Supplement

FM-Stereo Modulation

R&S®AMU-K57
1403.4102.02

R&S®SMATE-K57
1400.6450.02

R&S®SMJ-K57
1403.6350.02

R&S®SMU-K57
1403.6250.02

ROHDE&SCHWARZ
Test and Measurement Division

Dear Customer,

The Signal Generator includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/).

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Trade names are trademarks of the owners.

Grouped Safety Messages

## Make sure to read through and observe the following safety instructions!

All plants and locations of the Rohde & Schwarz group of companies make every effort to keep the safety standard of our products up to date and to offer our customers the highest possible degree of safety. Our products and the auxiliary equipment required for them are designed and tested in accordance with the relevant safety standards. Compliance with these standards is continuously monitored by our quality assurance system. The product described here has been designed 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, 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 an intention 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 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.

Symbols and safety labels

Observe product documentation	Weight indication for units >18 kg	Danger of electric shock	Warning! Hot surface	PE terminal	Ground	Ground terminal	Attention! Electrostatic sensitive devices

Supply voltage ON/OFF	Standby indication	Direct current (DC)	Alternating current (AC)	Direct/alternating current (DC/AC)	Device fully protected by double/reinforced insulation

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 putting the product into operation. It is also absolutely essential to observe the additional safety instructions on personal safety 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.

Tags and their meaning

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

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

CAUTION CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE NOTICE indicates a property damage message.

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

These tags 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 tags described here are always used only in connection with the related product documentation and the related product. The use of tags in connection with unrelated products or documentation can result in misinterpretation and thus contribute to personal injury or material damage.

Basic safety instructions

1. The product may be operated only under the operating conditions and in the positions specified by the manufacturer. Its ventilation must not be obstructed during operation. Unless otherwise specified, the following requirements apply to Rohde & Schwarz products:
   prescribed operating position is always with the housing floor facing down, IP protection 2X, pollution severity 2, overvoltage category 2, use only in enclosed spaces, max. operation altitude 2000 m above sea level, max. transport altitude 4500 m above sea level.
   A tolerance of ±10% shall apply to the nominal voltage and of ±5% to the nominal frequency.

2. Applicable local or national safety regulations and rules for the prevention of accidents must be observed in all work performed. The product may be opened only by authorized, specially trained personnel. Prior to performing any work on the product or opening the product, the product must be disconnected from the supply network. Any adjustments, replacements of parts, maintenance or repair must be carried out only by technical personnel 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, PE conductor test, insulation resistance measurement, leakage current measurement, functional test).

3. As with all industrially manufactured goods, the use of substances that induce an allergic reaction (allergens, e.g. nickel) such as aluminum cannot be generally excluded. If you develop an allergic reaction (such as a skin rash, frequent sneezing, red eyes or respiratory difficulties), consult a physician immediately to determine the cause.

4. If products/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, e.g. for disposal purposes, by specially trained personnel. Improper disassembly may be hazardous to your health. National waste disposal regulations must be observed.

5. If handling the product yields 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.

6. Depending on the function, certain products such as RF radio equipment can produce an elevated level of electromagnetic radiation. Considering that unborn life requires increased protection, pregnant women should be protected by appropriate measures. Persons with pacemakers may also be endangered by electromagnetic radiation. The employer/operator is required to assess workplaces where there is a special risk of exposure to radiation and, if necessary, take measures to avert the danger.

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

8. Prior to switching on the product, it must be ensured 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.

9. In the case of products of safety class I with movable power cord and connector, operation is permitted only on sockets with earthing contact and protective earth connection.

10. Intentionally breaking the protective earth connection 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.

11. If the product has no power switch for disconnection from the AC supply, the plug of the connecting cable is regarded as the disconnecting device. In such cases, it must be ensured that the power plug is easily reachable and accessible at all times (corresponding to the length of connecting cable, approx. 2 m). Functional or electronic switches are not suitable for providing disconnection from the AC supply. If products without power switches are integrated in racks or systems, a disconnecting device must be provided at the system level.

12. Never use the product if the power cable is damaged. Check the power cable on a regular basis to ensure that it is 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 e.g. tripping over the cable or suffering an electric shock.

13. The product may be operated only from TN/TT supply networks fused with max. 16 A (higher fuse only after consulting with the Rohde & Schwarz group of companies).

14. Do not insert the plug into sockets that are dusty or dirty. Insert the plug firmly and all the way into the socket. Otherwise, this can result in sparks, fire and/or injuries.

15. Do not overload any sockets, extension cords or connector strips; doing so can cause fire or electric shocks.

16. For measurements in circuits with voltages $V_{rms} > 30$ V, suitable measures (e.g. appropriate measuring equipment, fusing, current limiting, electrical separation, insulation) should be taken to avoid any hazards.

17. Ensure that the connections with information technology equipment comply with IEC 950/EN 60950.

18. 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.

19. If a product is to be permanently installed, the connection between the PE terminal on site and the product's PE conductor must be made first before any other connection is made. The product may be installed and connected only by a license electrician.

20. For permanently installed equipment without built-in fuses, circuit breakers or similar protective devices, the supply circuit must be fused in such a way that suitable protection is provided for users and products.

21. Do not insert any objects into the openings in the housing that are not designed for this purpose. Never pour any liquids onto or into the housing. This can cause short circuits inside the product and/or electric shocks, fire or injuries.

22. Use suitable overvoltage protection to ensure that no overvoltage (such as that caused by a thunderstorm) can reach the product. Otherwise the operating personnel will be endangered by electric shocks.

23. Rohde & Schwarz products are not protected against penetration of liquids, unless otherwise specified (see also safety instruction 1.). If this is not taken into account, there exists the danger of electric shock for the user or damage to the product, which can also lead to personal injury.

24. Never use the product under conditions in which condensation has formed or can form in or on the product, e.g. if the product was moved from a cold to a warm environment.

25. Do not close any slots or openings on the product, since they are necessary for ventilation and prevent the product from overheating. Do not place the product on soft surfaces such as sofas or rugs or inside a closed housing, unless this is well ventilated.

26. Do not place the product on heat-generating devices such as radiators or fan heaters. The temperature of the environment must not exceed the maximum temperature specified in the data sheet.

27. Batteries and storage batteries must not be exposed to high temperatures or fire. Keep batteries and storage batteries away from children. Do not short-circuit batteries and storage batteries.
If batteries or storage batteries are improperly replaced, this can cause an explosion (warning: lithium cells). Replace the battery or storage battery only with the matching Rohde & Schwarz type (see spare parts list). Batteries and storage batteries must be recycled and kept separate from residual waste. Batteries and storage batteries that contain lead, mercury or cadmium are hazardous waste. Observe the national regulations regarding waste disposal and recycling.

28. Please be aware that in the event of a fire, toxic substances (gases, liquids etc.) that may be hazardous to your health may escape from the product.

29. The product can be very heavy. Be careful when moving it to avoid back or other physical injuries.

30. 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).

31. Handles on the products are designed exclusively for personnel to hold or carry the product. It is therefore not permissible to use handles for fastening the product to or on means of transport such as cranes, fork lifts, wagons, etc. The user is responsible for securely fastening the products to or on the means of transport and for observing the safety regulations of the manufacturer of the means of transport. Noncompliance can result in personal injury or material damage.

32. If you use the product in a vehicle, it is the sole responsibility of the driver to drive the vehicle safely. Adequately secure the product in the vehicle to prevent injuries or other damage in the event of an accident. Never use the product in a moving vehicle if doing so could distract the driver of the vehicle. The driver is always responsible for the safety of the vehicle. The manufacturer assumes no responsibility for accidents or collisions.

33. If a laser product (e.g. a CD/DVD drive) is integrated in a Rohde & Schwarz product, do not use any other settings or functions than those described in the product documentation. Otherwise this may be hazardous to your health, since the laser beam can cause irreversible damage to your eyes. Never try to take such products apart, and never look into the laser beam.

34. Prior to cleaning, disconnect the product from the AC supply. Use a soft, non-linting cloth to clean the product. Never use chemical cleaning agents such as alcohol, acetone or diluent for cellulose lacquers.

Informaciones elementales de seguridad

## ¡Es imprescindible leer y observar 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. Nuestra sección de gestión de la seguridad de calidad controla constantemente que sean cumplidas estas normas. El presente producto ha sido fabricado y examinado según el comprobante de conformidad adjunto según las normas de la CE 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 despreciando las informaciones de seguridad 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.

Se parte del uso correcto del producto para los fines definidos si el producto es utilizado dentro de las instrucciones de la correspondiente documentación de 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 profundos y conocimientos básicas del idioma inglés. Por eso se debe tener en cuenta que el producto sólo pueda ser operado por personal especializado o personas minuciosamente instruidas con las capacidades correspondientes. Si fuera necesaria indumentaria de seguridad para el uso de productos de R&S, encontrará 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 entréguela a usuarios posteriores.

Símbolos y definiciones de seguridad

Ver documentación de producto	Informaciones para maquinaria con un peso de > 18kg	Peligro de golpe de corriente	¡Advertencia! Superficie caliente	Conexión a conductor protector	Conexión a tierra	Conexión a masa conductora	¡Cuidado! Elementos de construcción con peligro de carga electroestática

Potencia EN MARCHA/PARADA	Indicación Stand-by	Corriente continua DC	Corriente alterna AC	Corriente continua/-alterna DC/AC	El aparato está protegido en su totalidad por un aislamiento de doble refuerzo

Tener en cuenta las informaciones de seguridad sirve para tratar de evitar daños y peligros de toda clase. Es necesario de que se lean las siguientes informaciones de seguridad concienzudamente y se tengan en cuenta debidamente antes de la puesta en funcionamiento del producto. También deberán ser tenidas en cuenta las informaciones para la protección de personas que encontrarán en el capítulo correspondiente de la documentación de producto y que también son obligatorias de seguir. En las informaciones de seguridad actuales hemos juntado todos los objetos vendidos por el grupo de empresas Rohde & Schwarz bajo la denominación de „producto", entre ellos también aparatos, instalaciones así como toda clase de accesorios.

Palabras de señal y su significado

PELIGRO	Identifica un peligro directo con riesgo elevado de provocar muerte o lesiones de gravedad si no se toman las medidas oportunas.
ADVERTENCIA	Identifica un posible peligro con riesgo medio de provocar muerte o lesiones (de gravedad) si no se toman las medidas oportunas.
ATENCIÓN	Identifica un peligro con riesgo reducido de provocar lesiones de gravedad media o leve si no se toman las medidas oportunas.
AVISO	Indica la posibilidad de utilizar mal el producto y a consecuencia dañarlo.
	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 de 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 malinterpretaciones y tener por consecuencia daños en personas u objetos.

Informaciones de seguridad elementales

1. El producto solamente debe ser utilizado según lo indicado por el fabricante referente a la situación y posición de funcionamiento sin que se obstruya la ventilación. Si no se convino de otra manera, es para los productos R&S 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, grado de suciedad 2, categoría de sobrecarga eléctrica 2, utilizar solamente en estancias interiores, utilización hasta 2000 m sobre el nivel del mar, transporte hasta 4.500 m sobre el nivel del mar.
Se aplicará una tolerancia de ±10% sobre el voltaje nominal y de ±5% sobre la frecuencia nominal.

2. En todos los trabajos deberán ser tenidas en cuenta las normas locales de seguridad de trabajo y de prevención de accidentes. El producto solamente debe de ser abierto por personal especializado autorizado. Antes de efectuar trabajos en el producto o abrirlo deberá este ser desconectado de la corriente. El ajuste, el cambio de partes, la manutención y la reparación deberán ser solamente efectuadas por electricistas autorizados por R&S. Si se reponen partes con importancia para los aspectos de seguridad (por ejemplo el enchufe, los transformadores o los fusibles), solamente podrán ser sustituidos por partes originales. Después de cada recambio de partes elementales para la seguridad deberá ser efectuado un control de seguridad (control a primera vista, control de conductor protector, medición de resistencia de aislamiento, medición de la corriente conductora, control de funcionamiento).

3. Como en todo producto de fabricación industrial no puede ser excluido en general de que se produzcan al usarlo elementos que puedan generar alergias, los llamados elementos alergénicos (por ejemplo el níquel). Si se producieran en el trato con productos R&S reacciones alérgicas, como por ejemplo urticaria, estornudos frecuentes, irritación de la conjuntiva o dificultades al respirar, se deberá consultar inmediatamente a un médico para averiguar los motivos de estas reacciones.

4. Si productos / elementos de construcción son tratados fuera del funcionamiento definido de forma mecánica o térmica, pueden generarse elementos peligrosos (polvos de sustancia de metales pesados como por ejemplo plomo, berilio, níquel). La partición elemental del producto, como por ejemplo sucede en el tratamiento de materias residuales, debe de ser efectuada solamente por personal especializado para estos tratamientos. La partición elemental efectuada inadecuadamente puede generar daños para la salud. Se deben tener en cuenta las directivas nacionales referentes al tratamiento de materias residuales.

5. En el caso de que se produjeran agentes de peligro o combustibles en la aplicación del producto que debieran de ser transferidos a un tratamiento de materias residuales, como por ejemplo agentes refrigerantes que deben ser repuestos en periodos definidos, o aceites para motores, deberán ser tenidas en cuenta las prescripciones de seguridad del fabricante de estos agentes de peligro o combustibles y las regulaciones regionales para el tratamiento de materias residuales. Cuiden también de tener en cuenta en caso dado las prescripciones de seguridad especiales en la descripción del producto.

6. Ciertos productos, como por ejemplo las instalaciones de radiocomunicación RF, pueden a causa de su función natural, emitir una radiación electromagnética aumentada. En vista a la protección de la vida en desarrollo deberían ser protegidas personas embarazadas debidamente. También las personas con un bypass pueden correr peligro a causa de la radiación electromagnética.

El empresario/usuario está comprometido a valorar y señalar áreas de trabajo en las que se corra un riesgo aumentado de exposición a radiaciones para evitar riesgos.

7. La utilización de los productos requiere instrucciones especiales y una alta concentración en el manejo. Debe de ponerse por seguro de que las personas que manejen los productos estén a la altura de los requerimientos necesarios referente a sus aptitudes físicas, psíquicas y emocionales, ya que de otra manera no se pueden excluir lesiones o daños de objetos. El empresario lleva la responsabilidad de seleccionar el personal usuario apto para el manejo de los productos.

8. Antes de la puesta en marcha del producto se deberá tener por seguro de que la tensión preseleccionada en el producto equivalga a la del la red de distribución. Si es necesario cambiar la preselección de la tensión también se deberán en caso dabo cambiar los fusibles correspondientes del producto.

9. Productos de la clase de seguridad I con alimentación móvil y enchufe individual de producto solamente deberán ser conectados para el funcionamiento a tomas de corriente de contacto de seguridad y con conductor protector conectado.

10. Queda prohibida toda clase de interrupción intencionada del conductor protector, tanto en la toma de corriente como en el mismo producto. Puede tener como consecuencia el peligro de golpe de corriente por el producto. Si se utilizaran cables o enchufes de extensión se deberá poner al seguro que es controlado su estado técnico de seguridad.

11. Si el producto no está equipado con un interruptor para desconectarlo de la red, se deberá considerar el enchufe del cable de distribución como interruptor. En estos casos deberá asegurar de que el enchufe sea de fácil acceso y nabejo (según la medida del cable de distribución, aproximadamente 2 m). Los interruptores de función o electrónicos no son aptos para el corte de la red eléctrica. Si los productos sin interruptor están integrados en bastidores o instalaciones, se deberá instalar el interruptor al nivel de la instalación.

12. No utilice nunca el producto si está dañado el cable eléctrico. Compruebe regularmente el correcto estado de los cables de conexión a red. Asegure a través de las medidas de protección y de instalación adecuadas de que el cable de eléctrico no pueda ser dañado o de que nadie pueda ser dañado por él, por ejemplo al tropezar o por un golpe de corriente.

13. Solamente está permitido el funcionamiento en redes de distribución TN/TT aseguradas con fusibles de como máximo 16 A (utilización de fusibles de mayor amperaje sólo previa consulta con el grupo de empresas Rohde & Schwarz).

14. 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. Si no tiene en consideración estas indicaciones se arriesga a que se originen chispas, fuego y/o heridas.

15. No sobrecargue las tomas de corriente, los cables de extensión o los enchufes de extensión ya que esto pudiera causar fuego o golpes de corriente.

16. En las mediciones en circuitos de corriente con una tensión de entrada de $U_{eff} > 30$ V se deberá tomar las precauciones debidas para impedir cualquier peligro (por ejemplo medios de medición adecuados, seguros, limitación de tensión, corte protector, aislamiento etc.).

17. En caso de conexión con aparatos de la técnica informática se deberá tener en cuenta que estos cumplan los requisitos del estándar IEC950/EN60950.

18. 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 heridas, fuego o daños en el producto.

19. Si un producto es instalado fijamente en un lugar, se deberá primero conectar el conductor protector fijo con el conductor protector del aparato antes de hacer cualquier otra conexión. La instalación y la conexión deberán ser efectuadas por un electricista especializado.

20. En caso de que los productos que son instalados fijamente en un lugar sean sin protector implementado, autointerruptor o similares objetos de protección, el circuito de suministro de corriente deberá estar protegido de manera que usuarios y productos estén suficientemente protegidos.

21. Por favor, no introduzca ningún objeto que no esté destinado a ello en los orificios de la caja del aparato. No vierta nunca ninguna clase de líquidos sobre o en la caja. Esto puede producir cortocircuitos en el producto y/o puede causar golpes de corriente, fuego o heridas.

22. Asegúrese con la protección adecuada de que no pueda originarse en el producto una sobrecarga por ejemplo a causa de una tormenta. Si no se verá el personal que lo utilice expuesto al peligro de un golpe de corriente.

23. Los productos R&S no están protegidos contra líquidos si no es que exista otra indicación, ver también punto 1. Si no se tiene en cuenta esto se arriesga el peligro de golpe de corriente para el usuario o de daños en el producto lo cual también puede llevar al peligro de personas.

24. No utilice el producto bajo condiciones en las que pueda producirse y se hayan producido líquidos de condensación en o dentro del producto como por ejemplo cuando se desplaza el producto de un lugar frío a un lugar caliente.

25. Por favor no cierre ninguna ranura u orificio del producto, ya que estas son necesarias para la ventilación e impiden que el producto se caliente demasiado. No pongan el producto encima de materiales blandos como por ejemplo sofás o alfombras o dentro de una caja cerrada, si esta no está suficientemente ventilada.

26. No ponga el producto sobre aparatos que produzcan calor, como por ejemplo radiadores o calentadores. La temperatura ambiental no debe superar la temperatura máxima especificada en la hoja de datos.

27. Baterías y acumuladores no deben de ser expuestos a temperaturas altas o al fuego. Guardar baterías y acumuladores fuera del alcance de los niños. No cortocircuitar baterías ni acumuladores. Si las baterías o los acumuladores no son cambiados con la debida atención existirá peligro de explosión (atención células de litio). Cambiar las baterías o los acumuladores solamente por los del tipo R&S correspondiente (ver lista de piezas de recambio). Las baterías y acumuladores deben reutilizarse y no deben acceder a los vertederos. Las baterías y acumuladores que contienen plomo, mercurio o cadmio deben tratarse como residuos especiales. Respete en esta relación las normas nacionales de evacuación y reciclaje.

28. Por favor tengan en cuenta que en caso de un incendio pueden desprenderse del producto agentes venenosos (gases, líquidos etc.) que pueden generar daños a la salud.

29. El producto puede poseer un peso elevado. Muévalo con cuidado para evitar lesiones en la espalda u otras partes corporales.

30. No sitúe el producto encima de superficies, vehículos, estantes o mesas, que por sus características de peso o de estabilidad no sean aptas para él. Siga siempre las instrucciones de instalación del fabricante cuando instale y asegure el producto en objetos o estructuras (por ejemplo paredes y estantes).

31. Las asas instaladas en los productos sirven solamente de ayuda para el manejo que solamente está previsto para personas. Por eso no está permitido utilizar las asas para la sujeción en o sobre medios de transporte como por ejemplo grúas, carretillas elevadoras de horquilla, carros etc. El usuario es responsable de que los productos sean sujetados de forma segura a los medios de transporte y de que las prescripciones de seguridad del fabricante de los medios de transporte sean observadas. En caso de que no se tengan en cuenta pueden causarse daños en personas y objetos.

32. Si llega a utilizar el producto dentro de un vehículo, queda en la responsabilidad absoluta del conductor que conducir el vehículo de manera segura. Asegure el producto dentro del vehículo debidamente para evitar en caso de un accidente las lesiones u otra clase de daños. No utilice nunca el producto dentro de un vehículo en movimiento si esto pudiera distraer al conductor. Siempre queda en la responsabilidad absoluta del conductor la seguridad del vehículo. El fabricante no asumirá ninguna clase de responsabilidad por accidentes o colisiones.

33. Dado el caso de que esté integrado un producto de láser en un producto R&S (por ejemplo CD/DVD-ROM) no utilice otras instalaciones o funciones que las descritas en la documentación de producto. De otra manera pondrá en peligro su salud, ya que el rayo láser puede dañar irreversiblemente sus ojos. Nunca trate de descomponer estos productos. Nunca mire dentro del rayo láser.

34. Antes de proceder a la limpieza, desconecte el producto de la red. Realice la limpieza con un paño suave, que no se deshilache. No utilice de ninguna manera agentes limpiadores químicos como, por ejemplo, alcohol, acetona o nitrodiluyente.

Contents - FM-Stereo Modulation

FM-Stereo Modulation

Introduction - FM-Stereo

The R&S Signal Generator enables you to generate signals in accordance with the United States Radio Broadcast Data System (RBDS) standard and the european standard CENELEC EN50067 "Specification of the Radio Data System (RDS) for VHF/FM Sound Broadcasting in the frequency Range from 87.5 to 108.0 MHz".
The R&S Signal Generator simulates FM-STEREO signal at the physical layer. The following list gives an overview of the main options provided by the R&S Signal Generator for generating a FM-STEREO signal in accordance with the RDS/RBDS standard:

◆ Generation of standard compliant FM-Stereo signal with Stereo audio signal and RDS/RBDS signal
◆ Full configuration of all group types and versions
◆ Internal modulation sources from LF Generator and wave file for digital stereo signal
◆ External modulation sources from digital S/P DIF interface for digital stereo signal
◆ In case of two path instrument, simulation of two independent FM radio transmitters
◆ Configuration of other networks and alternative frequency list

Modulation System FM-Stereo

The figure below shows the stereophonic multiplex containing the data signal.
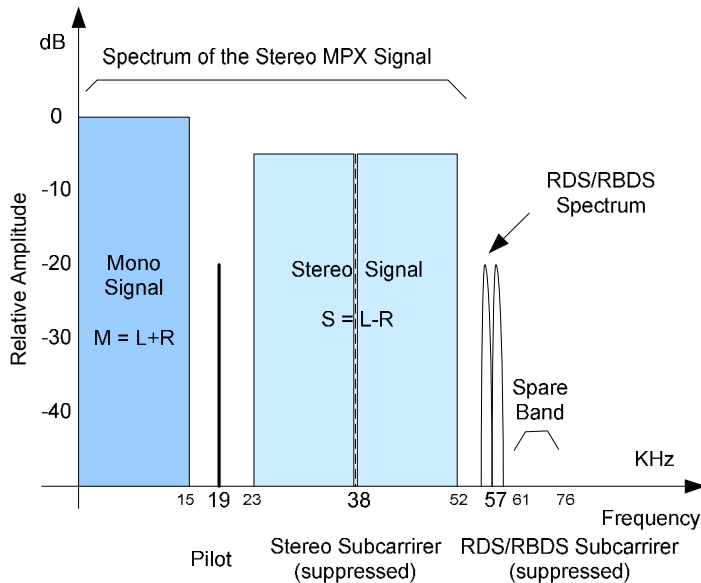
Fig. 1   FM baseband spectrum including RDS/RBDS subcarrier

The radio frequency signal consists of a frequency modulated carrier with frequency of 19 kHz and maximum frequency deviation of 80 kHz.

The stereophonic multiplex signal consists of a mono signal, the sidebands of the stereo signal with suppressed subcarrier at 38 kHz and a pilot signal with exactly one half of the subcarrier frequency. The mono signal M is the sum of the left-hand signal L and the right-hand signal R. The stereo signal S is the difference between the signals L and R. A pre-emphasis can be applied to both L and R signal prior to stereo coding.

The RDS/RBDS subcarrier is locked to the third harmonic of the 19 kHz pilot tone and suppressed. The R&S Signal Generator enables you to configure the pilot's phase and frequency deviation, the RDS/RBDS subcarrier's phase and frequency deviation and the preemphasis. The pilot's phase and the RDS/RBDS subcarrier phase are set with respect to the 38 kHz subcarrier.

The firgure below shows the FM-Stereo block diagram.
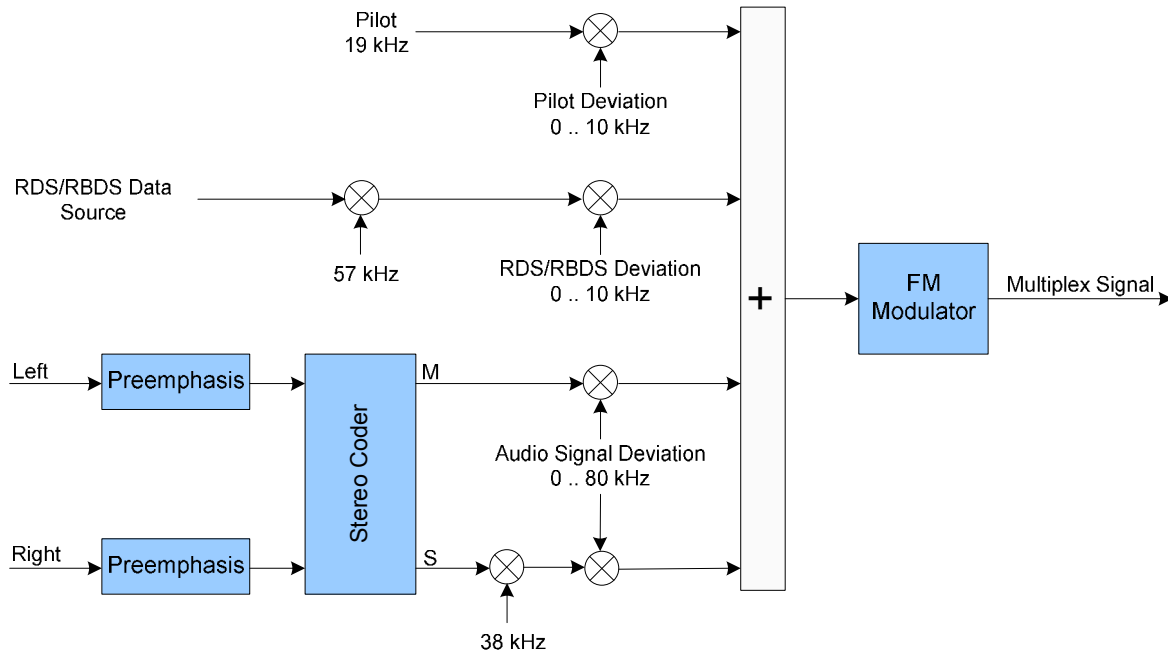
Fig. 2   FM-Stereo block diagram

Baseband Coding and Group Structure

The figure below shows the baseband coding principle.
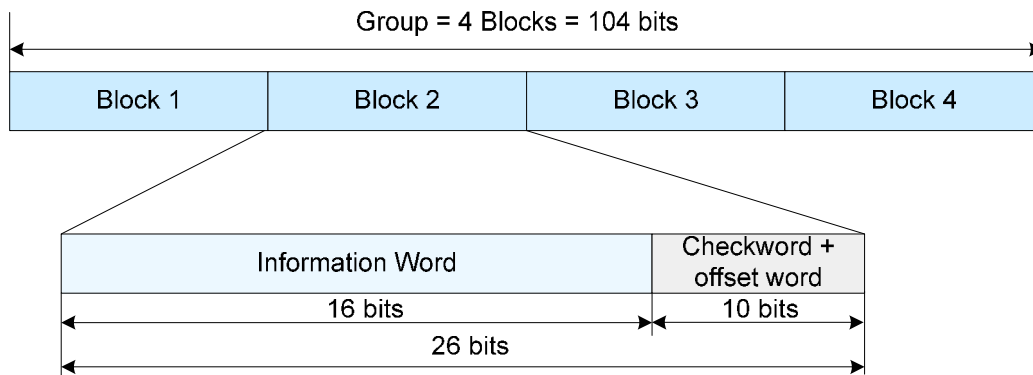
Fig. 3   Structure of the baseband coding

The basic element in the signal structure is the group. There are 16 groups (0 to 15) with 104 bits each. Each group consists of 4 blocks, 26 bits each. A block comprises an information word (16 bits) and a check word (10 bits).

Each group has two versions, version A and Version B. The figure below shows the group structure for both versions.
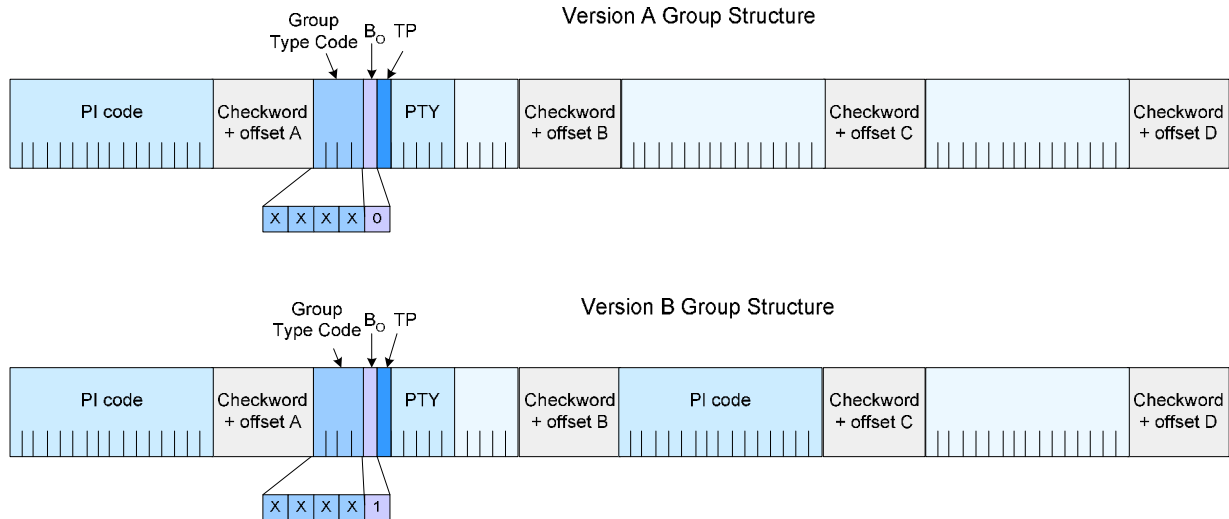
Fig. 4   Version A and B group format

The table below gives an overview of the available frame formats per Group Type and Group Type Version. The frame format is displayed in the **RDS/RBDS User Message Table** dialog of the corresponding group type and group type version

Tab. 1   Frame Formats per Group Type and Group Type Version

Group Type	Frame Format for Group Type Version A	Frame Format for Group Type Version B
0		
1		
2		
3		
4		

Group Type	Frame Format for Group Type Version A	Frame Format for Group Type Version B
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

FM-Stereo Menu

The menu for setting the FM-Stereo digital standard is either called from the baseband block or from the menu tree under **Baseband**.

Main Menu for FM-Stereo Signals

The menu is split into several sections for configuring the standard.

The upper menu section is where the FM-Stereo digital standard is activated and deactivated and the FM deviation is set. Configuration settings can be stored and already stored configuration settings can be loaded.

In the next two sections, the audio and stereo pilot tone settings are selected.

The buttons in the lower menu section lead to submenus for setting the trigger parameters and RDS/RBDS parameters.
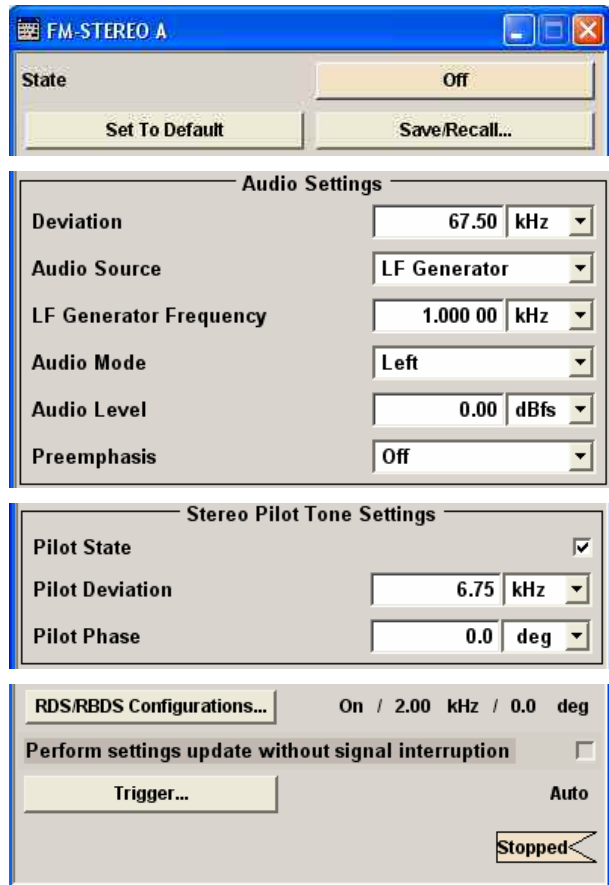
The upper menu section is where the FM-Stereo digital standard is selected, enabled, and preset.

State – FM-STEREO   Activates or deactivates the FM-STEREO standard.

Activating this standard deactivates all the other digital standards and digital modulation modes (in case of two-path instruments, this affects the same path).

The FM-STEREO signal is generated according to the performed settings.

Remote-control command:
SOUR:BB:STER:STAT ON

Set To Default - FM-STEREO   Calls the default settings.

Remote-control command:
SOUR:BB:STER:PRES

Parameter	Value
State	Remains unchanged
Deviation	67 500 Hz
Audio Source	Off
Audio Mode	Mono Left
Audio Level	0 dBfs
Preemphase	Off
Pilot State	On
Pilot Deviation	6750 Hz
Pilot Phase	0 deg
RDS/RBDS Configuration	On / 2.00 kHz / 0 deg
Trigger	Auto
Perform settings update without signal interruption	On

Save/Recall.. - FM-STEREO   Calls the **Save/Recall** menu.

From the **Save/Recall** menu, the **File Select** windows for saving and recalling FM-STEREO configurations and the **File Manager** is called.

FM-STEREO configurations are stored as files with the predefined file extension ***.fm**. The file name and the directory they are stored in are user-definable.

The complete settings in the **FM-STEREO** menu are saved and recalled.

Recall FM-STEREO Setting   Opens the **File Select** window for loading a saved FM-STEREO configuration.

The configuration of the selected (highlighted) file is loaded by pressing the **Select** button.

Remote-control command:
MMEM:CDIR 'F:\gen_list\fmstereo'
SOUR:BB:STER:SETT:CAT?
Response: 'fmstereo_1', 'fmstereo_2'
SOUR:BB:STER:SETT:LOAD 'fmstereo_1'

Save FM-STEREO Setting	Opens the **File Select** window for saving the current FM-STEREO signal configuration.
	The name of the file is specified in the **File Name** entry field. The file is saved by pressing the Save button.

	Remote-control command:
	`MMEM:CDIR 'F:\gen_list\fmstereo'`
	
	`SOUR:BB:STER:SETT:STOR 'fmstereo_1'`

File Manager	Calls the **File Manager**.
	The **File Manager** is used to copy, delete, and rename files and to create new directories.
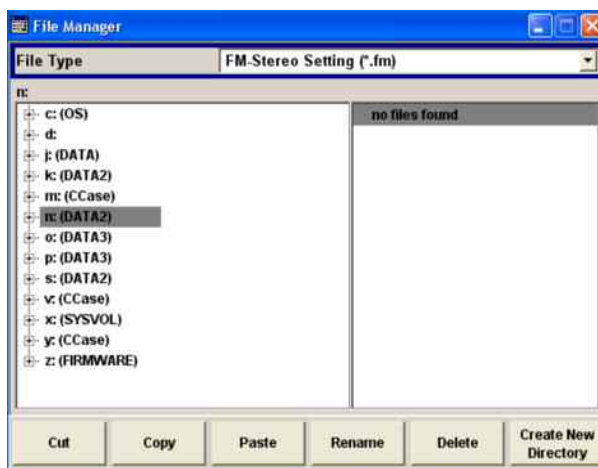
In the **Audio Settings** section, the source for the audio signal and the preemphase are selected.

Deviation - FM-STEREO	Sets the frequency deviation of the audio signal, i.e. the deviation of the mono signal M and the stereo signal S (see figure *"FM-Stereo block diagram"*).
	Remote-control command: `SOUR:BB:STER:DEV 70000`

Audio Source - FM-STEREO	Selects the audio source for the FM-Stereo signal.
	The sources cannot be used simultaneously.
	The following audio sources are available for selection:

Off	The audio source is switched off.
	Remote-control command: `SOUR:BB:STER:SOUR OFF`
Extern S/P-DIF	Activates the S/P-DIF input for the external digital modulation signals. The audio source for path A/B has to be connected respectively to the USER1/2 connector on the rear panel. The parameters **Map Output Connector User 1 (BNC) / User 2 (AUX I/O) To** in the **User Marker/ AUS I/O** dialog have to be set to General Purpose Input.
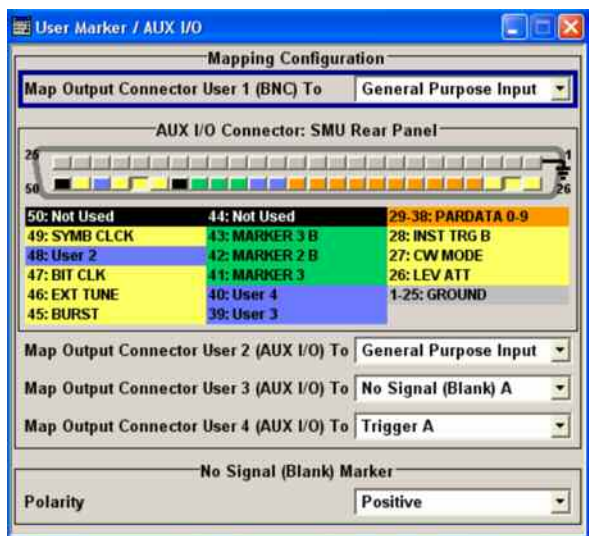
Note:

In case an audio signal is applied to the **S/P-DIF** interface, an **Extern Clock Source** has to be selected and the parameters **Threshold Trigger/Control Input** and **Impedance Trigger/Control Input** in the **Global Trigger/Clock/External Inputs** dialog have to be set to 0,1 V and to 50 Ohm respectivelly.
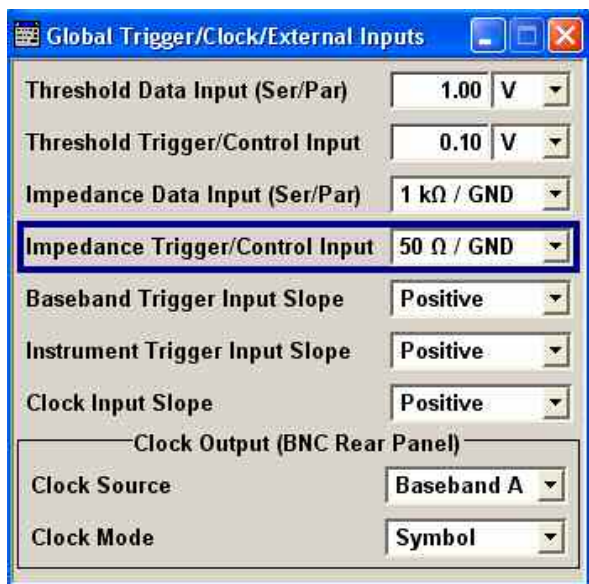
Remote-control command:

```
OUTP:USER1:SOUR GPIN
SOUR:INP:TRIG:LEV 0.1
SOUR:INP:TRIG:IMP G50

SOUR:BB:STER:SOUR SPEX
SOUR:BB:STER:AUD:EXTC 48000
```

	LF-Generator	The audio source is generated by the internal LF generator. The frequency of the LF generator is set with the parameter **LF Generator Frequency**.

Remote-control command:
```
SOUR:BB:STER:SOUR LFG
SOUR:BB:STER:AUD:FREQ 1000
```

	Waveform Audio File	A WAV-File can be selected. Audio files are selected in the **Load Audio File** menu.

Remote-control command:
```
SOUR:BB:STER:SOUR FILE
SOUR:BB:STER:AUD:DSEL 'fm_audio'
```

External Clock - FM-STEREO

Sets the external clock (44.1 or 48 kHz) in case an extern S/P-DIF audio source is selected.

Remote-control command:
```
SOUR:BB:STER:SOUR SPEX
SOUR:BB:STER:AUD:EXTC 48000
```

Load Audio File - FM-STEREO

Opens the **Load Audio File** menu to select the WAV-File.

Remote-control command:
```
SOUR:BB:STER:SOUR FILE
SOUR:BB:STER:AUD:DSEL 'fm_audio'
```

LF Generator Frequency - FM-STEREO

Sets the frequency of the LF-Generator in case a LF-Generator is selected as audio source.

Remote-control command:
```
SOUR:BB:STER:SOUR LFG
SOUR:BB:STER:AUD:FREQ 1000
```

Audio Mode - FM-STEREO

Sets the way the stereo audio source is mapped in case of mono or stereo operating mode.

	Left	Audio signal only in the left-hand channel.
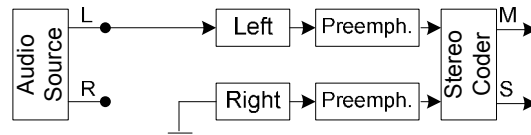
Remote-control command:
```
SOUR:BB:STER:AUD:MODE LEFT
```

	Right	Audio signal only in the right-hand channel.
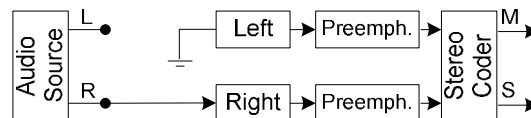
Remote-control command:
```
SOUR:BB:STER:AUD:MODE RIGH
```

Stereo Left=Right Audio signal of same frequency and phase in both channels.
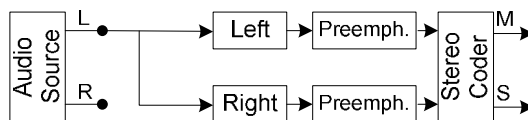
Remote-control command:
SOUR:BB:STER:AUD:MODE REL

Stereo Left=-Right Audio signal of same frequency but opposite phase in both channels.
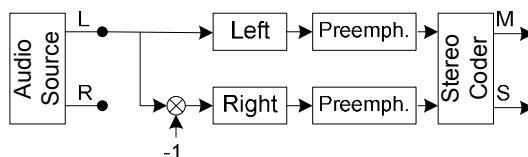
Remote-control command:
SOUR:BB:STER:AUD:MODE REML

True Stereo Audio signal with true stereo quality, i.e. different and independent signals in both channels.

This audio mode is not possible for audio source LF Generator.
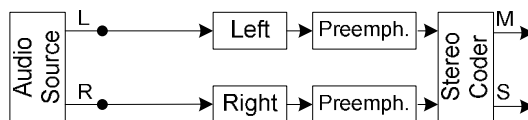
Remote-control command:
SOUR:BB:STER:AUD:MODE RNEL

Audio Level - FM-STEREO

Sets the level of the audio signal.

Remote-control command:
SOUR:BB:STER:AUD:LEV –10

Preemphasis - FM-STEREO

Enables/disables and sets the preemphasis parameter value to 50 µs or 75µs.

Remote-control command:
SOUR:BB:STER:AUD:PRE 50

Pilot State - FM-STEREO

Enables/disables the 19 kHz pilot tone.

Stereo operating mode is possible with enabled pilot tone only.

Remote-control command:
SOUR:BB:STER:PIL:STAT ON

Pilot Deviation - FM-STEREO

Sets the frequency deviation of the pilot tone (see figure *"FM-Stereo block diagram"*).

The parameter is enabled only for enabled pilot tone.

Remote-control command:
SOUR:BB:STER:PIL:DEV 5000

Pilot Phase - FM-STEREO

Sets the phase of the pilot tone (with respect to the 38 kHz subcarrier).

The parameter is enabled only for enabled pilot tone.

Remote-control command:
SOUR:BB:STER:PIL:PHAS 3

The buttons in the lower menu section lead to submenus to configure the RDS/RBDS system and setting the trigger parameters.

RDS/RBDS Configurations - FM-STEREO

Calls the **RDS/RBDS Configurations** menu for configuring the RDS/RBDS.
The currently selected RDS/RBDS parameters state, deviation and phase are displayed next to the button.

The menu is described in section *"RDS/RBDS Configuration - FM-STEREO"*.

Remote-control command: n.a.

Perform settings update without signal interruption - FM-STEREO

Sets the way the FM signal is calculated in case of parameter update. If this parameter is enabled and some parameters are changed, these parameters are updated but the FM signal will not be interrupted.

Disabling the parameter results in automatically re-calculation of the FM signal after each parameter update. This will disturb the pilot and the receiver has to be re-synchronized.

Remote-control command:
SOUR:BB:STER:PUWS ON

Trigger… - FM-STEREO

Calls the menu for selecting the trigger .

This menu is described in section *"Trigger - FM-STEREO"*, page 33.

The currently selected trigger mode is displayed next to the button.

Remote-control command: n.a.

RDS/RBDS Configuration - FM-STEREO

The **RDS/RBDS Configuration** menu allows you to configure the RDS/RBDS data.
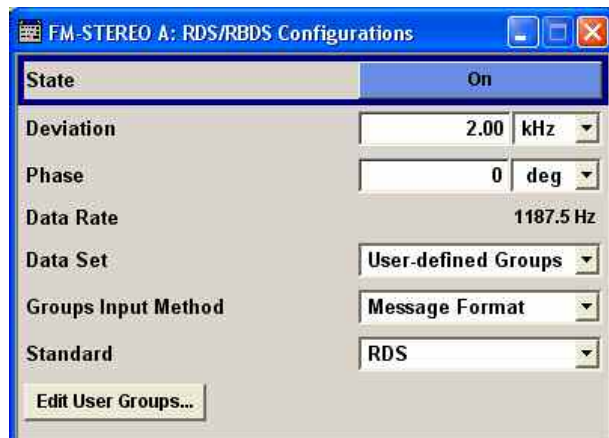
State - RDS/RBDS - FM-STEREO	Activates/deactivates RDS/RBDS function.
	Remote-control command: SOUR:BB:STER:DS:STAT ON
Deviation - RDS/RBDS - FM-STEREO	Sets the frequency deviation of the RDS/RBDS subcarrier (see figure *"FM-Stereo block diagram"*).
	Remote-control command: SOUR:BB:STER:DS:DEV 5000
Phase - RDS/RBDS - FM-STEREO	Selects the phase of the RDS/RBDS subcarrier (with respect to the 38 kHz subcarrier).
	Remote-control command: SOUR:BB:STER:DS:PHA 10.1
Data Rate - RDS/RBDS - FM-STEREO	Displays the RDS/RBDS data rate in Hz.
	Remote-control command: SOUR:BB:STER:DS:DRAT? Response: 1187.5
Data Set - RDS/RBDS - FM-STEREO	Selects and activates the RDS/RBDS data set.

	User-defined Groups	The RDS/RBDS parameters in the **RDS/RBDS Groups Message Settings** or in the **RDS/RBDS Group Hex Table** menu can be configured by the user.
		Remote-control command: SOUR:BB:STER:DS:DSET UDGR

Group List	The RDS/RBDS parameters can be loaded from a group list file.
	Group List can be generated internally in the data editor by means of the **Save Groups** button in **RDS/RBDS Groups Message Settings** menu.
	The Group lists files have to have an extension ***.fm_gt**.
	Group lists are selected in the **Load Group List** window, which is called by means of the **Select Group List ..** button.
	Remote-control command:
	`SOUR:BB:STER:DS:DSET GRPL`
	`SOUR:BB:STER:DS:DSEL 'fm_gl_gt'`

Groups Input Method - RDS/RBDS - FM-STEREO

Selects the input format the RDS/RBDS parameters are represented for editing. There are two input formats: message format or hex table.

The parameter is enabled for data set **User-defined Groups** only.

Remote-control command:
`SOUR:BB:STER:DS:DSET UDGR`
`SOUR:BB:STER:DS:GIM MSGF`

Standard - RDS/RBDS - FM-STEREO

Selects the standard, RDS or RBDS, the signal is generated for.

Remote-control command:
`SOUR:BB:STER:DS:MODE RBDS`

Edit User Group - RDS/RBDS - FM-STEREO

Depending on the selection made for the parameter **Groups Input Method**, calls the **RDS/RBDS Groups Message Settings** menu or the **RDS/RBDS Group Hex Table** menu for configuring the RDS/RBDS parameters.

The parameter is enabled for data set **User-defined Groups** only.

The menus are described in sections *"RDS/RBDS Groups Message Settings - FM-STEREO"* and *"RDS/RBDS Group Hex Table - FM-STEREO"*.

Remote-control command: `n.a.`

Select Group List - RDS/RBDS - FM-STEREO

(enabled for data set **Group List** only)

Calls the **Load Group List** menu for group file selection.

Remote-control command:
`SOUR:BB:STER:DS:DSET GRPL`
`SOUR:BB:STER:DS:DSEL 'fm_gl1'`

RDS/RBDS Groups Message Settings - FM-STEREO

The **RDS/RBDS Settings** menu allows you to configure the RDS/RBDS parameters. The RDS/RBDS parameters are divided into common RDS/RBDS settings and group type specific settings.

	Group	Type	Transmit Time	State	Do Conf.
0	Type 0	A	40%	On	Off
1	Type 1	A	10%	On	Off
2	Type 2	A	15%	On	Off
3	Type 3	A	4%	On	Off
4	Type 4	A	2%	On	On
5	Type 5	A	2%	On	Off
6	Type 6	A	2%	On	Off
7	Type 7	A	2%	On	Off
8	Type 8	A	2%	On	Off
9	Type 9	A	2%	On	Off
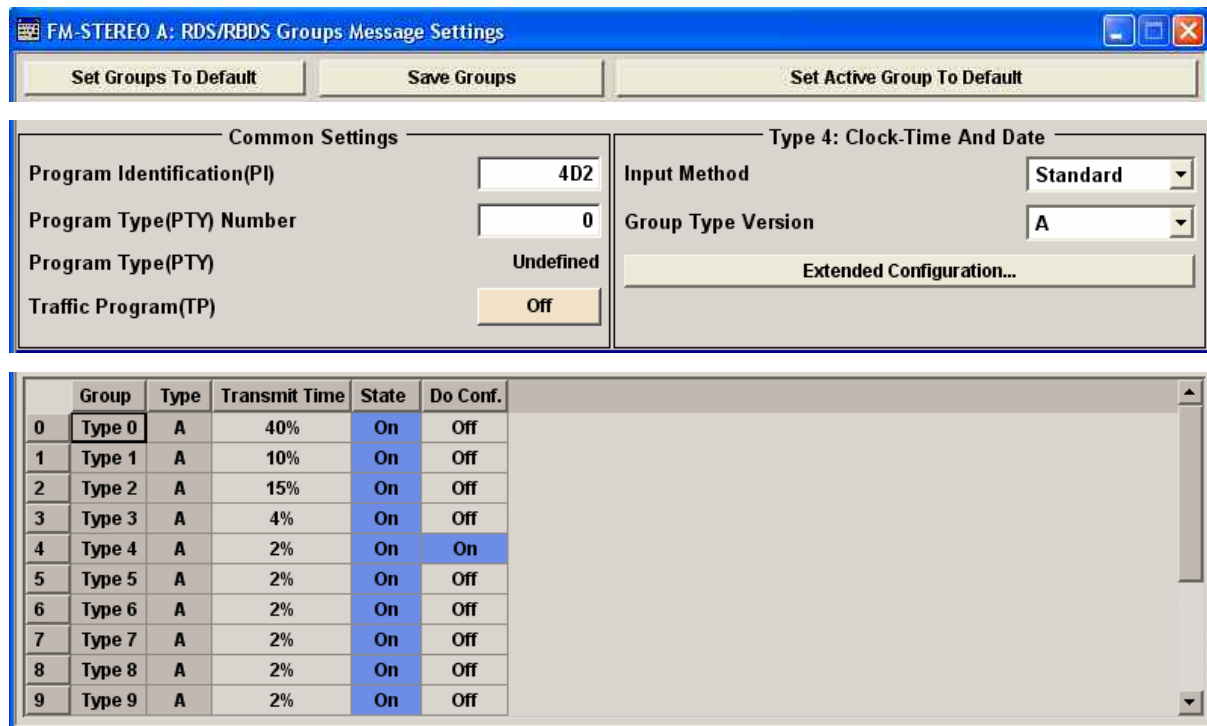
Set Groups to Default - FM-STEREO

Sets all group parameter values to the default settings.

Remote-control command:
SOUR:BB:STER:GRPS:PRES

Save Groups - FM-STEREO

Calls **Save Groups** menu for saving the settings to a file with extension ***.fm_gt**.

These files can be than loaded by means of the **Select Group List …** button in the **RDS/RBDS Configuration** menu.

Remote-control command:
SOUR:BB:STER:GRPS:STOR 'fm_groups'

Set Active Group to Default - FM-STEREO

Sets the parameter values of the active group to the default settings.

Remote-control command:
SOUR:BB:STER:GRPS:AGPR

Program Identification (PI) - FM-STEREO

Sets the parameter PI (Program Identification) in hex format.

The PI code is an international network identificator. PI identifies the nation, the coverage area of the service and the radio network. PI can be used for automatically tuning and is transmitted in all the groups.

Remote-control command:
SOUR:BB:STER:GRPS:CMNS:PI #HAB18

**Program Type (PTY)
Number - FM-STEREO**

Sets the program type number (see Table *"RDS/RBDS Program Types"*).
The PTY number identifies the content of the program.

PTY can be used for automatically tuning and is transmitted in all the groups.

Remote-control command:
`SOUR:BB:STER:GRPS:CMNS:PTY 4`

PTY Code	RDS Program Type	RBDS Program Type
0	No program type or undefined	No program type or undefined
1	News	News
2	Current Affairs	Information
3	Information	Sports
4	Sports	Talk
5	Education	Rock
6	Drama	Classic Rock
7	Culture	Adult Hits
8	Science	Soft Rock
9	Varied	Top 40
10	Pop Music	Country
11	Rock Music	Oldies
12	M.O.R. Music	Soft
13	Light classical	Nostalgia
14	Serious classical	Jazz
15	Other Music	Classical
16	Weather	Rhythm and Blues
17	Finance	Soft Rhythm and Blues
18	Children's programs	Foreign Language
19	Social Affairs	Religious Music
20	Religion	Religious Talk
21	Phone In	Personality
22	Travel	Public
23	Leisure	College
24	Jazz Music	Unassigned
25	Country Music	Unassigned
26	National Music	Unassigned
27	Oldies Music	Unassigned
28	Folk Music	Unassigned
29	Documentary	Weather
30	Alarm Test	Emergency Test
31	Alarm	Emergency Test

Table 1   RDS/RBDS Program Types

Program Type (PTY) - FM-STEREO

Displays the program type name of the selected PTY number (see Table *"RDS/RBDS Program Types"*).

Remote-control command: `n.a.`

Traffic Program (TP) - FM-STEREO

Enables/ disables the traffic program.
TP code identifies radio programmes that continuously broadcasts traffic information.

TP can be used for automatically tuning and is transmitted in all the groups.

Remote-control command:
`SOUR:BB:STER:GRPS:CMNS:TP ON`

Group Type 0A .. 15B Settings - FM-STEREO

The parameters in this section depend on the group type selected. To enable a group type for configuration, enable the corresponding parameter **Do Conf.** in the **Group Table** (see *"Do Conf - Group Table - FM-STEREO"*).
Table *"RDS/RBDS Group Type Codes"* gives an overview of the available RDS/RBDS Group Types.

Group Type	Group Type Version	Description
0	A	Basic tuning and switching information only
	B	Basic tuning and switching information only
1	A	Program Item Number and slow labeling codes only
	B	Program Item Number
2	A	Radio text only
	B	Radio text only
3	A	Applications Identification for ODA only
	B	Open Data Applications
4	A	Clock-time and date only
	B	Open Data Applications
5	A	Transparent Data Channels (32 channels) or ODA
	B	Transparent Data Channels (32 channels) or ODA
6	A	In House applications or ODA
	B	In House applications or ODA
7	A	Radio Paging or ODA
	B	Open Data Applications
8	A	Traffic Message Channel or ODA
	B	Open Data Applications
9	A	Emergency Warning System or ODA
	B	Open Data Applications
10	A	Program Type Name
	B	Open Data Applications
11	A	Open Data Applications
	B	Open Data Applications
12	A	Open Data Applications
	B	Open Data Applications

Group Type	Group Type Version	Description
13	A	Enhanced Radio Paging or ODA
	B	Open Data Applications
14	A	Enhanced Other Networks information only
	B	Enhanced Other Networks information only
15	A	Defined in RBDS only
	B	Fast Basic Tuning and Switching Information

Table 2   RDS/RBDS Group Type Codes

Table *"Frame Formats per Group Type and Group Type Version"* gives an overview of the available frame formats per Group Type and Group Type Version. The frame format is displayed in the **RDS/RBDS User Message Table** dialog of the corresponding group type and group type version

Input Method - FM-STEREO

Selects the format the corresponding group type 0 ..15 will be represented for editing.

        Standard   Configuration based on direct parameter input

Remote-control command:
```
SOUR:BB:STER:GRPS:GT4:INPM PAR
```

        User-defined   Allows configuration of the group type using a user-defined message

Remote-control command:
```
SOUR:BB:STER:GRPS:GT4:INPM UDM
```

Group Type Version - FM-STEREO

Selects A or B as group type version for the corresponding group type.

Remote-control command:
```
SOUR:BB:STER:GRPS:GT4:VERS B
```

Text A/B Flag - FM-STEREO

(Enabled for **Group Type 2A/B** only)

Sets the Text A/B Flag to 0 (disabled parameter) or 1 (enabled parameter).

Each change of the state of the parameter Text A/B Flag (form 0 to 1 and from 1 to 0) triggers the receiver to clear the radio text and the program type name.

Remote-control command:
```
SOUR:BB:STER:GRPS:GT2:TABF ON
```

Radio Text - FM-STEREO

(Enabled for **Group Type 2A** and **2B** only)

Sets the radio text.
The radio text is maximum 64 characters long for group type 2A and maximum 32 characters for group type 2B.
If less than 64 respectively 32 characters are used, the unused positions are filled in with zeros (0x00).

Remote-control command:
SOUR:BB:STER:GRPS:GT2:RADT 'RADIO MESSAGE'

A/B Flag - FM-STEREO

(Enabled for **Group Type 10A/B** only)

Sets the A/B Flag to 0 (disabled parameter) or 1 (enabled parameter).

Each change of the state of the parameter A/B Flag (form 0 to 1 and from 1 to 0) triggers the receiver to clear the radio text and the program type name.

Remote-control command:
SOUR:BB:STER:GRPS:GT10:ABFL ON

Program Type Name - FM-STEREO

(Enabled for **Group Type 10A** only)

Enters the program type name (max 8 characters).

If less than 8 characters are used, the unused positions are filled in with zeros (0x00).

Remote-control command:
SOUR:BB:STER:GRPS:GT10:PTN 'Music Only'

Extended Configuration .. - RDS/RBDS - FM-STEREO

(Enabled for **Input Method** set to **Parameters** only)

Calls the **Group 0/4A/14/15B Extended Configuration** menu for configuring the RDS/RBDS parameters.

The menus are described in sections *"Extended Configuration - FM-STEREO"*.

Remote-control command: n.a.

Edit User Message Table .. - RDS/RBDS - FM-STEREO

(Enabled for **Input Method** set to **User Message Table** only)

Calls the **RDS/RBDS User Message Table - Group 0A .. 15B** menu for configuring the RDS/RBDS user message parameters in hex format.
The checkwords are calculated automatically.

The menus are described in sections *"RDS/RBDS User Message Table - Group 0A .. 15B"*.

Remote-control command: n.a.

Group Table - FM-STEREO

The **Group Table** is located in the lower part of the menu.

Group - Group Table - FM-STEREO

Displays the group type number.

Remote-control command:
```
SOUR:BB:STER:GRPS:GT2:TYPE?
Response: 2
```

Type - Group Table - FM-STEREO

Displays the group type version.

Remote-control command:
```
SOUR:BB:STER:GRPS:GT2:TYPE?
Response: 2
SOUR:BB:STER:GRPS:GT2:VERS B
```

Transmit Time - Group Table - FM-STEREO

Sets the transmit time of the selected group. The transmit time is the group repetition rate given as proportion.

The sum of the transmit times of all groups can not exceed 100%. If the total transmit time is less than 100%, during the rest of the transmit time zeros will be transmitted.

Only groups with **State** set to On are transmitted.

Remote-control command:
```
SOUR:BB:STER:GRPS:GT2:TTIM 15
```

State - Group Table - FM-STEREO

Enables/disables the transmission of the corresponding group type.

Only groups with **State** set to On are transmitted.

Remote-control command:
```
SOUR:BB:STER:GRPS:GT2:STAT ON
```

Do Conf - Group Table - FM-STEREO

Enables/disables the corresponding group type for configuration. All editable parameters are displayed in the menu section **Group Type 0A .. 15B** (see *"Group Type 0A .. 15B Settings - FM-STEREO"*).

To see the frame format of the selected group type, select **User-defined Input Method** and select **Edit User Message Table**.

Remote-control command: n.a.

Extended Configuration - FM-STEREO

The menu Extended Configuration is enabled only for group types 0A, 0B, 4A, 14A, 14B and 15B.

Group Type 0 - Extended Configuration - FM-STEREO

The menu is separated into two sections, **Group Type** Parameters and **Alternative Frequency List**. The List of the Alternative Frequencies contains a group of maximum 25 frequencies. The list comprises the frequencies of the station of the same network that broadcast the same radio program within the geographical area concerned.
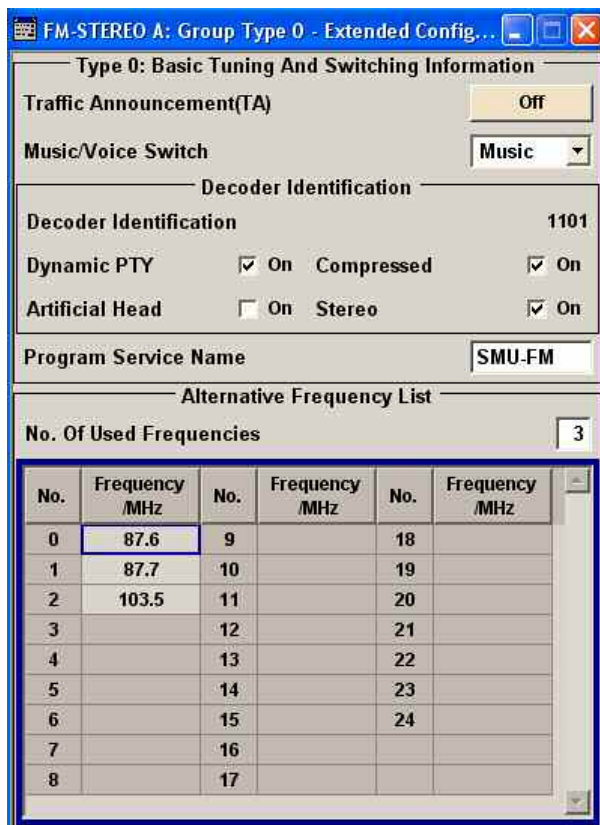
Traffic Announcement - FM-STEREO	Enables/disables broadcasting of traffic announcement. TA code indicates a traffic communication.
	Remote-control command: `SOUR:BB:STER:GRPS:GT0:TA ON`

Music/Voice Switch - FM-STEREO	Enables switching between speech and music transmission.
	Remote-control command: `SOUR:BB:STER:GRPS:GT0:MVSW MUS`

Decoder Identification (DI) - FM-STEREO

Displays the decoder identification control code (DI) depending on the settings made for the parameter **Dynamic PTY**, **Compressed**, **Artificial Head** and **Stereo**.

The DI is 4-bits long and identifies one of the 16 different operating modes of the decoder. The values of this 4 bits (d_0, d_1, d_2 and d_3) are set with the parameters **Stereo, Artificial Head**, **Compressed** and **Dynamic PTY** respectively.

Remote-control command:
```
SOUR:BB:STER:GRPS:GT0:DID:DPTY OFF
SOUR:BB:STER:GRPS:GT0:DID:COMP ON
SOUR:BB:STER:GRPS:GT0:DID:ARTH ON
SOUR:BB:STER:RDS:GT0:DID:STER OFF
SOUR:BB:STER:GRPS:GT0:DID:DATA?
Response: 0110
```

Dynamic PTY - DI - FM-STEREO

Enables/disables dynamically PTY switching.

Disabled parameter corresponds to a static PTY and sets the d_3 bit of DI to 0; Dynamic PTY is indicated with 1.

Remote-control command:
```
SOUR:BB:STER:GRPS:GT0:DID:DPTY OFF
```

Compressed - DI - FM-STEREO

Enables/disables the compressed bit of DI.

Disabled parameter sets the d_2 bit of DI to 0; enabled - to 1.

Remote-control command:
```
SOUR:BB:STER:GRPS:GT0:DID:COMP ON
```

Artificial Head - DI - FM-STEREO

Enables/disables using of Artificial Head.

Disabled parameter sets the d_1 bit of DI to 0; enabled - to 1.

Remote-control command:
```
SOUR:BB:STER:GRPS:GT0:DID:ARTH ON
```

Stereo - DI - FM-STEREO

Sets the mono/stereo switch in the DI.

Disabled parameter corresponds to Mono and sets the d_0 bit of DI to 0; Stereo is indicated with 1.

Remote-control command:
```
SOUR:BB:STER:RDS:GT0:DID:STER OFF
```

Program Service Name - FM-STEREO

Enters the program service (PS) name.
The PS name is displayed on the receiver and supply the listener with the name of the radio station.

PS cannot be used for automatic search.

The default maximum length of PS is 8 characters.

Remote-control command:
```
SOUR:BB:STER:GRPS:GT0:PSN 'Program 1'
```

No. Of Used Frequencies (Alternative Frequency List) - FM-STEREO	(Enabled for Group Type Version A only)
	Sets the number of alternative frequency to be configured. A maximal number of 25 AFs can be configured.
	Remote-control command:
	`SOUR:BB:STER:GRPS:GT0:ALTF:NOEN 5`

Frequency/ MHz (Alternative Frequency List) - FM-STEREO

(Enabled for Group Type Version A only)

Sets the alternative frequency (AF) for the broadcast frequency.

The list(s) of alternative frequencies give information on the various transmitters broadcasting the same program in the same or adjacent reception areas, and enable receivers equipped with a memory to store the list(s), to reduce the time for switching to another transmitter.

Remote-control command:
`SOUR:BB:STER:GRPS:GT0:ALTF:DATA3 108`

Group Type 4A - Extended Configuration - FM-STEREO

The Group Type 4 menu displays the clock time and date information.
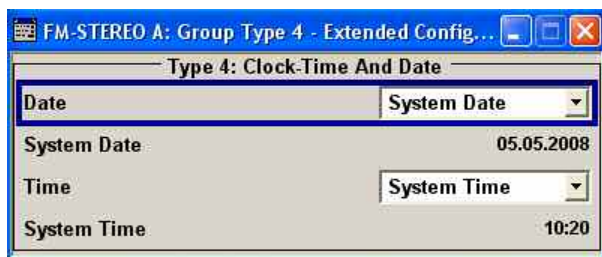
Date - FM-STEREO

Sets the date type to user date or system date.

Remote-control command:
`SOUR:BB:STER:GRPS:GT4:DATE USRD`

System Date - FM-STEREO

Displays the system date.

Remote-control command:
`SOUR:BB:STER:GRPS:GT4:DATE SYSD`
`SOUR:BB:STER:GRPS:GT4:SYSD?`
`Response: 5,5,2008`

User Date - FM-STEREO

Sets the user date in format DD.MM.YYYY.

Remote-control command:
`SOUR:BB:STER:GRPS:GT4:DATE USRD`
`SOUR:BB:STER:GRPS:GT4:USRD 30,5,2007`

Time - FM-STEREO

Sets the time type to system time or user time.

Remote-control command:
`SOUR:BB:STER:GRPS:GT4:TIME USRT`

| **System Time - FM-STEREO** | Displays the system time. |
| | Remote-control command:
`SOUR:BB:STER:GRPS:GT4:TIME SYST`
`SOUR:BB:STER:GRPS:GT4:SYST?`
`Response: 10,20` |

| **User Time - FM-STEREO** | Sets the user time in format HH:MM. |
| | Remote-control command:
`SOUR:BB:STER:GRPS:GT4:TIME USRT`
`SOUR:BB:STER:GRPS:GT4:USRT 12,15` |

Local Offset Time - FM-STEREO	(available for **User Time** only)
	Sets the local offset time expressed in multiples of half hours within the range -12h to +12h.
	The time is the sum of the user time and the local time offset.

	Remote-control command:
	`SOUR:BB:STER:GRPS:GT4:TIME USRT`
	`SOUR:BB:STER:GRPS:GT4:USRT 12,15`
	`SOUR:BB:STER:GRPS:GT4:LOT 5,30`

Group Type 14 - Extended Configuration - FM-STEREO

The menu is separated into two sections, one section that is always displayed, **Group Type** Parameters, and a dynamic one, where the parameters displayed depend on the selection made for the parameter **Information Block**.

The Group Type 14 has two versions: A and B. The A version is the normal form and shall be used for the background transmission of Enhanced Other Networks information. The B version of a type 14 group is used to indicate a change in the status of the TA flag of a cross-referenced program service. The Group Type 14 Version A has 16 variants which can be used in any time mixture and order. Variant 4 (AF method A) and variants 5 to 9 (Mapped Frequency Method) are defined for the transmission of frequencies of cross-referenced program services.

The figure below shows the frame format of group type 14 version A, according to the RDS/RBDS standard.
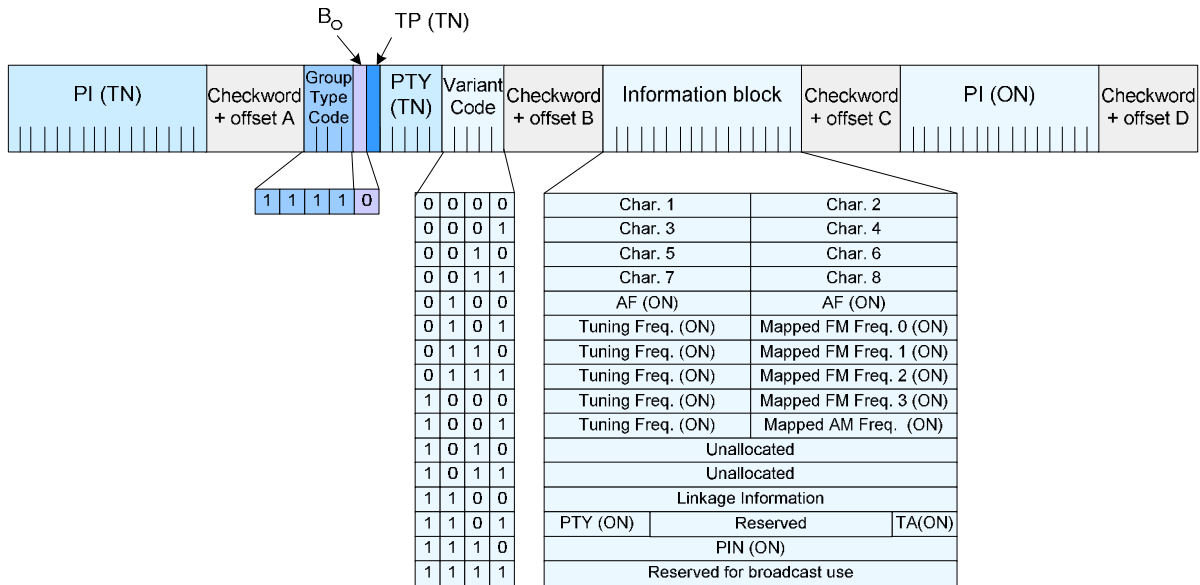
Fig. 5   Frame format of group type 14A

Switching between the different variants is performed with the parameter **Information Block.**
The table below gives an overview of the cross-reference between the Group Type 14A variants and the content of the Information Block.

Group Type 14A Variant	Information Block
0 .. 3	PS (ON)
4	AF (ON)
5..8	Mapping between Tuning Freq. (TN) and Mapped FM Freq. 0 .. 3 (ON)
9	Mapping between Tuning Freq. (TN) and the Mapped AM Freq. (ON)
10..11	Unallocated
12	Linkage Information
13	PTY (ON), 10 Reserved Bits, TA (ON)
14	PIN (ON)
15	Reserved for Broadcast use

Table 3   Information Block Content (Group Type 14A)

Alternative Frequencies

Alternative Frequencies are set in the Alternative Frequency List. Method AF method A is configured with the parameters **Frequency (ON)**.The List of the Alternative Frequencies contains a group of maximum 25 frequencies. The list comprises the frequencies of the stations of the other networks that broadcast the same radio program.

Mapped Frequencies

Mapped Frequencies are set in the Mapped Frequency List. The **Mapped Frequency List** sets the cross-reference between the frequency in the tuned network (**Tuning Frequency (TN)**) and the corresponding one or more frequencies in other network. The table allowed a mapping to more than one VHF/FM frequency (**Mapped Frequency (ON)** 0 .. 3) and to one LF/MF frequency (Mapped Frequency (ON) 4).
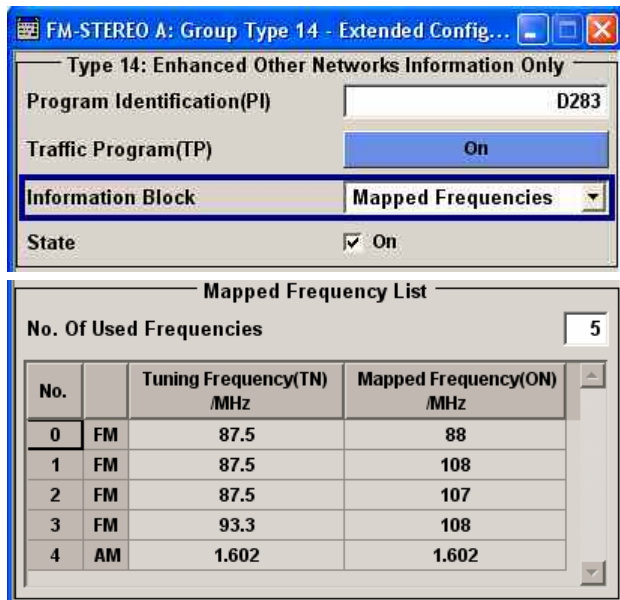
Program Identification (PI) - Other Networks (ON) - FM-STEREO	Sets the parameter Program Identification of other networks in hex format.		

Program Identification (PI) - Other Networks (ON) - FM-STEREO

Sets the parameter Program Identification of other networks in hex format.

The PI code is an international network identificator. PI identifies the nation, the coverage area of the service and the radio network. PI can be used for automatically tuning and is transmitted in all the groups.

Remote-control command:
SOUR:BB:STER:GRPS:GT14:PION #H2D3A,16

Traffic Program (TP) - Other Networks (ON) - FM-STEREO

Enables/ disables the traffic program of other networks.
TP code identifies radio programmes that continuously broadcasts traffic information.

Remote-control command:
SOUR:BB:STER:GRPS:GT14:TPON ON

Information Block - FM-STEREO

(Enabled for group type version A only)

Sets the Group Type 14A variant codes.
Depending on the selection made for this parameter; different additional parameters are displayed for configuration.

Remote-control command: n.a.

Program Service	Sets the content of Information Block Variant Codes 0..3 - PS (ON).
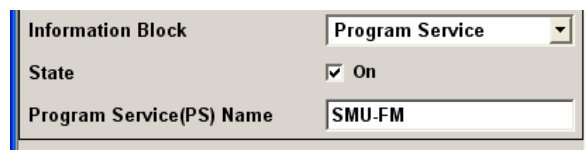
AF   Sets the content of Information Block Variant Code 4 - Alternative Frequencies Method A.

Mapped Frequency   Sets the content of Information Block Variant Codes 5..9 - Mapped Frequencies.

Linkage Information   Sets the content of Information Block Variant Code 12 - Linkage Information.

PTY/TA   Sets the content of Information Block Variant Code 13 - PTY (ON) and TA (ON).

| | PIN | Sets the content of Information Block Variant Code 14 - PIN (ON). |

Information Block	PIN ▼
State	☑ On
Program Item Number	1F3B
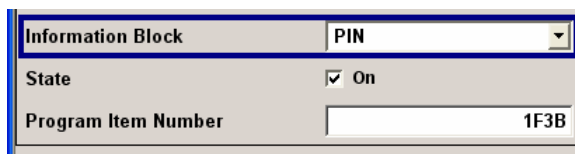
State (Program Service) - Other Networks (ON) - FM-STEREO

(Enabled for group type version A and Information Block set to Program Service only)

Enables/disables sending of program service name of other networks PS (ON).

Remote-control command:
`SOUR:BB:STER:GRPS:GT14:PSON:STAT ON`

Program Service (PS) Name - Other Networks (ON) - FM-STEREO

(Enabled for group type version A and Information Block set to Program Service only)

Enters the program service name of other networks.
The PS name has a length of max 8 characters. If less than 8 characters are used, the unused positions are filled in with zeros (0x00).

Remote-control command:
`SOUR:BB:STER:GRPS:GT14:PSON:PSN 'PrServ1'`

State (Alternative Frequency) - FM-STEREO

(Enabled for group type version A and Information Block set to AF only)

Enables/disables using AF method A.

Remote-control command:
`SOUR:BB:STER:GRPS:GT14:AFON:STAT ON`

No. Of Used Frequencies (Alternative Frequency List ON) - FM-STEREO

(Enabled for Group Type Version A only)

Sets the number of alternative frequency of other networks to be configured. A maximal number of 25 AFs can be configured.

Remote-control command:
`SOUR:BB:STER:GRPS:GT14:AFON:NOEN 5`

Frequency/ MHz (Alternative Frequency List ON) - FM-STEREO

(Enabled for Group Type Version A only)

Sets the alternative frequency (AF) of other networks for the broadcast frequency.

The list(s) of alternative frequencies give information on the various transmitters of other networks broadcasting the same program in the same or adjacent reception areas, and enable receivers equipped with a memory to store the list(s), to reduce the time for switching to another transmitter.

Remote-control command:
`SOUR:BB:STER:GRPS:GT14:AFON:DATA3 108`

State (Mapped Frequencies) - FM-STEREO

(Enabled for group type version A and Information Block set to Mapped Frequencies only)

Enables/disables using of mapped frequencies.

Remote-control command:
`SOUR:BB:STER:GRPS:GT14:MFL:STAT ON`

No. Of Used Frequencies (Mapped Frequency List) - FM-STEREO

(Enabled for group type version A and Information Block set to Mapped Frequencies only)

Sets the number of mapped frequency to be configured. A maximal number of 5 frequencies can be configured.

The mapped frequencies are the frequencies of other network that are cross-referenced to the frequencies in the tuned network to allow a transmission of several different services from the same transmitter with the same coverage area.

Remote-control command:
`SOUR:BB:STER:GRPS:GT14:MFL:NOEN 3`

Radio Band (Mapped Frequency List) - FM-STEREO

(Enabled for group type version A and Information Block set to Mapped Frequencies only)

Displays the radio band, AM or FM, used.

The first four frequencies (Frequency 0 .. 3) are VHF/FM frequencies (FM); the last one (Frequency 4) is a LF/MF frequency (AM).

Remote-control command: `n.a.`

Tuning Frequency (TN)/ MHz- FM-STEREO

(Enabled for group type version A and Information Block set to Mapped Frequencies only)

Sets the tuning frequency.

Remote-control command:
`SOUR:BB:STER:GRPS:GT14:MFL:TF0 87.7`

Mapped Frequency (ON)/ MHz- FM-STEREO

(Enabled for group type version A and Information Block set to Mapped Frequencies only)

Sets the FM/AM frequency.

Selected FM/AM frequency is mapped to the tuned frequency.

Remote-control command:
`SOUR:BB:STER:GRPS:GT14:MFL:MF0 88`
`SOUR:BB:STER:GRPS:GT14:MFL:MF4 0.54`

State (Linkage Information) - FM-STEREO

(Enabled for group type version A and Information Block set to Linkage Information)

Enables/disables using of Linkage Information (ON).

Linkage Information enables the receiver to treat several program services as a single service.

Remote-control command:
`SOUR:BB:STER:GRPS:GT14:LION:STAT ON`

Linkage Actuator (LA) - FM-STEREO

(Enabled for group type version A and Information Block set to Linkage Information)

Enables/disables the Linkage Actuator LA for other networks.

Enabled LA corresponds to active link (LA=1), i.e. the program service is linked to the set of services, set with the **Linkage Set Number**.

Disabled LA corresponds to passive link (LA=0), i.e. the link is currently not active but becomes active in the feature.

Remote-control command:
`SOUR:BB:STER:GRPS:GT14:LION:LA ON`

Extended Generic Indicator (EG) - FM-STEREO	(Enabled for group type version A and Information Block set to Linkage Information)
	Enables/disables the Extended Generic Indicator EG for other networks.
	Enabled EG corresponds to EG=1, i.e. the program service is a member of an extended generic set.
	Remote-control command: `SOUR:BB:STER:GRPS:GT14:LION:EG ON`
International Linkage Set Ind. - FM-STEREO	(Enabled for group type version A and Information Block set to Linkage Information)
	Enables/disables the International Linkage Set indicator ILS for other networks.
	Enabled ILS corresponds to international link (ILS=1).
	Remote-control command: `SOUR:BB:STER:GRPS:GT14:LION:ILS ON`
Linkage Set Number (LSN) - FM-STEREO	(Enabled for group type version A and Information Block set to Linkage Information)
	Sets the Linkage Set Number LSN for other networks.
	The LSN is a 12 bit number.
	Remote-control command: `SOUR:BB:STER:GRPS:GT14:LION:LSN #H78`
State (PTY/TA) - Other Networks (ON) - FM-STEREO	(Enabled for group type version A and Information Block set to PTY/TA)
	Enables/disables using of PTY (ON) and TA (ON).
	Remote-control command: `SOUR:BB:STER:GRPS:GT14:PTYT:STAT ON`
Program Type (PTY) Number - Other Networks (ON) - FM-STEREO	(Enabled for group type version A and Information Block set to PTY/TA)
	Sets the program type number of other networks (see Table *"RDS/RBDS Program Types"*).
	Remote-control command: `SOUR:BB:STER:GRPS:GT14:PTYT:PTY 15`
Traffic Announcement (TA) - Other Networks (ON) - FM-STEREO	Enables/disables the traffic announcement (TA) of other networks. TA code indicates a traffic communication.

	Remote-control command:
	`SOUR:BB:STER:GRPS:GT14:VERS A`
	`SOUR:BB:STER:GRPS:GT14:PTYT:TA ON`

	`SOUR:BB:STER:GRPS:GT14:VERS B` `SOUR:BB:STER:GRPS:GT14:TAON ON`

State (PIN) - Other Networks (ON) - FM-STEREO	(Enabled for group type version A and Information Block set to PIN)
	Enables/disables using of PIN (ON).
	Remote-control command: `SOUR:BB:STER:GRPS:GT14:PIN:STAT ON`
Program Item Number (PIN) - Other Networks (ON) - FM-STEREO	(Enabled for group type version A and Information Block set to PIN)
	Enters the program item number (PIN) of other networks.
	The transmitted Program Item Number code is the scheduled broadcast start time and day of month as published by the broadcaster.
	Remote-control command: `SOUR:BB:STER:GRPS:GT14:PIN:PIN #H2AB3`

Group Type 15 - Extended Configuration - FM-STEREO

The Group Type 15 menu displays the basic tuninig and switching information, as selected for group type 0.

Traffic Announcement (TA) - FM-STEREO	Displays the state of traffic announcement (TA) as selected for group type 0.

	Remote-control command:
	`SOUR:BB:STER:GRPS:GT15:TA?`
	`Response: OFF`

Music/Voice Switch - FM-STEREO	(enabled for group type version B only)
	Displays the current state of the parameter Music/Voice Switch as selected for group type 0.

	Remote-control command:
	`SOUR:BB:STER:GRPS:GT15:MVSW?`
	`Response: Music`

Decoder Identification (DI) - FM-STEREO	(enabled for group type version B only)
	Displays the current decoder operating mode (mono, stereo, rtc.) as selected for group type 0.

	Remote-control command:
	`SOUR:BB:STER:GRPS:GT15:DID?`
	`Response: 0110`

RDS/RBDS User Message Table - Group 0A .. 15B

The RDS/RBDS User Message table allows direct configuration of the user message in hex format (see also *"Baseband Coding and Group Structure"*).
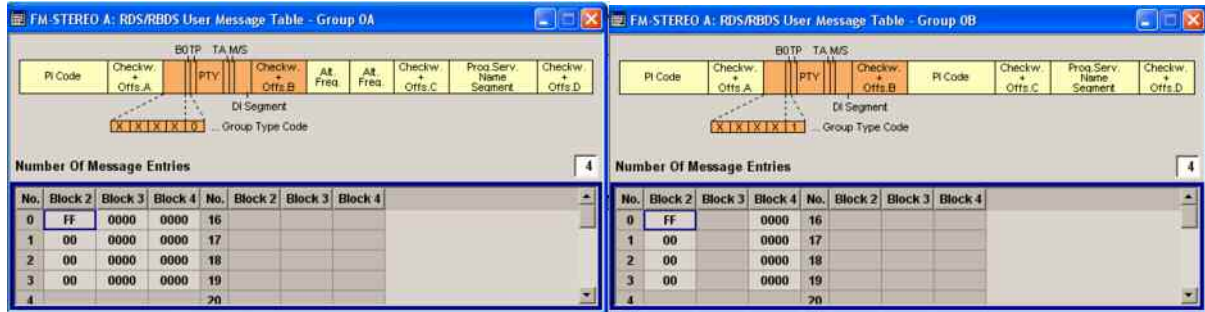
Depending on the selected **Group Type** and **Group Type Version**, the frame format is displayed.

No. Of Message Entries (User Message Table) - FM-STEREO	Sets the number of transmitted groups per message. A maximal number of 32 groups can be configured.
	Remote-control command: `SOUR:BB:STER:GRPS:GT0:UMT:NOEN 4`

Block 2 (User Message Table) - FM-STEREO	Sets the hex value for Block 2 of the corresponding user message hex table row.
	Checkword and offset B are automatically calculated.
	Remote-control command: `SOUR:BB:STER:GRPS:GT0:UMT:DATA0:BLOCK2 #H1F`

Block 3 (User Message Table) - FM-STEREO	(enabled for group type version A only)
	Sets the hex value for Block 3 of the corresponding user message hex table row.
	Checkword and offset C are automatically calculated.
	Remote-control command: `SOUR:BB:STER:GRPS:GT0:UMT:DATA0:BLOCK3 #H1BCD`

Block 4 (User Message Table) - FM-STEREO	Sets the hex value for Block 4 of the corresponding user message hex table row.
	Checkword and offset D are automatically calculated.
	Remote-control command: `SOUR:BB:STER:GRPS:GT0:UMT:DATA0:BLOCK4 #H1BCD`

RDS/RBDS Group Hex Table - FM-STEREO

Alternatively to selecting RDS/RBDS Parameters, the RDS/RBDS Message Blocks can be directly configured in hex format.
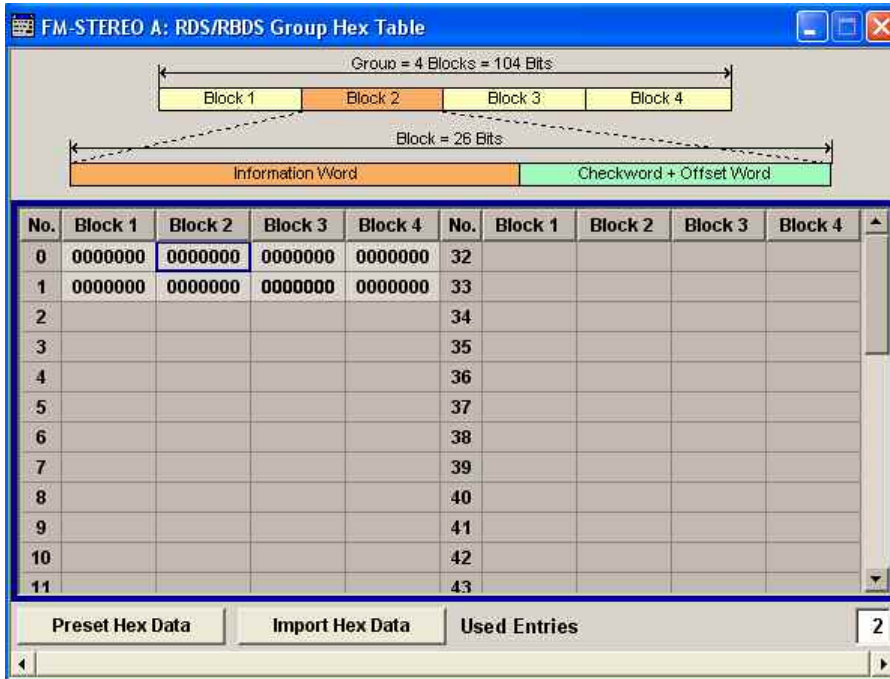
Used Entries - FM-STEREO	Sets the number of messages to be configured. A maximal number of 64 messages can be configured.
	Remote-control command: `SOUR:BB:STER:GHEX:NOEN 3`
Block 1 .. 4 (Group Hex Table) - FM-STEREO	Sets the hex value for the Block 1 .. 4 of the corresponding group hex table row.
	Remote-control command: `SOUR:BB:STER:GHEX:DATA5:BLOCK1 #HBFFF`
Preset Hex Table - FM-STEREO	Presets the group hex table.
	Remote-control command: `SOUR:BB:STER:GHEX:PRES`

Load Hex Data - FM-STEREO

Opens the **Load Group Hex Data** dialog for loading of group lists files in hex formal.
The hex file is generated externally and has to have an extension ***.fm_ghex.**

A group list file in hex format are file with extension ***.fm_ghex** and the following format:

Parameter	Description
GrouptypeXXX	Group Type and Group Type Version, where XXX=00A, 00B, .. 15A, 15B
:	Separator between the Group Type and the Data Blocks
0xNNNNNNN	where: 0x indicates the data format (hex format) and NNNNNNN is the 26-bit long data per Block, i.e. the Information Word and the Checkword + Offset Word.
,	Separator between the Data Blocks
//	Comment separator

The figure below gives an example of group list file in hex format.

```
// Type       Block 1     Block 2     Block 3     Block 4
// ------------------------------------------------------------
Grouptype00A: 0x0123456, 0x1234567, 0x2345678, 0x3456789  // Comment
Grouptype00B: 0x0123456, 0x1234567, 0x2345678, 0x3456789  // Comment
Grouptype00A: 0x0123456, 0x1234567, 0x2345678, 0x3456789  // Comment
Grouptype00A: 0x0123456, 0x1234567, 0x2345678, 0x3456789  // Comment
Grouptype00A: 0x0123456, 0x1234567, 0x2345678, 0x3456789  // Comment
Grouptype10A: 0x0123456, 0x1234567, 0x2345678, 0x3456789  // Comment
Grouptype11A: 0x0123456, 0x1234567, 0x2345678, 0x3456789  // Comment
Grouptype12A: 0x0123456, 0x1234567, 0x2345678, 0x3456789  // Comment
Grouptype13A: 0x0123456, 0x1234567, 0x2345678, 0x3456789  // Comment
```

Remote-control command:
```
SOUR:BB:STER:GHEX:LOAD fm_gl_hex1
```

Trigger - FM-STEREO

The **Trigger** menu can be reached via the FM-STEREO main menu.

The **Trigger In** section is where the trigger for the FM-STEREO signal is set. The current status of signal generation (**Running** or **Stopped**) is indicated for all trigger modes.

The **Global Trigger/Clock Settings** button leads to a submenu for general trigger and clock settings.

The **User Marker/AUX I/O Settings** button leads to a submenu for general marker and AUX I/O settings.
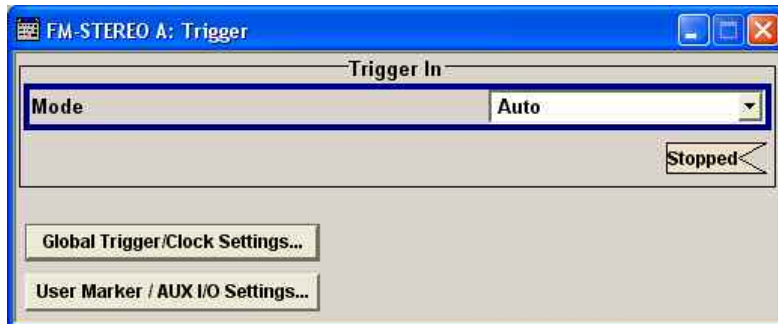
The **Trigger In** section is where the trigger for the FM-STEREO signal is set. The current status of the signal generation is displayed for all trigger modes.

Mode - FM-STEREO

Selects the trigger mode. The trigger mode determines the effect of a trigger on the signal generation.

> **Auto**
>
> The FM-STEREO signal is generated continuously.
>
> Remote-control command:
> `SOUR:BB:STER:TRIG:SEQ AUTO`

Running - Stopped - FM-STEREO

Displays the status of signal generation for all trigger modes. This display appears only when FM-STEREO is enabled (**State On**).

Remote-control command:
`SOUR:BB:STER:TRIG:RMOD?`
`Response: RUN`

> **Running**
>
> The FM-STEREO modulation signal is generated; a trigger was initiated in triggered mode. A new trigger causes a restart.
>
> **Stopped**
>
> The signal is not generated, and the instrument waits for a trigger event.

Global Trigger/Clock Settings - FM-STEREO

Calls the **Global Trigger/Clock/Input Settings** menu. This menu is used among other things for setting the trigger threshold, the input impedance and the polarity of the clock and trigger inputs

In the case of two-path instruments, these settings are valid for both paths. The parameters in this menu affect all digital modulations and standards, and are described in the section "*Global Trigger/Clock/Input Settings – Setup -Environment*".

User Marker / AUX I/O Settings - FM-STEREO

Calls the **User Marker AUX I/O Settings** menu. This menu is used to map the connector on the rear of the instruments see section "*User Marker - AUX IO - Setup-Environment-Global...Settings*".

SOURce:BB:STEReo Subsystem Remote-Control Commands

The commands in the Source:BB:STEReo subsystem are described in the following section.

This subsystem contains commands for the FM-Stereo standard. These settings concern activation and deactivation of the standard and setting the transmission parameters and trigger settings.

For two-path instruments, the numerical suffix at SOURce distinguishes between path A and path B:

SOURce<1> = path A

SOURce2 = path B

The keyword SOURce is optional with commands for path A and can be omitted. For path B, the command must include the keyword with the suffix 2.

Command Table - FM-Stereo

Command	Parameters	Default unit	Comments
Primary Commands			
[SOURce<[1]	2>:]BB:STEReo:STATe	ON	OFF		
[SOURce<[1]|2>:]BB:STEReo:PRESet			
[SOURce<[1]|2>:]BB:STEReo:SETTing:LOAD	<file name>		
[SOURce<[1]|2>:]BB:STEReo:SETTing:CATalog			
[SOURce<[1]|2>:]BB:STEReo:SETTing:STORe	<file name>		
[SOURce<[1]|2>:]BB:STEReo:DEViation	0…75000	Hz	
[SOURce<[1]	2>:]BB:STEReo:SOURce	OFF	SPEXt	LFGen	FILE		
[SOURce<[1]|2>:]BB:STEReo:AUDio:CATalog			
[SOURce<[1]	2>:]BB:STEReo:AUDio:EXTClock	44100	48000		
[SOURce<[1]|2>:]BB:STEReo:AUDio:DSELect	<file name>		
[SOURce<[1]|2>:]BB:STEReo:AUDio[:FREQuency]	20Hz…15kHz	Hz	
[SOURce<[1]|2>:]BB:STEReo:AUDio:MODE	LEFT	FIGHt	RELeft	REMLeft	RNELeft		
[SOURce<[1]|2>:]BB:STEReo:AUDio:LEVel	-30.00 ... 10.00	dBfs	
[SOURce<[1]	2>:]BB:STEReo:AUDio:PREemphasis	OFF	50	75		
[SOURce<[1]	2>:]BB:STEReo:PILot:STATe	ON	OFF		
[SOURce<[1]|2>:]BB:STEReo:PILot[:DEViation]	0 .. 19 kHz	Hz	
[SOURce<[1]|2>:]BB:STEReo:PILot:PHAse	-50 .. 50	deg	
[SOURce<[1]	2>:]BB:STEReo:PUWSinterruption	ON	OFF		
[SOURce<[1]|2>:]BB:STEReo:TRIGger:SEQuence	AUTO		
RDS/RBDS Configuration			
[SOURce<[1]	2>:]BB:STEReo:DS:STATe	ON	OFF		
[SOURce<[1]	2>:]BB:STEReo:DS:MODE	RDS	RBDS		
[SOURce<[1]|2>:]BB:STEReo:DS:DEViation	0 ..10 kHz		
[SOURce<[1]|2>:]BB:STEReo:DS:PHAse	0…359deg	deg	
[SOURce<[1]|2>:]BB:STEReo:DS:DRATe			Query only

Command	Parameters	Default unit	Comments
[SOURce<[1]|2>:]BB:STEReo:DS:DSET	UDGRoups | GRPList		
[SOURce<[1]|2>:]BB:STEReo:DS:GIM	MSGFormat | HEXFormat		
[SOURce<[1]|2>:]BB:STEReo:DS:CATalog			
[SOURce<[1]|2>:]BB:STEReo:DS:DSELect	<file name>		
Group Hex Settings			
[SOURce<[1]|2>:]BB:STEReo:GHEX:CATalog			
[SOURce<[1]|2>:]BB:STEReo:GHEX:LOAD	<file name>		
[SOURce<[1]|2>:]BB:STEReo:GHEX:PRESet			
[SOURce<[1]|2>:]BB:STEReo:GHEX:NOENtries	0 .. 63		
[SOURce<[1]|2>:]BB:STEReo:GHEX:DATA<0..63>:BLOCk<0..3>	#H0000000 .. #H3FFFFF		
Group Settings			
[SOURce<[1]|2>:]BB:STEReo:GRPS:PRESet			
[SOURce<[1]|2>:]BB:STEReo:GRPS:AGPReset			
[SOURce<[1]|2>:]BB:STEReo:GRPS:STORe	<file name>		
[SOURce<[1]|2>:]BB:STEReo:GRPS:CMNS:PI	#H0000 .. #HFFFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:CMNS:PTY	1..31		
[SOURce<[1]|2>:]BB:STEReo:GRPS:CMNS:TP	ON |OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:TYPE	0 .. 15		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:VERSion	A | B		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:TTIMe	0 .. 100	%	
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:STATe	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:INPMetod	PARameters | UDMessage		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0 | 15>:TA	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0 | 15>:MVSWitch	MUSic | VOICe		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:DID:ARTHead	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:DID:COMPressed	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:DID:DPTY	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:DID:STEReo	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0 | 15>:DID:DATA			Query only
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:PSName	<Program Service Name>		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:ALTF:NOENtries	0 .. 25		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:ALTF:DATA<0..24>	87.6 .. 107.9	MHz	
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:UMT:NOENtries	0 .. 31		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:UMT:DATA<0..31>:BLOCk<2..4>	#H00 .. #HFF (Block 2) #H0000 .. #HFFFF (Block 3 and Block 4)		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT2:RADText	<Radio Text>		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:DATE	SYSDate | USRData		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:SYSDate	01,01,2006 | 31,12,9999		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:USRDate	01,01,2006 | 31,12,9999		

Command	Parameters	Default unit	Comments
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:TIME	SYSTime | USRTime		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:USRTime	00,00 .. 23,59		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:SYSTime	00,00 .. 23,59		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:LOTime	-12,00 .. 12,00		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PION	0000..FFFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT10:PTName	<Program Type Name>		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT10:ABFLag	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT2:TABFlag	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:TPON	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:TAON	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:MFL:STATe	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:MFL:NOENtries	0 .. 4		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:MFL:MF<0..4>	87.6 .. 107.9 MHz (Data 0 .. 3) 153 .. 279 kHz / 531 .. 1602 kHz (Data 4)		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:MFL:TF<0..4>	87.6 .. 107.9 MHz (Data 0 .. 3) 153 .. 279 kHz / 531 .. 1602 kHz (Data 4)		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:LION:STATe	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:LION:LA	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:LION:EG	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:LION:ILS	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:LION:LSN	#H000 .. #HFFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:AFON:STATe	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:AFON:NOENtries	0 .. 25		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:AFON:DATA<0..24>	87.6 .. 107.9	MHz	
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PSON:STATe	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PSON:PSName	<Program Service Name>		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PTYTa:STATe	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PTYTa:PTY			
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PTYTa:TA	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PINon:STATe	ON | OFF		
[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PINon:PIN	#H0000 .. #HFFFF		

SOURce-STEReo - Primary Commands

[SOURce<[1]|2>:]BB:STEReo:STATe OFF | ON

Activates or deactivates the FM-STEREO standard.
Activating this standard deactivates all the other digital standards and digital modulation modes (in case of two-path instruments, this affects the same path).

The FM-STEREO signal is generated according to the performed settings.

Example: SOUR:BB:STER:STAT ON
                    'activates modulation in accordance with the FM-STEREO standard.

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:PRESet

The command produces a standardized default for the FM-Stereo standard. The settings correspond to the *RST values specified for the commands.

This command triggers an action and therefore has no *RST value and no query form.

Example: BB:STER:PRES
                    'resets all the FM-stereo settings to default values.

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:SETTing:LOAD   <file name>

Loads the selected file with FM-STEREO settings.
The directory is set using command MMEM:CDIRectory. A path can also be specified, in which case the files in the specified directory are read. The file extension may be omitted. Only files with the file extension ***.fm** will be loaded.

This command triggers an event and therefore has no *RST value and no query form.

Example: SOUR:BB:STER:SETT:LOAD 'fm_configuration1'
                    'loads the file fm_configuration1.fm

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:SETTing:CATalog?   <file name>

Reads out the files with FM-STEREO settings in the default directory.
The directory is set using command MMEM:CDIRectory. A path can also be specified, in which case the files in the specified directory are read. The file extension may be omitted. Only files with the file extension ***.fm** will be listed.

This command triggers an event and therefore has no *RST value and no query form.

Example: MMEM:CDIR 'D:\user\FMSTereo'
                    'sets the default directory to D:\user\FMSTereo

                    SOUR:BB:STER:SETT:CAT?
                    'reads out all the files with FM-STEREO settings in the default directory

                    Response: fm_stereo1, fm_stereo 2

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:SETTing:STORe <file name>

Stores the selected file with FM-STEREO settings.
The directory is set using command MMEM:CDIRectory. A path can also be specified, in which case the files in the specified directory are read. The file extension may be omitted. FM-STEREO settings are stored as files with the specific file extension ***.fm**.

This command triggers an event and therefore has no *RST value and no query form.

Example: SOUR:BB:STER:SETT:STOR 'fm_configuration1'
                    'stores the current setting

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:DEViation 0.. 75000

Sets the frequency deviation of the stereo signal.

Example: SOURce:BB:STER:DEV 70000
                    'sets the deviation value 70kHz

*RST value	Resolution	SCPI
67500	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:SOURce   OFF | SPEXt | LFGen | FILE

Selects the audio source for the FM-Stereo signal.
The sources cannot be used simultaneously.

Parameter: **OFF**
                   The audio source is switched off.

                   SPEXt
                   Activates the S/P-DIF input for the external digital modulation signals. The audio source for path A/B has to be connected respectively to the USER1/2 connector on the rear panel.

                   Note:
                   In case an audio signal is applied to the S/P-DIF interface, an Extern Clock Source has to be selected and the parameter Threshold Trigger/Control Input has to be set to 0,1 V.

                   LFGen
                   The audio source is generated by the internal LF generator.
                   The frequency of the LF generator is set with the command
                   SOUR:BB:STER:AUDio:FREQuency.

FILE
A WAV-File can be selected. Audio files are selected with the command
`SOUR:BB:STEReo:AUDio:DSELect`

Example: `SOUR:BB:STER:SOUR LFG`
'selects the audio source

`SOUR:BB:STER:AUD:FREQ 1000`
'sets the LF Generator Frequency

*RST value	Resolution	SCPI
0	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:AUDio[:FREQuency] 20.00 … 15 000.00

Sets the frequency of the LF-Generator in case a LF-Generator is selected as audio source.

Example: `SOUR:BB:STER:SOUR LFG`
'selects the audio source

`SOUR:BB:STER:AUD:FREQ 1000`
'sets the LF Generator Frequency to 1 kHz

*RST value	Resolution	SCPI
1000.00 Hz	0.01	Device-specific

[SOURce<[1]|2>:]BB:STEReo:AUDio:DSELect <file name>

Loads the selected file with audio data. The file extension may be omitted. Only files with the file extension ***.wav** will be loaded.

Example: `SOUR:BB:STER:SOUR FILE`
'selects the audio source

`MMEM:CDIR 'D:\user\waveforms'`
'sets the default directory to D:\user\waveforms

`SOUR:BB:STER:AUD:DSEL 'fm_wave`
'loads the audio file fm_wave.wav from the default directory

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:AUDio:CATalog <file name>

Reads out the Waveform files in the default directory.
The directory is set using command `MMEM:CDIRectory`. A path can also be specified, in which case the files in the specified directory are read. The file extension may be omitted. Only files with the file extension ***.wav** will be listed.

This command triggers an event and therefore has no *RST value and no query form.

Example: `MMEM:CDIR '\user\FMStereo'`
'sets the default directory to \user\FMStereo

`SOUR:BB:STER:AUD:CAT?`
'reads out all the waveform files in the default directory

`Response: fm_stereo_waveform1, fm_stereo_waveform2`

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:AUDio:EXTClock   44100 | 48000

Sets the external clock (44.1 or 48 kHz) in case an extern S/P-DIF audio source is selected.

Example: SOUR:BB:STER:SOUR SPEX
                      'selects the audio source

                      SOUR:BB:STER:AUD:EXTC 48000
                      'sets the external clock to 48 kHz

*RST value	Resolution	SCPI
44100	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:AUDio:LEVel   -30.00 .. 10.00

Sets the level of the audio signal.

Example: SOUR:BB:STER:AUD:LEV -10.00
                      'sets the audio level –10dBFs

*RST value	Resolution	SCPI
0 dBfs	0.01	Device-specific

[SOURce<[1]|2>:]BB:STEReo:AUDio:MODE   LEFT | RIGHt | RELeft | REMLeft | RNELeft

Selects the operating mode.

Parameter: **LEFT**
                      Audio signal only in the left-hand channel

                      RIGHt
                      Audio signal only in the left-hand channel

                      RELeft
                      Audio signals of the same frequency and phase in both channels

                      REMLeft
                      Audio signals of same frequency but opposite phase in both channels

                      RNELeft
                      Different and independent audio signals in both channels
                      (not possible with source selection LF Generator)

Example: SOUR:BB:STER:AUDio:MODE RNEL
                      'sets the audio mode to true stereo

*RST value	Resolution	SCPI
RNELeft	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:AUDio:PREemphasis   OFF | US50 | US75

Enables/disables and sets the preemphasis parameter value to 50 µs or 75µs.

Example: SOUR:BB:STER:AUD:PRE US50
                      'sets the preemphasis to 50 µs

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:PILot:STATe OFF | ON

Enables/disables the pilot tone.

Stereo operating mode is possible with enabled pilot tone only.

Example: `SOUR:BB:STER:PIL:STAT ON`
                    'enables pilot tone

*RST value	Resolution	SCPI
ON	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:PILot[:DEViation] 0 ... 10 000 Hz

Sets the frequency deviation of the pilot tone. The parameter is enabled only for enabled pilot tone.

Example: `SOUR:BB:PIL:DEV 5000`
                    'sets the deviation of the pilot tone to 5 kHz

*RST value	Resolution	SCPI
6.75 kHz	10Hz	Device-specific

[SOURce<[1]|2>:]BB:STEReo:PILot:PHASe -50…50 deg

Sets the phase of the pilot tone (with respect to the 38 kHz subcarrier). The parameter is enabled only for enabled pilot tone.

Example: `SOUR:BB:STER:PIL:PHAS -3`
                    'sets the phase to 3 degrees

*RST value	Resolution	SCPI
0	0.1 deg	Device-specific

[SOURce<[1]|2>:]BB:STEReo:PUWSint OFF | ON

Sets the way the FM signal is calculated in case of parameter update.
If this parameter is enabled and some parameters are changed, these parameters are updated but the FM signal will not be interrupted.

Disabling the parameter results in automatically re-calculation of the FM signal after each parameter update. This will disturb the pilot and the receiver has to be re-synchronized.

Example: `SOUR:BB:STER:PUWS ON`
                    'enables FM-STEREO signal generation without interruption

*RST value	Resolution	SCPI
ON	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:TRIGger:SEQuence AUTO

Sets the trigger mode.

Parameter: **AUTO**
                    The modulation signal is generated continuously.

Example: `BB:STER:TRIG:SEQ AUTO`
                    'sets the Auto trigger mode

*RST value	Resolution	SCPI
AUTO	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:TRIGger:RMODe?

The command queries the current status of signal generation for all trigger modes with FM-STEREO modulation on.

The command is a query command and therefore has no *RST value.

Parameter: **RUN**
                                 the signal is generated. A trigger event occurred in the triggered mode.

                      STOP
                                 the signal is not generated.

Example: `BB:STER:TRIG:RMOD?`
                                 queries the current status of signal generation.

                      `Response: "RUN"`
                                 "the signal is generated

*RST value	Resolution	SCPI
-	-	Device-specific

SOURce-STEReo - RDS/RBDS Configurations

[SOURce<[1]|2>:]BB:STEReo:DS:DEViation   0..10000

Sets the frequency deviation of the RDS/RDBS subcarrier.

Example: SOUR:BB:STER:DS:DEV 5000
                              'sets the deviation to 5 kHz

*RST value	Resolution	SCPI
2 kHz	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:DS:DRATe?

Queries the data rate.

This command triggers an action and therefore has no *RST value and no query form.

Example: SOUR:BB:STER:DS:DRATe?
                              'queries the data rate

                          Response: 1187.5

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:DS:DSELect   <file name>

Selects the group list.

Example: BB:STER:DS:DSET GRPL
                              'selects group lists

                          BB:STER:DS:DSEL 'fm_group_list'
                              'selects the group list file

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:DS:CATalog   <file name>

Reads out the files with the group list settings in the default directory.
The directory is set using command MMEM:CDIRectory. A path can also be specified, in which case the files in the specified directory are read. The file extension may be omitted. Only files with the file extension ***.fm_gt** will be listed.

This command triggers an event and therefore has no *RST value and no query form.

Example: MMEM:CDIR '\user\FMStereo'
                              'sets the default directory to \user\FMStereo

                          SOUR:BB:STER:DS:CAT?
                              'reads out all the files with group lists settings in the default directory

                          Response: fm_stereo_GL1, fm_stereo_GL2

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:DS:DSET UDGRoups | GRPList

Selects and activates the RDS/RBDS data set.

Parameter: **UDGRoups**
  User-defined Grouips

  GRPList
  the RDS/RBDS parameter are loaded from group lists files

Example: `BB:STER:DS:DSET GRPL`
  'selects group list files

*RST value	Resolution	SCPI
UDGRoups	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:DS:GIM MSGFormat | HEXFormat

Sets the input method.

Parameter: **MSGFormat**
  Message Format

  HEXFormat
  Hex Format

Example: `BB:STEReo:DS:GIM HEXF`
  'selects the group input method Hex Format

*RST value	Resolution	SCPI
MSFGFormat	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:DS:MODE RDS | RBDS

Selects the standard, RDS (Radio Data System) or RBDS (Radio Broadcast Data System), the signal is generated for.

Example: `SOUR:BB:STER:DS:MODE RBDS`
  'selects the Radio Broadcast Data System.

*RST value	Resolution	SCPI
RDS	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:DS:PHAse 0..359.9 deg

Selects the phase of the RDS/RBDS subcarrier (with respect to the 38 kHz subcarrier).

Example: `SOUR:BB:STER:DS:PHAse 10.1`
  'sets a phase of 10.1 degrees.

*RST value	Resolution	SCPI
0	0.1	Device-specific

[SOURce<[1]|2>:]BB:STEReo:DS:STATe ON | OFF

Activates/deactivates RDS/RBDS function.

Example: `SOUR:BB:STER:DS:STAT ON`
  'activates the RDS/RBDS function

*RST value	Resolution	SCPI
ON	-	Device-specific

SOURce-STEReo - Group Hex Settings

[SOURce<[1]|2>:]BB:STEReo:GHEX:CATalog   <file name>

Reads out the files in hex format with the group list settings in the default directory.
The directory is set using command `MMEM:CDIRectory`. A path can also be specified, in which
case the files in the specified directory are read. The file extension may be omitted. Only files with the
file extension ***.fm_ghex** will be listed.

This command triggers an event and therefore has no *RST value and no query form.

Example: `MMEM:CDIR '\user\FMStereo'`
               'sets the default directory to \user\FMStereo

               `SOUR:BB:STER:GHEX:CAT?`
                'reads out all the files in hex format with group lists settings in the default
                directory

               `Response: fm_stereo_GL_hex1, fm_stereo_GL_hex2`

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GHEX:LOAD   <file name>

Loads the selected file with group hex settings.
The directory is set using command `MMEM:CDIRectory`. A path can also be specified, in which case the
files in the specified directory are read. The file extension may be omitted. Only files with the file
extension ***.fm_ghex** will be loaded.

This command triggers an event and therefore has no *RST value and no query form.

Example: `SOUR:BB:STER:GHEX:LOAD 'fm_stereo_GL_hex1'`
                'loads the file fm_stereo_GL_hex1.fm

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GHEX:PRESet

The command resets the group hex table.

This command triggers an action and therefore has no *RST value and no query form.

Example: `BB:STER:GHEX:PRES`
                'resets the group hex table.

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GHEX:DATA<0..63>:BLOCk<0..3>   0…#H3FFFFFF

Sets the block data.

Example: `SOUR:BB:STER:GHEX:DATA2:BLOC3 #HA6BE`
                'sets the hex value #HA6BE for block 3 at group hex row index 2.

*RST value	Resolution	SCPI
0	1	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GHEX:NOENtries 0..64

Sets the number of used group hex entries.

Example: SOUR:BB:STER:GHEX:NOEN 5

'selects 3 used group hex entries for signal generation

*RST value	Resolution	SCPI
0	-	Device-specific

SOURce-STEReo - RDS/RBDS Group Settings

[SOURce<[1]|2>:]BB:STEReo:GRPS:AGPReset

Sets the parameter values of the active group to the default settings.

This command triggers an action and therefore has no *RST value and no query form.

Example: BB:STER:GRPS:AGPR

'sets the active group ro default

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:CMNS:PI 0 … #HFFFF

Sets the parameter PI (Program Identification).
The input format is hex format with 4 symbols length.

Example: SOUR:BB:STER:GRPS:CMNS:PI #HAB18

'sets the PI to #HAB18

*RST value	Resolution	SCPI
#HD238	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:CMNS:PTY 1 .. 31

Sets the program type number.
The PTY number identifies the content of the program.

Example: SOUR:BB:STER:GRPS:CMNS:PTY 4

'sets the PTY number

*RST value	Resolution	SCPI
1	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:CMNS:TP OFF | ON

Enables/ disables the traffic program.

Example: SOUR:BB:STER:GRPS:CMNS:TP ON

'enables sending of TP.

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:AFON:STATe ON | OFF

Enables/disables using AF method A for other networks.
This command is enabled only for group type 14A.

Example:　　　　　SOUR:BB:STER:GRPS:GT14:AFON:STAT ON
　　　　　　　　　　　　'enables using of Alternative Frequency (ON)

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:AFON:DATA<0..24> 87.6 ... 109.9

Sets the alternative frequency (AF) for other networks.
This command is enabled only for group type 14A.

Example:　　　　　SOUR:BB:STER:GRPS:GT14:AFON:NOEN 10
　　　　　　　　　　　　'enables using of 10 AFs.

　　　　　　　　　　　SOUR:BB:STER:GRPS:GT14:AFON:DATA3 108.5
　　　　　　　　　　　　'sets the alternative frequency at index 3 to 108.5 MHz

*RST value	Resolution	SCPI
87.6	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:AFON:NOENtries 0 .. 24

Sets the number of alternative frequency of other networks to be configured. A maximal number of 25 AFs can be configured.

This command is enabled only for group type 14A.

Example:　　　　　SOUR:BB:STER:GRPS:GT14:AFON:NOEN 10
　　　　　　　　　　　　'enables using of 10 AFs.

*RST value	Resolution	SCPI
0	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:ALTF:DATA<0..24> 87.6 ... 109.9

Sets the alternative frequency (AF) for the broadcast frequency.
This command is enabled only for group type 0A.

Example:　　　　　SOUR:BB:STER:GRPS:GT0:ALTF:NOEN 10
　　　　　　　　　　　　'enables using of 10 AFs.

　　　　　　　　　　　SOUR:BB:STER:GRPS:GT0:ALTF:DATA3 108.5
　　　　　　　　　　　　'sets the alternative frequency at index 3 to 108.5 MHz

*RST value	Resolution	SCPI
87.6	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:ALTF:NOENtries 0 .. 24

Sets the number of alternative frequency to be configured. A maximal number of 25 AFs can be configured.

This command is enabled only for group type 0A.

Example: SOUR:BB:STER:GRPS:GT0:ALTF:NOEN 10
                              'enables using of 10 AFs.

*RST value	Resolution	SCPI
0	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:DATE   SYSDate | USRDate

Sets the date type to user date (USRDate) or system date (SYSDate).
This command is enabled only for group type 4A.

Example: SOUR:BB:STER:GRPS:GT4:DATE USRD
                              'selects user date

*RST value	Resolution	SCPI
SYSDate	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0 | 15>:DID:DATA?

Queries the current decoder operating mode (mono, stereo, rtc.) as selected for group type 0.
This command is enabled only for group type 0 and 15B.

Example: SOUR:BB:STER:GRPS:GT15:DID:DATA?
                              'queries the DI

                          Response: 0101

*RST value	Resolution	SCPI
0000	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:DID:DPTY   ON | OFF

Enables/disables dynamically PTY switching.

Example: SOUR:BB:STER:GRPS:GT0:DID:DPTY OFF
                              'disables dynamic PTY

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:DID:COMPressed   ON | OFF

Enables/disables the compressed bit of DI.

Example: SOUR:BB:STER:GRPS:GT0:DID:COMP ON
                              'enables the compressed bit

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:DID:ARTHead   ON | OFF

Enables/disables using of Artificial Head.

Example: SOUR:BB:STER:GRPS:GT0:DID:ARTH ON
                          'enables artificial head

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:DID:STEReo   ON | OFF

Sets the mono/stereo switch in the DI.

Example: SOUR:BB:STER:GRPS:GT0:DID:STER OFF
                          'sets the DI bit to mono

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:INPMethod   PARameters | UDMessage

Selects the input format of the RDS/RBDS parameters.

Parameter: **PARameters**
                          Confirguration based on direct parameter input

                          UDMessage
                          User defined messages are used to configure the group types

Example: SOUR:BB:STER:GRPS:GT:INPM UDM
                          'used defined message is used.

*RST value	Resolution	SCPI
PAR	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:LION:EG   OFF | ON

Enables/disables the Extended Generic Indicator EG.
This command is enabled only for group type 14A.

Example: SOUR:BB:STER:GRPS:GT14:LION:EG ON
                          'enables the Extended Generic Indicator EG

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:LION:ILS   OFF | ON

Enables/disables the International Linkage Set indicator ILS.
This command is enabled only for group type 14A.

Example: SOUR:BB:STER:GRPS:GT14:LION:ILS ON
                          'enables ILS. i.e. sets ILS=1

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:LION:LA   OFF | ON

Enables/disables the Linkage Actuator LA.
This command is enabled only for group type 14A.

Example: SOUR:BB:STER:GRPS:GT14:LION:LA ON
                    'enables LA, i.e. LA=1

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:LION:LSN   000 ... FFF

Sets the Linkage Set Number LSN.
The LSN is a 12 bit number.
This command is enabled only for group type 14A.

Example: SOUR:BB:STER:GRPS:GT14:LION:LSN #H78
                    'sets the LSN to #H78

*RST value	Resolution	SCPI
000	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:LION:STATe   ON | OFF

Enables/disables using of Linkage Information.
This command is enabled only for group type 14A.

Example: SOUR:BB:STER:GRPS:GT14:LION:STAT ON
                    'enables using of Linking Information

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:LOTime   -12,00 .. 12,00

Sets the local offset time expressed in multiples of half hours within the range -12h to +12h.

The time is the sum of the user time and the local time offset.
This command is enabled only for group type 4A.

Example: SOUR:BB:STER:GRPS:GT4:TIME USRT
                    'enables user time

                    SOUR:BB:STER:GRPS:GT4:USRT 12,15
                    'sets the user time

                    SOUR:BB:STER:GRPS:GT4:LOT 5,30
                    'sets the local offset time, i.e. the local time is 17:45

*RST value	Resolution	SCPI
0:00	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:MFL:MF<0..4> 87.6 .. 107.9 MHz (Data 0..3) or 153 .. 279 kHz/531 .. 1602 kHz (Data 4)

Sets a mapped frequency entry.
The following variant codes will be used to encode the frequency settings:
- Variant Code 5 (binary 0101) Mapped FM frequency 1 (ON)
- Variant Code 6 (binary 0110) Mapped FM frequency 2(ON)
- Variant Code 7 (binary 0111) Mapped FM frequency 3(ON)
- Variant Code 8 (binary 1000) Mapped FM frequency 4(ON)
- Variant Code 9 (binary 1001) Mapped AM frequency(ON)

This command is enabled only for group type 14A.

Example: BB:STER:GRPS:GT14:MFL:MF2 101.3
                      'sets the mapped frequency at index 2 to 101.3MHz.

                      BB:STER:GRPS:GT14:MFL:MF4 532
                      'sets the mapped frequency at index 4 to 532 kHz.

*RST value	Resolution	SCPI
87.6	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:MFL:TF<0..4> 87.6 .. 107.9 MHz (Data 0..3) or 153 .. 279 kHz/531 .. 1602 kHz (Data 4)

Sets a tuning frequency entry.
The following variant codes will be used to encode the frequency settings:
- Variant Code 5 (binary 0101) Tuning FM frequency 1 (ON)
- Variant Code 6 (binary 0110) Tuning FM frequency 2 (ON)
- Variant Code 7 (binary 0111) Tuning FM frequency 3 (ON)
- Variant Code 8 (binary 1000) Tuning FM frequency 4 (ON)
- Variant Code 9 (binary 1001) Tuning AM frequency (ON)

This command is enabled only for group type 14A.

Example: BB:STER:GRPS:GT14:MFL:TF2 87.7
                      'sets the tuning frequency at index 2 to 87.7 MHz.

*RST value	Resolution	SCPI
87.6	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:MFL:NOENtries 0 ... 4

Sets the number of mapped frequency to be configured. A maximal number of 5 frequencies can be configured.

This command is enabled only for group type 14A.

Example: SOUR:BB:STER:GRPS:GT14:MFL:NOEN 3
                      'sets 3 mapped frequencies

*RST value	Resolution	SCPI
0	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:MFL:STATe ON | OFF

Enables/disables using of mapped frequencies.

This command is enabled only for group type 14A.

Example: SOUR:BB:STER:GRPS:GT14:MFL:STAT ON
                      'enables using of mapped sequences

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0 | 15>:MVSWitch MUSic | VOICe

For GT0, enables switching between speech and music transmission.

For GT15B, this command is query only.

Example: SOUR:BB:STER:GRPS:GT0:MVSW VOIC
                      'enables voice transmission

                      SOUR:BB:STER:GRPS:GT15:MVSW?
                       'qieries the state of Music/Voice parameter

                      Response: Voice

*RST value	Resolution	SCPI
MUSic	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PINon:PIN 0000 ... FFFF

Enters the program item number (PIN) of other networks.

This command is enabled only for group type 14A.

Example: SOUR:BB:STER:GRPS:GT14:PIN:STAT ON
                      'enables using of PIN (ON)

                      SOUR:BB:STER:GRPS:GT14:PIN:PIN #H2AB3
                      'sets the PIN of other networks

*RST value	Resolution	SCPI
0000	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PINon:STATe ON | OFF

Enables/disables using of PIN (ON).

This command is enabled only for group type 14A.

Example: SOUR:BB:STER:GRPS:GT14:PIN:STAT ON
                      'enables using of PIN (ON)

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PION　#H0000 .. #HFFFF

Sets the parameter Program Identification of other networks in hex format.

This command is enabled only for group type 14A.

Example:　　　　　SOUR:BB:STER:GRPS:GT14:PION #H2D3A
　　　　　　　　　'sets the PI (ON)

*RST value	Resolution	SCPI
#HD238	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT0:PSName　<Program Service Name>

Enters the program service (PS) name.
The default maximum length of PS is 8 characters.

Example:　　　　　SOUR:BB:STER:GRPS:GT0:PSN 'Program 1'
　　　　　　　　　'sets the PS name.

*RST value	Resolution	SCPI
SMU-FM	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PSON:PSName　<Program Service Name>

Enters the program service name (max 8 characters) of other networks.

This command is enabled only for group type 14A.

Example:　　　　　SOUR:BB:STER:GRPS:GT14:PSON:STAT ON
　　　　　　　　　'enables using of program service name (ON).

　　　　　　　　　SOUR:BB:STER:GRPS:GT14:PSON:PSN 'PrServ1'
　　　　　　　　　'sets the program service name (ON)

*RST value	Resolution	SCPI
SMU-FM2	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PSON:STATe　ON | OΦΦ

Enables/disables sending of program service name of other networks PS (ON).

This command is enabled only for group type 14A.

Example:　　　　　SOUR:BB:STER:GRPS:GT14:PSON:STAT ON
　　　　　　　　　'enables using of program service name (ON).

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT10:PTName   <Program Type Name>

Enters the program type name (max 8 characters).

This command is enabled only for group type 10A.

Example: SOUR:BB:STER:GRPS:GT10:PTN 'Music Only'
              'enters the program type name

*RST value	Resolution	SCPI
Music	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PTYTa:PTY   1 ... 31

Sets the program type number of other networks.

This command is enabled only for group type 14A.

Example: SOUR:BB:STER:GRPS:GT14:PTYT:STAT ON
              'enables PTY/TA of other networks

            SOUR:BB:STER:GRPS:GT14:PTYT:PTY 15
              'sets the program type (ON)

*RST value	Resolution	SCPI
1	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PTYTa:STATe   ON | OFF

Enables/disables using of PTY (ON) and TA (ON).

This command is enabled only for group type 14A.

Example: SOUR:BB:STER:GRPS:GT14:PTYT:STAT ON
              'enables PTY/TA of other networks

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:PTYTa:TA   ON | OFF

Enables/disables the traffic announcement (TA) of other networks.

This command is enabled only for group type 14A.

Example: SOUR:BB:STER:GRPS:GT14:PTYT:STAT ON
              'enables PTY/TA of other networks

            SOUR:BB:STER:GRPS:GT14:PTYT:TAON ON
              'enables traffic communication (ON)

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT2:RADText <Radio Text>

Sets the radio text.

This command is enabled only for group type 2.

Example: SOUR:BB:STER:GRPS:GT2:RADT 'RADIO MESSAGE'
                  'sets the radio text

*RST value	Resolution	SCPI
SMU-Radio	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:STATe OFF | ON

Enables/disables the transmission of the corresponding group type.

Example: SOUR:BB:STER:GRPS:GT12:STAT ON
                  'group 12 will be transmitted

*RST value	Resolution	SCPI
ON	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:SYSDate 01,01,2006 .. 31,12,9999

Queries the system date.

This command is enabled only for group type 4A.

Example: SOUR:BB:STER:GRPS:GT4:DATE SYSD
                  'selects system date

                  SOUR:BB:STER:GRPS:GT4:SYSD?
                  'queries the system date

                  Response: 3,6,2008

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:SYSTime 00,00 ... 23,59

Queries the system time.

This command is enabled only for group type 4A.

Example: SOUR:BB:STER:GRPS:GT4:TIME SYSD
                  'selects system date

                  SOUR:BB:STER:GRPS:GT4:SYST?
                  'queries the system time

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT2:TABFlag   OFF | ON

Sets the Text A/B Flag to 0 (disabled parameter) or 1 (enabled parameter).

Example: SOUR:BB:STER:GRPS:GT2:TABF ON
                     'sets the Text A/B Flag for group type 2 to 1.

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT10:ABFLag   OFF | ON

Sets the A/B Flag to 0 (disabled parameter) or 1 (enabled parameter).

Example: SOUR:BB:STER:GRPS:GT10:ABFL ON
                     'sets the A/B Flag for group type 10 to 1.

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0 | 15>:TA   OFF | ON

Enables/disables broadcasting of traffic announcement.

Example: SOUR:BB:STER:GRPS:GT0:TA ON
                     'enables TA for group type 0

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:TAON   ON | OFF

Enables/disables the traffic announcement (TA) of other networks.

This command is enabled only for group type 14B.

Example: SOUR:BB:STER:GRPS:GT14:TAON ON
                     'enables TA (ON)

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:TIME   SYSTime | USRTime

Sets the time type to system time (SYSTime) or user time (USRTime).

This command is enabled only for group type 4A.

Example: SOUR:BB:STER:GRPS:GT4:TIME USRT
                     'selects user time

*RST value	Resolution	SCPI
SYSTime	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT14:TPON　ON | OFF

Enables/ disables the traffic program of other networks.

Example:　　　　SOUR:BB:STER:GRPS:GT14:TPON ON
　　　　　　　　　　'enables traffic program (ON)

*RST value	Resolution	SCPI
OFF	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:TTIMe　0 ... 100

Sets the group transmit time. The transmit time is the group repetition rate given as proportion. The sum of all transmit time is 100%.
Only groups with **State** set to On (SOUR:BB:STER:GRPS:GT12:STAT ON) are transmitted.

Example:　　　　SOUR:BB:STER:GRPS:GT12:STAT ON
　　　　　　　　　　'group 12 will be transmitted

　　　　　　　　　　SOUR:BB:STER:GRPS:GT12:TTIM 6
　　　　　　　　　　'the transmission time of group 12 is 6%

*RST value	Resolution	SCPI
40% (GT0) 10% (GT1) 15% (GT2) 4% (GT3) 2% (GT4..GT13) 10% (GT14) 1% (GT15)	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:TYPE?

Queries the group type number.

Example:　　　　SOUR:BB:STER:GRPS:GT:TYPE?
　　　　　　　　　　'queries the group type

*RST value	Resolution	SCPI
0..15	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:UMT:DATA<0..31>:BLOCk<2..4>　#H00..#H1F (Block 2), #H0000..#HFFFF (Block 3&4)

Sets the hex value for the corresponding block of the corresponding user message hex table row.

Checkword and offset are automatically calculated.

Example:　　　　SOUR:BB:STER:GRPS:GT0:UMT:DATA0:BLOCK2 #H1F
　　　　　　　　　　'sets block 2 to 1F

*RST value	Resolution	SCPI
#H00 (Block 2) #H0000 (Block 3, Block4)	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:UMT:NOENtries   0 ... 31

Sets the number of transmitted groups per message. A maximal number of 32 groups can be configured.

Example: SOUR:BB:STER:GRPS:GT0:UMT:NOEN 4
                   '4 user defined messages will be used

*RST value	Resolution	SCPI
0	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT4:USRDate   01,01,2006 .. 31,12,9999

Sets the user date in format DD,MM,YYYY.

This command is enabled only for group type 4A.

Example: SOUR:BB:STER:GRPS:GT4:DATE USRD
                   'selects user date

                   SOUR:BB:STER:GRPS:GT4:USRD '30,05,2008'
                   'sets the user date

*RST value	Resolution	SCPI
01,01,2006	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:USRTime   00,00 ... 23,59

Sets the user time in format HH,MM. The time is the sum of the user time and the local time offset (SOUR:BB:STER:GRPS:GT4:LOT).

This command is enabled only for group type 4A.

Example: SOUR:BB:STER:GRPS:GT4:TIME USRT
                   'selects user time

                   SOUR:BB:STER:GRPS:GT4:USRT 12,15
                   'sets the user time

*RST value	Resolution	SCPI
00,00	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:GT<0..15>:VERSion   A | B

Sets the group type version of the corresponding group type.

Parameter: **A**
                     Group Type Version A

                     B
                     Group Type Version B

Example: SOUR:BB:STER:GRPS:GT2:VERS B
                   'sets group type 2 with version B

*RST value	Resolution	SCPI
A	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:PRESet

Sets all group parameter values to the default settings.

This command triggers an action and therefore has no *RST value and no query form.

Example: `SOUR:BB:STER:GRPS:PRES`
             'presets all groups

*RST value	Resolution	SCPI
-	-	Device-specific

[SOURce<[1]|2>:]BB:STEReo:GRPS:STORe   <file name>

Stores the current RDS/RBDS group settings into the selected file. The directory is set using command `MMEM:CDIRectory`. A path can also be specified, in which case the files in the specified directory are read. Only the file name has to be entered. RDS/RBDS group settings are stored as files with the specific file extension ***.fm_gt**.

This command triggers an event and therefore has no *RST value and no query form.

Example: `SOUR:BB:STER:GRPS:STOR 'fm_groups'`
             'saves the RDS/RBDS setting into the file fm_groups.fm_gt

*RST value	Resolution	SCPI
-	-	Device-specific

Alphabetical List of Commands

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