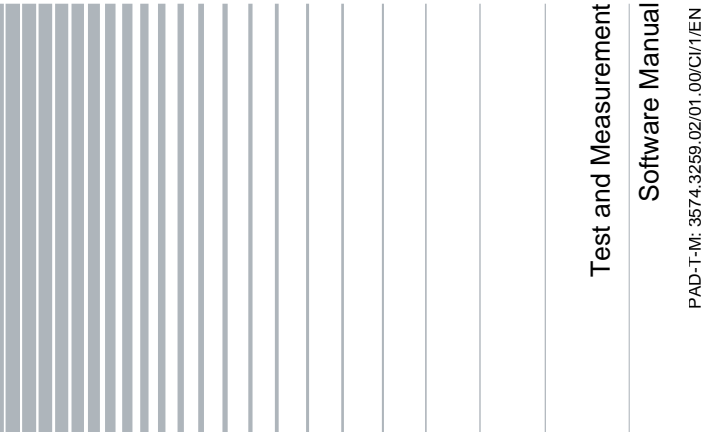


# R&S®FS-K9

## Measurements with Power Sensors Software Manual



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The following abbreviations are used throughout this manual:

R&S®FS-K9 is abbreviated as R&S FS-K9

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# 1 Installation and Enabling

## 1.1 Installation

Application Firmware R&S FS-K9 is part of the basic firmware of the base unit. The application is available starting with basic firmware version 3.2x.

If the basic firmware has to be updated, start the update with the floppy disks containing the basic firmware by SETUP → NEXT → FIRMWARE UPDATE.

---

### NOTICE

The instrument must be switched off before connecting the power sensor.

The drivers required for controlling the power sensor are installed along with the basic firmware for the analyzer, i.e. the software supplied with the power meter does not have to be installed.

---

The R&S NRP-Zx power sensor is connected to the instrument using the R&S NRP USB adapter. For details, refer the operating manual for the R&S NRP-Zx power sensor.

## 1.2 Enabling

Application Firmware R&S FS-K9 is enabled in the SETUP → GENERAL SETUP menu by entering a keyword. The keyword is supplied together with the application firmware. If the application firmware is installed at the factory, it will already be enabled.

### GENERAL SETUP menu:

The OPTIONS softkey opens a submenu in which you can enter the keywords for the application firmware. The existing applications are displayed in a table that opens when you enter the submenu.

### INSTALL OPTION

The INSTALL OPTION softkey enables entry of the keyword for application firmware.

If the keyword is valid, the message OPTION KEY OK is displayed and the application firmware is entered in the FIRMWARE OPTIONS table.

If an invalid keyword is entered, OPTION KEY INVALID is displayed.

## 2 Getting Started

Before you can start measurements, you must adjust the instrument settings to the properties of the device under test. The following procedure is recommended:

1. Set the spectrum analyzer to its default state.
  - Press the PRESET button.  
The device is now in its default state.
2. Activate measurements with the power sensor.
  - Press the PWR METER hotkey.  
Measurements with the power sensor will be activated and the menu with the settings for the power sensor will be opened.
3. Set the frequency
  - In the default setting, the frequency of the power sensor is coupled with the center frequency of the analyzer, i.e. when the center frequency of the analyzer is set (FREQ button), the power sensor is automatically set to the frequency to be measured.
4. Set the measurement time.
  - Press the MEAS TIME softkey.  
The list of available measurement times is opened.
  - Using the cursor keys, select the desired measurement time and confirm with ENTER.
5. Set the unit
  - Press the UNIT / SCALE softkey.  
The list of available units will be opened.
  - Using the cursor keys, select the desired unit and confirm with ENTER.

Additional setting options are described in the following reference section of the manual.

## 3 Test Setup for Measurements with Power Sensors

### NOTICE

Not complying with these precautions may cause damage to the instrument.

Before the instrument is put into operation, make sure the following are done:

- The instrument cover is on and screwed into place.
- The ventilation openings are unobstructed.
- No signal voltage levels exceed permitted limits.
- The instrument outputs are not overloaded or improperly connected.

This chapter describes the basic settings for the analyzer for measurements with a power sensor. Before measurements can be started, the analyzer must be correctly configured and powered as described in Chapter 1 of the operating manual for the base unit. Furthermore, Application Firmware R&S FS-K9 must be enabled. Chapter 1 of this manual describes how to install and enable the application firmware.

### 3.1 Standard Test Setup

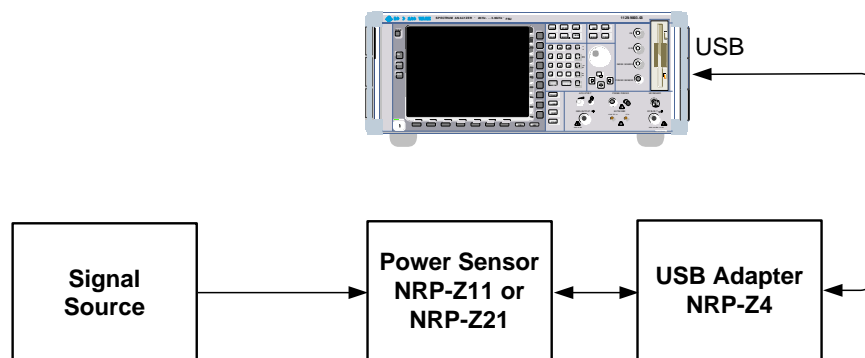


Figure 1 Test setup

## 4 Configuration of Power Measurement

Application Firmware R&S FS-K9 (measurements with power sensor) is activated with the PWR METER hotkey.

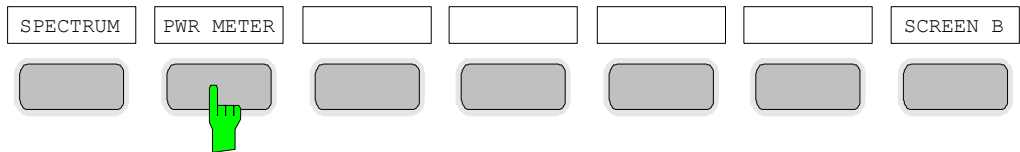


Figure 2 Hotkey bar with Application Firmware R&S FS-K9 enabled

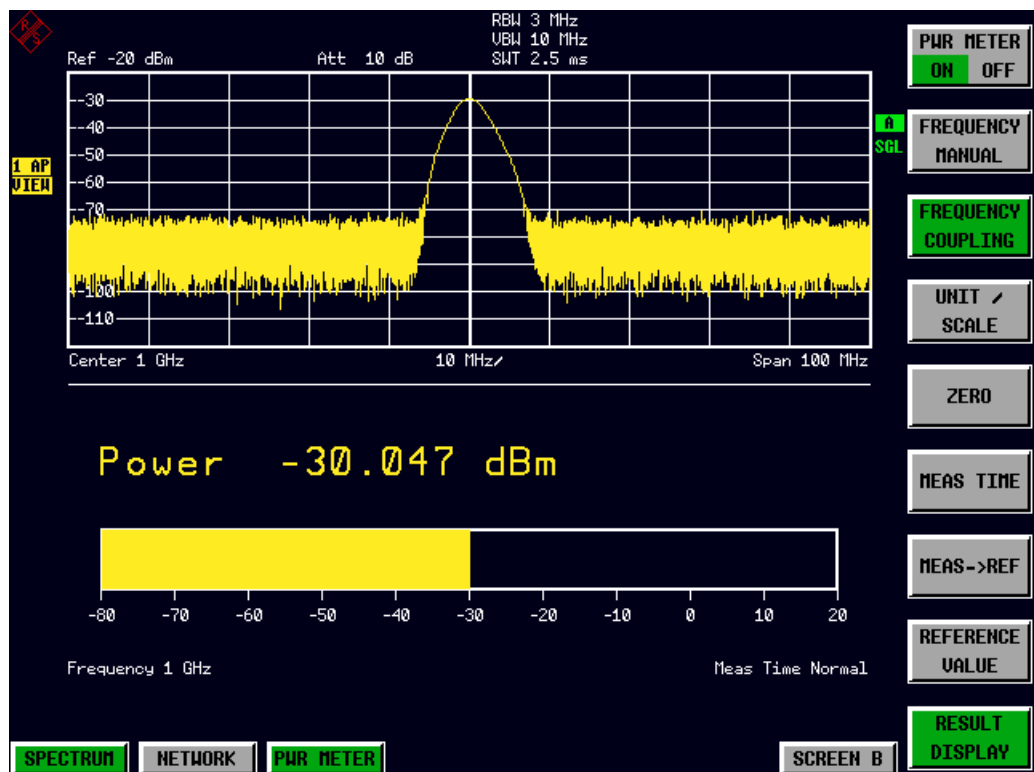
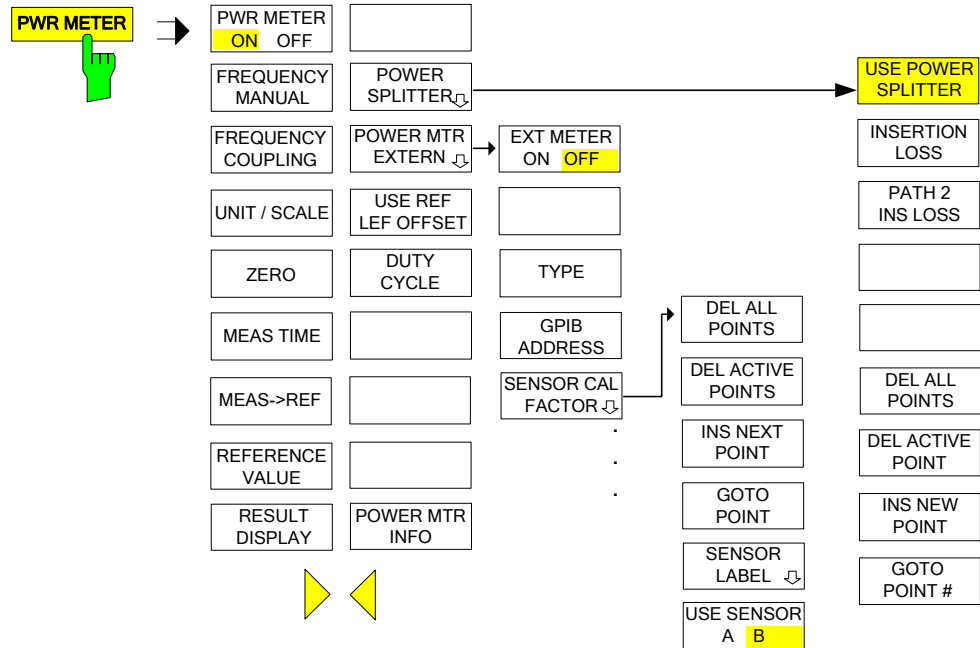


Figure 3 Result display of Application Firmware R&S FS-K9

If the hotkey bar is being used by an application, Application Firmware R&S FS-K9 can also be activated by pressing SETUP → NEXT → PWR METER.



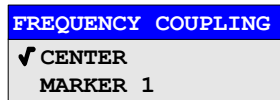
The PWR METER hotkey opens the menu for configuring the power measurement.



**PWR METER ON OFF** The *PWR METER ON / OFF* softkey switches the power measurement on or off.  
 Remote: SENS:PMET:STAT ON

**FREQUENCY MANUAL** The *FREQUENCY MANUAL* softkey opens the data entry field for the frequency of the signal to be measured.  
 The power sensor has a memory with frequency-dependent correction factors. This allows extreme accuracy for signals of a known frequency.  
 Remote: SENS:PMET:FREQ 1GHZ

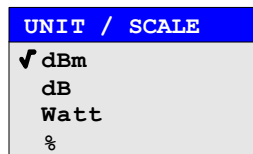
**FREQUENCY COUPLING** The *FREQUENCY COUPLING* softkey activates automatic coupling of the frequency to the center frequency of the instrument or to marker 1.  
 A list is used to make a selection. It is opened by pressing the softkey.



Remote: SENS:PMET:FREQ:LINK CENT

**UNIT / SCALE**

The *UNIT / SCALE* softkey opens a list for selecting the unit with which the measured power is to be displayed.



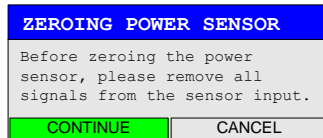
If dB or % is selected, the display is relative to a reference value that is defined with either the MEAS→REF softkey or the REFERENCE VALUE softkey.

```
Remote:  CALC:PMET:REL:STAT ON | OFF
         UNIT:PMET:POW DBM
         UNIT:PMET:POW:RAT DB
```

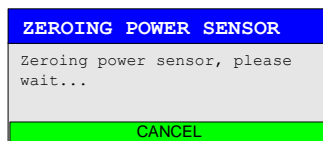
**ZERO**

The *ZERO* softkey starts zeroing of the power sensor.

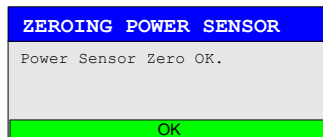
Before zeroing starts, the user is prompted to disconnect all signals from the input of the power sensor.



During zeroing, the following message appears:



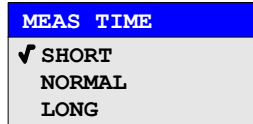
When zeroing is complete, the following message appears:



It disappears after approx. 3 seconds.

```
Remote:  CAL:PMET:ZERO:AUTO ONCE;*WAI
```

**MEAS TIME** The *MEAS TIME* softkey opens a list in which the measurement can be set. Results are more stable with longer measurement times, particularly if signals with lower power are measured.



Stationary signals with high power (>-40dBm) require only a short measurement time to yield stable and exact results. In this case, the SHORT setting is recommended because it provides the highest repetition rates.

The NORMAL setting increases the stability of the displayed results for the measurement of signals with lower power or of modulated signals.

The LONG setting is recommended for signals at the lower end of the measurement range (<-50 dBm). This setting can be used to minimize the influence of noise.

Remote: `SENS:PMET:MTIM LONG`

**MEAS→REF** The *MEAS→REF* softkey is used to obtain the currently measured power as a reference value for the relative display.

The reference value can also be set manually via the REFERENCE VALUE softkey.

Remote: `CALC:PMET:REL:MAGN:AUTO ONCE`

**REFERENCE VALUE** The *REFERENCE VALUE* softkey activates manual entry of a reference value for relative measurements in the unit dBm.

Remote: `CALC:PMET:REL:MAGN -30DBM`

## RESULT DISPLAY

The *RESULT DISPLAY* softkey switches the result display of the power measurement on or off. If the display is switched off, the measured power appears in the Marker Info field.

### Note:

The softkey is available only in the spectrum analysis mode as long as the lower half of the screen is not already being used for another result display (e.g. ACP measurement).

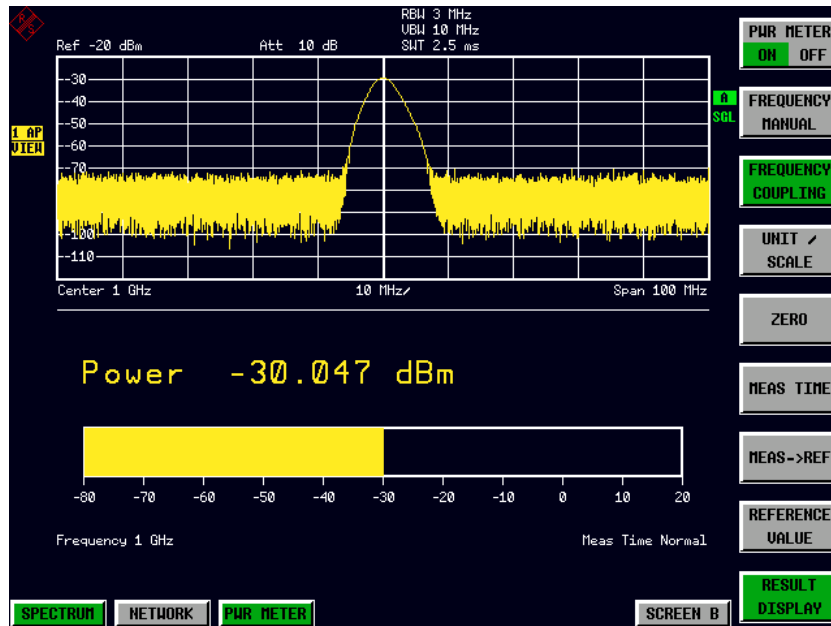


Figure 4 Result display with RESULT DISPLAY ON

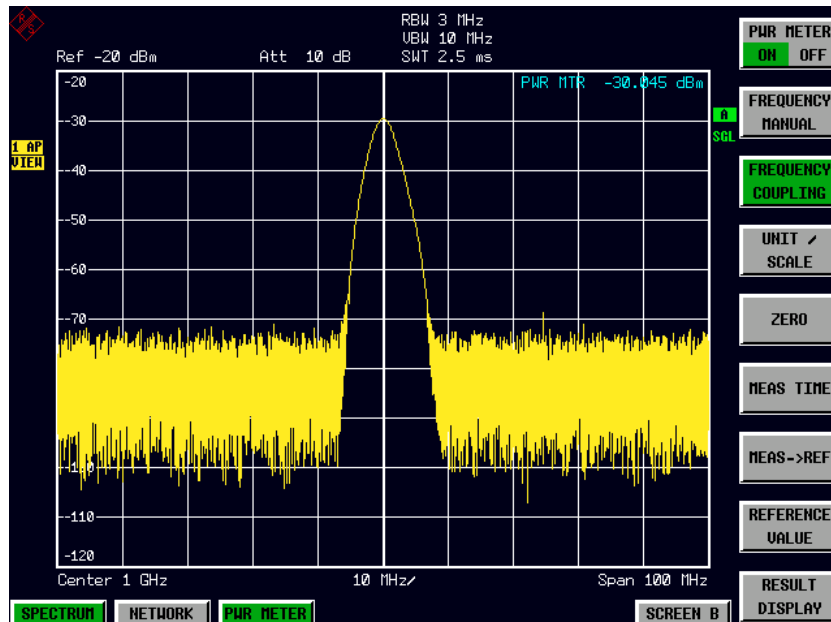
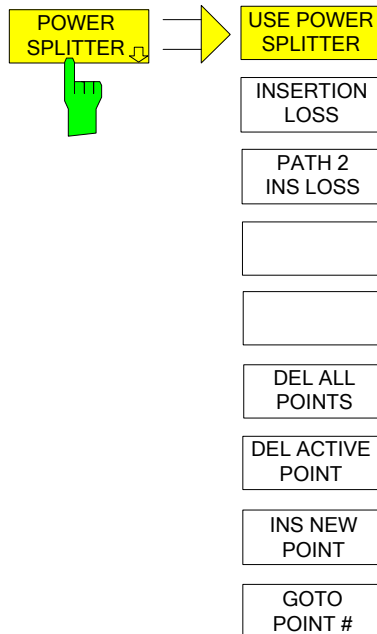


Figure 5 Result display with RESULT DISPLAY OFF

Remote: DISP:WIND:PMET:STAT OFF

## 4.1 Menu PWR METER - NEXT

The **POWER SPLITTER** softkey opens a submenu for power splitter settings. A table for entering the frequency-dependent insertion loss of the power splitter is opened simultaneously. It is valid for the path between power meter and signal source.



### USE POWER SPLITTER

The *USE POWER SPLITTER* softkey activates and deactivates automatic consideration of a power splitter that splits the present RF signal between the power meter and the R&S analyzer RF input.

Remote: `CORR:PLOS:INP:STAT ON`

### INSERTION LOSS

The *INSERTION LOSS* softkey opens the table for entering the frequency-dependent insertion loss of a power splitter.

Remote: `CORR:PLOS:INP 1e6,4.6,2e6,4.85`

### PATH 2 INS LOSS

The *PATH 2 INS LOSS* softkey opens a data entry field for defining the insertion loss of the power splitter between the signal source and the R&S analyzer RF input. This value is corrected during spectrum and IQ measurements.

Remote: `CORR:PLOS:INP:SPAT 4 DB`

### DEL ALL POINTS

The *DEL ALL POINTS* softkey deletes all values from the table with the frequency-dependent insertion loss of the power splitter.

Remote: -

### DEL ACTIVE POINT

The *DEL ACTIVE POINT* softkey deletes the marked value from the table with the frequency-dependent insertion loss of the power splitter.

Remote: -

**INS NEW POINT**

The *INS NEW POINT* softkey inserts a new line at the spot where the table is marked.

Remote: -

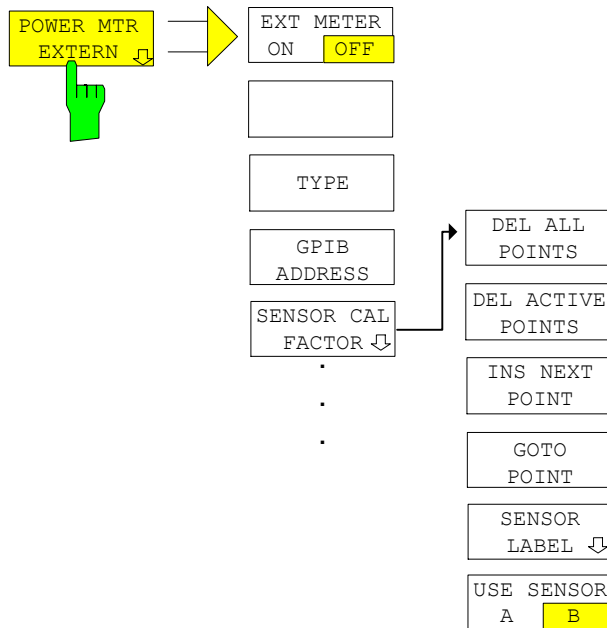
**GOTO POINT #**

The *GOTO POINT #* softkey sets the marking to the specified line within the table.

Remote: -

**POWER MTR EXTERN**

The *POWER MTR EXTERN* softkey opens the submenu for the external power measurement.



**EXT METER ON OFF**

The *EXT METER ON/OFF* softkey switches the measurement with the external power sensor on and off.

Remote: PMET:EXT:STAT ON

**TYPE**

The *TYPE* softkey selects the type of external power meter used from a list.

The R&S NRVS, R&S NRVD power meters from Rohde & Schwarz as well as EPM, 437B and 438A from Hewlett-Packard/Agilent are supported.

Remote: SYST:COMM:RDEV:PMET:TYPE 'NRVS'

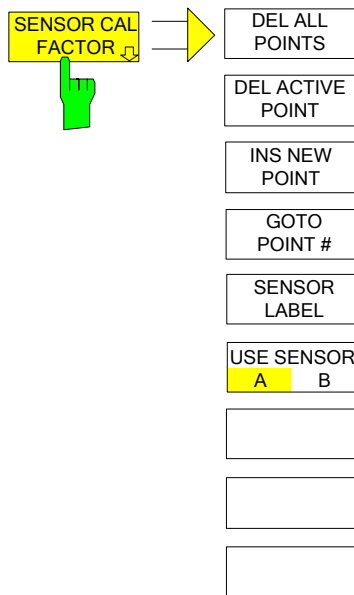
**GPIB ADDRESS**

The *GPIB ADDRESS* softkey opens a data entry field for setting the IEC/IEEE bus address via which the external power meter is addressed for remote-control.

Remote: SYST:COMM:GPIB:RDEV:PMET:ADDR 5

**SENSOR CAL FACTOR**

The *SENSOR CAL FACTOR* softkey opens a submenu for entering the frequency-dependent calibration factor of the power sensor used.



Due to mismatch, loss and change of sensitivity of the power sensor used, frequency-dependent errors occur during the power measurement. The calibration factor of a sensor, which is usually specified in percentage, describes which section of the forward power toward the sensor is actually sampled and displayed. Some power sensors read in the calibration factor from a memory in the sensor and automatically take this factor into account. With other devices (e.g. HP 436A), you have to set the calibration factor manually on the device; however, the factor applies only to a specific frequency. In this case, you can enter a table of the calibration factor above the frequency via the *SENSOR CAL FACTOR* menu; when measurements are performed, this factor is taken into account. You then have to set the calibration factor of 100% on the power meter.

You can enter the calibration factor for two different sensors on up to 20 frequency points each. Depending on the setting of the *USE SENSOR A B* softkey, either the *SENSOR A CAL FACTOR LIST* table or the *SENSOR B CAL FACTOR LIST* table is displayed. In the second line, a name for identifying the sensor is displayed; this name can be defined via the *SENSOR LABEL* softkey. The individual frequency points of the list are detailed below, but they can only be entered in ascending frequency order. Next to the number of the frequency point, there are two editable columns.

**FREQUENCY** – frequency value of the frequency point

**CAL FACTOR** – associated calibration factor in percentage

Linear interpolation occurs between the frequency points of the active calibration factor list. The calibration factors of the lower or upper cut-off frequency apply outside the specified frequency range. In the presetting, the table is empty and no correction has been made, i.e. the calibration factor is generally assumed to be 100%. If the list contains only one frequency point, the **FREQUENCY** field cannot be edited, and **CAL FACTOR** then applies to all frequencies.

```
Remote: SYST:COMM:RDEV:PMET:CFAC:ASEN 2GHZ,99PCT,4GHZ,98PCT
        SYST:COMM:RDEV:PMET:CFAC:BSEN 2GHZ,99PCT,4GHZ,98PCT
```

- DEL ALL POINTS** The *DEL ALL POINTS* softkey deletes all values from the table with the frequency-dependent insertion loss of the power splitter.  
Remote: -
- DEL ACTIVE POINT** The *DEL ACTIVE POINT* softkey deletes the marked value from the table with the frequency-dependent insertion loss of the power splitter.  
Remote: -
- INS NEW POINT** The *INS NEW POINT* softkey inserts a new line where the table is marked.  
Remote: -
- GOTO POINT #** The *GOTO POINT #* softkey sets the marking to the specified line within the table.  
Remote: -
- SENSOR LABEL** The *SENSOR LABEL* softkey sets the marking within the table to the LABEL line so that an alphanumeric label can be entered.  
Remote: SYST:COMM:RDEV:PMET:CFAC:ASEN:LAB 'SENSOR1'  
SYST:COMM:RDEV:PMET:CFAC:BSEN:LAB 'SENSOR2'
- USE SENSOR A B** The *USE SENSOR A/B* softkey switches between the calibration factors of the sensors A and B. Switchover refers both to the table displayed and to the data set used during power calibration.  
Remote: SYST:COMM:RDEV:PMET:CFAC:SEL ASEN | BSEN
- USE REF LEV OFFSET** The *USE REF LEV OFFSET* softkey controls whether the analyzer reference level offset is taken into account of the measured power (state ON) or not (state OFF).  
Remote: SENS1:PMET:ROFF:STAT ON | OFF
- DUTY CYCLE** The *DUTY CYCLE* softkey opens a dialog to set the duty cycle to a percent value for the correction of pulsemulated signals. With the correction activated, the sensor calculates the signal pulse power from this value and the mean power. The softkey is highlighted if the correction is switched on.  
Press the softkey again to switch the Duty Cycle correction off.  
Valid entries are from 0.001 % to 99.999%; the stepsize is 0.1 %; the maximum resolution for numerical entries is 0.001 dB. The default setting is 99.999%  
Remote: SENS1:PMET:DCYC:STAT ON | OFF  
SENS1:PMET:DCYC:VAL 0.001 ... 99.999 PCT
- POWER MTR INFO** The *POWER MTR INFO* softkey open a list showing details of the power sensor:
- | POWER METER INFO |              |
|------------------|--------------|
| Type             | NRP-211      |
| Serial Number    | 100057       |
| Order Number     | 1138.3004.02 |
- Remote: ---



## 5 Remote Control Commands

This chapter describes the remote control commands for the application firmware. An alphabetic list following the text of the manual provides a quick overview of the commands.

The commands that also apply to the base unit in the *SPECTRUM* mode and the system settings are described in the operating manual for the analyzer.

### 5.1 Common Commands

#### OPT?

**OPTION IDENTIFICATION QUERY** polls the options contained in the device and returns a list of installed options. The options are separated by commas. The identifier for option R&S FS-K9 is contained in the response string at position 34:

#### Example:

```
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,K9,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
```

### 5.2 CALCulate:PMETer Subsystem

This subsystem controls the settings of the instrument for measurements with a power sensor. The measurement window is selected via CALCulate1 (SCREEN A) and CALCulate2 (SCREEN B).

#### **CALCulate<1|2>:PMETer:RELative[:MAGNitude] -200 to 200**

---

This command sets the reference value for relative measurements

#### Example

```
CALC:PMET:REL -30
```

'sets the reference value for relative measurements to -30 dBm

#### Characteristics

\*RST value: 0

SCPI: device-specific

#### **CALCulate<1|2>:PMETer:RELative[:MAGNitude]:AUTO ONCE**

---

This command accepts the current result as a reference value for relative measurements

#### Example

```
CALC:PMET:REL:AUTO ONCE
```

'accepts the current result as a reference value for

'relative measurements

#### Characteristics

\*RST value: -

SCPI: device-specific

### CALCulate<1|2>:PMETer:RELative:STATe ON | OFF

---

This command switches between relative and absolute display of the result.

#### Example

```
CALC:PMET:REL:STAT ON
'activates relative display of the result
```

#### Characteristics

\*RST value: OFF

SCPI: device-specific

## 5.3 CALibration Subsystem

The commands of the CALibration subsystem determine the data for system error correction in the instrument.

### CALibration:PMETer:ZERO:AUTO ONCE

---

This command zeroes the power sensor

#### Example

```
CAL:PMET:ZERO:AUTO ONCE;*WAI
'zeroes the power sensor and waits until zeroing is
'completed before executing additional commands
```

#### Characteristics

\*RST value: -

SCPI: device-specific

## 5.4 DISPLAY Subsystem

The DISPLAY subsystem controls the selection and presentation of text and graphics information as well as measurement data on the screen.

The measurement window is selected via WINDOW1 (SCREEN A) or WINDOW2 (SCREEN B).

### **DISPLAY[:WINDOW<1|2>]:TRACE<1 to 3>:Y[:SCALE]:RLEVEL:OFFSET -200 dB to 200 dB**

---

This command defines the reference level offset in the selected measurement window. Depending on the coupling of the measurement windows, this command is valid for both screens (INST:COUP ALL) or only for the selected measurement window (INST:COUP NONE)

The numeric suffix under TRACE <1...3> is irrelevant.

#### **Example**

```
DISP:WIND1:TRAC:Y:RLEV:OFFS -10dB
```

#### **Characteristics**

\*RST value: 0 dB

SCPI: compliant

### **DISPLAY[:WINDOW<1|2>]:PMETER:STATE ON | OFF**

---

This command switches bargraph display on or off for measurements with a power sensor. If bargraph display is switched off, the measurement value appears in the Marker Info field.

#### **Example**

```
DISP:PMET:STAT OFF  
'switches bargraph display off
```

#### **Characteristics**

\*RST value: ON

SCPI: device-specific

## 5.5 FETCh:PMETer Subsystem

This subsystem contains the commands for outputting the results of the measurements with a power sensor without starting the measurement itself.

### FETCh<1|2>:PMETer?

---

This command outputs the result of the power sensor.

If no measurement has been carried out yet, a query error is triggered. This command is strictly a query and thus does not have a \*RST value.

#### Example

```
FETC:PMET?  
'outputs the result of the power sensor
```

#### Characteristics

\*RST value: -

SCPI: device-specific

## 5.6 INITiate Subsystem

The INITiate subsystem is used to control the measurement sequence in the selected measurement window. The measurement window is selected using INITiate1 (SCREEN A) and INITiate2 (SCREEN B)

### INITiate<1|2>:CONTinuous ON | OFF

---

This command determines whether the device performs measurements continuously ("Continuous") or only individual measurements ("Single"). In the spectrum analysis mode, this setting refers to the sweep operation (switchover between Continuous and Single Sweep).

#### Example

```
INIT2:CONT OFF  
'switches operation in screen B to Single Sweep
```

```
INIT2:CONT ON  
'switches operation to Continuous Sweep
```

#### Characteristics

\*RST value: ON

SCPI: compliant

**INITiate<1|2>[:IMMediate]**

This command starts a new measurement sequence in the specified measurement window.

This command starts a new measurement sequence (sweep) in the specified measurement window. A sweep count > 0 or average count > 0 means the number of specified measurements will be restarted. In the case of the trace functions MAXHold, MINHold and AVERage, the previous results are reset when the measurement is restarted.

In the Single Sweep mode, the commands \*OPC, \*OPC? or \*WAI can be used to perform synchronization with the end of the specified number of measurements. In the Continuous Sweep mode, synchronization with the end of the sweep is not possible because the entire measurement "never" actually ends.

**Example**

```
INIT:CONT OFF
'switches to Single Sweep mode
DISP:WIND:TRAC:MODE AVER
'activates Trace Averaging
SWE:COUN 20
'sets the sweep counter to 20 sweeps
INIT;*WAI
'starts the measurement by waiting for the end of 20
'measurements
```

**Characteristics**

\*RST value: -

SCPI: compliant

**5.7 READ:PMETer Subsystem**

This subsystem contains the commands for starting measurements with a power sensor and outputting the results.

**READ<1|2>:PMETer?**

This command triggers a measurement with the power sensor and then outputs the result.

This command is strictly a query and thus does not have a \*RST value.

**Example**

```
READ:PMET
'starts a measurement and output the result
```

**Characteristics**

\*RST value: -

SCPI: device-specific

## 5.8 SENSE:CORRection – Subsystem

This subsystem controls the settings of the power splitter.

**[SENSe<1|2>:]CORRection:PLOs:INPut <numeric\_value>,<numeric\_value> ...**

This command enters the frequency-dependent insertion loss of a power splitter.

### Example

```
CORR:PLOS:INP 1e6,4.6,2e6,4.85
```

### Characteristics

\*RST value: -

SCPI: device-specific

**[SENSe<1|2>:]CORRection:PLOs:INPut:STATe ON | OFF**

This command activates and deactivates automatic consideration of a power splitter that splits the present RF signal between the power meter and the R&S analyzer RF input.

### Example

```
CORR:PLOS:INP:STAT ON
```

### Characteristics

\*RST value: -

SCPI: device-specific

**[SENSe<1|2>:]CORRection:PLOs:INPut:SPATh <numeric\_value>**

This command defines the insertion loss of the power splitter between the signal source and the R&S analyzer RF input. This value is corrected during spectrum and IQ measurements.

### Example

```
CORR:PLOS:INP:SPAT 4 DB
```

### Characteristics

\*RST value: -

SCPI: device-specific

## 5.9 SENSE:PMETer Subsystem

This subsystem controls the settings of the instrument for measurements with a power sensor. The measurement window is selected via SENSE1 (SCREEN A) and SENSE2 (SCREEN B).

### [SENSE<1|2>:]PMETer[:STATe] ON | OFF

This command switches measurements with a power sensor on or off.

#### Example

```
PMET ON
'switches measurements with a power sensor on
```

#### Characteristics

\*RST value: OFF

SCPI: device-specific

### SENSE<1|2>:]PMETer:DCYClE:STATe ON | OFF

This command controls the calculation of the signal pulse power from the mean power. The duty cycle has to be set by SENS:PMET:DCYC:VAL according to characteristics of the input signal if the calculation is switched on.

#### Example

```
SENS:PMET:STAT ON
'activate power meter

SENS:PMET:DCYC:STAT ON
'switch the correction on

SENS:PMET:DCYC:VAL 50.0
'set the duty cycle to 50 %
```

#### Characteristics

\*RST value: OFF

SCPI: device-specific

### [SENSE<1|2>:]PMETer:DCYClE:VALue 0.001 ... 99.999

This command sets the duty cycle to a percent value for the correction of pulsemulated signals. With the correction activated (SENS:PMET:DCYC:STAT ON), the sensor calculates the signal pulse power from this value and the mean power. Valid entries are from 0.001% to 99.999%; the stepsize is 0.1%; the maximum resolution for numerical entries is 0.001%. The default setting is 99.999%

#### Example

```
SENS:PMET:STAT ON
'activate power meter
```

```
SENS:PMET:DCYC:STAT ON
'switch the correction on

SENS:PMET:DCYC:VAL 50.0
'set the duty cycle to 50 %
```

### Characteristics

\*RST value: 99.999 PCT  
 SCPI: device-specific

## [SENSe<1|2>]:PMETer:EXTErn[:STATe] ON | OFF

This command switches measurements with an external power sensor on or off.

### Example

```
PMET:EXT ON
'switches measurements with an external power sensor on
```

### Characteristics

\*RST value: OFF  
 SCPI: device-specific

## [SENSe<1|2>]:PMETer:FREQUency f<sub>min</sub> to f<sub>max</sub>

This command sets the frequency of the power sensor..  
 The limit values f<sub>min</sub> and f<sub>max</sub> are set by the power sensor that is connected.

### Example

```
PMET:FREQ 1GHZ
'sets the frequency of the power sensor to 1 GHz
```

### Characteristics

\*RST value: 50 MHz  
 SCPI: device-specific

## [SENSe<1|2>]:PMETer:FREQUency:LINK CENTer | MARKer1 | OFF

This command sets the coupling for the frequency of the power sensor.

### Parameters

CENTER couples the frequency to the center frequency of the analyzer  
 MARKer1 couples the frequency to the position of marker 1  
 OFF deactivates the coupling of the frequency

### Example

```
PMET:FREQ:LINK CENT
'couples the frequency to the center frequency of the
'analyzer
```



**Characteristics**

\*RST value: CENT

SCPI: device-specific

**[SENSe<1|2>:]PMETer:MTIME SHORT | NORMAl | LONG**

---

This command determines the measurement time of the power sensor.

**Example**

```
PMET:MTIM SHOR
'selects the short time for the measurement of 'stationary
signals with high power
```

**Characteristics**

\*RST value: NORM

SCPI: device-specific

This command defines whether the reference level offset set for the analyzer is taken into account for the measured power or not.

**[SENSe<1|2>:]PMETer:ROFFset:STATe ON | OFF**

---

This command controls whether the analyzer reference level offset is taken into account of the measured power (state ON) or not (state OFF).

**Example**

```
SENS:PMET ON
'switches measurements with a power sensor on

SENS:PMET:ROFF:STAT ON
'switches the reference level offset
```

**Characteristics**

\*RST value: ON

SCPI: device-specific

## 5.10 SYSTEM Subsystem

This subsystem contains the command for setting the external power sensors.

**SYSTEM:COMMunicate:GPIB:RDEvice:PMETer:ADDRESS 0 ... 30**

---

This command sets the IEC/IEEE bus address via which the external power meter is addressed for remote-control.

### Example

```
SYST:COMM:GPIB:RDEV:PMET:ADDR 5"
'Changes the IECBUS address 'of power sensor to 5
```

### Characteristics

\*RST value: -  
SCPI: device-specific

**SY:COMMunicate:RDEvice:PMETer:CFACtor[:SElect] ASENSOR | BSENSOR SYTem**

---

This command switches between the calibration factors of the sensors A and B.

### Example

```
SYST:COMM:RDEV:PMET:CFAC ASEN
```

### Characteristics

\*RST value: -  
SCPI: device-specific

**SYSTEM:COMMunicate:RDEvice:PMETer:CFACtor:ASENSor <num\_value>, <num\_value> ...**

---

This command enters the frequency-dependent calibration factor of the power sensor A.

### Example

```
SYST:COMM:RDEV:PMET:CFAC:ASEN 2GHZ,99PCT,4GHZ,98PCT
```

### Characteristics

\*RST value: -  
SCPI: device-specific

**SYSTEM:COMMunicate:RDEvice:PMETer:CFACtor:ASENSor:LABel <name>**

---

This command sets the marking within the table to the LABEL line so that an alphanumeric label can be entered.

**Example**

```
SYST:COMM:RDEV:PMET:CFAC:ASEN:LAB 'SENSOR1'
```

**Characteristics**

\*RST value: -

SCPI: device-specific

**SYSTem:COMMunicate:RDEvice:PMETer:CFACtor:BSENsor <num\_value>, <num\_value> ...**

---

*This command enters the frequency-dependent calibration factor of the power sensor A.*

**Example**

```
SYST:COMM:RDEV:PMET:CFAC:BSEN 2GHZ,99PCT,4GHZ,98PCT
```

**Characteristics**

\*RST value: -

SCPI: device-specific

**SYSTem:COMMunicate:RDEvice:PMETer:CFACtor:BSENsor:LABel <name>**

---

This command selects the type of external power meter. The R&S NRVS, R&S NRVD power meters from Rohde & Schwarz as well as EPM, 437B and 438A from Hewlett-Packard/Agilent are supported.

**Example**

```
SYST:COMM:RDEV:PMET:CFAC:BSEN:LAB 'SENSOR2'
```

**Characteristics**

\*RST value: -

SCPI: device-specific

**SYSTem:COMMunicate:RDEvice:PMETer:TYPE 'NRVD' | NRVS' | 'EPM' | 437B' | '437A'**

---

This command selects the type of external power meter. The R&S NRVS, R&S NRVD power meters from Rohde & Schwarz as well as EPM, 437B and 438A from Hewlett-Packard/Agilent are supported.

**Example**

```
SYST:COMM:RDEV:PMET:TYPE 'NRVS'
```

**Characteristics**

\*RST value: -

SCPI: device-specific

## 5.11 UNIT Subsystem

The Unit subsystem is used to switch the basic measurement unit of setting parameters. In split-screen display, a distinction is made between UNIT1 (SCREEN A) and UNIT2 (SCREEN B).

### UNIT<1|2>:PMETer:POWER DBM | WATT | W

This command selects the unit for absolute measurements with a power sensor.

#### Example

```
UNIT:PMET:POW DBM
```

#### Characteristics

\*RST value: DBM

SCPI: compliant

## 5.12 Table of Softkeys with Assignment of IEC/IEEE Bus Commands

### 5.12.1 PWR METER Hotkey

PWR METER ON OFF	[SENSe<1 2>:]PMETer[:STATe] ON   OFF
FREQUENCY MANUAL	[SENSe<1 2>:]PMETer:FREQuency:LINK OFF [SENSe<1 2>:]PMETer:FREQuency f <sub>min</sub> .. f <sub>max</sub>
FREQUENCY COUPLING	[SENSe<1 2>:]PMETer:FREQuency:LINK CENTER   MARKer1
UNIT / SCALE	CALCulate<1 2>:PMETer:RELative:STATe ON   OFF UNIT<1 2>:PMETer:POWER DBM   WATT   W UNIT<1 2>:PMETer:POWER:RATio DB   PCT
ZERO	CALibration:PMETer:ZERO:AUTO ONCE
MEAS TIME	[SENSe<1 2>:]PMETer:MTIME SHORT   NORMAl   LONG
MEAS→REF	CALCulate<1 2>:PMETer:RELative[:MAGNitude]:AUTO ONCE
REFERENCE VALUE	CALCulate<1 2>:PMETer:RELative[:MAGNitude] -200 .. 200
RESULT DISPLAY	DISPlay[:WINDow<1 2>]:PMETer:STATe ON   OFF
POWER SPLITTER	DISPlay[:WINDow<1 2>]:PMETer:STATe ON   OFF

USE POWER SPLITTER	[SENSe<1 2>:]CORRection:PLOs:INPut:STATe ON   OFF
INSERTION LOSS	[SENSe<1 2>:]CORRection:PLOs:INPut <numeric_value>
PATH2 INS LOSS	[SENSe<1 2>:]CORRection:PLOs:INPut:SPATH <numeric_value>
DEL ALL POINTS	---
DEL ACTIVE POINTS	---
INS NEW POINTS	---
GOTO POINT #	---
POWER MTR EXT	--
EXTERN MTR ON OFF	[SENSe<1 2>:]PMETer:EXTErn:STATe ON   OFF
TYPE	SYSTem:COMMunicate:RDEvice:PMETer:TYPE 'name'
GPIOB ADDRESS	SYSTem:COMMunicate:GPIOB:RDEvice:PMETer:ADDRess <numeric_value>
SENSOR CAL FACTOR	SYSTem:COMMunicate:RDEvice:PMETer:CFACTOR:ASENSor <numeric_value>, <numeric_value> SYSTem:COMMunicate:RDEvice:PMETer:CFACTOR:BESENSor <numeric_value>, <numeric_value>
DEL ALL POINTS	---
DEL ACTIVE POINTS	---
INS NEW POINTS	---
GOTO POINT #	---
SENSOR LABEL	SYSTem:COMMunicate:RDEvice:PMETer:CFACTOR:ASENSor:LABel 'label' SYSTem:COMMunicate:RDEvice:PMETer:CFACTOR:BESENSor:LABel 'label'
USE SENSOR A B	SYSTem:COMMunicate:RDEvice:PMETer:CFACTOR:SELEct ASENSor   BESENSor
USE REF LEV OFFSET	[SENSe<1 2>:]PMETer:ROFFset:STATe ON   OFF
DUTY CYCLE	SENSe1:PMETer:DCYCLE:STATe ON   OFF SENSe1:PMETer:DCYCLE: VALue 0.001 ... 99.999 PCT
POWER MTR INFO	--

### 5.12.2 AMPL Key

REF LEVEL OFFSET
---------------------

DISPlay[:WINDow<1|2>]:TRACe:Y[:SCALE]:RLEVel:OFFSet -200dB to 200dB

### 5.12.3 SWEEP Key

CONTINUOUS SWEEP
---------------------

INITiate<1|2>:CONTInuous ON

SINGLE SWEEP
-----------------

INITiate<1|2>:CONTInuous OFF

INITiate<1|2>[:IMMediate]

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