NRP Power Viewer Settings

Access:

► Select one of the following:

  ● Select "RF > config... > RF Measurement > NRP Power Viewer".
  ● Press the [menu] key and select "RF > RF Measurement > NRP Power Viewer".

The dialog shows the settings and measurement values of the sensor selected in the field next to the connector symbol. For indicating the parameters of another sensor, switch to the respective sensor in the selection list.

ⓘ When you connect your power sensor(s) via the R&S NRP-Z5 USB sensor hub, each channel of the hub is firmly assigned to the associated sensor channel in the generator.

The remote commands required to define the settings are described in Chapter 6.12, "SENSe, READ and INITiate Subsystems", on page 318.

Sensor

Selects the R&S NRP power sensor for display.

In remote control, the sensors are set up using the SENSe commands. The remote measurement is triggered by the READ query which also provides the measurement results.

The sensor is selected by suffix 1, 2, 3 or 4 in key word SENSe or READ of the command header.

Suffix 1 denotes the sensor connected at the first [USB] interface, and suffix 2, 3 and 4 are assigned to further sensors connected via USB. The suffix is identical to the index which is assigned automatically to each sensor upon connection.

Note: The software version of the connected power sensor can be retrieved by means of the remote control command SENS:POW:TYPE?.
Use the "Setup >" Chapter 4.2.3.4, "NRP Info/Update", on page 101 dialog to update the sensor software.

Remote command:
SENSe<ch>[:POWer]:STATus[:DEVice]? on page 329

Type

Indicates the type and the serial number of the connected R&S NRP power sensor. The sensor type is automatically detected.

Remote command:
SENSe<ch>[:POWer]:TYPE? on page 329
SENSe<ch>[:POWer]:SNUMber? on page 328

State

Activates/deactivates level measurement by the power sensor.

The local state is set with the INIT command. Switching the local state off enhances the measurement performance.

In remote control, the sensors are set up using the SENSe commands. The remote measurement is triggered by the READ query which also provides the measurement results. The state is not influenced by these commands, measurements results can be retrieved with local State on or off.

The sensor is selected by suffix 1, 2, 3 or 4 in key word SENSe or READ of the command header.

Suffix 1 denotes the sensor connected at the first [USB] interface, and suffix 2, 3 and 4 are assigned to further sensors connected via USB. The suffix is identical to the index which is assigned automatically to each sensor upon connection.

To query the availability of a sensor at a given connector, use the command SENSe<ch>[:POWer]:STATus[:DEVice]? on page 329.

Remote command:
:INITiate<hw>[:POWer]:CONTinuous on page 322

Level (Peak)

With certain power sensors only, for example R&S NRP-Z81.

Indicates the measured peak level value with the selected unit.

Remote command:
:READ<ch>[:POWer]? on page 322

Level (Avg.)

Indicates the measured level value with the selected unit.

Remote command:
:READ<ch>[:POWer]? on page 322

Unit

Selects the unit used for result display.

The power sensor provides the measured value in Watt.
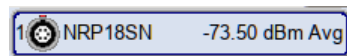
In which unit the measured value is indicated is selected here and might be Watt, dBm or dBuV.

Remote command:
:SENSe<ch>:UNIT[:POWer] on page 330

Permanent Display State

Activates the permanent indication of the power measurement result in the upper right corner of the block diagram. The instrument shows the type of sensor, the corresponding connector, the measurement source and - if set - the offset.

It is possible to switch the permanent display active for several sensors. In this case, the instrument indicates the values of the sensor with the lowest port number in the display.

Remote command:
:SENSe<ch>[:POWer]:DISPlay:PERManent:STATe on page 324

Display Priority

Determines whether the instrument displays the measured average or the peak power permanently on the screen.

To select the peak power display, it is required that the R&S NRP power sensor supports this feature. On power-on or connecting a sensor the average power value is set by default.

To enable the permanent display in the block diagram, select Permanent Display State.

Remote command:
:SENSe<ch>[:POWer]:DISPlay:PERManent:PRIority on page 324

Zero - Power Sensors

Activates the auto zero function.

Zeroing calibrates the external power sensor by adjusting its reading at zero signal power. For this purpose, the RF power source must be switched off or disconnected from the sensor. If a Rohde & Schwarz power sensor receives an input power during the zeroing process, it aborts zeroing and generates an error message. Zeroing takes a few seconds, depending on the sensor model. Refer to the documentation of your power sensor for more information.

Tips for zeroing

When to perform zeroing:
● During warm up after switching on or connecting the instrument
● After a substantial change of the ambient temperature
● After fastening the power sensor module to an RF connector at high temperature
● After several hours of operation
● When low-power signals are to be measured, e.g. less than 10 dB above the lower measurement limit.

- Switch off the RF power source for zeroing, but do not disconnect it from the power sensor. This proceeding keeps the thermal equilibrium, and the zeroing process also compensates the noise that superimposes the measured signal (e.g. from a broadband amplifier).

Remote command:
`:SENSe<ch>[:POWer]:ZERO` on page 330

Source
Selects the source for measurement.

"RF"	Measurement source is the RF signal of the generator. The RF frequency is used as the measurement frequency of the sensor and the corresponding correction factor is used. In this mode the RF frequency of the generator is send to the sensor automatically if changed.
"User"	Measurements source is any freely selectable source. The frequency is entered manually under frequency (e.g. for measurement of amplifier gain with 2 sensors).

Remote command:
`:SENSe<ch>[:POWer]:SOURce` on page 328

Frequency
Source User only

Enters the frequency for measurement source "User".

Remote command:
`:SENSe<ch>[:POWer]:FREQuency` on page 327

Level Offset
Activates and defines a level offset which is added to the measured value. This allows e.g. an attenuator in the signal path to be considered. The offset is always entered in dB, irrespective of the selected unit for result display.

Remote command:
`:SENSe<ch>[:POWer]:OFFSet:STATe` on page 328
`:SENSe<ch>[:POWer]:OFFSet` on page 327

Filter
Determines the length of the filter used for the measurement. The filter length affects the measurement time directly.

The averaging filter is used to reduce fluctuations in the measured result to the extent desired. Such fluctuations can be caused by inherent noise of the measuring instrument, modulation of the measurement signal or beats from the superposition of adjacent carriers. A more stable display has to be traded off against longer measurements. The measurement result is obtained from a two-stage averaging process.

Note: Longer measurements do not mean that it takes longer to display a new result, but rather that it takes longer for the result to settle when the power changes.

Measurements are continuously repeated in a predefined time window. The measurement result is obtained by averaging the measured values for the last 2N time windows. The number N is the filter length, the factor of 2 arises because the output signals from the microwave detector to suppress low-frequency noise are chopped at the same rate as the time windows, which means that an independent measured value can only be obtained from two consecutive values. As the filter length is the multiplier for the time window it directly influences the measurement time.

The filter length can be selected automatically or can be manually set to a fixed value. As a preliminary, you should always check if the auto mode is giving satisfactory results because you will always have to adjust an optimal, manual filter-length setting if the power is not constant.

Selection "Fixed Noise" is offered for achieving defined measurement accuracy.

"Auto"　　　　　The filter length is automatically selected and adapted to the currently measured value. With very high signals the filter length and therefore the measurement time can be short. With very low signal levels the filter length and therefore the measurement time is increased in order to reduce noise. The used filter length is indicated in the field to the right, see Filter Length.

"User"　　　　　The filter length is set manually.
The filter length is entered in the entry window to the right. As the filter length works as a multiplier for the time window, this results in a constant measurement time.

　　　　　　　　　Note: The time window varies depending on the used sensor. For most sensors it is fixed to 20 ms. For the R&S NRP-Z81 sensor it is 10 us. Therefore, the user filter length for the R&S NRP-Z81 has be about 1000 times larger than the filter length for other sensors in order to achieve the same filtering result.
The Auto Once button can be used to search for the optimum filter length for the current measurement conditions. The found filter length is indicated in the field to the right, see Filter Length.

"Fixed Noise"　The averaging factor is selected so that the sensors intrinsic noise (2 standard deviations) does not exceed the specified noise content. The desired noise content is entered in the entry field to the right, see Noise Content.
To avoid very long settling times when the power is low, the averaging factor can be limited with the Timeout parameter.

Remote command:
`:SENSe<ch>[:POWer]:FILTer:TYPE` on page 326

Filter Length ← Filter
Indicates the used filter length for filter type "Auto" or "User".

Remote command:
`:SENSe<ch>[:POWer]:FILTer:LENGth:AUTO?` on page 324
`:SENSe<ch>[:POWer]:FILTer:LENGth[:USER]` on page 325

Noise Content ← Filter
Sets the noise content for filter type "Fixed Noise".

Remote command:

:SENSe<ch>[:POWer]:FILTer:NSRatio on page 325

Timeout ← Filter
Sets a time limit for the averaging process.

Remote command:

:SENSe<ch>[:POWer]:FILTer:NSRatio:MTIMe on page 325

Auto Once ← Filter
Calculates the optimum filter length for the current measurement conditions and indicates the value in the Filter Length.

Remote command:

:SENSe<ch>[:POWer]:FILTer:SONCe on page 326

Use Default Aperture Time
Enables you to specify a user-defined aperture time for the respective sensor.

The sensor default setting is usually sufficient. If however, the readings vary, it is recommended that you adjust the aperture time exactly to one modulation period, in order to obtain stable readings. To specify the aperture time, see Aperture Time.

Remote command:

:SENSe<ch>[:POWer]:APERture:DEFault:STATe on page 321

Aperture Time
Defines the acquisition time for the respective sensor, provided the entry field is enabled, see Use Default Aperture Time.

For example you can adjust the aperture time exactly to one signal period, in order to obtain a sufficient low average value.

Remote command:

:SENSe<ch>[:POWer]:APERture:TIMe on page 321

Use SParameter - Power Sensors
Activates the use of the S-Parameter correction data of the connected power sensor. For sensors with attenuator this checkbox is automatically checked.

Refer to the manual of the connected R&S NRP power sensor for a description on how to use the SParameter table.

Remote command:

:SENSe<ch>[:POWer]:CORRection:SPDevice:STATe on page 323

Enable Logging
Activates recording of R&S NRP power sensor readings.

If enabled, every value measured by a connected power sensor and indicated in the user interface, is written to a log file. Per measurement the function logs the measured value (2 readings when you work with peak sensors), the sensor type and the measurement time (time stamp).