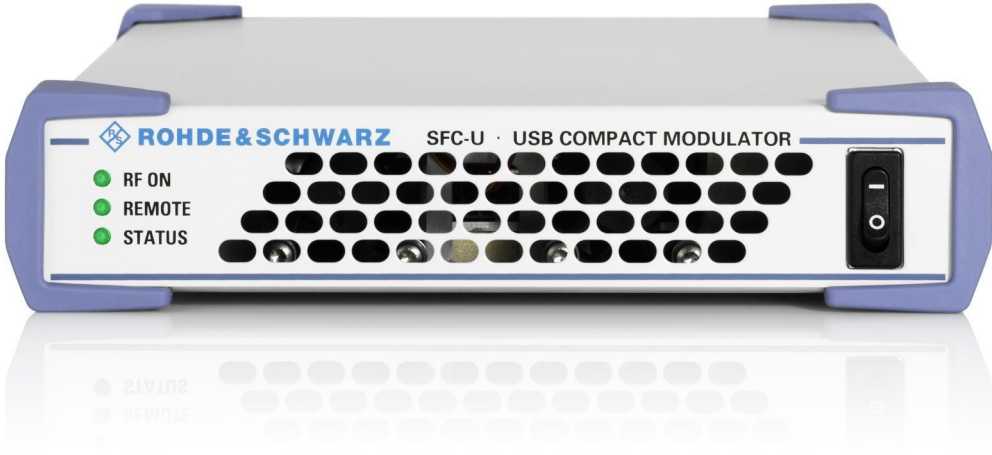


R&S[®]SFC-U

Compact USB Modulator

Getting Started



2115.3704.02 – 03

The software contained in this product makes use of several valuable open source software packages. For information, see the "Open Source Acknowledgement" document, which is available for download from the R&S SFC-U product page at www.rohde-schwarz.com/product/sfc-u.html > "Downloads" > "Firmware".

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

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

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

Contents

1	Preface	5
1.1	For Your Safety.....	5
1.2	Documentation Overview.....	5
1.3	Conventions Used in the Documentation.....	6
2	Setting Up the R&S SFC-U	7
2.1	Unpacking the R&S SFC-U.....	7
2.1.1	Inspecting for Shipping Damage.....	7
2.1.2	Unpacking the Cardboard Box.....	7
2.1.3	Checking the Accessories.....	8
2.1.4	Warranty Conditions.....	8
2.2	Putting up the R&S SFC-U.....	8
2.2.1	Placing the R&S SFC-U on a Bench Top.....	8
3	Installing the R&S SFC-U Software on a Computer	9
4	Interfaces and Connectors	10
4.1	Front Panel.....	10
4.1.1	Status Display LEDs.....	10
4.1.2	On/Off Key.....	11
4.2	Rear Panel.....	11
4.2.1	POWER Connector.....	11
4.2.2	USB Interface.....	12
4.2.3	DIG I/Q.....	13
4.2.4	TS IN.....	14
4.2.5	1PPS.....	15
4.2.6	REF IN.....	15
4.2.7	RF.....	15
5	Connecting the R&S SFC-U	16
5.1	Preventing Electromagnetic Interference.....	16
5.2	Connecting to the AC Power Supply.....	16
5.3	Connecting to the Computer.....	17
6	Switching On or Off the R&S SFC-U	18

6.1	Switching On the R&S SFC-U.....	18
6.2	Switching Off the R&S SFC-U.....	19
6.3	Checking the Provided Options.....	19
6.4	Turn-On Tests.....	20
7	Sample Application.....	21
8	Maintenance.....	27
8.1	Cleaning the Instrument.....	27
8.2	Storing the Instrument.....	28
	Index.....	29

1 Preface

This chapter provides safety related information, an overview of the user documentation and the conventions used in the documentation.

1.1 For Your Safety

The product documentation helps you to use the R&S SFC-U safely and efficiently. Keep the product documentation in a safe place and pass it on to the subsequent users. Use the R&S SFC-U only in its designated purpose as described in the product documentation. Observe the performance limits and operating conditions stated in the specifications (data sheet).

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

- In the "Basic Safety Instructions", safety issues are grouped according to subjects. For example one subject is electrical safety. The "Basic Safety Instructions" are delivered with the R&S SFC-U in different media and languages: on the CD-ROM, in the printed safety brochure and in the printed getting started manual.
- Throughout the documentation, safety instructions are provided when you need to take care during setup or operation.

Always read the safety instructions carefully. Make sure to fully comply with them. Do not take risks and do not underestimate the potential danger of small details such as a damaged power cable.

1.2 Documentation Overview

Getting started

This manual is delivered with the instrument in printed form. It is an excerpt from the user manual (see below) and provides the information needed to set up the R&S SFC-U and start working with it. Also a sample application is described. For instructions on installation, refer to the release notes. The printed getting started manual also includes general information, e.g. the basic safety instructions. In PDF format, it is included in the user manual to allow quick access to the information needed.

User manual

This manual is delivered with the instrument on CD-ROM. It provides the necessary information to work with the instrument. For additional information on default settings and parameters, refer to the data sheet.

Help

The help is context-sensitive and provides a quick access to the complete description. To avoid crowding the screen, the screenshots are omitted.

For detailed information on how to use the help, refer to the chapter "Operating Concepts".

1.3 Conventions Used in the Documentation

The following conventions are used throughout this documentation.

Typographical conventions

Convention	Description
"Graphical user interface elements"	All names of graphical user interface elements on the screen, such as dialogs, menus, options, buttons, and softkeys are enclosed by parentheses.
KEYS	Key names are written in capital letters.
File names, commands, program code	File names, commands, coding samples and screen output are distinguished by their font.
<i>Input</i>	Input to be entered by the user is displayed in italics.
Links	Links are displayed in blue font.
"References"	References to other parts of the documentation are enclosed by parentheses.

Conventions for procedure descriptions

When describing how to operate the R&S SFC-U, several alternative methods may be available to perform the same task. If possible, the procedure using the front panel is described.

The terms "select" and "press" may refer to any of the described methods, i.e. using a key on the R&S SFC-U or on a keyboard, or a mouse pointer in the display.

2 Setting Up the R&S SFC-U

WARNING

Risk of injuries

To avoid injuries to yourself or others, always follow the instructions provided in the following chapters. Furthermore, observe the general safety instructions at the beginning of this manual.

2.1 Unpacking the R&S SFC-U

The R&S SFC-U is shipped together with its mandatory accessories in a cardboard box.

2.1.1 Inspecting for Shipping Damage

Check the following. If anything is damaged, immediately notify the carrier.

1. Check the shipping container and cushioning material for damage.
2. Unpack the cardboard box (see [Chapter 2.1, "Unpacking the R&S SFC-U"](#), on page 7) and check the housing and handle for visible damages or loose parts.

2.1.2 Unpacking the Cardboard Box

Proceed as follows:

1. Open the cardboard box.
2. Remove the accessories packed into the box.
3. Take the R&S SFC-U out of the packaging.



Retain the original packing material. If the R&S SFC-U needs to be transported or shipped at a later date, you can use the material to prevent control elements and connectors from being damaged. Rohde & Schwarz will only accept claims of warranty if the R&S SFC-U is shipped with sufficient packaging.

2.1.3 Checking the Accessories

The R&S SFC-U comes with the following accessories:

- External power supply and power cable
- Getting started manual
- CD-ROM containing the complete user documentation and software

2.1.4 Warranty Conditions

For information on warranty conditions for the R&S SFC-U refer to the terms of the delivery documents.

2.2 Putting Up the R&S SFC-U

The R&S SFC-U is designed for interior use only. The R&S SFC-U is used as USB device.

NOTICE

Risk of material damage

Make sure that the following conditions are met at the operation site:

- The ambient temperature does not exceed the range specified in the data sheet.
- All fan openings are unobstructed and the airflow perforations are unimpeded. The minimum distance from the wall is at least 10 cm.

Failure to meet these conditions may cause damage to the R&S SFC-U or other devices in the test setup.

If necessary, use proper protective equipment to protect DUTs against electrostatic discharge in the event of human contact.

2.2.1 Placing the R&S SFC-U on a Bench Top

The R&S SFC-U is designed for use under general laboratory conditions.

⚠ WARNING

Risk of injuries

If the R&S SFC-U is not set up securely, you or others can be injured.

Place the R&S SFC-U on a stable and level surface. Do not place anything on top of the R&S SFC-U, if the R&S SFC-U is not in a level position.

3 Installing the R&S SFC–U Software on a Computer

For details refer to the release notes.

4 Interfaces and Connectors

This chapter describes the front panel and the rear panel of the R&S SFC-U, including all status displays and connectors. See the data sheet for information about permissible levels on the inputs and output levels on the outputs.

If you use the interfaces and connectors, take care to avoid electromagnetic interference. For details see [Chapter 5.1, "Preventing Electromagnetic Interference"](#), on page 16.

4.1 Front Panel

This chapter provides an overview of the controls and connectors on the front panel. Each control or connector is briefly described along with a reference to the chapter(s) containing detailed information about its usage.



Figure 4-1: Front panel view

1 = Status display LEDs
2 = On/Off key

4.1.1 Status Display LEDs

See (1) in [Figure 4-1](#).

The basic state is indicated by LEDs.

RF ON

Displays the status of the RF output.

- LED off: RF output is switched off.
- LED green: RF output is switched on.

REMOTE

Displays the remote control status.

- LED green: R&S SFC-U is connected to the USB host.
- LED yellow: R&S SFC-U is not connected to the USB host.

STATUS

Displays the error status.

- LED green: neither warning nor error is present.
- LED yellow: a warning is present, but no error.
- LED red: an error is present.

4.1.2 On/Off Key

See (2) in [Figure 4-1](#).

The on/off key switches the R&S SFC-U on or off if power is supplied at the power connector on the back.

Switch positions:

- I: The R&S SFC-U is in operation.
- O: The positive pole is disconnected from the power supply.

For further information:

- See [Chapter 4.2.1, "POWER Connector"](#), on page 11.
- See [Chapter 6, "Switching On or Off the R&S SFC-U"](#), on page 18.

4.2 Rear Panel

This chapter provides an overview of the controls and connectors on the rear panel. Each control or connector is briefly described along with a reference to the chapter(s) containing detailed information about its usage.



4.2.1 POWER Connector

The DC power supply connector is used to supply the R&S SFC-U with power (12 V DC).



The inner pin is the positive pole. The outer pin is the negative pole.

⚠ WARNING

Shock hazard

When external power supplies are used to supply the R&S SFC-U with DC safety extra low voltage (SELV), the requirements for strengthened/double insulation in line with DIN/EN/IEC 61010 (UL 3111, CSA C22.2 No. 1010.1) or DIN/EN/IEC 60950 (UL 1950, CSA C22.2 No. 950) must be met.

For further information see [Chapter 5.2, "Connecting to the AC Power Supply"](#), on page 16.

4.2.2 USB Interface

One USB 2.0 (universal serial bus) interface of the type B (receptacle) is provided to connect the R&S SFC-U to the computer on which the R&S SFC-U software is installed.



Electromagnetic interference (EMI) can affect the measurement results. To avoid any impact, make sure that the following conditions are met:

- Use suitable double-shielded cables.
- Do not use USB connecting cables exceeding 5 m in length.

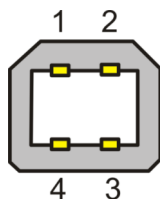


Table 4-1: Pin assignment

Pin	Abbreviation	Signal
1	VBUS	+5 V input
2	D-	Data -
3	D+	Data +
4	GND	Ground

For further information see [Chapter 5.3, "Connecting to the Computer"](#), on page 17.

4.2.3 DIG I/Q

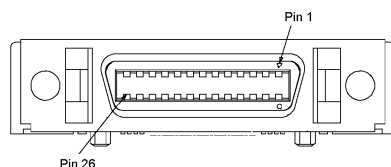
Requires the extended I/Q input option (R&S SFC-U-K80). Used to receive digital I/Q signals from another R&S instrument with the same interface.

For further details see the user manual or the help system.



4.2.3.1 DIG I/Q IN

Digital I/Q input of the R&S SFC-U.

**Table 4-2: Input pin assignment**

Pin	Name	Signal
1	DIG_IQ_CLK2+	Data clock 2 (control signal)
2	GND	Ground (control signal)
3	DIG_IQ_IN_D0+	Data bit (LSB), OUT/IN 0 line (I/Q signal)
4	DIG_IQ_IN_D1+	Data bit, OUT/IN 1 line (I/Q signal)
5	DIG_IQ_IN_D2+	Data bit, OUT/IN 2 line (I/Q signal)
6	DIG_IQ_IN_CLK1+	Data clock 1 (I/Q signal)
7	DIG_IQ_IN_SCLK	Serial clock (control signal)
8	+U5V2	+5 V (control signal)
9	DIG_IQ_IN_D3+	Data bit, OUT/IN 3 line (I/Q signal)

Pin	Name	Signal
10	DIG_IQ_IN_D4+	Data bit, OUT/IN 4 line (I/Q signal)
11	DIG_IQ_IN_D5+	Data bit, OUT/IN 5 line (I/Q signal)
12	DIG_IQ_IN_D6+	Data bit, OUT/IN 6 line (I/Q signal)
13	DIG_IQ_IN_D7+	Data bit (MSB), OUT/IN 7 line (I/Q signal)
14	DIG_IQ_CLK2-	Data clock 2 (control signal)
15	DIG_IQ_IN_D0-	Data bit (LSB), OUT/IN 0 line (I/Q signal)
16	DIG_IQ_IN_D1-	Data bit, OUT/IN 1 line (I/Q signal)
17	DIG_IQ_IN_D2-	Data bit, OUT/IN 2 line (I/Q signal)
18	DIG_IQ_IN_CLK1-	Data clock 1 (I/Q signal)
19	GND	Ground (control signal)
20	DIG_IQ_IN_SDAT	Serial data (control signal)
21	DIG_IQ_IN_D3-	Data bit, OUT/IN 3 line (I/Q signal)
22	DIG_IQ_IN_D4-	Data bit, OUT/IN 4 line (I/Q signal)
23	DIG_IQ_IN_D5-	Data bit, OUT/IN 5 line (I/Q signal)
24	DIG_IQ_IN_D6-	Data bit, OUT/IN 6 line (I/Q signal)
25	DIG_IQ_IN_D7-	Data bit (MSB), OUT/IN 7 line (I/Q signal)
26	GND	Ground (control signal)

Line pairs have a name that only differs in the last character. For example, the pins 1 and 14 are a pair.

4.2.4 TS IN

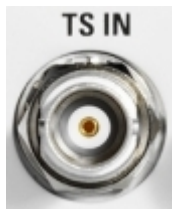
BNC connector. Used to feed in a serial MPEG2 transport stream.

These inputs handle a serial signal with one of three formats:

- ASI (asynchronous serial interface)
- SMPTE 310 (Society of Motion Picture and Television Engineers)
- ETI (TS2 IN only)

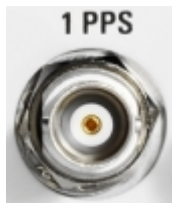
To select the input, select "DIGITAL TV" menu, "INPUT SIGNAL", "INPUT". For further details see the user manual or the help system.

For the T-DMB / DAB transmission standard, TS IN is used as an external ETI input (ensemble transport interface). TS IN is conform to the ETS 300 799 specification. ETI NI (network independent) and ETI NA 5592 or ETI NA 5376 (network adaptation) signals are accepted.



4.2.5 1PPS

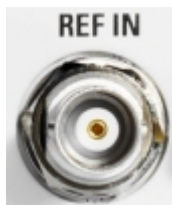
BNC connector. Input for the 1 pulse per second signal used in SFN modes.



4.2.6 REF IN

BNC connector. Used to input the reference frequency.

For further details see user manual or the help system.



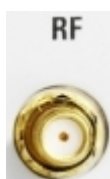
4.2.7 RF

SMA connector. Used to output the RF signal.

NOTICE

Do not overload the RF output

See the data sheet for the limits for the DC voltage and reverse RF power. Do not exceed these limits. Exceeding these limits can cause instrument damage.



5 Connecting the R&S SFC-U

This chapter describes how to connect the R&S SFC-U to the power supply and the computer on which the R&S SFC-U software is installed.

5.1 Preventing Electromagnetic Interference

To prevent electromagnetic interference, the R&S SFC-U must be operated with all shielding covers fitted. Only suitable and shielded signal and control cables may be used.

RF/ASI inputs and outputs

In particular cables that are connected to these inputs/outputs can cause EMC problems. Therefore these cables should have at least 80 dB to 1 GHz shielding. This is usually achieved by means of double-shielded cables.

USB interface

To connect the USB interfaces, only use peripheral equipment that does not cause limit violations. For details see [Chapter 4.2.2, "USB Interface"](#), on page 12.

Digital I/Q input

To connect to DIG I/Q IN, use a double-shielded cable.

All other cables can be single shielded. The AC cable is unshielded.

5.2 Connecting to the AC Power Supply

In the range specified in the data sheet, the external power supply of the R&S SFC-U adapts itself automatically to different AC power voltages. Adjusting to a particular AC supply voltage is therefore not required. Refer to the data sheet for the requirements of voltage and frequency. Operation at DC mains is not allowed.

WARNING

Shock hazard

Observe the basic safety instructions at the beginning of this manual, especially the instructions on electrical safety.

Take care that the AC voltage lies within the limits printed on the AC power connector of the external power supply as listed in the data sheet.

NOTICE**Risk of instrument damage**

If you connect the R&S SFC-U to an AC power supply, always use the power supply delivered with the R&S SFC-U because it supplies the voltage rating the R&S SFC-U is designed for.

The supply of another voltage rating can result in malfunction or damage of the R&S SFC-U.

- ▶ Connect the R&S SFC-U to the AC power supply, using the power plug delivered with the R&S SFC-U. The power connector is located on the rear panel of the R&S SFC-U.
The R&S SFC-U complies with safety class EN61010-1. The R&S SFC-U's power supply must be connected to a socket with protective earth contact.

For further information see [Chapter 4.2.1, "POWER Connector"](#), on page 11.

5.3 Connecting to the Computer

- ▶ Using the USB interface on the rear panel, connect the R&S SFC-U to a computer on which the R&S SFC-U software is installed.



To ensure a transport stream data rate as high as possible, connect the R&S SFC-U to a USB root hub that is exclusively used for this purpose.

For further information:

- See [Chapter 4.2.2, "USB Interface"](#), on page 12
- See [Chapter 3, "Installing the R&S SFC-U Software on a Computer"](#), on page 9

6 Switching On or Off the R&S SFC-U

⚠ WARNING

Shock hazard

Observe the basic safety instructions at the beginning of this manual, especially the instructions on electrical safety.

6.1 Switching On the R&S SFC-U

NOTICE

Risk of instrument damage

Before switching on the R&S SFC-U, make sure that the following conditions are met:

- The R&S SFC-U is set up as described in [Chapter 2, "Setting Up the R&S SFC-U"](#), on page 7.
- Signal levels at the input connectors are all within the specified ranges.
- Signal outputs are correctly connected and are not overloaded. In particular, do not exceed the maximum permissible reverse power allowed at the RF output.

The values are specified in the data sheet. Failure to meet these conditions may cause damage to the R&S SFC-U or other devices in the test setup.

To switch on the R&S SFC-U and start the software

1. Make sure that the R&S SFC-U is connected to a power supply (for details see [Chapter 5.2, "Connecting to the AC Power Supply"](#), on page 16).
2. Make sure that the R&S SFC-U is connected to computer on which the R&S SFC-U software is installed (for details see [Chapter 4.2.2, "USB Interface"](#), on page 12).
3. Press the power switch on the front panel into I position (for details see [Chapter 4.1.2, "On/Off Key"](#), on page 11).

After 3 cycles of running light, the REMOTE LED should be green.

4. Start the software on the controlling computer.

When the STATUS LED changes from blue to another color, the R&S SFC-U is ready for operation (for details see [Chapter 4.1.1, "Status Display LEDs"](#), on page 10).

The configuration settings that were active before the R&S SFC-U was last switched off are automatically restored. To load another instrument setting, use the "FILE" menu. For details see the user manual or the help system.

Note: If the controlling computer does not recognize the R&S SFC-U, the software does not start.

6.2 Switching Off the R&S SFC-U

To switch off the R&S SFC-U

1. Shut down the R&S SFC-U software on the computer that is connected to the R&S SFC-U.
2. Check the STATUS LED on the front panel of the R&S SFC-U. When it turns blue, you can proceed with the next step.
3. Set the On/Off key on the front panel of the R&S SFC-U to the O position.
None of the LEDs on the front panel should be lit.



If the correct order of steps is unintentionally violated while switching off (by switching off the hardware or disconnecting the USB cable before closing the application), proceed as follows.

- Shut down the application.
- Switch off the R&S SFC-U using the On/Off key on the front panel.

If you want to restart, wait until the Windows® resource manager has reset the improperly terminated USB logic channel (this takes up to 20 seconds). Then proceed with the switching on procedure as described in "[To switch on the R&S SFC-U and start the software](#)" on page 18.

6.3 Checking the Provided Options

The R&S SFC-U may be equipped with options. In order to check whether the installed options correspond to the options indicated on the delivery note, proceed as follows.

1. In the "HARDKEY" menu, select "SETUP".
2. In the tree, select "INFO HARDWARE" to display a list showing the currently installed hardware.
3. Check the availability of the hardware options as indicated in the delivery note.
4. In the tree, select "SOFTWARE OPTIONS" and then "ACTIVE OPTIONS" to display a short tabular overview of the enabled software options.
5. Check the availability of the software options as indicated in the delivery note.

For further details see the user manual or the help system.

For an overview of the all options available for the R&S SFC-U refer to the Rohde & Schwarz Homepage.

6.4 Turn-On Tests

If an error is detected, an error indication is displayed in the error/warnings line along with a brief description of the error.

- ▶ To obtain more information about the error, press the "ERROR/WARNING DETAILS" softkey.

A description of the error(s) or warning(s) is displayed.

For further details see the user manual or the help system.

Besides automatic monitoring of instrument functions, the R&S SFC-U also offers the following way of ensuring proper operation.

System adjustment

Use the SETUP menu to carry out an internal adjustment. This is a way of obtaining the best possible IQ modulator performance and level accuracy, for example.

1. In the "HARDKEY" menu, select "SETUP".
2. In the tree, select "ADJUSTMENT".

For further details see the user manual or the help system.

7 Sample Application

The following example involves the following main steps:

- Feed an MPEG2 transport stream to the R&S SFC-U using the serial interface (TS IN, see [Chapter 4.2.4, "TS IN"](#), on page 14) on the front panel.
- This MPEG2 transport stream undergoes channel encoding and modulation for transmission in compliance with the DVB-C specification. To achieve this, perform the following step-by-step instructions. The involved settings are summed up in [Table 7-1](#).
- The result is output as an RF signal on the RF output.

Table 7-1: Involved settings

Parameter	Value
Center frequency	330 MHz
Level	-20.0 dBm
Transmission standard	DVB-C
Constellation	64 QAM
Symbol rate	6.9 MS/s
Roll off	0.15



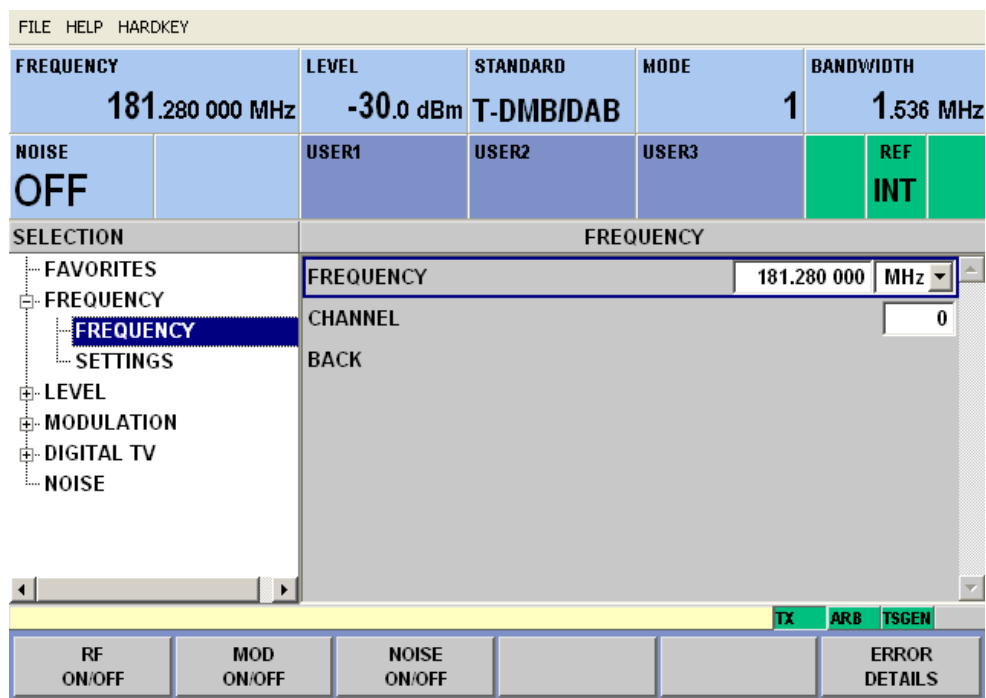
An explanation of the graphical user interface and information on how to select items, open lists and enter parameters are provided in the user manual or the help system.

Selecting the transmitter application (TX)

1. In the "HARDKEY" menu, select "APPL".
2. Select the TX application (DVB-C transmission is a transmitter application).
3. Press the ENTER key.
The TX application is displayed.

Setting the output frequency

1. In the tree, select the "FREQUENCY" menu.
2. Press the ENTER key.
The tree is expanded and the "FREQUENCY" submenu is displayed.



3. In the tree, select the "FREQUENCY" submenu.

4. Press the ENTER key.

The focus is set on the work view.

5. Set a frequency of 330 MHz.

a) Select the "FREQUENCY" field.

b) Enter 330.

c) Press the ENTER key.

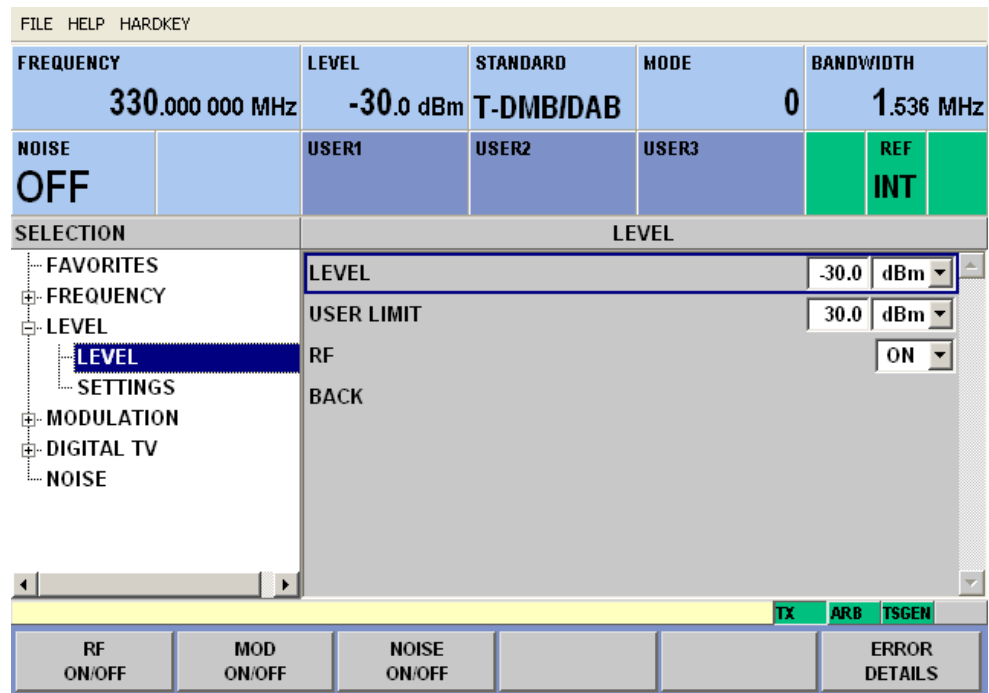
The entered frequency is displayed in the info area.

Setting the output level

1. In the tree, select the "LEVEL" menu.

2. Press the ENTER key.

The tree is expanded and the "LEVEL" submenu is displayed.

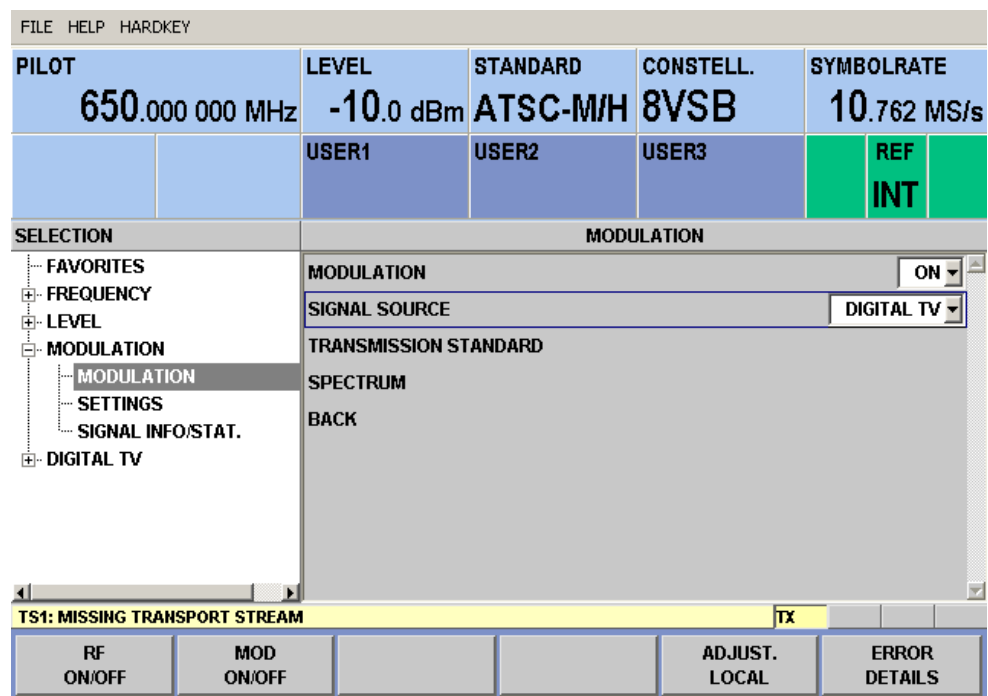


3. In the tree, select the "LEVEL" submenu.
4. Press the ENTER key.
The focus is set on the work view.
5. Set a level of -20 dBm.
 - a) Select the "LEVEL" field.
 - b) Enter -20.
 - c) Press the ENTER key.
 - d) If you want to enter the level in a different unit, change the unit in the "LEVEL" menu, under "SETTINGS" / "LEVEL UNIT" first (see user manual or help system).

The entered level is displayed in the info area.

Setting the modulation parameters and selecting the transmission standard

1. In the tree, select the "MODULATION" menu.
2. Press the ENTER key.
The tree is expanded and the "MODULATION" submenu is displayed.



3. In the tree, select the "MODULATION" submenu.
4. Press the ENTER key.
The focus is set on the work view.
5. Activate the modulation.
 - a) Select the "MODULATION" field.
 - b) Press the ENTER key to display the list.
 - c) Select "ON".
 - d) Press the ENTER key to confirm the selection.
6. Select the "DIGITAL TV" signal source.
 - a) Select the "SIGNAL SOURCE" field.
 - b) Press the ENTER key to display the list.
 - c) Select "DIGITAL TV".
 - d) Press the ENTER key to confirm the selection.
7. Depending on the installed options, select the "DVB-C" transmission standard.
 - a) Select the "TRANSMISSION STANDARD" field.
 - b) Press the ENTER key to display the list.
 - c) Select "DVB-C".
 - d) Press the ENTER key to confirm the selection.

The selected standard is displayed in the info area.

The I/Q modulation is switched on, the internal coder is selected as the signal source, and the DVB-C transmission standard is set.

Selecting the transport stream input and setting the DVB-C transmission parameters

1. In the tree, select the "DIGITAL TV" menu.
2. Press the ENTER key.
The tree is expanded and the "DIGITAL TV" submenu is displayed.
(See [Figure 7-1](#).)
3. In the tree, select the "INPUT SIGNAL" submenu.
4. Press the ENTER key.
The focus is set on the work view.

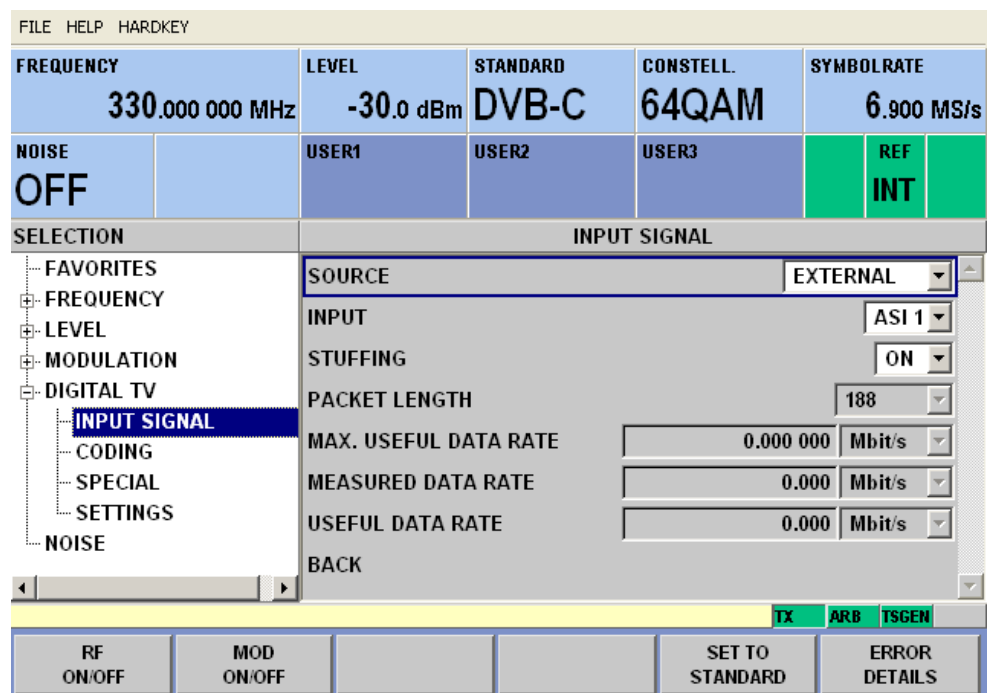


Figure 7-1: DIGITAL TV menu

5. Select the "EXTERNAL" signal source.
 - a) Select the "SOURCE" field.
 - b) Press the ENTER key to display the list.
 - c) Select "EXTERNAL".
 - d) Press the ENTER key to confirm the selection.
6. Select the "ASI 1" input.
 - a) Select the "INPUT" field.
 - b) Press the ENTER key to display the list.
 - c) Select "ASI 1".
 - d) Press the ENTER key to confirm the selection.
7. Make sure that the "STUFFING" field in the work view is set to "ON".

This ensures that the incoming transport stream will be adapted to the proper data rate of the coder. The data rate of the coder will depend on the transmission parameters. The data stream is padded with null packets to allow adaptation to the transmission parameters.

- a) Select the "STUFFING" field.
- b) Press the ENTER key to display the list.
- c) Select "ON".
- d) Press the ENTER key to confirm the selection.

8. Select "BACK" and press the ENTER key.

The focus is set to the tree.

9. In the tree, select the "CODING" submenu.

10. Press the ENTER key.

The focus is set on the work view.

11. Select a symbol rate of 6.9 .MS/s.

- a) Select the "SYMBOL RATE" field.
- b) Enter 6.9.
- c) If the units field to the right shows "MS/s", press the ENTER key.
- d) If the units field indicates another unit, select this field. Press the ENTER key, and select the "MS/s" unit. Press the ENTER key twice to confirm the unit and the symbol rate.

The selected symbol rate is displayed in the info area.

12. Select the "64 QAM" constellation.

- a) Select the "CONSTELLATION" field.
- b) Press the ENTER key to display the list.
- c) Select "64 QAM".
- d) Press the ENTER key to confirm the selection.

The selected constellation is displayed in the info area.

8 Maintenance

The R&S SFC-U does not need a periodic maintenance unless it is operated in dusty areas.

NOTICE

Risk of instrument damage

If the R&S SFC-U is operated in dusty areas, the fans may become obstructed by dust or other particles in the process of time. Make sure to check and, if necessary, clean the fans regularly to ensure they operate properly at all times. If the R&S SFC-U is run with obstructed fans for a longer period, it may become overheated which may cause damage.

Clean the outside of the instrument when necessary and check the rated data from time to time.

If any problem arises, contact one of our customer support centers. The addresses of our customer support centers are provided at the beginning of this manual.

8.1 Cleaning the Instrument

⚠ WARNING

Shock hazard

Before cleaning the R&S SFC-U, make sure that the R&S SFC-U is switched off and disconnected from all power supplies.

-
1. Clean the outside of the R&S SFC-U using a soft, lint-free dust cloth.
 2. Make sure that vents are not obstructed.

NOTICE

Instrument damage caused by cleaning agents

Cleaning agents contain substances that may damage the R&S SFC-U, e.g. cleaning agents that contain a solvent may damage the front panel labeling or plastic parts.

Never use cleaning agents such as solvents (thinners, acetone, etc), acids, bases, or other substances.

8.2 Storing the Instrument

The storage temperature range of the R&S SFC–U is given in the data sheet. If the R&S SFC–U is to be stored for a longer period of time, it must be protected against dust.

Repack the R&S SFC–U as it was originally packed when transporting or shipping. The two protective foam plastic parts prevent the control elements and connectors from being damaged. The antistatic packing foil avoids any undesired electrostatic charging to occur.

If you do not use the original packaging, provide for sufficient padding to prevent the R&S SFC–U from slipping inside the package. Wrap antistatic packing foil around the R&S SFC–U to protect it from electrostatic charging.

Index

Symbols

1PPS connector 15

A

AC power supply
connecting to 16

B

Bench operation 8

C

Checking
accessories 8
provided options 19

Cleaning the instrument 27

Connecting

power supply 16
to the computer 17

Connector

1PPS 15
DIG I/Q IN 13
power supply 11
REF IN 15
RF 15
TS IN 14
USB 12

Conventions 6

D

DIG I/Q IN connector 13

Documentation overview 5

E

Electromagnetic interference 16
preventing 16

EMC precautions 16

F

Firmware

options 19

Front panel 10

G

Getting started manual 5

H

Help 6

K

Key

on/off 11

M

Maintenance 27

Manual

getting started 5

user manual 5

O

On/off key 11

Options

checking 19

firmware 19

P

Packing the instrument 28

Power supply

connecting to 16

Power supply connector 11

Power switch 11

Provided options

checking 19

Putting up the instrument 8

R

Rear panel 11

REF IN connector 15

REMOTE status display 10

RF connector 15

RF ON status display 10

S

Safety 5

Shipping damage inspection 7

Status display

REMOTE 10

RF ON 10

STATUS 11

STATUS status display 11

Storing the instrument 28

Switching on the instrument 18

T

TS IN connector 14

U

Unpacking the cardboard box 7

USB connector 12

computer 17

User manual 5

W

Warranty 8