R&S®FE110 | R&S®FE170
EXTERNAL FRONTENDS

Frequency extension up to 110 GHz or 175 GHz for wideband signal analysis and generation

R&S®FE110SR
R&S®FE110ST
R&S®FE170SR
R&S®FE170ST

Product Brochure
Version 04.00

ROHDE&SCHWARZ
Make ideas real

AT A GLANCE

The frequency range of the FSW signal and spectrum analyzer, R&S®RTP oscilloscope, R&S®SMW200A and R&S®SMM100A vector signal generators and R&S®SFI100A wideband IF vector signal generator can easily be extended to 110 GHz or 175 GHz for wideband signal analysis with the R&S®FE110SR/R&S®FE170SR external RX frontends and signal generation with the R&S®FE110ST/R&S®FE170ST external TX frontends. The frontends come fully calibrated, can be extended with smart accessories and require a minimum number of connections to the base instruments, simplifying operation.

The external frontends provide a compact, easy-to-use and fully calibrated solution for wideband signal generation and analysis.

The R&S®FE110SR/ST frontends cover the W band for applications such as satellite communications, millimeter-wave radar research and wireless backhaul.

For the frequency range from 110 GHz to 175 GHz, also referred to as the D band, the R&S®FE170SR/ST frontends are ideal. This band is increasingly being used for a wide range of applications such as backhaul and 6G research for future wireless communications systems.

R&S®SMW200A vector signal generator with R&S®FE170ST external TX frontend.

KEY FACTS

- Frequency range:
  - R&S®FE110SR/ST: 70 GHz to 110 GHz
  - R&S®FE170SR/ST: 110 GHz to 175 GHz
- Output power:
  - 70 GHz to 110 GHz: +5 dBm
  - 110 GHz to 170 GHz: –15 dBm
- Sensitivity:
  - 75 GHz to 98 GHz: –158 dBm/Hz
  - 115 GHz to 148 GHz: –159 dBm/Hz
- Phase noise:
  - R&S®FE110ST: –128 dBc/Hz at 1 MHz offset [1)]
  - R&S®FE170ST: –122 dBc/Hz at 1 MHz offset [2)]

BENEFITS

- High-fidelity signal generation and analysis with minimal EVM
- Fully calibrated solution
- User-friendly operation
- Fully automated
- Smart accessories

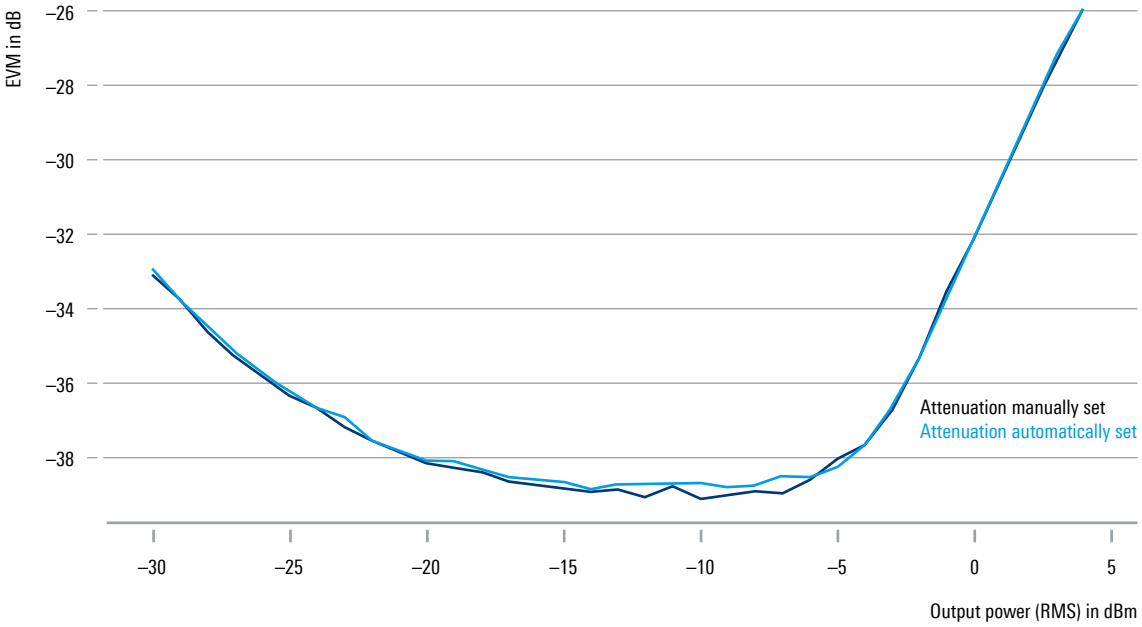
FSW signal and spectrum analyzer with R&S®FE170SR external RX frontend.

1) RF center frequency = 96.6 GHz.
2) RF center frequency = 148 GHz.

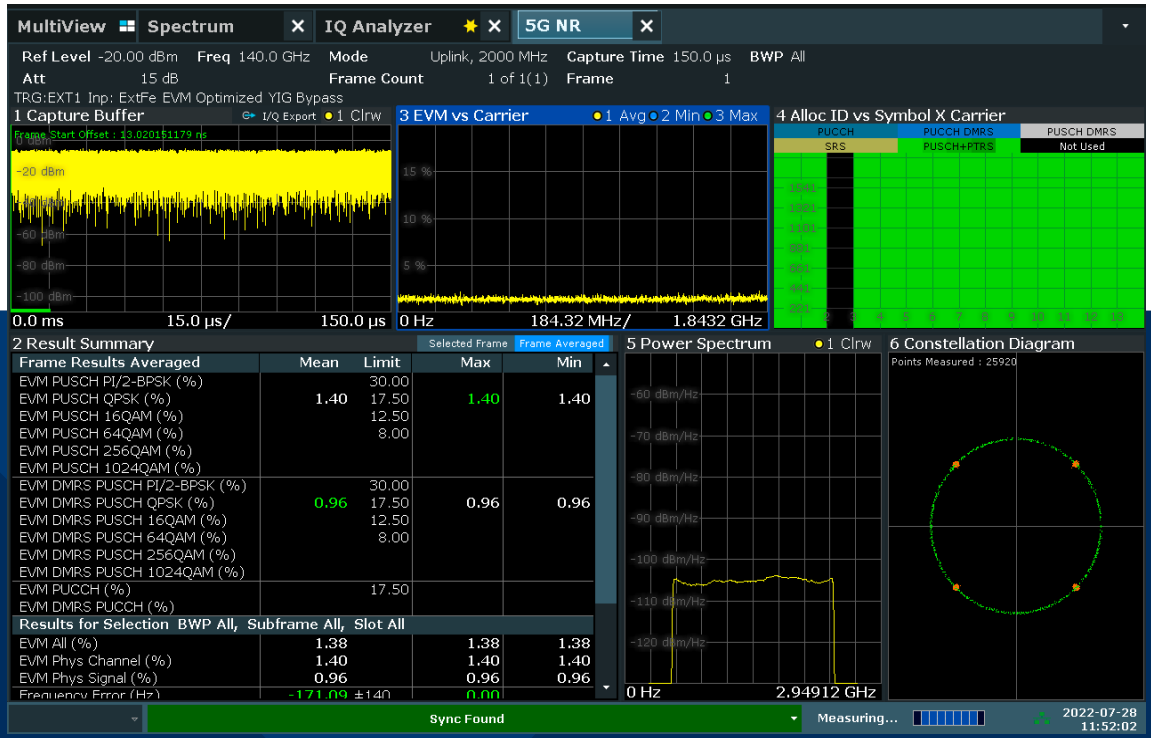
HIGH-FIDELITY SIGNAL GENERATION AND ANALYSIS WITH MINIMAL EVM

With the built-in low-phase-noise local oscillator, the frontends can produce and measure signals with exceptionally high signal fidelity.

EVM values versus RMS output power at 148 GHz center frequency in combination with an R&S®SMW200A



5G NR uplink signal with 2 GHz bandwidth and 148 GHz center frequency.



Fully calibrated solution

A fully calibrated signal generation and analysis solution reduces the time and equipment needed for setup and calibration and enhances the fidelity of the measurement.

User-friendly operation

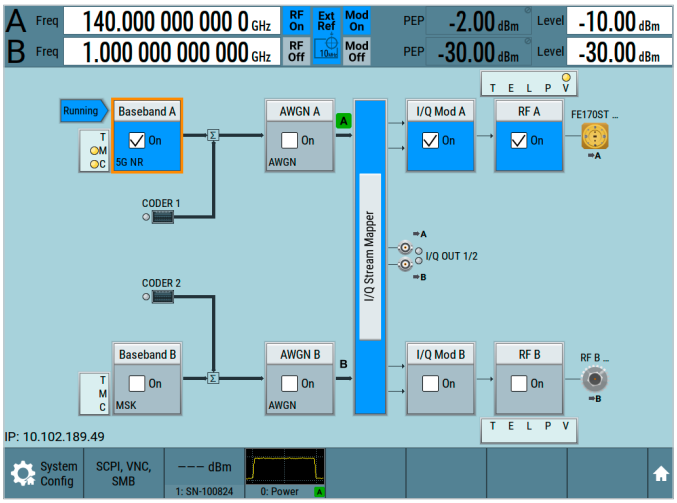
All the parameters of the frontends and connected accessories are known to the base instrument. This reduces the number of corrections needed by the user and increases confidence in the measurement.

Fully automated

Automated measurements can be easily and reliably set up since there is no need to program multiple instruments. The base instrument handles everything.

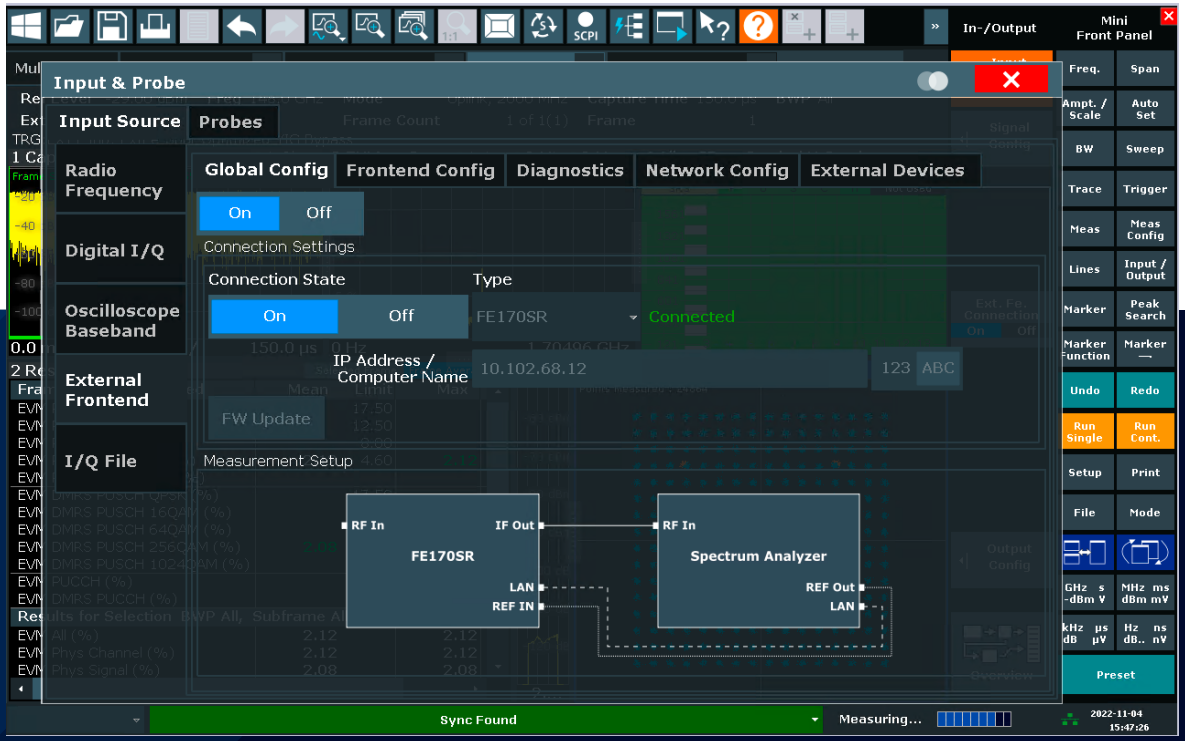
Smart accessories

Using additional devices such as filters and amplifiers is easy. The characteristics of these devices are provided to the base instrument and automatically included for a quick and reliable setup.



R&S®FE170ST setup integrated into the R&S®SMW200A firmware for full control of all relevant settings from a single GUI.

FSW GUI for controlling the R&S®FE170SR.



SPECIFICATIONS IN BRIEF

Specifications in brief		
R&S®FE110SR external RX frontend		
Frequency range		70 GHz to 110 GHz
Signal analysis bandwidth (equalized)	with R&S®FSW-B8001	max. 8.3 GHz
Displayed average noise level	70 GHz ≤ f < 75 GHz	–155 dBm (nom.)
	75 GHz ≤ f ≤ 98 GHz	–158 dBm (typ.)
	98 GHz < f ≤ 110 GHz	–155 dBm (typ.)
Maximum safe input level	RF attenuation = 0 dB	+5 dBm
	RF attenuation ≥ 25 dB	+20 dBm
Reference input		10 MHz, 640 MHz, 1 GHz
LAN interface		10BASE-T/100BASE-T
R&S®FE110ST external TX frontend		
Frequency range		70 GHz to 110 GHz
Modulation bandwidth (equalized)	with R&S®SMM100A	max. 1 GHz
	with R&S®SMW200A	max. 2 GHz
	with dual-channel R&S®SMW200A and R&S®SMW-K555 options	max. 4 GHz
	with R&S®SFI100A	max. 10 GHz
Specified level range	70 GHz ≤ f_{out} ≤ 110 GHz	–40 dBm to +5 dBm (PEP)
Reference input		10 MHz, 640 MHz, 1 GHz
LAN interface		10BASE-T/100BASE-T
R&S®FE170SR external RX frontend		
Frequency range		110 GHz to 170 GHz
	overrange	170 GHz to 175 GHz
Signal analysis bandwidth (equalized)	with R&S®FSW-B8001	max. 8.3 GHz
Displayed average noise level	110 GHz ≤ f ≤ 115 GHz	–152 dBm, –155 dBm (typ.)
	115 GHz < f ≤ 148 GHz	–156 dBm, –159 dBm (typ.)
	148 GHz < f ≤ 166 GHz	–152 dBm, –155 dBm (typ.)
	166 GHz < f ≤ 170 GHz	–147 dBm, –150 dBm (typ.)
Maximum safe input level	RF attenuation = 0 dB	–7 dBm
	RF attenuation ≥ 27 dB	+20 dBm
Reference input		10 MHz, 640 MHz, 1 GHz
LAN interface		10BASE-T/100BASE-T
R&S®FE170ST external TX frontend		
Frequency range		110 GHz to 170 GHz
	overrange	170 GHz to 175 GHz
Modulation bandwidth (equalized)	with R&S®SMM100A	max. 1 GHz
	with R&S®SMW200A	max. 2 GHz
	with dual-channel R&S®SMW200A and R&S®SMW-K555 options	max. 4 GHz
	with R&S®SFI100A	max. 10 GHz
Specified level range	110 GHz ≤ f_{out} ≤ 170 GHz	–40 dBm to –15 dBm (PEP)
Reference input		10 MHz, 640 MHz, 1 GHz
LAN interface		10BASE-T/100BASE-T

More information

For detailed specifications and ordering information, see R&S®FE110SR specifications (PD 3683.9457.22).
For detailed specifications and ordering information, see R&S®FE110ST specifications (PD 3683.9470.22).
For detailed specifications and ordering information, see R&S®FE170SR specifications (PD 3683.3694.22).
For detailed specifications and ordering information, see R&S®FE170ST specifications (PD 3609.9240.22).

Service at Rohde&Schwarz

YOU'RE IN GREAT HANDS

	SERVICE PLANS	ON DEMAND
Calibration	Up to five years [1]	Pay per calibration
Warranty and repair	Up to five years [1]	Standard price repair

[1] For extended periods, contact your Rohde&Schwarz sales office.

Instrument management made easy

The R&S®InstrumentManager makes it easy to register and manage your instruments. It lets you schedule calibration dates and book services.

Find out more about our service portfolio under:

Service at Rohde&Schwarz
You're in great hands

- Worldwide
- Local and personalized
- Customized and flexible
- Uncompromising quality
- Long-term dependability

Rohde&Schwarz

The Rohde&Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test&measurement, technology systems and networks&cybersecurity. Founded 90 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

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Sustainable product design

- Environmental compatibility and eco-footprint
- Energy efficiency and low emissions
- Longevity and optimized total cost of ownership

Certified Quality Management
ISO 9001

Certified Environmental Management
ISO 14001

Rohde&Schwarz training
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Rohde&Schwarz customer support
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Data without tolerance limits is not binding | Subject to change