjusted. Setting value: 11 µs ... 42 µs
3.		Press the Enter button / push rollkey.	Changeover to the new set "P.CODE" value. If the background of the display field is yellow, the entered "pulse code" value is not ICAO compliant.
			

3.8.3.6 Setting for the Search mode

NOTICE

Only adjust settings when TX mode is switched off!

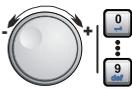
	Control	Operation	Function
1.		Press the softkey "PRR SEARCH".	The editing function for changing the pulse repetition rate for the search mode is enabled. 
2.		Setting the corresponding value with rollkey / keyboard.	Setting the pulse repetition rate Setting value: 5 ... 150 1/s
3.		Press the Enter button / push rollkey.	Changeover to the new set "PRR SEARCH" value.

3.8.3.7 Setting for the Track mode

NOTICE

Only adjust settings when TX mode is switched off!

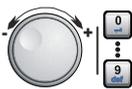
	Control	Operation	Function
1.		Press the softkey "PRR TRACK".	The editing function for changing the pulse repetition rate for the track mode is enabled. 

	Control	Operation	Function
2.		Setting the corresponding value with rollkey / keyboard.	Setting the pulse repetition rate Setting value: 5 ... 30 1/s
3.		Press the Enter button / push rollkey.	Changeover to the new set "PRR TRACK" value.

3.8.3.8 Setting of the transmission output to the Low Power Interrogator

NOTICE

Only adjust settings when TX mode is switched off!

	Control	Operation	Function
1.		Press the softkey "TX LEVEL".	Editing function for changing the transmitting output is enabled. 
2.		Setting the corresponding value with rollkey / keyboard.	Set the corresponding transmission output of the Low Power Interrogator. The transmission output can be linearly set in increments of 0.1 dB. Setting value: -30 ... +43 dBm (max. 20 W)
3.		Press the Enter button / push rollkey.	Transfer of the newly set transmission output value. If distance measurement is enabled (TX ON), transmission takes place at the set transmission output.

NOTICE

For combination with the High Power Interrogator, the transmission output cannot be adjusted. Transmission takes place exclusively at a pulse output rate of 500 W.

3.9 Multi DME mode (Option, EDS-K5) operation

NOTICE

The Option EDS-K5 (Multi DME) software is only usable in connection with the hardware options of EDS-B2 or EDS-B4 (low- or high-power interrogator) and a second RX module option EDS-B1. In multi DME mode.

10 different DME channels can be received and analyzed at the same time in a time multiplex process. To this end, all channels set are started in sequence in a fixed time grid of 5 ms. The settings in the setup for the Signal In input selection apply without restriction also the multi DME mode. For multi DME, both RX modules are switched on the same RF input, this being on that which is selected in the setup for TX Board 1. If the interrogator is active, a query pulse is sent at an interval (slot) of every 5 ms. This means that the pulse repeat rate (PRR) is permanently 20/s for every channel set, regardless of whether the distance measurement is currently in the search, track or memory mode.

3.9.1 Activates the Multi DME mode (Option, EDS-K5)



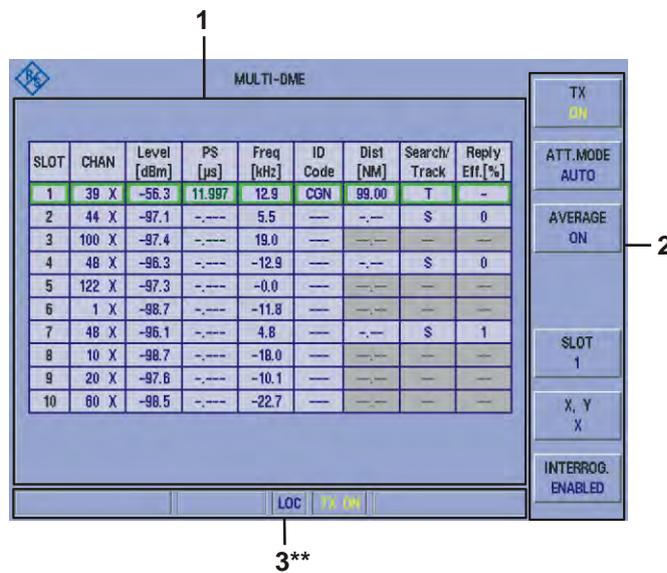
The corresponding basic settings for the interrogator are described in Section 3.3.14 of the setup. Settings such as the frequency / channel setting and the setting of the receive mode are described in Sections 3.7.2 to 3.7.4. Only the mode-typical settings deviating from the normal DME mode are described below.

	Control	Operation	Function
1.		Press the "SEQ" (15) button.	The R&S EDS300 switches over into the Multi DME mode. 

NOTICE

As soon as the EDS 300 switches to the multi DME mode, it is active and the corresponding analysis of the data is displayed on the channels set.

3.9.2 Signal Parameters and Display in the Multi DME mode (Option, EDS-K5)



3* for general description of the status section, refer to 3.2.1.1

3.9.2.1 Measured Values and RF Parameter Section (1)

1	2	3	4	5	6	7	8	9
SLOT	CHAN	Level [dBm]	PS [µs]	Freq [kHz]	ID Code	Dist [NM]	Search/Track	Reply Eff. [%]
1	39 X	-56.3	11.997	12.9	CGN	99.00	T	-
2	44 X	-97.1	----	5.5	---	---	S	0
3	100 X	-97.4	----	19.0	---	---	---	---
4	48 X	-96.3	----	-12.9	---	---	S	0
5	122 X	-97.3	----	-0.0	---	---	---	---
6	1 X	-98.7	----	-11.8	---	---	---	---
7	48 X	-96.1	----	4.8	---	---	S	1
8	10 X	-98.7	----	-18.0	---	---	---	---
9	20 X	-97.6	----	-10.1	---	---	---	---
10	60 X	-98.5	----	-22.7	---	---	---	---

Item	Display	Function	Indication
1	SLOT	Slots 1 ... 10, a slot is selected for the entry, this can be identified by the green frame.	1 ... 10

Item	Display	Function	Indication
2	CHAN	Display and setting of the channel (receiving frequency setting via the channel setting according to the ICAO frequency list, channel number extension directly selectable).	z.B. 1X
3	Level [dBm]	Measured level of the receipt signal in dBm. A receipt level that is too high (overload) is displayed in red, the values displayed cannot be used.	dBm
4	PS [μ s]	Display of the measured pulse spacing between the pulses of a pulse pair (pulse spacing).	μ s
5	Freq [kHz]	Display of the measured deviation relative to the set channel frequency (carrier frequency delta).	kHz
6	ID-CODE	The decoded code of the identifier. The background is highlighted in yellow during the transmission of the ID code; if the identifier is decoded, it is displayed for at least 60 seconds.	z.B. "CGN"
7	Dist [NM]	Display of the measured distance in nautical miles; the delay time (main delay) of the ground station (50μ s in x mode / 56μ s in y mode) is considered when converting the time to slant range. Values are only displayed if the interrogator function is also activated in the corresponding slot and the dispatch function is activated.	NM
8	Search/Track	Display in which mode the distance measurement currently is. The measurement always starts in search mode; when synchronizing on a DME station, a switch to track mode is performed. If there is no synchronization, it puts the time set in the SETUP-DME INTERROG-MEMORY TIME in the MEMORY mode and attempts to restore the synchronization. If the resynchronization is not carried out, after memory there is a switch to search mode, otherwise back to track mode. Values are only displayed if the interrogator function is also activated in the corresponding slot and the dispatch function is activated.	„S“ (search), „M“ (memory) „T“ (track)

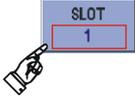
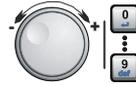
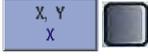
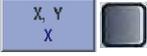
Item	Display	Function	Indication
9	Reply Eff. [%]	Display of the reply efficiency, rating of the valid reply pulses relative to the transmitted request pulses in percent.	%

* Measurement accuracies are given in the Technical Data!

3.9.2.2 Softkeys (2)

Display	Function															
	Switching the transmitter ON/OFF for distance measurement.															
	Changeover of the RF-attenuation, set range is displayed in the softkey: <table border="1" data-bbox="491 887 1385 1146"> <thead> <tr> <th></th> <th>Average Level</th> <th>Peak Level</th> </tr> </thead> <tbody> <tr> <td>Low Noise</td> <td>-110 ... -10 dBm</td> <td>-100 ... -10 dBm</td> </tr> <tr> <td>Norm</td> <td>-100 ... +5 dBm</td> <td>-90 ... +0 dBm</td> </tr> <tr> <td>Low Distortion</td> <td>-85 ... +12 dBm</td> <td>-75 ... +12 dBm</td> </tr> <tr> <td>Auto</td> <td>-110 ... +12 dBm</td> <td>-100 ... +12 dBm</td> </tr> </tbody> </table> <p>Note: The max. input level is +13 dBm. The Setting of the RF-Signal Adjustment is described in section 3.4!</p>		Average Level	Peak Level	Low Noise	-110 ... -10 dBm	-100 ... -10 dBm	Norm	-100 ... +5 dBm	-90 ... +0 dBm	Low Distortion	-85 ... +12 dBm	-75 ... +12 dBm	Auto	-110 ... +12 dBm	-100 ... +12 dBm
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Low Distortion	-85 ... +12 dBm	-75 ... +12 dBm														
Auto	-110 ... +12 dBm	-100 ... +12 dBm														
	Activation / deactivation of the average function. If the average function is activated, the values displayed are averaged by a second, i.e. for every slot an averaging of 20 measurement values takes place.															
	Selection of one of the 10 slots for setting the channel and for activating or deactivating the interrogator. These settings are individual for every slot. The currently selected slot has a green frame.															
	Changeover between the channel codes X and Y according to the ICAO frequency list.															
	Activate/deactivate the interrogator for distance measurement. This setting can be used for every slot individually.															

3.9.3 Settings for the Multi DME mode

	Control	Operation	Function
Select slot:			
1.		Press the softkey "SLOT".	Editing function for selecting a slot is activated. 
2.		Setting the corresponding slot with rollkey.	Select slot. Slot: 1 ... 10
3.		Press the Enter button / push rollkey.	The correspondingly selected slot is displayed by the green frame, and the slot-related settings (channel entry, interrogator activated/deactivated) can be applied.
Setting the receive channel:			
4.		Press the "CHAN" (7) button.	Change to the editing function for entering the channel (frequency assignment according to the ICAO frequency list, 3.7.5.1). The channel section is highlighted by means of a different background and the cursor is displayed to the right of the last digit.
5.		Setting the corresponding channel using the rollkey / keyboard.	Only enter the numeric parts (also refer to ILS frequency / channel list).
6.		Press the Enter button / push rollkey.	Changeover to the new receiving channel set.
Setting a channel code:			
7.		Press the softkey repeatedly until the channel code (X, Y) assigned to the frequency has been set.	Setting of the corresponding channel code (X, Y), the code set will be displayed in the softkey. 

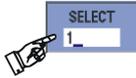
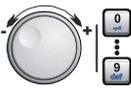
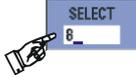
	Control	Operation	Function																																																																																																												
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		Activating/deactivating the interrogator function:																																																																																																													
8.		Press softkey to activate or deactivate the function.	<p>The function set is immediately active for the slot selected and will be displayed in the softkey.</p> 																																																																																																												

NOTICE

If the same channel is set for two or more slots, the activation of the interrogator is only possible in one of these slots, as otherwise the query rate of 20/s would be exceeded for this channel. The dispatch is made in TX ON send pulse active mode, in combination with the high power interrogator, dispatches are made exclusively with the 500 W pulse output performance; in combination with the low power interrogator, dispatches are made with the dispatch power set in the distance measurement mode.

3.10 Preset mode operation

The preset function enables 20 different individual device settings to be saved and used. This pre -settings includes operational settings for a mode (such as frequency, channel etc.) and the most important set up settings. If a particular device setting is stored, date and time are automatically assigned to the list's element. Each element of a list may be named individually.

	Control	Operation	Function
1.		Press the "PRESET" (1) button.	The display changes to the window of the Preset function. 
Creating a Presetting			
2.		Press the softkey "SELECT".	Switch to the editing function for selecting a "UserPreset no". The value field in the softkey will be displayed on a different background. 
3.		Set a "UserPreset no." using the rollkey / keyboard.	The selection will be carried along numerically in the softkey. 
4.		Press the Enter button / push rollkey.	Acceptance of the new set selection. 
5.		Press the softkey "SAVE".	Following selection, a dialog box will display the name up to that time by default. This name, however, can be changed as desired. After confirming a security prompt, the topical device settings will be saved with the topical date and time.

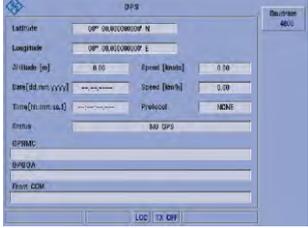
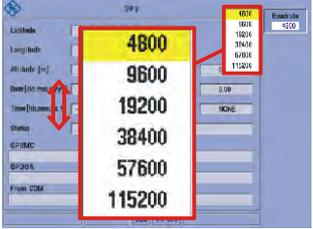
	Control	Operation	Function
			<p>Assignment of a saved presetting is indicated by a date / time entry. Available memory has no date / time entry. Assigned memory can be rewritten any number of times!</p>
6.		Press the Enter button / push rollkey.	The current settings will be stored. The process can be aborted at any time by pressing the "ESC" button.
Recalling a Presetting			
7.		Press the softkey "SELECT".	Select a "UserPreset no." according to steps 2 ... 4.
8.		Press the softkey "RECALL".	<p>The current device settings will be rewritten with the pre-settings of the selected "UserPreset-No." after the security question has been confirmed. The process can be aborted at any time by pressing the "ESCAPE" button.</p>
Deleting a Presetting			
9.		Press the softkey "SELECT".	Select a "UserPreset no." according to steps 2 ... 4.
10.		Press the softkey "DELETE".	<p>The name and the settings stored for this "UserPreset no." will be deleted after the security prompt has been confirmed. The process can be aborted at any time by pressing the "ESCAPE" button.</p>

	Control	Operation	Function
Renaming a list element			
11.		Press the softkey "SELECT".	Select a "UserPreset no." according to steps 2 ... 4.
12.		Press the softkey "RENAME".	Following selection, a dialog box will display the name up to that time by default. This name, however, can be changed as desired. 
13.		Press the Enter button / push rollkey.	The active list element is saved with a new name. The process can be aborted at any time by pressing the "ESCAPE" button.
Calling the factory defaults			
14.		Press the softkey "FACTORY PRESET".	The current device settings will be overwritten with the default settings after the security question has been confirmed. 

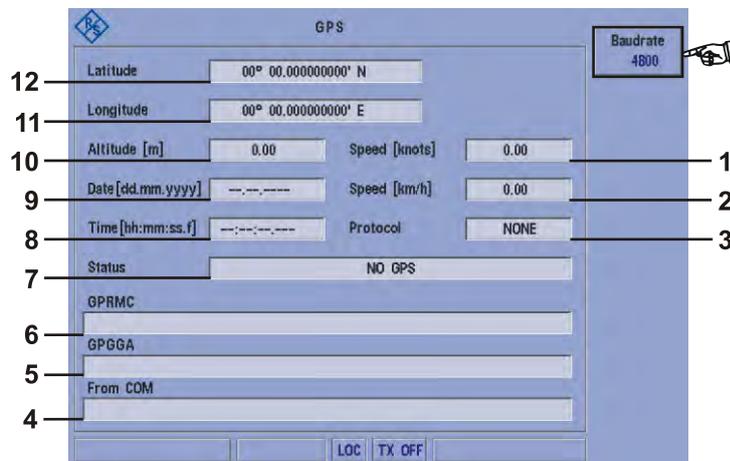
3.11 GPS function (Option, EDS-K3)

The GPS function enables the indication of the current position and corresponding parameters, which were gained from the dataset of the NMEA protocol. A GPS receiver needs to be connected to the RS232 interface (3) for this purpose.

3.11.1 GPS operating (Option, EDS-K3)

	Control	Operation	Function
1.		Press the "GPS" (13) button.	The device changeover into the GPS function window. 
Setting the baud rate of the RS 232 interface:			
2.		Press the softkey "Baudrate".	The selection list for setting the baud rate will be displayed. 
3.		Turn the rollkey until the desired baud rate is marked in the selection list.	The softkey will be updated with the set baud rate.  Setting value: 4800 ... 115200 Baud
4.		Press the Enter button / push rollkey.	Acceptance of the new set baud rate. 

3.11.2 Displays in the GPS menu

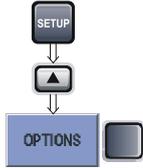
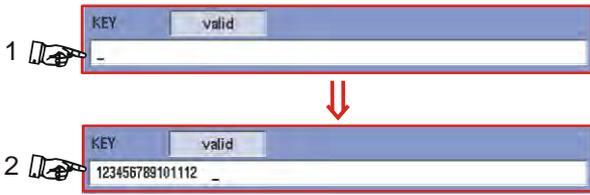


Item	Display	Function	Indication
1	Speed [knots]	Indication of speed (knots)	knots / h
2	Speed [km/h]	Indication of speed (km/h)	km/h
3	Protocol	Indication of the GPS protocol, e.g. NMEA (National Marine Electronics Association)	
4	From COM	Arriving data from the serial interface (GPS RS 232, 3).	
5	GPGGA	<p>GPGGA (Global Positioning System Fix Dat) dataset containing the most important information of the GPS position and accuracy. They will be displayed as ASCII character set with 4.800 baud and in the following format:</p> <pre>\$GPGGA,hhmmss.ss, llll.ll,a,yyyyy.yy,b,q,nn,d,d,a,a,M,g,g,M,h,h, rrrr*hh</pre> <ul style="list-style-type: none"> a. hhmmss.ss = current time (UTC) b. llll.ll = Latitude detail c. a = Hemisphere of latitude N (north) / S (south) d. YYYYY.YY = Longitude detail e. a = Hemisphere of longitude E (east) / W (west) f. q = GPS-quality g. nn = Number of used satellites (0 ... 12) h. d.d = Horizontal deterioration of the position i. a.a = Height of the antenna j. M = Unity of the antenna height in meter (m) k. h.h = Age of the DGPS data l. rrrr = DGPS-reference station (0000 ... 1023) m. hh = Checksum 	

Item	Display	Function	Indication
6	GPRMC	<p>GPRMC (Global Positioning Recommended Minimum Specific) means, a GPS receiver with NMEA protocol should display a dataset with the least amount of information. This dataset will be displayed as ASCII character set with 4.800 baud and in the following format.</p> <p>\$GPRMC,hhmmss.ss,A,IIII.II,a,yyyy.yy,a,x.x,x.x,ddmmyy,x.x,a*hh</p> <ul style="list-style-type: none"> n. hhmmss.ss = current time (UTC) o. A = Status (A=ok, V=warning) p. IIII.II = Latitude detail q. a = Hemisphere of latitude N (north) / S (south) r. YYYYYY.YY = Longitude detail s. a = Hemisphere of longitude E (east) / W (west) t. x.x = Speed into knots u. x.x = Direction in degree v. ddmmyy = Date w. x.x = magnetic deviation x. a = E (east) / W (west) y. hh = Checksum 	
7	Status	GPS status and number of satellites detected	
8	Time	Indication of the current Time	hh.mm.ss
9	Date	Indication of the current Date	dd.mm.yyyy
10	Altitude [m]	Indication of the current altitude	m
11	Longitude	Indication of the Longitude	[°] Degree
12	Latitude	Indication of the Latitude	[°] Degree

3.12 Release of Software options

A license key for the purchased options can be entered via the options window. Once the option has been purchased, Rohde & Schwarz will provide you with the necessary key number in writing.

	Control	Operation	Function
1.		Switch to the second menu window of the setup function and press the softkey "OPTIONS".	Changeover into the "OPTIONS" menu window. 
2.		Press the Enter button / push rollkey.	The editing function (1) for the entry of the key number is activated and the key number (2) received can be entered. 
3.		Press the Enter button / push rollkey.	Transfer of the key number, the purchased option will be enabled and identified as "available". 



If an incorrect key number is entered, the entered key will be shown in red. The option will not be enabled, repeat the entry using the correct key.



3.13 Calibration- and service function



The calibration- and service function is left to exclusively authorised service points!

3.13.1 Activates the Calibration- and service function

	Control	Operation	Function
1.		Press the " CAL " (44) button.	<p>The R&S EDS300 switches over into the calibration- and service function.</p> 

3.14 Remote Control of the R&S EDS 300 DME / PULSE Analyzer

3.14.1 Operation via LAN interface

Through the LAN interface (6), all functions of the device and the data transfer of the measurement data of the R&S EDS300 DME/PULSE Analyzer can be remotely operated from a PC / network. IP Addresses and subnet mask identifier are set in the setup menu.

3.14.2 Remote Control Commands

There are two categories of control commands.

- super commands (mode related)
- Mode mode dependant commands (specified mode must first be selected)

The following table makes clear the control commands structure:

Mode related control commands	Mode dependant control commands		
	DME mode	PULSE VIEW mode	Setup mode
	DME Distance Measurement-Mode	Multi DME mode	

3.14.2.1 Mode related Control Commands

Command	Parameter	Response	Function
*IDN?		<IDN_string>	Query of the device ID
VER?		<sw-version>	Query of the software version
HELP?	<COMMAND_NAME> ALL ALL2	<string>	Query of the command HELP
LOCAL		READY.	Resets the device to local control if local control was previously locked by the "REMOTELOCK" command.
REMOTELOCK?		ON, OFF	Query of the remote lock status

Command	Parameter	Response	Function
REMOTELOCK	ON OFF	READY.	If the function is set to "ON", local control of the device is not possible, the "LOCAL" button on the device is also locked. The local control lock is switched off by setting the function to "OFF" or by restarting the device.
FACTORY_PRESET		READY.	Reset of the R&S® EDS 300 to the basic settings.
KEY	<key code decimal>	<key> READY.	Sends the key number via the remote control, for enabling SW options.
RX?		<RX:Nr>	Query of the standard RX board no.
MAIN_BOARD_FPGA_VER?		<version>	Query of the main board FPGA-Software version
MAIN_BOARD_CPLD_VER?		<version>	Query of the main board CPLD-Software version
RX_BOARD_FPGA_VER?		<version>	Query of the RX board FPGA-Software version
LPIU_FPGA_VER?		<version>	Query of the LPIU board FPGA-Software version
MEASMODE?		MODE_DMETAC, MODE_PULSE, MODE_PULSE_INACTIV	Query of the currently set measurement mode
MEASMODE_DME		READY.	Switchover to the DME mode.
MEASMODE_PULSE		READY.	Switchover to the PULSE VIEW mode.

3.14.2.2 Remote Control Commands of the DME mode

Command	Parameter	Response	Function
DME:RFCH?		<channel>	Query of the currently set DME receive channel.
DME:RFCH	<channel number> <channel character>	READY.	Setting of a DME receive channel.
DME:FREQ?		<numeric_value>	Query of the currently set DME receiving frequency.
DME:FREQ	<frequency in MHz>	READY.	Setting of the DME receiving frequency; in this process, all the frequency settings (channel number, XY etc.) will be overwritten.
DME:RFCH_PS?		<channel - pulse_code_repl_us pulse_code_intrg_us > e.g. 001Y-30-36	Query of the DME RF channel and the pulse spacing (e.g.:1X-12)
DME:PEAKLEVEL?		<numeric_value>	Query of the measured DME peak level in dBm.
DME:MEASTIME?		<numeric_value>	Query of the measured DME measurement time in ms.
DME:MEASTIME	time in ms	READY.	Setting of the DME measurement time in ms.
DME:ATTMODE?		LOW_NOISE, NORM, LOW_DIST, AUTO	Query of the currently set DME mode for RF signal matching.
DME:ATTMODE	LOW_NOISE NORM LOW_DIST AUTO	READY.	Setting of the DME mode for RF signal matching.
DME:PULSE_REPT_RATE?		<numeric_value>	Query of the measured DME pulse repetition rate.

Command	Parameter	Response	Function
DME:CARRIER_F_DELTA?		<numeric_value>	Query of the measured carrier frequency deviation in kHz.
DME:PULSE_SPACING?		<numeric_value>	Query of the measured pulse spacing in μ s.
DME:ID_PRR?		<numeric_value>	Query of the ID pulse repetition rate 1/s
DME:ID_CODE?		<string>	Query of the ID code
DME:RXMODE?		REPLY, INTERROG	Query of the DME RX mode: REPLY, INTERROG
DME:RXMODE	REPLY INTERROG	READY.	Setting of the DME RX mode.
DME:TXFREQ?		<numeric_value>	Query of the interrogator frequency in MHz
DME:TXFREQ	<frequency in MHz>	READY.	Setting of the interrogator frequency.
DME:AVRGLEVEL?		<numeric_value>	Query of the measured average level in dBm

3.14.2.3 Remote Control Commands of the Multi DME mode

Command	Parameter	Response	Function
MEASMODE_MDME		READY.	Switchover to the Multi DME mode. To use the Multi DME option two RX Boards are required.
MDME:ATTMODE	LOW_NOISE NORM LOW_DIST AUTO	READY.	Setting of the Multi DME mode for RF signal matching.
MDMEDATA?	Dataset definition Slot 1 ... 10	<string>	Query of a single dataset of one slot in Multi DME mode.

Command	Parameter	Response	Function
MDME:STREAMCFG	Slots 1..10, separated by ; (default:1;2;3;4;5; 6; 7;8;9;10)	READY.	Select of Multi DME Slots for streaming, only selected slots are streamed out.
MDME:CH	Slot 1..10 Channel Nr X/Y TX enable ON/OFF	READY.	Configure one Multi DME Slot.
MDME:AVRG	ON OFF	READY.	Activation / deactivation of the average function.

3.14.2.4 Remote Control Commands of the PULSE VIEW mode

Command	Parameter	Response	Function
PULSEVIEW:DATASET?		<numeric_list>	Query of the PULSE VIEW measurement values.
PULSEVIEW:TIMEDIV?		<numeric_value>	Query of the set time base in μ s.
PULSEVIEW:TIMEDIV	<time in us>	READY.	Setting of the time base in μ s.
PULSEVIEW:UNIT?		DBM, MW, UW, NW, PW, V, MV, UV	Query of the set unit.
PULSEVIEW:UNIT	DBM MW UW NW PW V MV UV	READY.	Setting of the unit.
PULSEVIEW:TRIGSOURCE?		LEVEL, EXTERN DME_PULSE INTERROG TAC_MRB TAC_ARB CONT	Query of the set trigger source.

Command	Parameter	Response	Function
PULSEVIEW:TRIGSOURCE	LEVEL, EXTERN DME_PULSE INTERROG TAC_MRB TAC_ARB CONT	READY.	Setting of the trigger source.
PULSEVIEW:TRIGMODE?		NORMAL, SINGLE, AUTO	Query of the trigger mode.
PULSEVIEW:TRIGMODE	NORMAL SINGLE AUTO	READY.	Setting of the trigger mode.
PULSEVIEW:TRIGSLOPE?		POS, NEG	Query of the set trigger slope.
PULSEVIEW:TRIGSLOPE	POS NEG	READY.	Setting of the trigger slope.
PULSEVIEW:TRIGDOUBLE?		ON, OFF	Query of the set trigger double function.
PULSEVIEW:TRIGDOUBLE	ON OFF	READY.	Setting of the trigger double function.
PULSEVIEW:TRACE?		CLRWR, AVRG, MAXHOLD	Query of the set trace function.
PULSEVIEW:TRACE	CLRWR AVRG MAXHOLD	READY.	Setting of the trace function.
PULSEVIEW:AVRG?		<numeric_value>	Query of the set AVRG factor.
PULSEVIEW:AVRG	<average factor>	READY.	Setting of the AVRG factor.
PULSEVIEW:TRIGLEVEL_MV?		<numeric_value>	Query of the set trigger level.

Command	Parameter	Response	Function
PULSEVIEW:TRIGLEV RF_MV	<trigger level>	READY.	Setting of the trigger level. The setting range depends on the unit set for "UNIT".
PULSEVIEW:TRIGDEL AY?		<numeric_value>	Query of the set trigger delay time in μ s.
PULSEVIEW:TRIGDEL AY	<trigger delay in μ s>	READY.	Setting of the trigger delay time in μ s.
PULSEVIEW:RF_BW	OFF 500K 10M	READY.	Setting of the RF Bandwidth of the Receiver (IF2 Bandwidth) Demod Bandwidth is not affected!
PULSEVIEW:RF_BW?		OFF 500K 10M	Issue of the RF Bandwidth of the Receiver

3.14.2.5 Remote Control Commands of the Setup mode

Command	Parameter	Response	Function
SETUP:INPUT?		INPUT_RF1, INPUT_RF2, INPUT_BBAND	Query for the signal selection of the receiver module (RX board).
SETUP:INPUT	<INPUT_RF1, INPUT_RF2, INPUT_BBAND>	READY.	Signal selection on the receiver module (RX board)
SETUP:BBAND_RANG E?		BBRANGE_LOW, BBRANGE_HIGH	Query of the currently set baseband range of the receiver module (RX board).
SETUP:BBAND_RANG E	<BBRANGE_LO W, BBRANGE_HIG H>	READY.	Setting of the baseband range of the receiver module (RX board).

Command	Parameter	Response	Function
SETUP:TRIGGER_OUT_MODE?		PULSE_TRIGGER, PULSE_DECODED, INTERROG TRIGGER, ID_CODE, MRB_TRIGGER, ARB_TRIGGER	Query of the set trigger type for the trigger output.
SETUP:TRIGGER_OUT_MODE	PULSE_TRIGGER, PULSE_DECODED, INTERROG TRIGGER, ID_CODE, MRB_TRIGGER, ARB_TRIGGER	READY.	Setting of the trigger type for the trigger output. Setting : PULSE_TRIGGER, ID_CODE, ARB_TRIGGER, MRB_TRIGGER
SETUP:ANALOG_OUT_MODE?		RX-DEMOD, DET_ENVELOPE, DET_15HZ, DET_135HZ	Query of the set signal selection at the analog output.
SETUP:ANALOG_OUT_MODE	RX-DEMOD, DET_ENVELOPE, DET_15HZ, DET_135HZ	READY.	Setting of the signal selection at the analog output. Setting : RX-DEMOD, RX1-LOGAMP, 15_HZ, 135_HZ
SETUP:AUDIO_OUT?		IDENTIFIER, FULL	Query of the set audio mode.
SETUP:AUDIO_OUT	<IDENTIFIER, FULL>	READY.	Setting of the audio mode. Setting : IDENTIFIER, FULL,
SETUP:UNIT_LEVEL?		<dBm>	Query of the set unit for the level.
SETUP:REFERENCE:SOURCE?		FREF_INTERN, FREF_EXTERN	Query of the source for the reference frequency.

Command	Parameter	Response	Function
SETUP:REFERENCE:SOURCE	FREF_INTERN FREF_EXTERN	READY.	Setting of the source for the reference frequency. Setting : FREF_INTERN, FREF_EXTERN,
SETUP:REFERENCE:EXTREFERENCE?		Output, present, not present	Abfrage des Status der externen Referenz
SETUP:AF_VOLUME?		<numeric_value>	Query of the set audio level in %.
SETUP:AF_VOLUME	<pegel in %>	READY.	Setting of the audio level in %.
SETUP:SPEAKER?		ON, OFF	Query of the current speaker level.
SETUP:SPEAKER	ON OFF	READY.	Switching the speaker ON/OFF. Setting : ON, OFF,
SETUP:DISPLAY_UPDATE_MS?		<ms>	Query of the set display interval in ms.
SETUP:DISPLAY_UPDATE_MS	<time in ms>	READY.	Setting of the display interval in ms.
GETHWINVENTORY			Output of the hardware / software inventory list.
GETHWSTATUS		<string>	Issue of the hardware status of the hardware modules inside the EDS300.
GETUNCAL		<string>	Issue of the uncal status.
GETOPTIONS		<string>	Issue of the installed SW options.
TEMP?		<DEG>	Output of the temperatures of all the integrated temperature sensors.

3.14.2.6 Remote Control Commands of the Distance measurement mode

Command	Parameter	Response	Function
DST:TXON	ON, OFF	READY.	Switches the TX interrogator ON/OFF.
DST:TXON?		ON, OFF	Query if the TX interrogator is ON.
DST:VSWR?		"VSWR OK", "VSWR IU", "VSWR DU", "VSWR IDU"	Query if the TX interrogator was switched off due to bad VSWR condition.
DST:PRR	<PRR Search 5 ... 150> <PRR Track 5 ... 30>	READY.	Setting the TX Pulse Repetition rate during search and track condition.
DST:SOT?		SEARCH,TRACK, MEMORY, INACTIVE	Issue of the search or track status.
DST:DELAY?		delay in μ s	Issue of the measured reply pulse delay.
DST:DST?		distance in m	Issue of the distance .
DST:REPEFF?		reply efficiency in %	Issue of the current reply efficiency in %.

4 Service

To guarantee a repair as quick as possible a defective R&S EDS300 DME/PULSE Analyzer must be sent to the services as stated below.



To avoid damages on transport the unit should be sent inside its original packing.

Shipping address:

Rohde&Schwarz GmbH & Co. KG.
Service Operations West
Graf-Zeppelin-Str. 18
D-51147 Köln



For questions concerning the service or other problems with the unit, please contact us.

Note:

For questions concerning the service or other problems with the unit, please contact us.

 ROHDE & SCHWARZ Service Operations West	
	(49) / 2203 / 49-51 406 (49) / 2203 / 49-51 402
	(49) / 2203 / 49-51 642

4.1 Guarantee

See our terms and conditions of trade (sales contract).

NOTICE

During the guarantee a defective internal battery may only be changed by a Rohde & Schwarz-Service Centre, otherwise the right to claim under guarantee get lost!

5 Maintenance

5.1 Calibration



The R&S EDS300 DME/PULSE Analyzer needs to be calibrated yearly!

5.2 Cleaning

To clean the **R&S EDS300 DME/PULSE Analyzer** we recommend the following utensils:

- Brush
- soft, lint free cloth

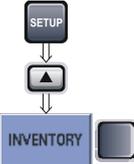
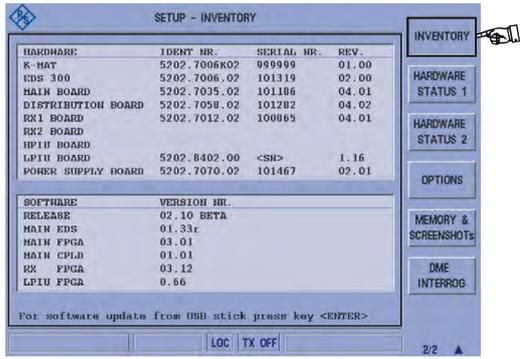
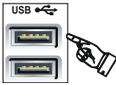
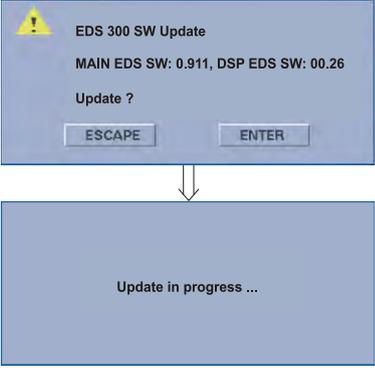
NOTICE

Before cleaning R&S EDS300 DME/PULSE Analyzer it must be switched OFF! Don't use aggressive cleaner for cleaning the surfaces of the R&S EDS300 DME/PULSE Analyzer! Electric interfaces must not be cleaned with liquid cleanser e.g. contact spray!

5.3 Software Update

Click on the following website to receive the latest software update for your **R&S EDS300 DME/PULSE Analyzer**:

<http://www.rohde-schwarz.com/product/eds300>

	Control	Operation	Function
1.		<p>Activate setup and switch to the second menu window, press the softkey "INVENTORY".</p>	<p>Changeover to the "INVENTORY" menu window.</p> 
2.		<p>Insert the USB memory stick with the current software update into one of the USB interfaces (29)/(8).</p>	<p>wait about 5 seconds</p>
3.		<p>Press the "ENTER" (31) button.</p>	<p>Initialisation of the software update is beginning.</p> 
4.		<p>Press the "ENTER" (31) button.</p>	<p>The software update will begin after the security question has been confirmed.</p> 

NOTICE

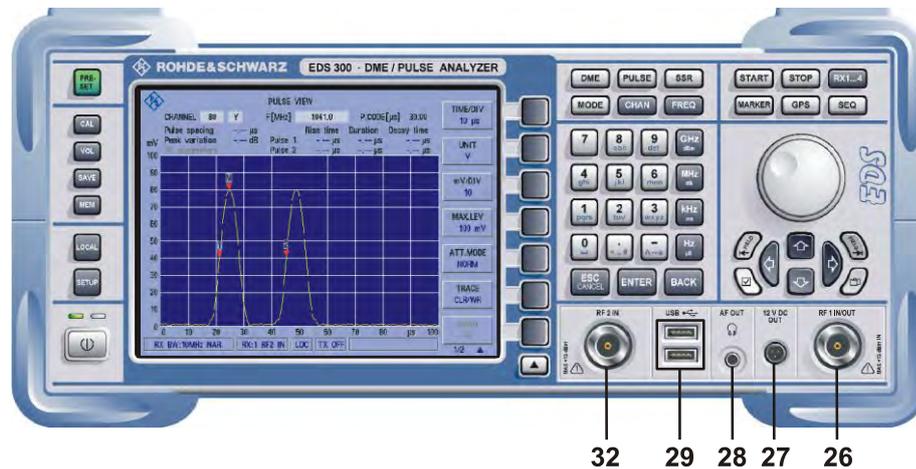
Never remove the USB memory stick or switch off the device during the software update!

If the USB memory stick is removed during an update, the following error message will be displayed: "Cannot unpack Update". Use the "ESC" button to acknowledge the message. The update mode will be interrupted, i.e., the device can still be operated.

	Control	Operation	Function
5.		Press the "ENTER" (31) button.	When the software update is completed, the update programme is ended after confirmation by pressing "Enter". 
6.		Remove the USB memory stick.	
7.		Press the button twice	The device needs to be restarted to activate the new software.

6 Interfaces of the Unit

6.1 Front side interfaces



6.1.1 Receiving antenna connection (26)



If equipped with the interrogator options EDS-B2 / EDS-B4, the RF1 IN/OUT is simultaneously used as HF output when in operation. For this, the R&S EDS 300 DME / PULSE Analyzer must be connected to a transmitter antenna of equivalent frequency range and power range (low power mode (20 W), high power mode (500 W)).

Item	Designation	Description
26	RF1 IN/OUT	<p>RF input for the first receiver unit.</p> <p>Input level: max. +13 dBm</p> <p>Frequency range: 960 MHz ... 1215 MHz</p> <p>VSWR: <1.5</p> <p>Connector: N-socket, 50 Ω</p> <p>Note: The max. input level is +13 dBm, Data stability until 10 dBm guaranteed!</p> <p>RF-output of the interrogator options</p> <p>Low Power Interrogator, Option EDS-B2</p> <p>Output power: max. 20 W (+43 dBm) ± 1.5 dB</p> <p>Frequency range: 1025 MHz ... 1150 MHz</p> <p>Channel offset: 1 MHz</p> <p>Distance range: 5.4 NM (ca. 10 km)</p> <p>Resolution: 0,1 m</p>

Item	Designation	Description
		Deviation: ≤ 5 m Connector: N-socket, 50 Ω High Power Interrogator, Option EDS-B4 Output power: 500 W (+57 dBm) -2.0 dB/+1.0 dB Frequency range: 1025 MHz ... 1150 MHz Channel offset: 1 MHz Distance range: 200 NM (ca. 400 km) Resolution: 1 m Deviation: ≤ 20 m Connector: N-socket, 50 Ω

NOTICE**Normal operation:**

To prevent destruction of the transmitter modules, transmission is only permissible with termination.

Laboratory operation:

To prevent destruction of laboratory equipment in laboratory operation, it is essential to interconnect a 30 dB attenuation element in low power mode and a 40 dB attenuation element in high power mode.

6.1.2 Voltage supply for external consumers (27)

Item	Designation	Description
27	12 VDC OUT	Supply voltage output for external consumers. Power supply: 12 VDC / 300 mA Connection: 3pol. circular connector

6.1.3 Headphone output (28)

Item	Designation	Description
28	AF OUT	3.5 mm jack plug.

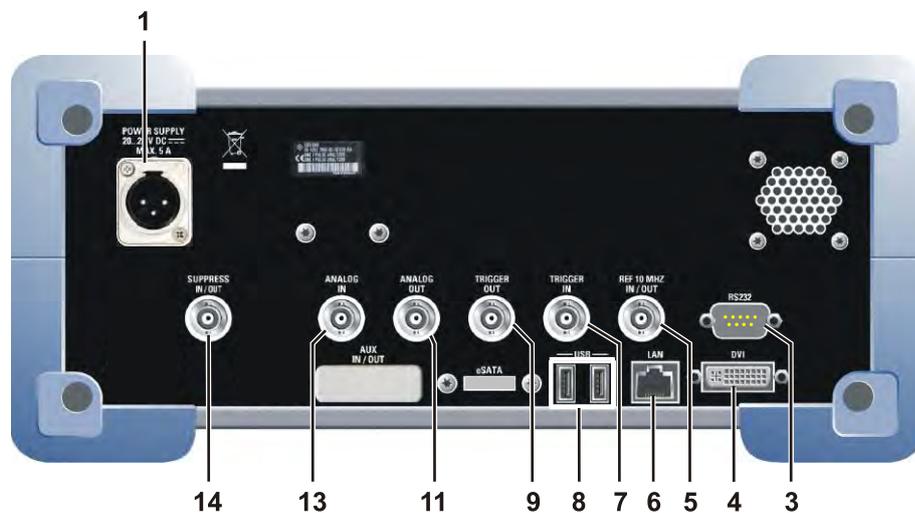
6.1.4 USB interface (29)

Item	Designation	Description
29	USB 	<p>USB 2.0 standard twin port.</p> <p>Transmission rate: max. 40 Mbit/s</p> <p>Power supply: 5 VDC / 500 mA at each port (integrated)</p>

6.1.5 Receiving antenna connection (32)

Item	Designation	Description
32	RF2 IN	<p>RF input for the second receiver unit. (Option, EDS-B1)</p> <p>Input level: max. +13 dBm</p> <p>Frequency range: 960 MHz ... 1215 MHz</p> <p>VSWR: <1.5</p> <p>Connector: N-socket, 50 Ω</p> <p>Note: The max. input level is +13 dBm, Data stability until 10 dBm guaranteed!</p>

6.2 Rear side interfaces



6.2.1 Power Supply connection (1)

Item	Designation	Description
1	POWER SUPPLY 20 ... 28 VDC Max. 5A	Supply voltage input Input voltage: 20 ... 28 VDC Connector: DC-socket

NOTICE

When connecting the device to an external direct voltage source, a 5-A fuse protection must be provided! The length of the DC cable must be <3 m. The device must not be connected to available direct voltage networks.

6.2.2 RS232 interface (3)

Item	Designation	Description
3	RS232	Serial interface of the R&S EDS300 DME/PULSE Analyzer to the connection of an external GPS receiver. COM-parameter: N81 Baud-rate: 4800 ... 115200 bit/s Connector: SUB-D-plug (9 pin)

6.2.3 DVI interface (4)

Item	Designation	Description
4	DVI	Digital interface for the connection of a second monitor (TFT). Connector: DVI-D-socket (24+1)

6.2.4 10-MHz Reference frequency IN / OUT (5)

Item	Designation	Description
5	REF 10 MHZ IN/OUT	In- / Output for the 10-MHz Reference frequency, the setting is made in the setup. Frequency: 10 MHz Input level: 1 V _{eff.} Output level: 1 V _{eff.} Connector: BNC-socket, 50 Ω

6.2.5 LAN interface (6)

Item	Designation	Description
6	LAN	LAN interface (Fast Ethernet Standard) Data transfer rate: 100 Mbit/s Connector: RJ 45

6.2.6 Trigger input (7)

Item	Designation	Description
7	TRIGGER IN	External trigger input for triggering the corresponding analysis modes. Input level: digital, 0 V / 3,3 ... 30 V Connector: BNC-socket, 100 kΩ

6.2.7 USB interface (8)

Item	Designation	Description
8	USB 	<p>USB 2.0 standard twin port.</p> <p>Transmission rate: max. 40 Mbit/s</p> <p>Power supply: 5 VDC / 500 mA at each port (integrated)</p>

6.2.8 Trigger output (9)

Item	Designation	Description
9	TRIGGER OUT	<p>Trigger output for digital trigger signals, e.g. Pulse, ARB and MRB triggers. The setting is made in the setup.</p> <p>Output level: digital, 0 V / 5 V</p> <p>Connector: BNC-socket, 50 Ω</p>

6.2.9 Analog output (11)

Item	Designation	Description
11	ANALOG OUT	<p>Analog output for the baseband signal, the corresponding setting is made in the setup.</p> <p>Analog Out: 4 V_{pp}</p> <p>Audio Out: 4 V_{pp}</p> <p>Connector: BNC-socket, 50 Ω</p>

6.2.10 Analog input (13)

Item	Designation	Description
13	ANALOG IN	<p>AF input for analysing baseband signals, the corresponding setting is made in the setup.</p> <p>Input level: 1 V_{pp}</p> <p>Connector: BNC-socket, 50 Ω</p>

6.2.11 SUPPRESS-Signal in- / output (14)

Item	Designation	Description
14	SUPPRESS IN/OUT	Switch signal in- / output for the suppressor signal. Input level: digital, 0 V / 8 ... 30 V Output level: digital, 0 V / 20 ... 28 V (minus ca. 1 V) Connector: BNC-socket, 30 k Ω