

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 03.00

ROHDE & SCHWARZ

Make ideas real



AT A GLANCE

The frequency range of the R&S®FSW signal and spectrum analyzer, R&S®RTP oscilloscope and R&S®SMW200A and R&S®SMM100A vector signal generators 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



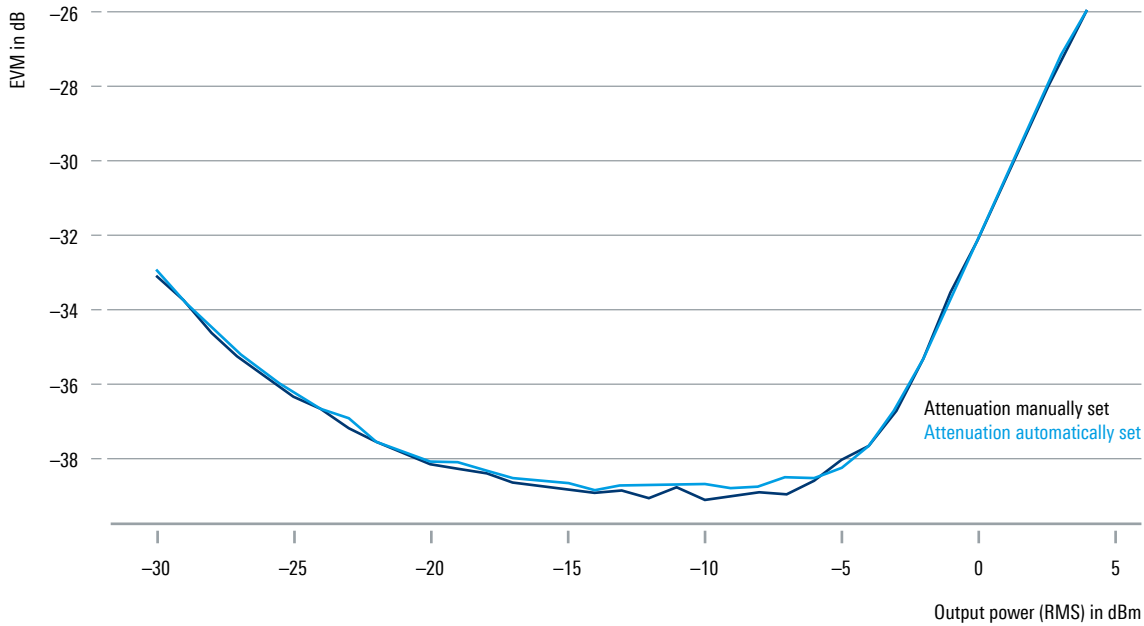
R&S®FSW signal and spectrum analyzer with R&S®FE170SR external RX frontend.

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

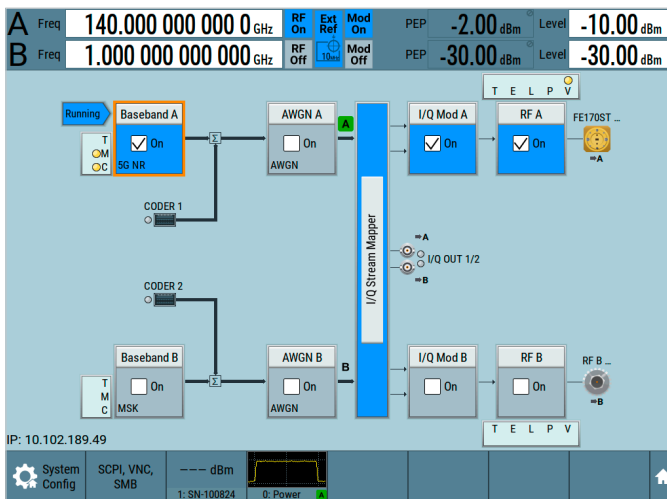
All the parameters of the frontends and connected accessories are known to the base instrument. This reduces the number of corrections needed by the user and increases confidence in the measurement.

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.

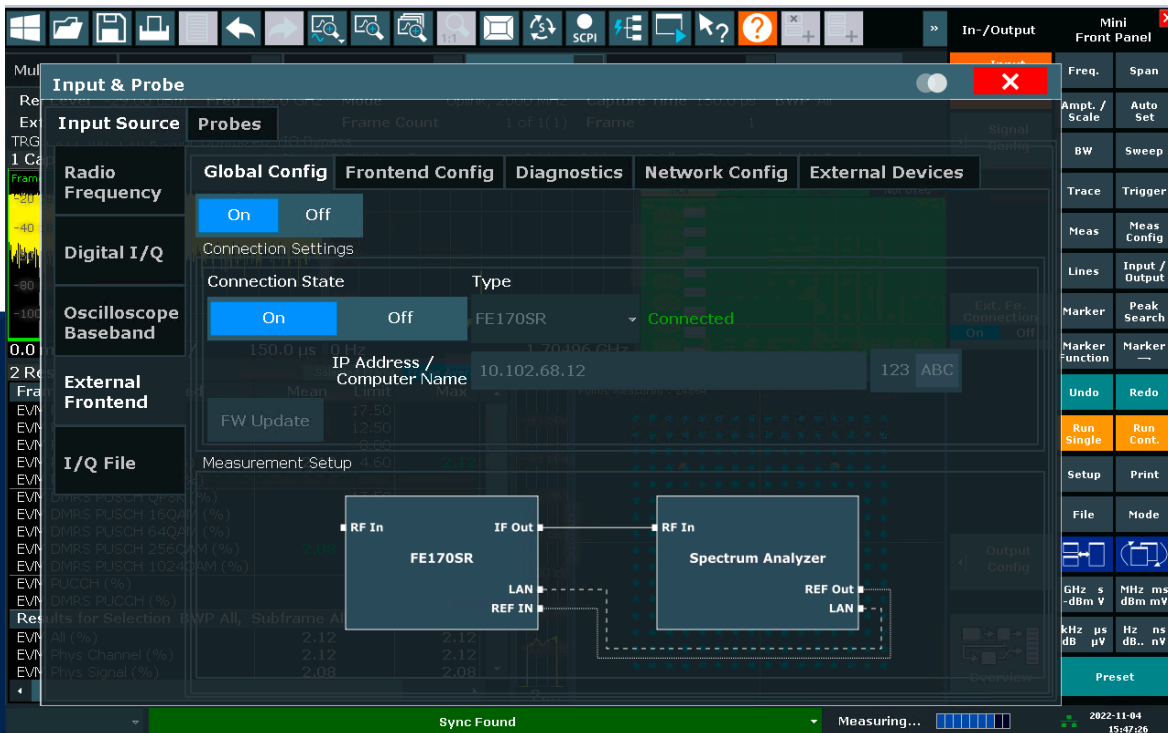
Smart accessories

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.

R&S®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 | | 10/100BASE-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 |
| 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 | | 10/100BASE-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 | | 10/100BASE-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 |
| 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 | | 10/100BASE-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)

Warranty

Base unit 1 years

Service options

| | | |
|--|---------|--|
| Extended warranty, one year | R&S°WE1 | |
| Extended warranty, two years | R&S°WE2 | |
| Extended warranty, three years | R&S°WE3 | |
| Extended warranty, four years | R&S°WE4 | Contact your local Rohde & Schwarz sales office. |
| Extended warranty with calibration coverage, one year | R&S°CW1 | |
| Extended warranty with calibration coverage, two years | R&S°CW2 | |
| Extended warranty with calibration coverage, three years | R&S°CW3 | |
| Extended warranty with calibration coverage, four years | R&S°CW4 | |

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

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Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

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