R&S®SFI100A
Wideband IF Vector Signal Generator
Getting Started

1179641402
Version 03

This document describes the R&S®SFI100A, stock no. 1444.4001.02.

Contents

1   Safety and regulatory information

The product documentation helps you use the product safely and efficiently. Follow the instructions provided here and in the following sections.

Intended use

The product generates radio frequency (RF) signals for the development, production and verification of electronic components, modules or devices. The product is intended for industrial use, for example for production and conformance testing, maintenance and engineering laboratories.

Use the product only for its designated purpose. Any other use is considered improper use. Observe the operating conditions and performance limits stated in the specifications document.

Target audience

This document targets at all users, including technicians, operators, administrators and maintenance personnel. The required skills and experience of the users depend on the test setup and application of the product.

Where do I find safety information?

Safety information is part of the product documentation. It warns you of potential dangers and gives instructions on how to prevent personal injury or damage caused by dangerous situations. Safety information is provided as follows:

- In Chapter 1.1, "Safety instructions", on page 5. The same information is provided in many languages in printed format. The printed "Safety Instructions" for "Mains-Powered Products, Not Heavy" (document number 1171.1771.99) are delivered with the product.

- Throughout the documentation, safety instructions are provided when you need to take care during setup or operation.

1.1   Safety instructions

Products from the Rohde & Schwarz group of companies are manufactured according to the highest technical standards. To use the products safely, follow

the instructions provided here and in the product documentation. Keep the product documentation nearby and offer it to other users.

Use the product only for its intended use and within its performance limits. Intended use and limits are described in the product documentation such as the specifications document, manuals and the printed "Safety Instructions" document. If you are unsure about the appropriate use, contact Rohde & Schwarz customer support.

Using the product requires specialists or specially trained personnel. These users also need sound knowledge of at least one of the languages in which the user interfaces and the product documentation are available.

Reconfigure or adjust the product only as described in the product documentation or the specifications document. Any other modifications can affect safety and are not permitted.

Never open the casing of the product. Only service personnel authorized by Rohde & Schwarz are allowed to repair the product. If any part of the product is damaged or broken, stop using the product. Contact Rohde & Schwarz customer support at https://www.rohde-schwarz.com/support.

Lifting and carrying the product

The maximum weight of the product is provided in the specifications document. You can lift or carry the product by yourself, if you can manage the weight on your own. Alternatively, you can use lifting or transporting equipment. Follow the instructions provided by the equipment manufacturer.

Choosing the operating site

Only use the product indoors. The product casing is not waterproof. Water that enters can electrically connect the casing with live parts, which can lead to electric shock, serious personal injury or death if you touch the casing.

If Rohde & Schwarz provides accessories designed for outdoor use of your product, e.g. a protective cover, you can use the product outdoors.

You can operate the product up to an altitude of 2000 m above sea level. If a higher altitude is permissible, the value is provided in the specifications document. The product is suitable for pollution degree 2 environments where nonconductive contamination can occur. For more information on environmental conditions such as ambient temperature and humidity, see the specifications document.

Setting up the product

Always place the product on a stable, flat and level surface with the bottom of the product facing down. If the product is designed for different positions, secure the product so that it cannot fall over.

If the product has foldable feet, always fold the feet completely in or out to ensure stability. The feet can collapse if they are not folded out completely or if the product is moved without lifting it. The foldable feet are designed to carry the weight of the product, but not an extra load.

If stacking is possible, keep in mind that a stack of products can fall over and cause injury.

If you mount products in a rack, ensure that the rack has sufficient load capacity and stability. Observe the specifications of the rack manufacturer. Always install the products from the bottom shelf to the top shelf so that the rack stands securely. Secure the product so that it cannot fall off the rack.

Connecting the product

Before connecting the interfaces and measuring inputs of the product to other products or electrical circuits, make sure that the other products or electrical circuits provide special protection against electric shock. This protection principle is referred to as SELV (safety extra-low voltage) and is based on a low voltage level and increased insulation. Exceptions are indicated by a measurement category on the product and given in the specifications document.

Connecting to power

The product is an overvoltage category II product. Connect the product to a fixed installation used to supply energy-consuming equipment such as household appliances and similar loads. Keep in mind that electrically powered products have risks, such as electric shock, fire, personal injury or even death. Replace parts that are relevant to safety only by original parts, e.g. power cables or fuses.

Take the following measures for your safety:

● Before switching on the product, ensure that the voltage and frequency indicated on the product match the available power source. If the power adapter does not adjust automatically, set the correct value and check the rating of the fuse.

● If a product has an exchangeable fuse, its type and characteristics are indicated next to the fuse holder. Before changing the fuse, switch off the product

and disconnect it from the power source. How to change the fuse is described in the product documentation.

- Only use the power cable delivered with the product. It complies with country-specific safety requirements. Only insert the plug into an outlet with protective conductor terminal.
- Only use intact cables and route them carefully so that they cannot be damaged. Check the power cables regularly to ensure that they are undamaged. Also ensure that nobody can trip over loose cables.
- Only connect the product to a power source with a fuse protection of maximum 20 A.
- Ensure that you can disconnect the product from the power source at any time. Pull the power plug to disconnect the product. The power plug must be easily accessible. If the product is integrated into a system that does not meet these requirements, provide an easily accessible circuit breaker at the system level.

Cleaning the product

Use a dry, lint-free cloth to clean the product. When cleaning, keep in mind that the casing is not waterproof. Do not use liquid cleaning agents.

Meaning of safety labels

Safety labels on the product warn against potential hazards.

	Potential hazard
	Read the product documentation to avoid personal injury or product damage.

	Electrical hazard
	Indicates live parts. Risk of electric shock, fire, personal injury or even death.

	Hot surface
	Do not touch. Risk of skin burns. Risk of fire.

	Protective conductor terminal
	Connect this terminal to a grounded external conductor or to protective ground. This connection protects you against electric shock if an electric problem occurs.

1.2   Labels on R&S SFI100A

Labels on the casing inform about:

- Personal safety, see "Connecting to power" on page 7.
- Product and environment safety, see Table 1-1.
- Identification of the product, see the serial number on the rear panel.

Table 1-1: Labels regarding R&S SFI100A and environment safety

🚮	Labeling in line with EN 50419 for disposal of electrical and electronic equipment after the product has come to the end of its service life. For more information, see the product user manual, chapter "Disposal".

1.3   Warning messages in the documentation

A warning message points out a risk or danger that you need to be aware of. The signal word indicates the severity of the safety hazard and how likely it will occur if you do not follow the safety precautions.

WARNING

Potentially hazardous situation. Could result in death or serious injury if not avoided.

CAUTION

Potentially hazardous situation. Could result in minor or moderate injury if not avoided.

NOTICE

Potential risks of damage. Could result in damage to the supported product or to other property.

1.4   Where to find key documents on Rohde & Schwarz

Certificates issued to Rohde & Schwarz that are relevant for your country are provided at www.rohde-schwarz.com/key-documents, e.g. concerning:

- Quality management
- Environmental management
- Information security management
- Accreditations

1.5   Korea certification class A

이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

2 Documentation overview

This section provides an overview of the R&S SFI100A user documentation. Unless specified otherwise, you find the documents at:

www.rohde-schwarz.com/manual/sfi100a

2.1 Getting started manual

Introduces the R&S SFI100A and describes how to set up and start working with the product. Includes basic operations, typical measurement examples, and general information, e.g. safety instructions, etc. A printed version is delivered with the instrument.

2.2 Printed safety instructions

Provides safety information in many languages. The printed document is delivered with the product.

2.3 Videos

Find various videos on Rohde & Schwarz products and test and measurement topics on YouTube: https://www.youtube.com/@RohdeundSchwarz

3 Key features

The R&S SFI100A is a wideband IF vector signal generator in the high-end range developed to meet demanding customer requirements for wideband I/Q and RF testing up to the sub-THz frequency range. Offering excellent signal characteristics and straightforward and intuitive operation, the R&S SFI100A makes signal generation fast and easy.

Outstanding key features of the R&S SFI100A are:

- IF signal generation from 11 GHz to 21 GHz
- IF output power of up to 0 dBm
- Perfect IF source for external frontends and frequency converters
- Up to 10 GHz RF modulation bandwidth in a compact form factor
- Wideband analog I/Q output signals with V_{pp} up to 2 V:
    - Differential direct DAC output with up to 5 GHz bandwidth
    - Amplified differential output with up to 2 GHz bandwidth
    - Single-ended output with up to 5 GHz bandwidth
- Fully software-defined option concept to extend the instrument easily with software options
- Internal baseband generator including ARB with maximum sample rate of 16 Gsample/s, maximum ARB memory of 8 Gsample
- Support of waveforms for generation of 5G NR, IEEE 802.11ad/ay, OFDM, custom digital modulation and multicarrier continuous wave signals
- Intuitive operation via 5" touchscreen with block diagram as key element
- Graphical signal monitoring at practically every point in the signal flow
- SCPI macro recorder and code generator for generating executable remote control code from manual operating steps (for MATLAB®, CVI, etc.)

For more information, refer to the specifications document.

4   Preparing for use

Here, you can find basic information about setting up the product for the first time.

4.1   Lifting and carrying

For safety information, see "Lifting and carrying the product" on page 6.

4.2   Unpacking and checking

1. Unpack the R&S SFI100A carefully.

2. Retain the original packing material. Use it to protect the control elements and connectors when transporting or shipping the R&S SFI100A later.
    See also chapter "Transporting" in the user manual.

3. Using the delivery notes, check the equipment for completeness. In particular, check that the delivery includes the two QSFP+ cables.
    See "Cable selection and electromagnetic interference (EMI)" on page 16.

4. Check the equipment for damage.

    If the delivery is incomplete or equipment is damaged, contact
    Rohde & Schwarz.

4.3   Choosing the operating site

Specific operating conditions ensure proper operation and avoid damage to the product and connected devices. For information on environmental conditions such as ambient temperature and humidity, see the specifications document.

For safety information, see "Choosing the operating site" on page 6.

Electromagnetic compatibility classes

The electromagnetic compatibility (EMC) class indicates where you can operate the product. The EMC class of the product is given in the specifications document.

- Class B equipment is suitable for use in:
  - Residential environments
  - Environments that are directly connected to a low-voltage supply network that supplies residential buildings
- Class A equipment is intended for use in industrial environments. It can cause radio disturbances in residential environments due to possible conducted and radiated disturbances. It is therefore not suitable for class B environments.
  If class A equipment causes radio disturbances, take appropriate measures to eliminate them.

4.4   Setting up the R&S SFI100A

For safety information, see:
- "Setting up the product" on page 7
- "Intended use" on page 5

4.4.1   Placing the R&S SFI100A on a bench top

To place the product on a bench top

1. Place the product on a stable, flat and level surface. Ensure that the surface can support the weight of the product. For information on the weight, see the specifications document.

2. **CAUTION!** Foldable feet can collapse. For safety information, see "Setting up the product" on page 7.

   Always fold the feet completely in or out. With folded-out feet, do not place anything on top or underneath the product.

3. **WARNING!** A stack of products can fall over and cause injury. Never stack more than three products on top of each other. Instead, mount them in a rack.

   Stack as follows:

- If the products have foldable feet, fold them in completely.
- All products must have the same dimensions (width and length).
- Do not exceed a total load of 50 kg placed on the product at the bottom of the stack.
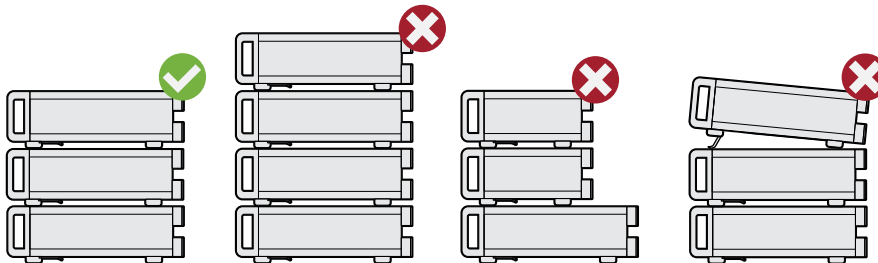
Left	= Stacked correctly
Middle left	= Stacked incorrectly, too many products
Middle right	= Stacked incorrectly, different dimensions
Right	= Stacked incorrectly, folded-out feet

4. **NOTICE!** Overheating can damage the product.

   Prevent overheating as follows:

   - Keep a minimum distance of 10 cm between the fan openings of the product and any object in the vicinity to provide sufficient airflow and ventilation.
   - Do not place the product next to heat-generating equipment such as radiators or other products.

4.4.2   Mounting the R&S SFI100A in a rack

To prepare the rack

1. Observe the requirements and instructions in "Setting up the product" on page 7.

2. **NOTICE!** Insufficient airflow can cause overheating and damage the product.

   Design and implement an efficient ventilation concept for the rack.

To mount the R&S SFI100A in a rack

1. Use an adapter kit that fits the dimensions of the R&S SFI100A to prepare the instrument for rack mounting.

   a) Order the rack adapter kit designed for the R&S SFI100A. For the order number of the kit, see the specifications document.

    b) Mount the adapter kit. Follow the assembly instructions provided with the adapter kit.

2. Lift the R&S SFI100A to shelf height.

3. Push the R&S SFI100A onto the shelf until the rack brackets fit closely to the rack.

4. Tighten all screws at the rack brackets with a tightening torque of 1.2 Nm to secure the R&S SFI100A in the rack.

To unmount the R&S SFI100A from a rack

1. Loosen the screws at the rack brackets.

2. Bring the lifting equipment to shelf height.

3. Remove the R&S SFI100A from the rack.

4. If placing the R&S SFI100A on a bench top again, unmount the adapter kit from the R&S SFI100A. Follow the instructions provided with the adapter kit.

4.5   Considerations for test setup

Cable selection and electromagnetic interference (EMI)

Electromagnetic interference (EMI) can affect the measurement results.

To suppress electromagnetic radiation during operation:

- Use the two cables 100G QSFP28 Passive Direct Attach Copper Twinax for connecting the Dig. IQ HS interfaces of the instrument. The cables are included in the delivery of the instrument and are available under order number 3708.5920.00.
  How to: Chapter 4.10, "Establishing the high-speed digital crosslink", on page 20

- Use high-quality shielded cables, for example, double-shielded RF, LAN and USB cables.

- Always terminate open cable ends.

- Ensure that connected external devices comply with EMC regulations.

- Use cables of the same type and equal length for connection to the I/Q interfaces of the instrument.

Signal input and output levels

The specifications document provides information on signal levels. Keep the signal levels within the specified ranges to avoid damage to the R&S SFI100A and connected devices.

Over-the-air (OTA) tests

For over-the-air (OTA) tests, operate the instrument in a shielded environment.

For more information, refer to the specifications document.

4.6   Connecting to power

For safety information, see "Connecting to power" on page 7.

1. Plug the AC power cable into the AC power connector on the rear panel. Only use the AC power cable delivered with the R&S SFI100A.

2. Plug the AC power cable into a power outlet with ground contact.
    The required ratings are listed next to the AC power connector.

For more information, refer to the specifications document.

4.7   Connecting to LAN

Network environment

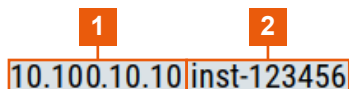Before connecting the product to a local area network (LAN), consider the following:

● Install the latest firmware to reduce security risks.
● For internet or remote access, use secured connections if applicable.
● Ensure that the network settings comply with the security policies of your company. Contact your local system administrator or IT department before connecting your product to your company LAN.

● When connected to the LAN, the product may potentially be accessed from the internet, which may be a security risk. For example, attackers might misuse or damage the product.

To connect to LAN

► Connect the LAN socket on the rear panel via an RJ-45 cable to the LAN.

Using DHCP (dynamic host configuration protocol), the R&S SFI100A assigns the IP address automatically.

If connected to the LAN, the R&S SFI100A displays the IP address and the hostname at the left bottom of the block diagram.

1 = IP address
2 = Hostname

If disconnected from the LAN, the R&S SFI100A displays the IP address *0.0.0.0*.

See also chapter "Setting up remote control in the user manual.

4.8   Connecting a monitor

This section describes how to connect a monitor for direct operation of the R&S SFI100A. You can skip the following procedure, if you only operate the R&S SFI100A remotely.

1. Connect the monitor to the "Display Port" socket of the R&S SFI100A on the rear panel.
   The "Display Port" socket does not support a dual-mode Display Port (DP++). Use an active adapter if you connect to HDMI cables, for example.

2. At the monitor, connect the cable to one of the following sockets:
   ● Display Port: Connect it to the Display Port socket of the monitor.
   ● HDMI: You need an active adapter Display Port to HDMI. Passive adapters do not work.

- VGA: You need an active adapter, Display Port to VGA. Passive adapters do not work.

If the monitor provides touch functionality, an additional connection can be required, for example, a USB connection. Refer to the documentation of your monitor.

4.9 Connecting USB devices

You can connect or disconnect all USB devices from the R&S SFI100A during operation.

To connect USB storage devices

USB storage devices, such as memory sticks, allow data transfer from or to the R&S SFI100A. You can also use them for firmware updates.

1. Connect the USB storage device to the USB type A connector on the front panel.

2. Connect the device directly, without a connecting cable.
   Connecting cables can cause electromagnetic radiation and impair a measurement result.

To connect USB devices with an external power supply

1. **NOTICE!** Connected devices with external power supply can feed back current into the 5 V power supply of the USB interface and thus damage the R&S SFI100A.

   Ensure that there is no connection between the positive pole of the power supply and the +5 V power pin of the USB interface (VBUS).

2. Connect the USB storage device to a USB connector on the rear panel.

To connect a keyboard

► Connect the USB storage device to a USB connector on the rear panel.

When connected, the R&S SFI100A detects the keyboard automatically. A detected keyboard has the default layout English – US.

To connect a mouse

► Connect the USB storage device to a USB connector on the rear panel.

When connected, the R&S SFI100A detects the mouse automatically.

To connect power sensors

Connect power sensors of the R&S NRP families to a USB connector on the rear panel.

See chapter "Using power sensors" in the user manual.

4.10 Establishing the high-speed digital crosslink

For correct operation, always connect the "Dig. IQ HS x" connectors to establish the high-speed I/Q data crosslink between the two baseband signal boards BBCV. Connect the connectors as follows:

1. For connection, use the two cables 100G QSFP28 Passive Direct Attach Copper Twinax.
   See "Cable selection and electromagnetic interference (EMI)" on page 16.

2. To connect the cable and the interface, proceed as follows:
   a) Hold the QSFP+ plug of the cable by its panes.
   b) Turn the QSFP+ cable, so that the release tab shows upwards.
      See also (5) in Figure 4-1.
   c) Insert and push the QSFP+ plug into the QSFP+ cage.

   If you hear a clicking sound, the plug engaged correctly with the cage and the cable is connected to the interface.

3. For the I component of the I/Q data crosslink, connect "Dig. IQ HS 1" and "Dig. IQ HS 3".

   See also (1) and (3) in Figure 4-1.

4. For the Q component of the I/Q data crosslink, connect "Dig. IQ HS 2" and "Dig. IQ HS 4".
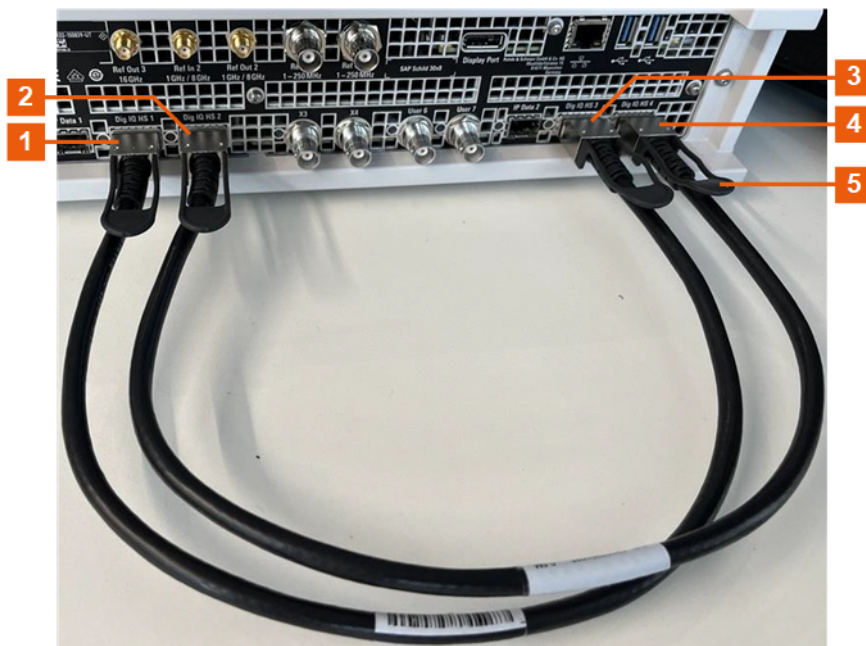
See also (2) and (4) in Figure 4-1.

Figure 4-1: QSFP+ connections for I/Q data crosslink

1, 3 = I components crosslink with connectors "Dig. IQ HS 1" and "Dig. IQ HS 3"
2, 4 = Q components crosslink with connectors "Dig. IQ HS 2" and "Dig. IQ HS 4"
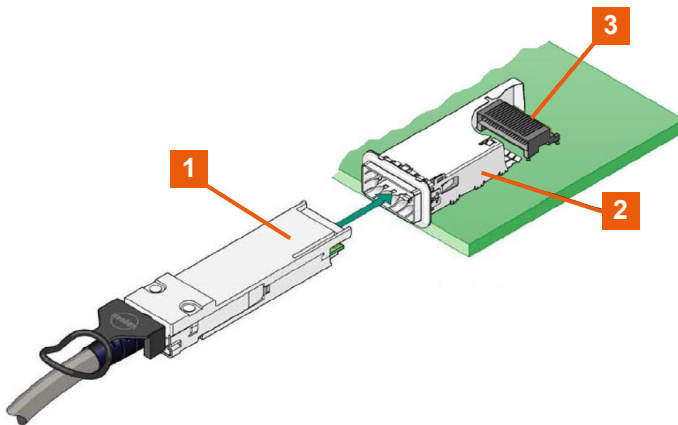5   = Release tab (pull-strap) of the QSFP+ cable

To disconnect from the QSFP+ interface

1. **NOTICE!** If you pull the cable, you can damage the cable and the Dig. IQ HS connector.

   Pull the release tab.

2. Pull the QSFP+ plug out of the QSFP+ cage.

About the QSFP+ interface

The "Dig. IQ HS" connector is a QSFP+ (quad small form factor pluggable) interface or QSFP28 interface. The connector socket has two components: a QSFP+ cage and a QSFP+ connector. The QSFP+ cable is equipped with the QSFP+ plug. The interface supports a maximum bandwidth of up to 50 Gsample/s with active optical cables.

1 = QSFP+ plug
2 = QSFP+ cage
3 = QSFP+ connector

4.11 Connecting to RF coaxial connectors

Here, you find information on how to prepare and to connect to RF coaxial connectors of the R&S SFI100A. Use these RF connectors, for example, for output of the RF signal or for input of an external reference signal.

To prepare for connecting

1. **NOTICE!** Damaged or not clean connections can lead to RF insertion loss and mismatch, and even premature wear of the connectors.

   Before connecting to the port, inspect the RF connector visually. Check that it is clean, undamaged and mechanically compatible.

2. **NOTICE!** DC voltage at the RF connector can damage the instrument. Never apply DC voltage to the RF input connectors.

   Make sure that the values are within the DC limits given in the specifications document.

3. If your test setup has a DC component at the RF input, insert a DC blocker.

4. Use a high-quality RF cable that matches the RF connector type. See also "Cable selection and electromagnetic interference (EMI)" on page 16.

5. You can connect to two kinds of connectors:
   - "To connect to screwable connectors" on page 23
   - "To connect to pluggable connectors" on page 23

To connect to screwable connectors

► **NOTICE!** Excessive tightening can damage the connectors.

To connect the cable with the connector, proceed as follows:

a) Carefully align the connector of the cable and the connector along a common axis.
b) Mate the connectors along the common axis until the male pin of the inner connector engages with the female socket of the outer connector.
c) Turn the nut of the outer connector until the connectors are firmly coupled.
d) Using a calibrated torque wrench torque the nut to the limit as in the table below. Hold the opposite connector part stationary with a spanner.

The R&S SFI100A provides screwable RF connectors as in Table 4-1.

Table 4-1: Connector name, type, size, torque limit and nut opening

Connector		Torque limit		Nut opening	
Type	Name	lb-Inch	Nm	Inch	mm
SMA	I/Q / I/Q bar Ref In 2 Ref Out 2/3 User 1/2/3	5	0.56	5/16	8
2.92 mm	RF Out*)	8	0.9	5/16	8

To connect to pluggable connectors

The R&S SFI100A provides pluggable Bayonet Neill-Concelman (BNC) connectors.

► To connect the RF cable with the BNC connector, proceed as follows:

a) Carefully align the connector of the cable and the BNC connector along a common axis.
b) Mate the connectors along the common axis until the male pin of the connector of the cable engages with the female socket of the BNC connector.

For more information on handling and maintaining coaxial RF connectors, see the application note 1MA99.

For information on mounting test port adapters onto the RF connector, see the application note 1MA100.

4.12 Connecting to RF Out

1. Before connecting, disable the RF output:
   In the block diagram, switch off the RF block.

2. For connection, use the connector "RF Out" on the front panel.
   See "To connect to screwable connectors" on page 23.

To prevent RF output switch-off

► **NOTICE!** If you set a too high output level without a load connected to the instrument, the reverse power can exceed a limit forcing the R&S SFI100A to switch off the RF output.

Connect a load with sufficient return loss.
For more information, refer to the specifications document.

4.13 Connecting to Ref In/Ref Out

For connection, the R&S SFI100A provides BNC connectors or SMA connectors on the rear panel. See "To connect to pluggable connectors" on page 23 and "To connect to screwable connectors" on page 23.

4.14 Switching on or off

The following table provides an overview of power states, LEDs and positions of the power switch.

Table 4-2: Overview of power states

State	LED	Position of power switch
Off	⚪ gray	[0]
Standby	🟠 orange	[I]
Ready	🟢 green	[I]

To switch on the R&S SFI100A

The R&S SFI100A is off but connected to power. See Chapter 4.6, "Connecting to power", on page 17.

1. Set the switch on the power supply to position [I] on the rear panel.

    The LED of the [On/Standby] key on the front panel is orange.

2. Press the [On/Standby] key on the front panel.

    The LED changes to green. The R&S SFI100A boots.

    After booting, the R&S SFI100A starts up displaying the block diagram on the screen on the front panel.

To check startup functions

When starting for the first time, the R&S SFI100A starts with the default settings. When restarting, the R&S SFI100A recalls the instrument configuration before shut-down.

See chapter "Saving and recalling instrument settings" in the user manual.

When switched on, the R&S SFI100A monitors the main functions and logs erroneous functions. See the following:

See chapter "Querying notifications" in the user manual.

To shut down the product

The product is in the ready state.

► Press the [On/Standby] key.

    The operating system shuts down. The LED changes to orange.

To disconnect from power

The R&S SFI100A is in the standby state.

1. **NOTICE!** Risk of data loss. If you disconnect the product from power when it is in the ready state, you can lose settings and data. Shut it down first.

    Set the toggle switch on the power supply to position [0].

    The LED of the [On/Standby] key is switched off.

2. Disconnect the R&S SFI100A from the power source.

5   Instrument tour

This chapter explains the control elements and the connectors of the R&S SFI100A. The views of the front panel and the rear panel help you to get familiar with the instrument and to perform the first steps. For specifications of the interfaces, see the specifications document.

The meanings of the labels on the R&S SFI100A are described in Chapter 1.2, "Labels on R&S SFI100A", on page 9.

5.1   Front panel tour

This section provides an overview of the control elements and connectors of the front panel of the R&S SFI100A. On the rear panel, you find all further connectors.
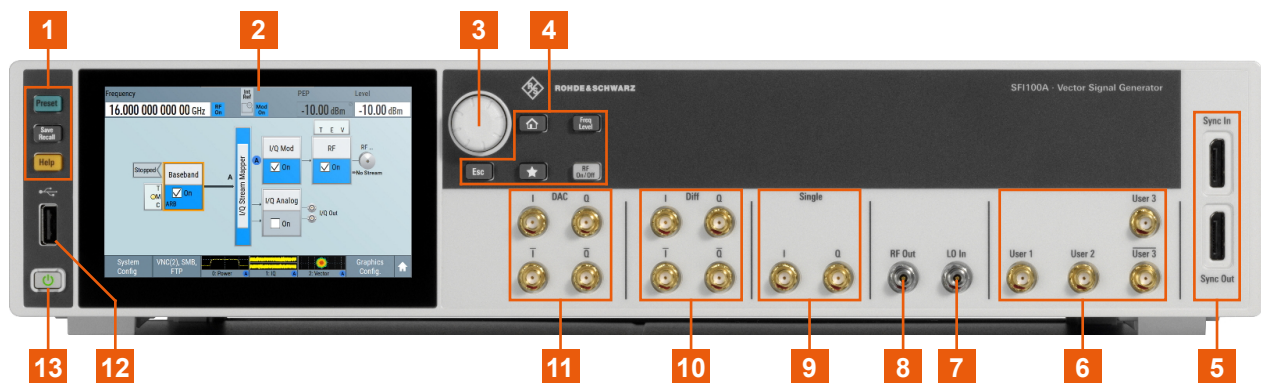
Figure 5-1: Front panel view

1 = Utility keys
2 = Touchscreen
3 = Rotary knob
4 = Function keys
5 = Sync In/Sync Out
6 = User x
7 = LO In
8 = RF Out
9 = Single connectors
10 = Diff connectors
11 = DAC connectors
12 = USB
13 = On/Standby key

5.1.1 Touchscreen

The screen on the front panel displays the block diagram and the most important settings. Also, the screen display provides status and setting information and allows you to quickly reconfigure the signal flow. The screen is touch-sensitive, offering an alternative means of user interaction for quick and easy handling of the instrument.

Any user interface elements that react to a click by a mouse pointer also react to a tap on the screen, and vice versa. Using the touchscreen, you can perform the following tasks (among others) by the tap of your finger:

- Changing a setting
- Selecting new settings
- Scrolling through a list or a table of parameters
- Saving or recalling settings
- Opening and closing dialogs

See also:

- Chapter "Cleaning" in the user manual, for instructions on cleaning the screen.

5.1.2 Keys

On/Standby key

The [On/Standby] key switches the instrument from the standby to the ready state or vice versa.

The LED below the [On/Standby] key indicates the instrument state, see Chapter 4.14, "Switching on or off", on page 24.

Utility keys

The utility keys set the instrument to a defined state, provide information on the instrument and provide access to the instrument help.

Table 5-1: Utility keys

Utility key	Assigned functions
[Preset]	Sets the instrument to a defined state.
[Save/Recall]	Opens the file manager to save or load an instrument configuration. Accesses the file manager
[Help]	Opens the "Help" dialog and displays the description for a context-sensitive help topic.

See also chapter "General Instrument Functions" in the user manual.

Function keys

Function keys provide access to the most common generator settings and functions.

Table 5-2: Function keys

Function key	Assigned functions
[Home]	Brings the block diagram to the foreground and minimizes opened dialogs.
[Freq/Level]	Pressing once: Enables frequency entry. Pressing twice: Enables level entry. Toggles between frequency and level entry.
[★]	User key with a customizable function.
[RF On/Off]	Switches the RF output on and off. The status bar above the block diagram displays the current RF output state.
[Esc]	For non-edit mode, closes all kinds of dialog boxes analogous to tapping the "Cancel" button. In edit mode, quits this mode and keeps the last entry during editing.

See also chapter "General Instrument Functions" in the user manual.

Rotary knob

The rotary knob has several functions:

- Increments (clockwise direction) or decrements (counterclockwise direction) numeric instrument parameters at a defined step size.
- Moves the selection, e.g. to a function block in the block diagram.
- Shifts the selection bar within focused areas (e.g. lists).
- Activates editing of entries or confirms and terminates entries.
- Opens a context-sensitive menu, if you press and hold the knob.

5.1.3   Connectors

There are SMA connectors, a USB connector and "Sync" connectors on the front panel.

USB

Female USB (universal serial bus) 2.0 connector of type A (host USB). You can connect, for example, a keyboard, a mouse or a USB memory stick.

How to: Chapter 4.9, "Connecting USB devices", on page 19

Single connectors

Two female SMA connectors for single-ended I/Q output signals.

How to: "To connect to screwable connectors" on page 23

Diff connectors

Four female SMA connectors for amplified differential I/Q signal output.

"I/Q"   Two connectors for the positive differential I/Q output signal.

"I/Q bar"   Two connectors for the negative differential I/Q output signal.

How to: "To connect to screwable connectors" on page 23

DAC connectors

Four female SMA connectors for differential I/Q signal output direct from the D/A converter (DAC) board.

"I/Q"   Connectors for the positive differential I/Q output signal.

"I/Q bar"   Connectors for the negative differential I/Q output signal.

How to: "To connect to screwable connectors" on page 23

RF Out

Female 2.92 mm connector for output (50Ω) of the RF signal.

How to: "To connect to screwable connectors" on page 23

LO In

Female 2.92 mm connector for input (50Ω) of a local oscillator (LO) signal. The connector is for future use.

User x

Four female SMA multipurpose connectors for user-configurable input and output signals.

Table 5-3 lists available User x connectors and their description.

Table 5-3: User x front panel connectors

Connector	Description
User 1	Trigger signal input or output, high-level and low-level control signal output.
User 2	Trigger signal input or output, high-level and low-level control signal output.
User 3 User 3 bar	Differential trigger signal output, high-level and low-level control signal output.

A dedicated LED indicates the connector status:
- 🟢 green: an input connector
- 🟡 yellow: an output connector
- ⚪ no light / gray: the connector is not active

See also chapter "Global connector settings" in the user manual.

How to: "To connect to screwable connectors" on page 23

Sync In/Sync Out
Connector for multi-Instrument setups to synchronize input signals and output signals. For future use.

5.2   Rear panel tour

This section provides an overview of the connectors on the rear panel of the instrument. For technical data of the connectors, refer to the specifications document.
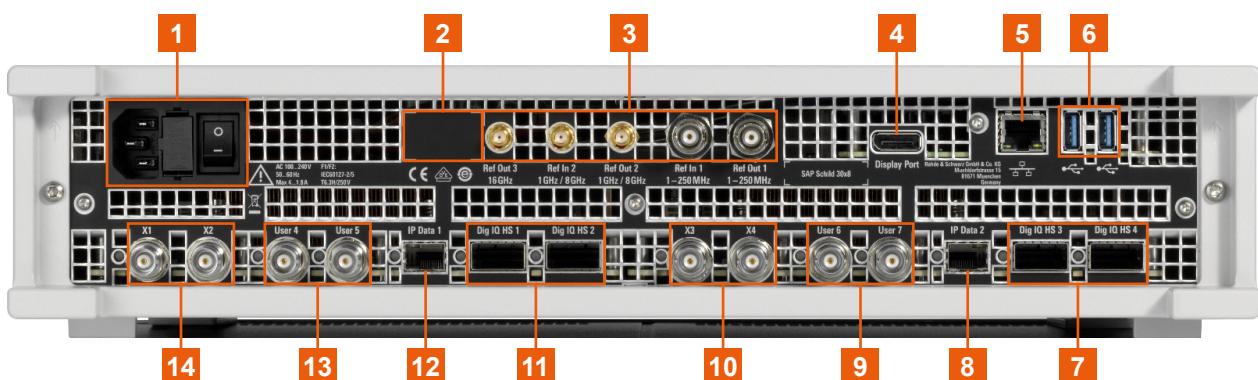
Figure 5-2: Rear panel

1   = AC power supply connector and switch
2   = Serial number (six digits in the string 1444.4001.02-<serial number>-<checksum>)
3   = Ref In/Ref Out
4   = Display Port
5   = LAN
6   = USB
7, 11   = Dig. IQ HS x
8, 12   = IP Data
9, 13   = User x
10, 14 = X x

5.2.1 Connectors

AC power supply connector and switch
Mains power switch for performing the following tasks:
- Connecting the internal power supply to the power source
- Disconnecting the internal power supply from the power source

The required ratings are listed next to the AC power connector and in the specifications document.

How to:
- Chapter 4.6, "Connecting to power", on page 17
- Chapter 4.14, "Switching on or off", on page 24

Ref In/Ref Out
Input or output for an external reference signal.

For reference signals with frequency f_{ref} of 250 MHz and lower, connect to the BNC female connectors "Ref In 1" and "Ref Out 1".

For reference signals with frequency f_{ref} higher than 250 MHz, connect to the SMA female connectors "Ref In 2", "Ref Out 2" and "Ref Out 3".

How to:
- f_{ref} ≤ 250 MHz: "To connect to pluggable connectors" on page 23
- f_{ref} > 250 MHz: "To connect to screwable connectors" on page 23

Display Port
Display Port monitor connector.

How to:Chapter 4.8, "Connecting a monitor", on page 18

LAN

RJ-45 connector to connect the R&S SFI100A to a LAN for remote control, remote operation and data transfer.

How to: Chapter 4.7, "Connecting to LAN", on page 17

USB

Two female USB (universal serial bus) 3.1 connectors of type A (host USB). They have the same functionality as the USB connector on the front panel, but provide higher data rates. See "USB" on page 29.

How to: Chapter 4.9, "Connecting USB devices", on page 19

Dig. IQ HS x

QSFP+ or QSFP28 interface connectors that provide the high-speed I/Q data link between the two baseband signaling boards BBCV.

For correct operation, always connect the "Dig. IQ HS x" connectors to establish the high-speed I/Q data crosslink between the two baseband signal boards BBCV. Connect the connectors as follows:
- I component of the I/Q link:
  Connect "Dig. IQ HS 1" and "Dig. IQ HS 3".
- Q component of the I/Q link:
  Connect "Dig. IQ HS 2" and "Dig. IQ HS 4".

How to: Chapter 4.10, "Establishing the high-speed digital crosslink", on page 20

IP Data

"IP Data 1" and "IP Data 2" connectors with an SFP+ (small form factor pluggable) interface. The connectors are for future use.

User x

Four BNC connectors with fixed marker output signal routing.

Table 5-4 lists available User x connectors and their description.

Table 5-4: User x rear panel connectors

Connector	Description
User 4	"Marker 4" output signal
User 5	"Marker 3" output signal
User 6	"Marker 2" output signal
User 7	"Marker 1" output signal

How to: "To connect to pluggable connectors" on page 23

X x

Four BNC multipurpose connectors for future use.

How to: "To connect to pluggable connectors" on page 23

6   Trying out the instrument

This chapter provides step-by-step instructions to introduce the most important functions and settings of the R&S SFI100A.

Prerequisites

- The R&S SFI100A is equipped with its base unit configuration.
- The R&S SFI100A is connected to the power supply and started up.
- The R&S SFI100A has its default configuration after an instrument preset.

Base unit

The R&S SFI100A has the following options when equipped as a base unit:
- Frequency option R&S SFI-B1016
- ARB option R&S SFI-K510 with 4 GHz RF bandwidth and 2 Gsample memory
- Frontend control option R&S SFI-K553
- Reference input and output option R&S SFI-K703

Instrument equipment and screenshots

In this description, the screenshots show a fully equipped instrument. Consider that some settings in the block diagram or in the configuration dialogs can differ from the settings of your instrument.

For the first signal generation tasks, you use the internal baseband and reference signal, so you do not need any additional signal source. More complex signal generation tasks require an instrument equipped with additional options or external signals.

The following sections provide introductory step-by-step instructions using the touchscreen. Each instruction lists the prerequisites to execute the instruction.

6.1 Generating an unmodulated RF signal

This step-by-step instruction explains how to generate an unmodulated RF con-tinuous wave signal. This signal is an IF signal in the frequency range of 11 GHz to 21 GHz. The signal is sufficient for generic IF receiver testing, for example for testing chipsets.

1. Connect the RF Out connector of the R&S SFI100A to the RF input connector of the DUT.
See "To connect to screwable connectors" on page 23.

2. Configure the IF signal:

   a) In the status bar, select the "Frequency" field to enter a frequency value.
   For example, enter *16g* to set an IF frequency value of 16 GHz.
   b) Select the "Level" field to enter a level value.
   For example, enter *-20* to set an IF level value of -20 dBm.

3. In the block diagram, select "RF" > "On" to enable IF signal generation.
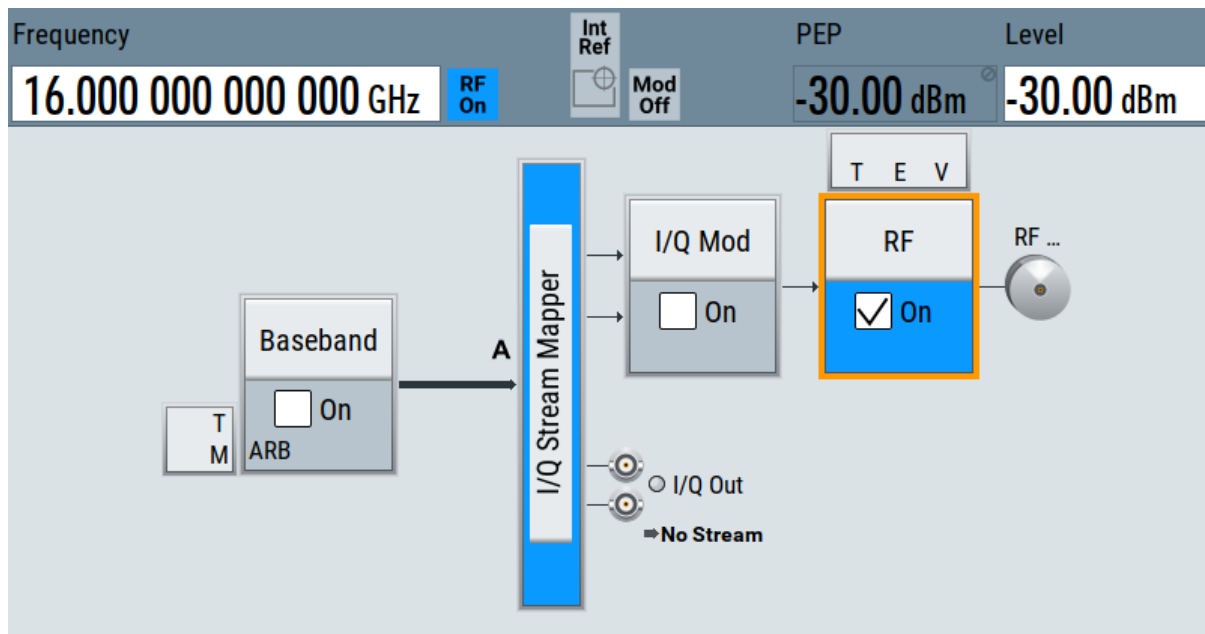
The status bar displays the set frequency and the level of the IF signal. The R&S SFI100A outputs this IF signal at the "RF Out" connector on the front panel.

6.2   Generating a modulated RF signal

This step-by-step instruction explains how to generate a modulated RF signal. This signal is an IF signal in the frequency range of 11 GHz to 21 GHz. The signal is sufficient for generic IF receiver testing, for example for testing chipsets.

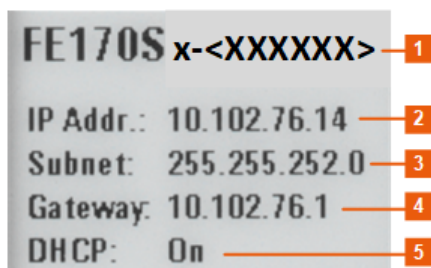1. Connect the "RF Out" connector of the R&S SFI100A to the RF input connector of the DUT.
   See "To connect to screwable connectors" on page 23.

2. In the block diagram, select "Baseband" > "Misc" > "ARB".
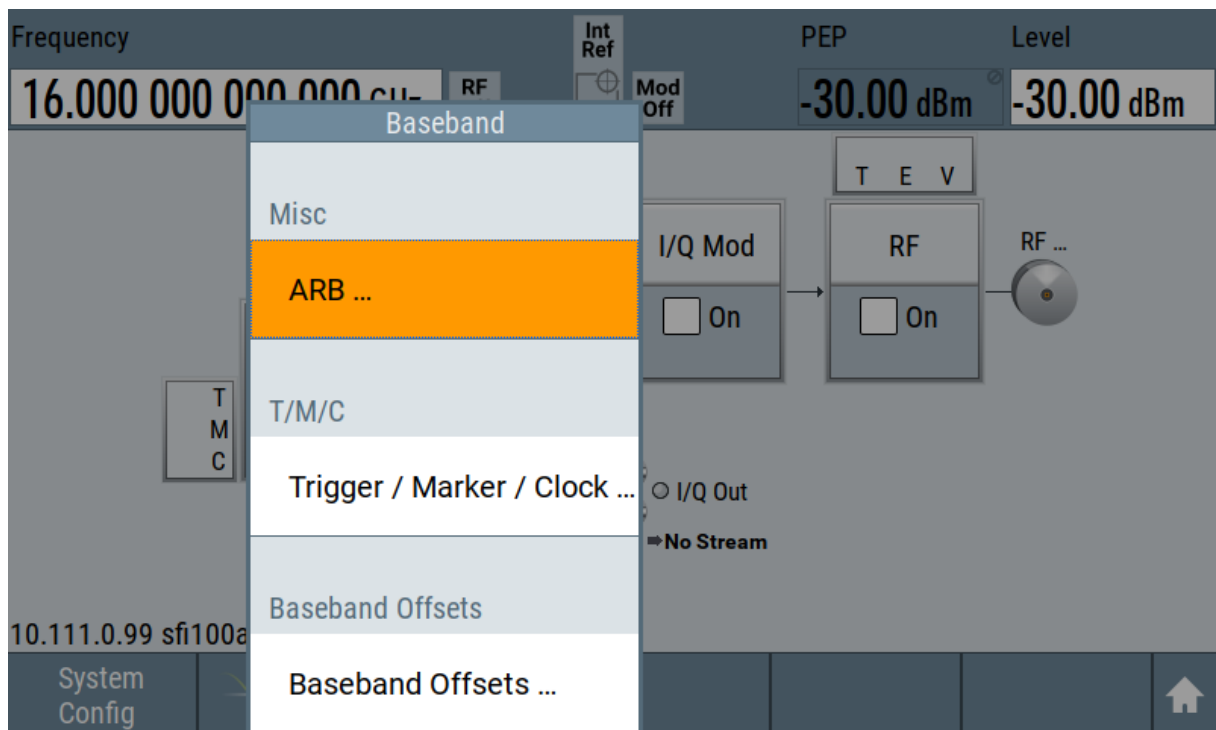
   The ARB dialog opens.

3. Load a waveform file. For example, load the file 5GNR_test.wv that resembles the default configuration of a 5G NR baseband signal.
   See section "Loading and playing waveform files" in the user manual.

4. Optionally, to check the waveform file properties, select "Waveform Info".
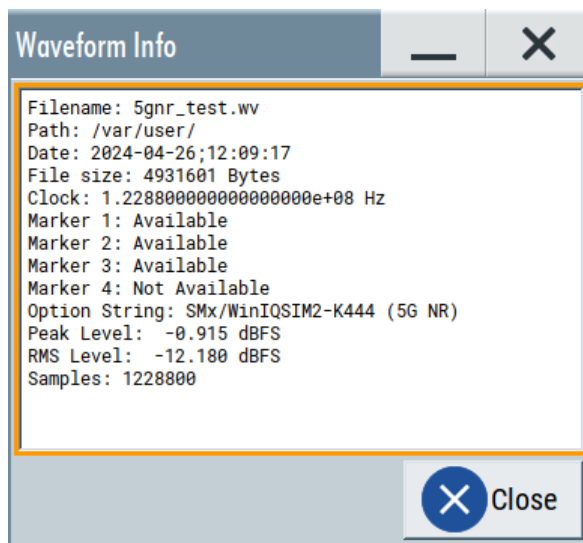
The dialog provides detailed information on the waveform file including the file size and the clock frequency.

5. Select "State" > "On".
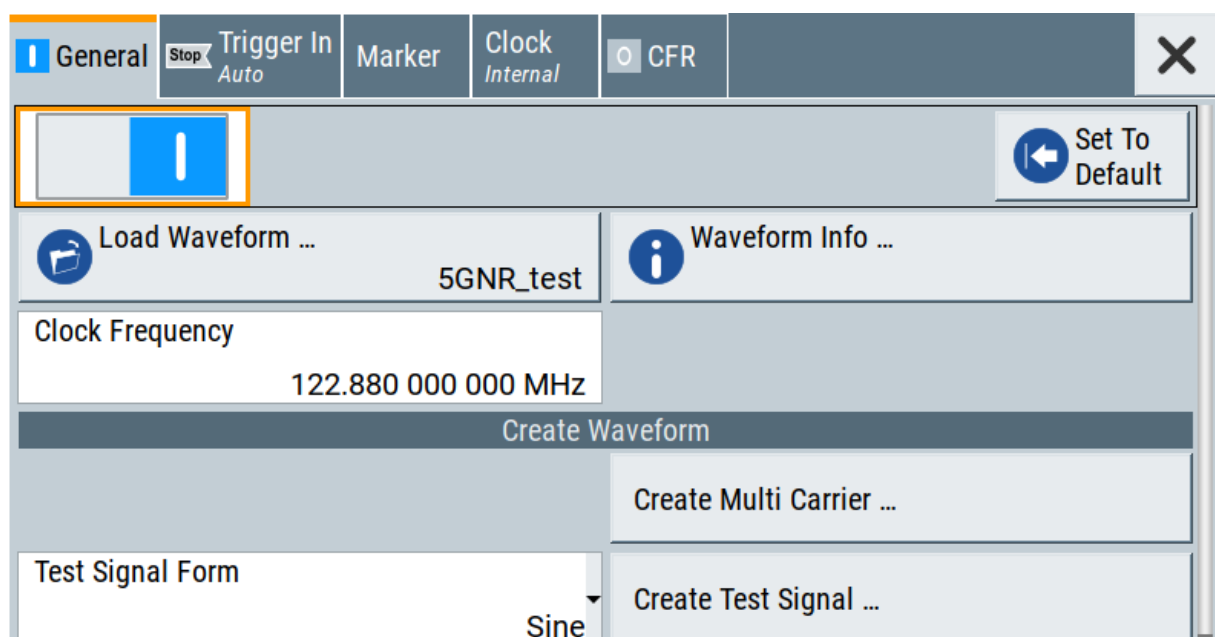
The R&S SFI100A loads the waveform file and starts signal processing.

6. In the status bar, configure the frequency and the level of the IF signal.

7. In the block diagram, select "RF" > "On" to enable IF signal generation.
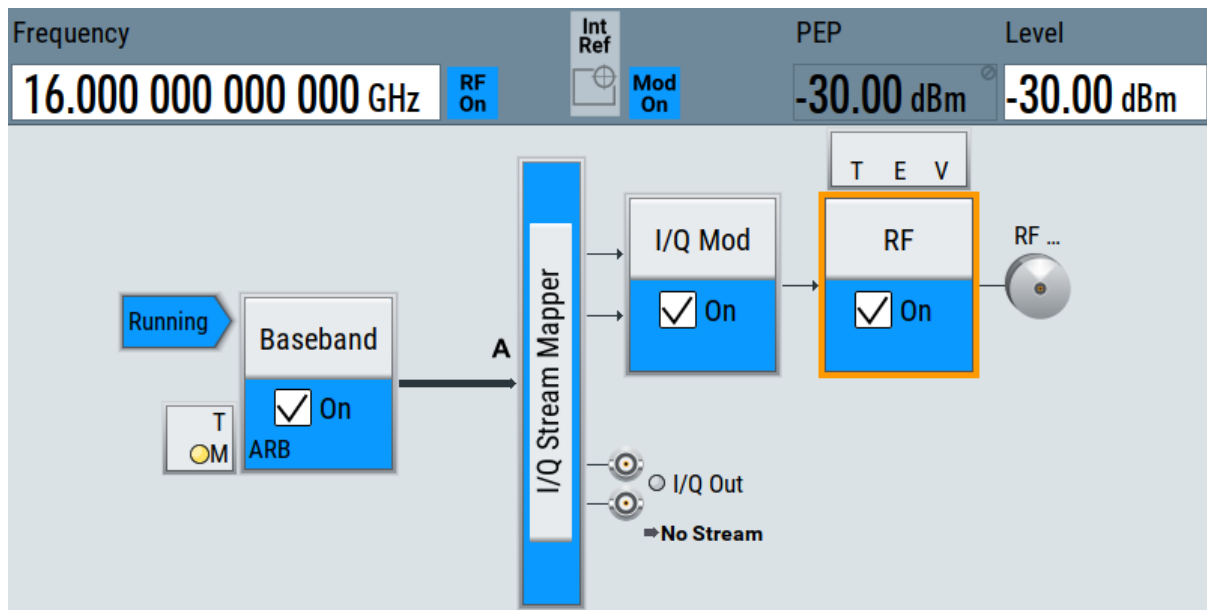
The R&S SFI100A outputs this IF signal at the "RF Out" connector on the front panel.

6.3 Generating a wideband RF signal

When operating the R&S SFI100A with a connected external frontend, you can generate upconverted wideband RF signals. For example, with a connected R&S FE170ST, R&S SFI100A generates RF signals in the D band.

This section provides step-by-step descriptions for connecting, controlling and generating RF signals with external frontends. Connecting instructions use the R&S FE170ST as an example. Connecting other external frontend is analogous. The instructions cover the following topics:

To connect an external frontend

This step-by-step instruction describes how to connect the R&S SFI100A to an R&S FE170ST. The instruments are switched on and connected to power.

1. **NOTICE!** Cable selection. Use all cables delivered with the external frontend. Other connections can require additional cables.

   For the IF connection, use the IF cable (order number 1348.3850.00). For the reference signal connection, use the reference cable (order number 1347.7569) delivered with the external frontend. For the LAN connection, use a high-quality cable.
   See also Chapter 4.5, "Considerations for test setup", on page 16.

2. Connect the "RF Out" connector of the R&S SFI100A with the "IF In" connector of the R&S FE170ST.
   See also "To connect to screwable connectors" on page 23.

3. Connect the "LAN" connector with the "LAN" connector of the R&S FE170ST.
   See also Chapter 4.7, "Connecting to LAN", on page 17.

4. Check if the host name (1), IP address (2), subnet mask (3) and gateway address (4) of the R&S FE170ST are correct.
   Once connected to LAN, the electronic label on the right side panel of the R&S FE170ST displays these network parameters:

   For more information, see section "Electronic label" in the manual of the external frontend.

5. Connect the "Ref Out 2" connector of the R&S SFI100A with the "Ref In" connector of the R&S FE170ST.
   See also "To connect to screwable connectors" on page 23.

   Table 6-1 and Figure 6-1 provide an overview on connections and a test setup.

Table 6-1: R&S SFI100A and R&S FE170ST connections

Signal	R&S SFI100A	R&S FE170ST
Reference	Connector: "Ref Out 2" Frequency: 1 GHz, 8 GHz	"Ref In"
LAN (Control)	"LAN"	"LAN"
IF In	"RF Out"	"IF In"
RF Out	-	"RF Out"
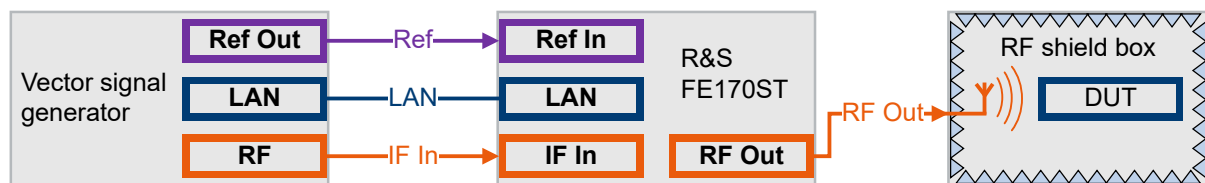
Figure 6-1: Test setup: R&S SFI100A, R&S FE170ST and RF shield box

To configure the R&S SFI100A for frontend control

The following procedure describes how to configure the R&S SFI100A to establish a control connection between R&S SFI100A and an external frontend. The R&S SFI100A is connected to the external frontend.

See "To connect an external frontend" on page 39.

1. In the taskbar, select "System Config" > "System Configuration" > "External RF".

2. Select "RF Out" > "External Instrument" > "Config".
   The "Remote Instrument" dialog opens.

3. Select the connected external frontend from "External Instrument" selection. The selection displays available instruments in format `<product>-<serial_number>`, for example "FE170ST-123456".

4. In the field "Hostname or IP Address", check if the host name or IP address of the connected external frontend is correct.
   If read out correctly, the host name or IP address match with the information displayed on the electronic label of the external frontend.
   See step 4) in the section "To connect an external frontend" on page 39.

5. Select "Apply and Connect".
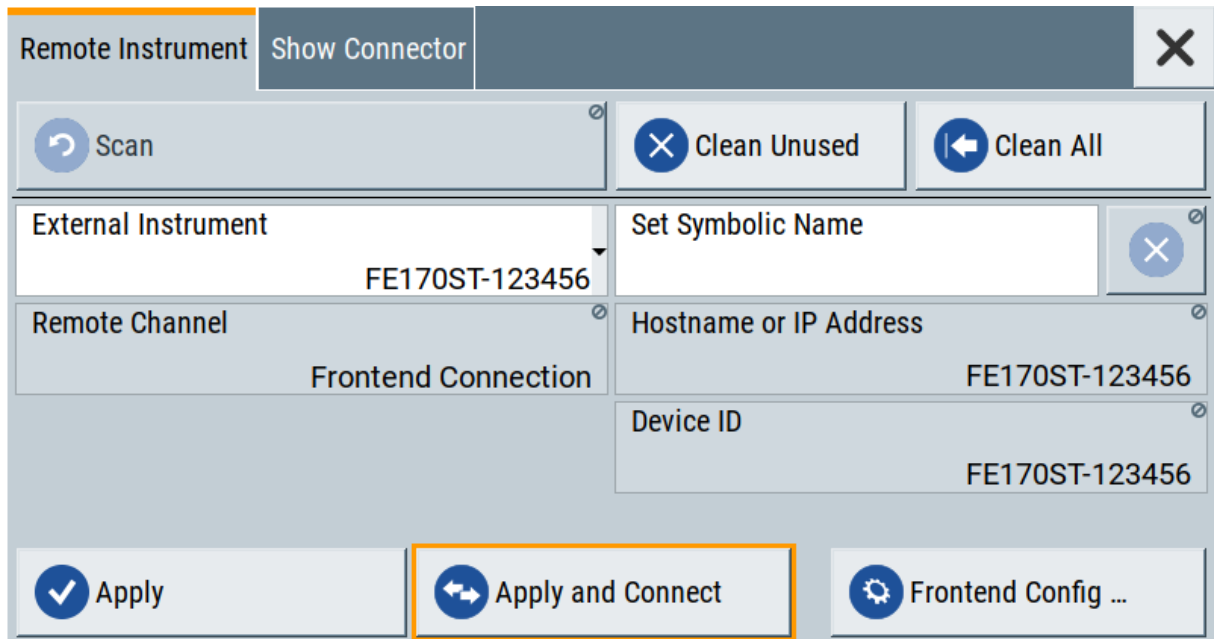
A message displays if the remote connection to the external frontend is established or not.
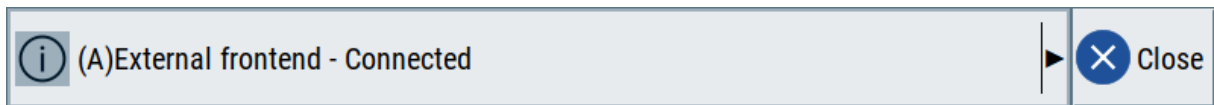
Figure 6-2: Message displaying an established remote connection

If connected successfully, you can configure dedicated frontend settings in the "Frontend Configuration" dialog.
See section "To configure external frontend settings" in the R&S SFI100A user manual.

6. Select "System Config" > "System Configuration" > "External RF".
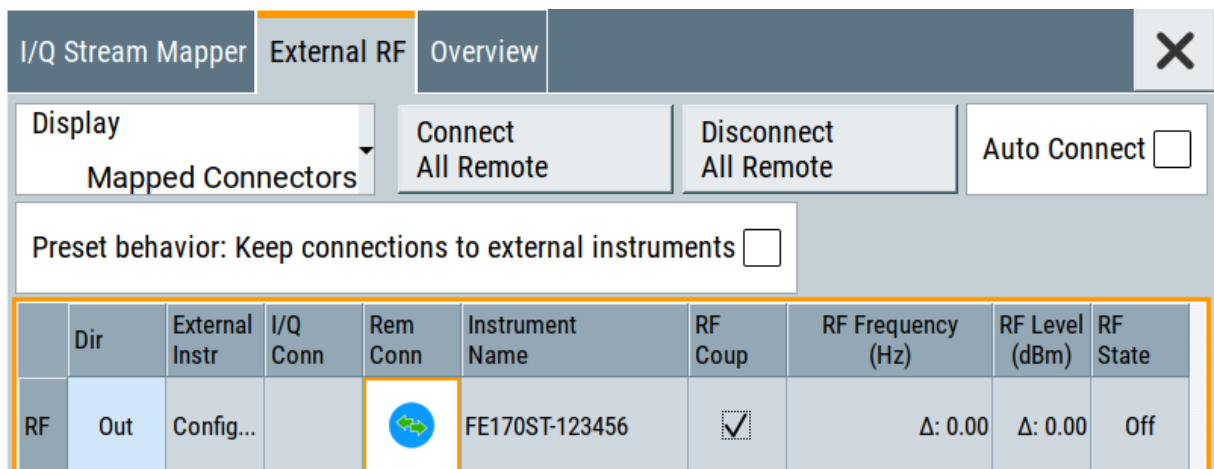
The dialog displays the settings and state of the connected external instrument. The "RF" > "Rem Conn" field displays an active control connection:

The control connection is established, the LAN LED on the external frontend switches from green to orange.

If you change the network configuration, e.g. the IP address, the connection to the R&S SFI100A is aborted. Re-establish a connection to the frontend as in step 3).

To output a generated wideband RF signal

The procedure assumes that a remote control connection between R&S SFI100A and R&S FE170ST is established, the frontend settings are configured and a test signal is loaded.

See also Chapter 6.2, "Generating a modulated RF signal", on page 36.

1. Return to the block diagram.

2. Configure the RF output signal.
   Once you connect the external frontend, the R&S SFI100A sets the "Frequency" in the status bar automatically. In particular, the R&S SFI100A and the R&S FE170ST set the lower frequency of the frequency band that is 110 GHz.

   a) In the status bar of the R&S SFI100A, set the frequency of the RF signal, for example to 140 GHz.
   b) In the status bar of the R&S SFI100A, set the level of the RF signal, for example to -25 dBm.

3. In the block diagram, select "RF" > "On".
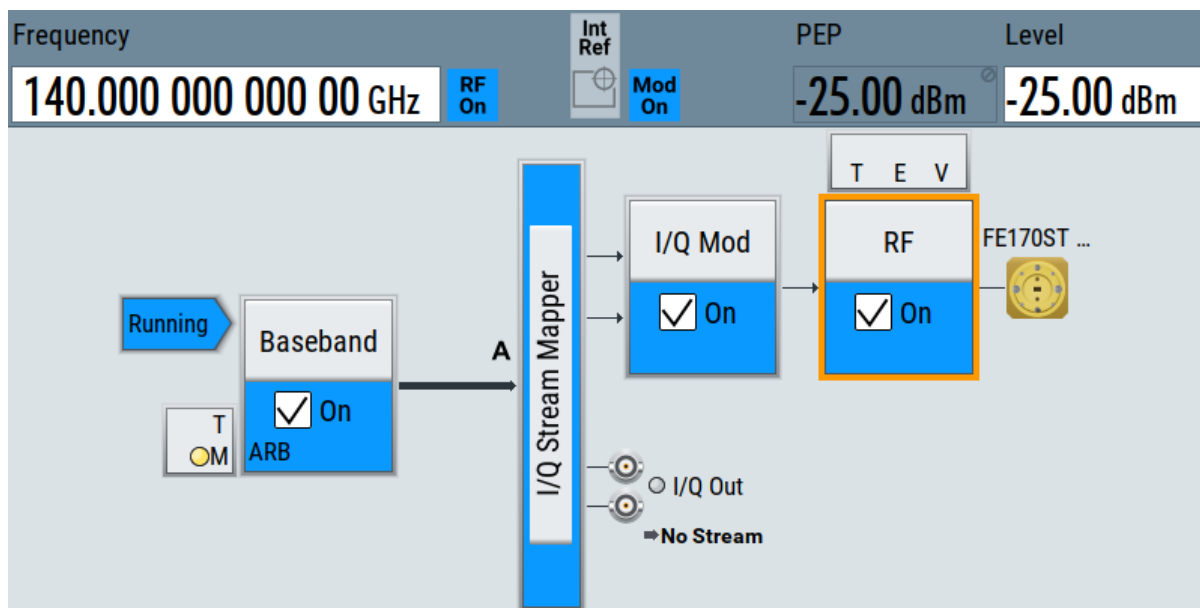
The RF signal is output at the external frontend.

7   Operating the instrument

This chapter provides an overview on basic operating tasks. There are three ways to operate the R&S SFI100A.

Manual operation

Use the touchscreen, keys and rotary knobs, or an optional mouse and/or keyboard. The principles of manual operation are explained in this section.

Remote control

Create programs to automatize repeating settings, tests, and measurements. The instrument is connected to a computer that runs the program.

This way of operation is described in the user manual, chapter "Network operation and remote control".

Remote operation

For remote monitoring and operation of the instrument, a VNC server is installed on the R&S SFI100A. You need a LAN connection to the computer, and a VNC client or browser to connect to the instrument.

This way of operation is described in the user manual, chapter "Network operation and remote control".

The following sections show how to operate the instrument manually.

7.1   Means of manual interaction

For the manual interaction with the R&S SFI100A, you have several methods that you can use as an alternative to perform a task:
● Touchscreen:

Touchscreen operation is the most direct way to interact. Almost all control elements and actions on the screen are based on the standard operating system concept. You can tap any user interface element to set parameters in dialog boxes, enter data, scroll within a dialog etc., as if you work with a mouse pointer.

Tapping the screen works like clicking mouse buttons:

– Touch quickly = click: Selects a parameter or provokes an action.
– Touch and hold = right-click: Opens a context-sensitive menu.
– Touch and swipe = drag: Scrolls through the contents of a display element larger than the screen, e.g. a list or a table.

● Function keys and rotary knob:
The front panel provides nearly all functions and controls to operate the instrument in the classic way, without touchscreen.

● Optional mouse and/or keyboard:
These devices work like known from PCs. The navigation keys on the front panel correspond to the keys on the keyboard.

This manual describes the manual interaction with the instrument via the touchscreen. It mentions the alternative methods using the keys on the instrument or the on-screen keypads if it deviates from the standard operating procedures. The usage of the touchscreen and navigation keys is described in

Throughout the manual, the term "select" refers to any of the following methods:

● Using a finger on the touchscreen
● Using a mouse pointer in the display
● Using a key on the instrument or on a keyboard

7.2 Understanding the display information

The block diagram of the R&S SFI100A displays all main settings and generator states, divided into main operation areas.
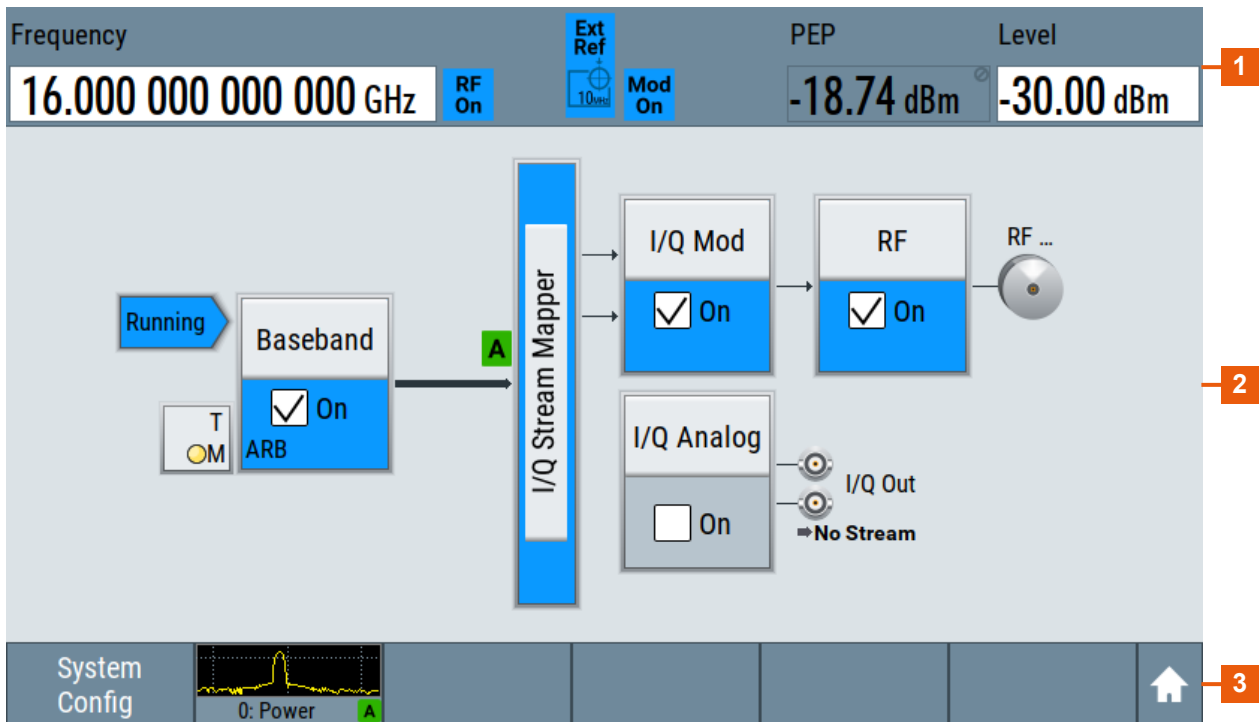
Figure 7-1: Block diagram

1 = Status bar
2 = Block diagram
3 = Taskbar

7.2.1   Status bar

The status bar at the top of the screen indicates the RF frequency and the level of the output signal provided to the DUT. You can set both parameters directly here.
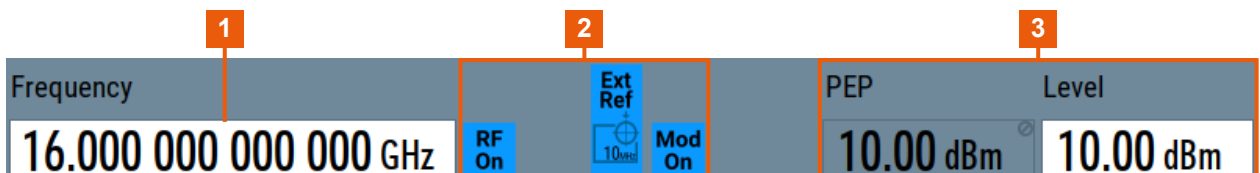

1 = Frequency display
2 = Status buttons
3 = Level display

The status buttons indicate key parameters that are set for the output signal. Most of the status buttons are virtual keys that you can use to open a corresponding menu or dialog.

7.2.2   Block diagram

The block diagram shows the current configuration and the signal flow in the generator with the aid of function blocks, connected by signal lines. The following figure displays the most common elements that can appear in the block diagram. However, it does not necessarily represent a useful configuration.
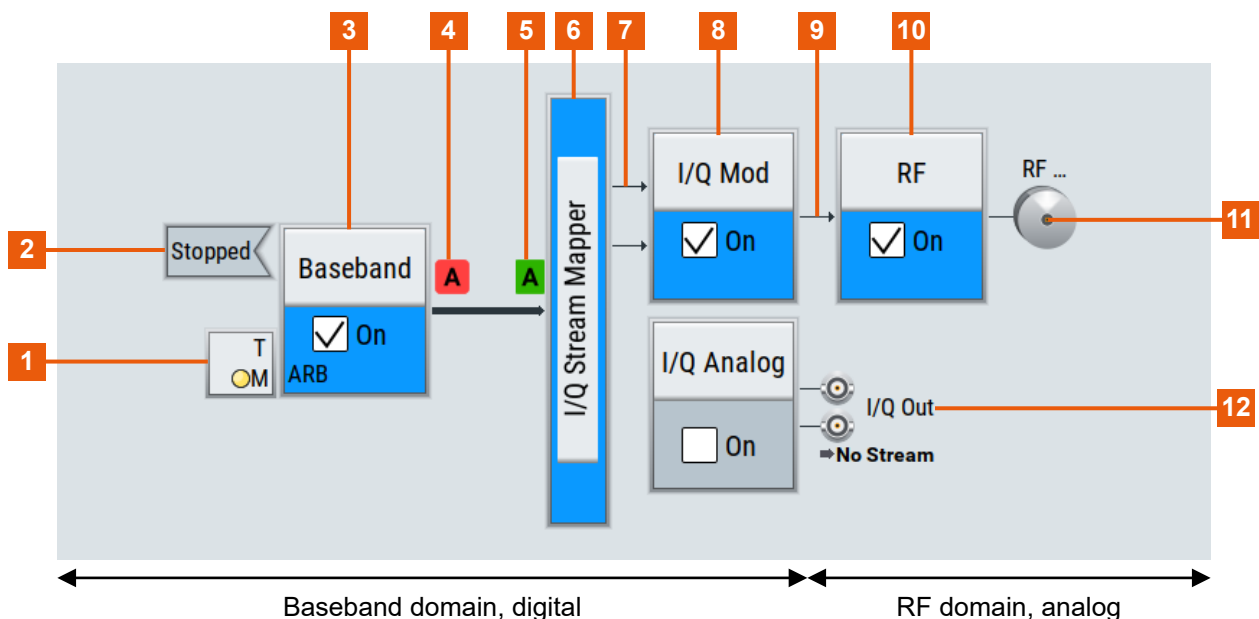

```
1          = Control signal block
2          = Status indicator
3, 6, 8, 10 = Functional block
4, 5        = Graphics indicator
7, 9        = Signal line
11, 12      = Connector icons (RF, I/Q analog)
```

Starting from the left up to the "I/Q Mod" functional block, you can see the functional blocks provided in the baseband domain. After the I/Q modulation on the analog RF carrier, the analog section implies the routing to the "RF" functional block.

Legend	Item	Description
1	Control signal block	Indicates information on the control signals like signal content, input or output and provides quick access to the corresponding configuration dialog. A dedicated control block is displayed to the left of the baseband block.
2	Status indicator	Indicates whether the signal is running or waiting for a trigger.
3, 6, 8, 10	Functional block	Represents a basic task in signal generation. The push button provides access to any number of associated actions to accomplish the task. A checkbox and the block label quickly enable the basic task.
4, 5	Graphics indicator	Denotes that the signal is displayed graphically: • Baseband signal after the baseband block (4) • Stream signal before mapping (5)
7, 9	Signal line	Shows the currently configured signal flow.
11, 12	Connector icon	Represents the interfaces for signal output. • RF signal connector output (11) • I/Q analog signal connector output (12)

7.2.3 Taskbar

The "Taskbar" contains labeled softkeys and minimized views (thumbnails) of active graphics and dialogs.

Initially, it shows the permanently assigned softkeys. The softkey with the sine wave denotes that no signal is enabled for graphical representation.
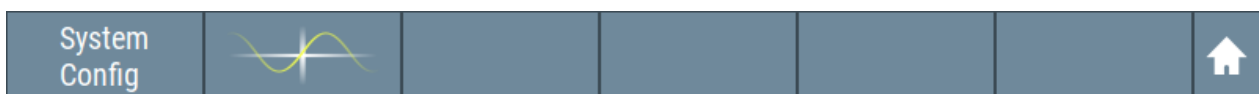
Figure 7-2: Taskbar in default state

Whenever you open a settings or graphics dialog, it is automatically assigned to the "Taskbar". The softkeys shown in the following figure represent the variants.

Figure 7-3: Taskbar fully assigned

1 = System configuration and setup
2 = Remote control connections
3 = Graphics
4 = Dialogs
5 = Show block diagram / more

1	System Config	Provides access to general system configurations like setup, display, or remote.
2	Remote control connections	Shows the established remote connections when the instrument is remotely controlled. **Tip:** An indicator in the status bar shows the current remote control status.
3	Graphics	Shows that a signal is represented graphically.
4	Dialogs	Shows a dialog as a thumbnail, the dialog name, and the name of the signal channel.
5	Show block diagram / more	The show block diagram icon as in Figure 7-2 minimizes all dialogs indicated on the screen. The block diagram is in the foreground. The "More" softkey indicates that more dialogs are open than can be displayed in the taskbar. Use this softkey to open a selection list with the remaining active dialogs, and the "Diagram" function.

7.2.4   Additional display characteristics

The following section provides a short insight on the indication of the screen in general, and significant elements that you see under specific modes, in dialogs or settings.

- **Appearance of active elements**
    - *Active* elements like On/Off switches, state buttons have a **blue** background.
    - *Selected* elements are framed or highlighted **orange**.
    - *Inactive* elements are **gray**.
- **On-screen keypads**
  As an additional means of interacting with the instrument either a numerical or alphanumerical on-screen keypad appears when you enable an entry field, see Chapter 7.4, "Entering data", on page 52.
- **Info line**

The "Info line" shows brief status information and error messages. It appears when an event generates a message. If selected, the R&S SFI100A shows information on static errors and the error history.
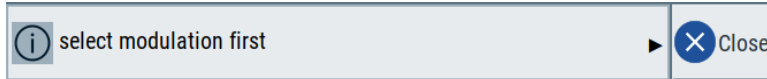
- **Key parameters indicated in tab labels**
  Most dialogs are divided into tabs with logically grouped parameters. The tab label expresses the content and can also contain status indicators or the set value of a key parameter.
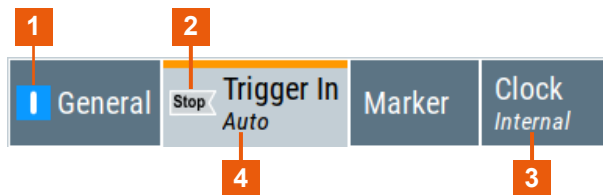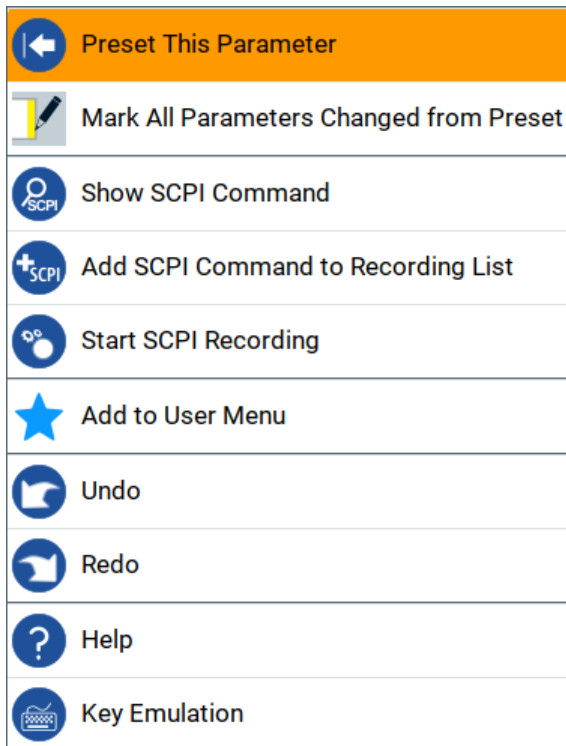

1, 2 = Status indicators
3, 4 = Key parameter values

- **Scrollbar handle**
  An arrow icon that appears when you touch a scrollbar helps you to scroll in a dialog or list.

- **Progress indicators**
  A busy icon indicates a currently running process. If a process takes some time, a progress bar shows the current state.

- **Context-sensitive menus**
  Within the entire screen display, including single parameters, you can access context-sensitive menus that provide some additional functions.

(←)	Preset This Parameter
✏	Mark All Parameters Changed from Preset
🔍SCPI	Show SCPI Command
+SCPI	Add SCPI Command to Recording List
⚙	Start SCPI Recording
★	Add to User Menu
↶	Undo
↷	Redo
?	Help
⌨	Key Emulation

7.3   Accessing the functionality

All functionalities are provided in dialog boxes as known from computer programs. You can control the instrument intuitively with the touchscreen. This section provides an overview of the accessing methods.

The instrument's functions and settings can be accessed by selecting one of the following elements:

- System and function keys on the front panel of the instrument
- Taskbar/softkeys on the touchscreen
- Context-sensitive menus for specific elements on the touchscreen, or with the rotary knob (press and hold).
- Elements on the status bar in the touchscreen
- Displayed setting on the touchscreen that means block diagram and all settings available in dialogs.

To open a dialog box

► Perform one of the following actions:

- Select the required block, and then the menu entry.
- Select the minimized view (thumbnail) on the taskbar.

Some of the utility keys access a dedicated dialog, too.

To minimize a dialog box

► To return to the block diagram, select the "Home" button.

To close a dialog box

To close a dialog box, you have the same controls as you know from computers or devices with touchscreen.

► Perform one of the following actions:
  - Select the "Close" icon in the upper right corner.
  - Select the [Esc] key on the front panel.
  - Drag and drop a minimized dialog from the taskbar to the block diagram.

To select an option in a dialog box

► Select the required option.

To select an option in a list

If you can select many options, these options are provided in a list. The current selection is shown on the list button.

1. Select in the list.

2. To navigate through the list, try out the following:
   - Using a mouse, scroll in the list to select the required option.
   - Use the rotary knob.

7.4   Entering data

Some parameters have their own key on the front panel. For data input in dialog boxes, the instrument provides on-screen keypads for entering numeric and alphanumeric values. You can always set the parameters via the touchscreen, the front panel or an external keyboard.

To enter numeric values with the on-screen keypad

For numeric settings, the instrument displays the numeric keypad. The units specified correspond to the units of the parameter.

1. Enter the numeric value.

   Tip: For a quick entry, you can enter a value in an exponential representation, for example *1e7* for *10000000*.

2. Tap the unit button to complete the entry.

   The unit is added to the entry.

   Tip: For a quick unit change, you can enter shortcuts, for example for a frequency value *1e8h* for *100 MHz*.
   For an overview of shortcuts supported by the R&S SFI100A, see chapter "Unit Shortcuts" in the appendix of the user manual.

3. If the parameter does not require a unit, confirm the entered value by pressing "Enter".

If you edit numeric data in tables, enable edit mode first. Press the rotary knob to enable the edit mode.

To enter alphanumeric values

If a field requires alphanumeric input, you can use the on-screen keyboard to enter letters and characters including special characters.

To complete an entry

► On the on-screen keyboard, press "Enter" ↵.

To correct an entry

1. Using the arrow keys, move the cursor to the right of the entry you want to delete.

2. On the on-screen keyboard, press "Clear".

3. Enter your correction.

To abort an entry

► Press the [Esc] key.
   The dialog box closes without changing the settings.

7.5   Undo and redo actions

Accessed via the context-sensitive menus, "Undo" allows you to restore one or more actions on the instrument. Depending on the available memory, the "Undo" steps can restore all actions.
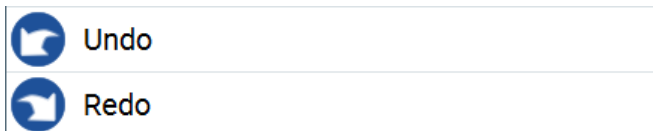
🔵	Undo
🔵	Redo

"Redo" restores a previously undone action.

7.6   Getting information and help

In some dialog boxes, graphics are included to explain the way a setting works.

For further information, you can use the following sources:

- Tooltips give the value range of the parameter.
- The context help provides a functional description on a setting.
- The general help explains a dialog box, provides instructions, and general information.

To display context help

► To access a help topic, perform one of the following:

   a) Tap and hold the parameter for which you need information and tap "Help" in the context menu.

   b) Tap the parameter and press the [Help] key.

   The "Help" dialog opens. You can browse the help for further information.
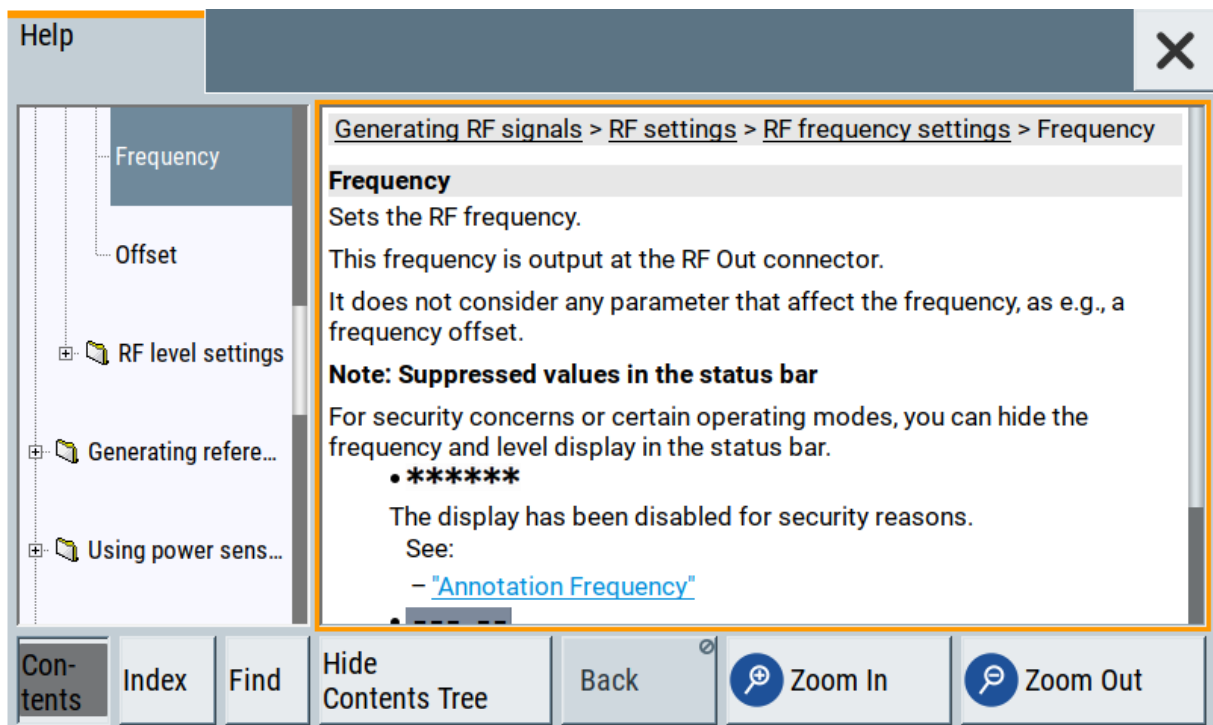
Contents of the help dialog box

The help dialog box covers two main areas:

- "Contents" - contains a table of help contents
- "Topic" - contains a specific help topic

The help system also provides an "Index" and a "Find" area, and "Zoom" functions that are accessed via the corresponding buttons.

To open general help

► Press the yellow [Help] key on the front panel.

If a dialog box is opened, the help topic for the current tab is shown. Otherwise the "Contents" page appears.

Navigating in the table of contents and in the help topics

1. To move through the displayed contents entries, tap on an entry and scroll or use a connected mouse.
   Entries with a plus sign contain further entries.

2. To display a help topic, tap on the topic name or double-click the topic name.

3. To follow a cross-reference, tap on the link text.

4. To return to the previous page, select "Back".
    This function scrolls back all steps that you have performed before.

5. Use the "scroll bars" to shift the visible section of content shown.

6. To maximize the "Topics" area, tap the "Hide Contents Tree" button to hide the contents tree.

Using the index

1. Select the "Index" button.

2. Enter the first characters of the topic that you are interested in.
    The entries starting with these characters are displayed.

3. Tap on the index entry.

    The corresponding help topic is displayed.

8   Contacting customer support

Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz product, contact our customer support center. A team of highly qualified engineers provides support and works with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz products.

Contact information

Contact our customer support center at www.rohde-schwarz.com/support, or follow this QR code:

Figure 8-1: QR code to the Rohde & Schwarz support page

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