



ROHDE & SCHWARZ

Broadcasting
Division

Operating Manual

Remote Control for R&S[®] FSH3-TV

R&S[®] FSHTV-K1

2111.7140.02

R&S FSH – Firmware Version 13.25

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Enabling Remote Control Option R&S FSHTV-K1

The R&S FSH3-TV spectrum analyzer can be fitted with the Remote Control Option R&S FSHTV-K1, which is enabled by entering a key code. The key code is based on the unique serial number of the instrument. To retrofit an option, enable it with a key code.

Operation

- Press the GENERAL key.
- Use the Rotary knob or the Cursor keys to select the OPTIONS... menu item and confirm the entry with the ENTER key.

Enter the key code (ten-digit number) for the option with the decimal keys and confirm with the ENTER key.

If the correct key code is entered, the R&S FSH3-TV displays "Remote Control enabled".

If an invalid key code is entered, the R&S FSH3-TV displays "Option key error".

The correct key code can then be entered.

Connecting PCs

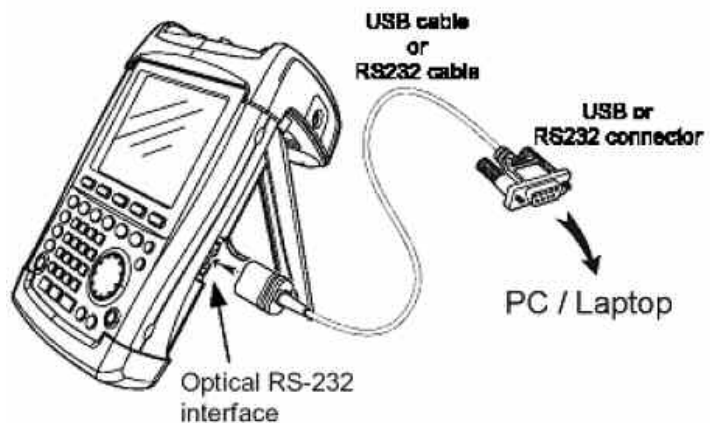
The R&S FSH3-TV can be remote controlled by a PC or Laptop equipped with an USB interface or a RS232 interface.

RS232 optical interface

The RS232 optical interface is used for connecting a PC or Laptop. The interface connector is located at the right-hand side of the R&S FSH3-TV, it can be accessed by folding out the support.

The USB Optical Interface Cable R&S FSH-Z37 (supplied with the R&S FSH3-TV) or the RS232 Optical Interface Cable R&S FSH-Z34 are used to make the connection. The optical connection prevents spurious measurements being caused by interference from these devices.

- Fold out the support at the rear of the R&S FSH3-TV.
- Connect the optical connector of the RS-232 cable to the optical interface on the right-hand side of the R&S FSH3-TV.
- Connect the USB connector of the cable to the USB connector of the PC (R&S FSH-Z37) or the 9-pin D-Sub connector of the cable to the RS-232 connector of the PC (R&S FSH-Z34).
- For the USB cable R&S FSH-Z37: Install the USB driver supplied on the R&S FSH3-TV CD-ROM.



Installation of the driver for the USB optical cable (R&S FSH-Z37)

The USB driver available on the R&S FSH3-TV CD-ROM emulates a serial COM port on the PC. In order to install the driver on a PC equipped with Windows XP or Windows 2000 please proceed as follows:

- Connect the optical USB cable to the PC. The hardware installation wizzard will pop up and state that it has found a USB to serial bridge.
- Insert the R&S FSH3-TV CD-ROM.
- Select "automatic software installation" and press "Next". The installation wizzard will automatically search for the necessary driver and install it.

In case that the wizzard does not find the driver files you will be prompted for manual entry of the corresponding path. The driver is located on the CD-ROM in folder "\drivers\USB".

- Press "Finish" in order to finalize the installation. The USB cable is now ready for use.

Serial Port Configuration

The serial interface configuration on the PC should be set to

8 data bits, 1 stop bit, no parity

The baud rate can be configured via the Setup menu on the R&S FSH3-TV or the SET BAUD command. The baud rates can be 9.600, 19.200, 38.400, 57.600 or 115.200 Baud. The default baud rate is 19.200 Baud

Notational Conventions

The following section describes the notational conventions as they are used throughout this document.

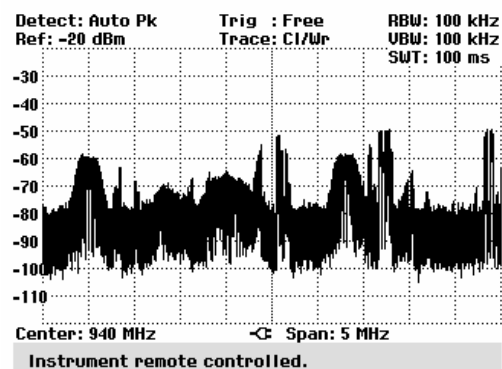
<u>Meta Symbol</u>	<u>Specification</u>
:=	Equals
	Separator for selectable items
“...”	Characters between “ ” are taken as they are, but the “ ” are excluded (example “,” means an ASCII comma).
[...]	Specifies an optional element
{...}	Specifies an element that may be repeated.

<u>Item</u>	<u>Description</u>
<character>	'0' .. '9', 'a' .. 'z', 'A' .. 'Z'
<string>	<character> { <character> }
<sign>	('+' '-')
<digit>	'0' .. '9'
<numeric value>	[<sign>] <digit> { <digit> } [. { <digit> }] [e E [<sign>] { <digit> }]

Starting Remote Control Operation

On power-on, the R&S FSH3-TV is always in the manual operation state (“LOCAL” state) and can be operated via the front panel.

- If the R&S FSH3-TV receives a remote command the instrument remains in local state. It is switched to remote state as soon as it receives the command “REMOTE” from the PC.
- In remote state the front panel access is disabled.
- The R&S FSH3-TV can be switched back to local state by sending the LOCAL command.



Device Messages

The remote control command set of the R&S FSH3-TV can be grouped into three categories:

- **SET commands**

SET commands are used to program parameters of the instrument like center frequency, span, etc.

- **GET commands**

GET commands are used to query current settings and data from the instrument like center frequency, marker, trace data, etc.

- **CMD commands**

CMD commands are used to initiate an action or a state transition in the instrument like marker-to-peak, preset, remote state, etc.

Acknowledge Response <ack>

After receiving a SET, GET or CMD command the R&S FSH3-TV responds with an “acknowledge” message. The acknowledge message consists of an ASCII digit (“0” for no error) followed by a Carriage Return <cr>. The response message indicates if the command or parameter is valid. A second acknowledge response is generated after the command parameter.

<ack> response:

“0”	No Error.
“1”	Syntax Error. This response is generated when the command sent to the instrument is not known or when the timeout on data reception expired. It is also generated, when the parameter or value for the command are in the wrong data format.
“2”	Execution Error. The command sent is not allowed in the current measurement mode.
“3”	Dataset Storage Full. This response is generated when the dataset storage is full.
“4”	Not Allowed. In the current state of the R&S FSH3-TV setting this parameter or value is not allowed.
“5”	Out Of Range. The parameter value is out of range and cannot be programmed.

Timeout

To prevent any lockups in the communication between PC and instrument the data transfer via the serial interface is monitored by the R&S FSH3-TV. There is a timeout time of 60 seconds on every byte received by the instrument. When the time between 2 bytes in a command or parameter send exceeds 60 seconds the R&S FSH3-TV will respond with a ‘Syntax Error’ acknowledge message (“1”<cr>).

Note: When using remote control commands and the sweep time is less than 30 ms (e.g. Zero span) the measurement will stop until the complete command is received (in this case all interrupts are switched off due to the processing of all data points).

Functional Description of Commands

The command strings and parameter strings are not case sensitive, eg 'Freq' is similar to 'FREQ'.

GET Command

GET commands are used to query parameter settings or measured data from the instrument.

Program syntax: get<cr>

Response syntax: <ack><cr>

Program syntax: <parameter><cr>

<parameter> := <string>

This is one of the parameters defined in the following section.

Response syntax: <ack><cr>

<value><cr>

<value>:= This field depends on the type of parameter, see the specific value descriptions

Example: This command queries the unit from the instrument.

```
get<cr>                    (send 'get' command)
0<cr>                      (responds 'command ok')
UNIT<cr>                  (send parameter 'UNIT')
0<cr>                      (responds 'parameter ok')
6<cr>                      (responds UNIT value 'Volt')
```

SET Command

SET commands are used to program parameter and setup settings of the instrument.

Program syntax: set<cr>

Response syntax: <ack><cr>

Program syntax: <parameter>,<value><cr>

<parameter> := <string>

This is one of the parameters defined in the following section.

<value>:= This field depends on the type of parameter, see the specific value descriptions

Response syntax: <ack><cr>

Example: This command sets the unit to Watt.

```
set<cr>                    (send 'set' command)
0<cr>                      (responds 'command ok')
UNIT,7<cr>                (send parameter 'UNIT' value is 'Watt')
0<cr>                      (responds 'parameter ok')
```

CMD Command

CMD commands are used to initiate an action or a state transition on the instrument.

Program syntax: cmd<cr>

Response syntax: <ack><cr>

Program syntax: <parameter>,<value><cr>

<parameter> := <string>

This is one of the commands defined in the following section

<value>:= This field depends on the type of parameter, see the specific value descriptions

Response syntax: <ack><cr>

Example 1: This command sets the instrument in Remote Controlled.

```
cmd<cr>          (send 'cmd' command)
0<cr>           (responds 'command ok')
REMOTE<cr>      (send parameter 'REMOTE')
0<cr>           (responds 'parameter ok')
```

Example 2: This command saves a dataset on the instrument with the name 'test'.

```
cmd<cr>          (send 'cmd' command)
0<cr>           (responds 'command ok')
SAVE, test<cr>   (send parameter 'SAVE' with name 'test')
0<cr>           (responds 'parameter ok')
```

Parameter Overview

In the following tables all parameters and commands are listed with the different measurement modes they are active in.

Note: Parameters are not always available; this depends on the type of measurement selected and other settings.

Get / Set Parameter

Parameter	Analyzer	Receiver Mode	DTV Measurement List	DTV Constellation Diagram	DTV Shoulder Attenuation	ATV Measurement List	ATV Video Scope	ATV Vision Modulation	ATV Carrier Measurements	ATV HUM Measurement	Cable TV CTB	Cable TV CSO	Tracking Gen.	Vector Voltmeter	Isotropic Antenna	Power Sensor	Carrier Noise	Channel Power	Occupied BW	TDMA Power	Distance to Fault
ACCESSORY	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ATVVIDSTD	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ATVGDEL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ATVASTD	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ATVASRC						*															
ATVQFLD						*															
ATVQLN						*															
ATVTLN						*		*													
ATVNFLD						*															
ATVNLN						*															
ATVTB							*														
ATVVOL						*															
ATVUNIT						*	*		*												
ATVXPOS							*														
ATVVVCLVLUNIT						*		*													
ATVSBPOS						*	*	*		*											
ATVSBPOSAUTO						*	*	*		*											
ATVDISP								*		*											
ATVSYNMRK								*													
ATVWHTMRK								*													
AUTOCISPRBW		*																			
AUTODET	*				*			*			*	*	*	*	*		*	*	*	*	*
AUTORBW	*				*						*	*	*	*	*		*	*	*	*	*
AUTOSPAN					*						*	*	*	*	*		*	*	*	*	*
AUTOSWPTIME	*				*						*	*	*	*	*		*	*	*	*	*
AUTOVBW	*				*					*	*	*	*	*	*		*	*	*	*	*
BAUD	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
CABLELEN																					*
CABLEMOD																					*
CALKIT													*	*							
CALKITLEN													*	*							
CHANNEL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Parameter	Analyzer	Receiver Mode	DTV Measurement List	DTV Constellation Diagram	DTV Shoulder Attenuation	ATV Measurement List	ATV Video Scope	ATV Vision Modulation	ATV Carrier Measurements	ATV HUM Measurement	Cable TV CTB	Cable TV CSO	Tracking Gen.	Vector Voltmeter	Isotropic Antenna	Power Sensor	Carrier Noise	Channel Power	Occupied BW	TDMA Power	Distance to Fault
CBLCAROFFS										*	*										
CBLCAROFFSMAN										*	*										
CBLCHBW										*	*										
CBLDISP										*	*										
CBLCSTD												*									
CBLCSOMODE												*									
CBLCSOISECOR											*										
CBLCTBMODE										*											
CBLCTBNOISECOR										*											
CBLMANREFPWR										*	*										
CBLREFPWR										*	*										
CBLREFUNIT										*	*										
CBLSBPOS										*	*										
CBLSBPOSAUTO										*	*										
CHCFREQ				*	*		*	*	*	*	*				*		*	*	*	*	
CHMODE	*	*	*	*	*		*	*	*	*	*				*		*	*	*	*	
CHPWRBW																	*	*	*	*	
CHPWRSTD																	*	*	*	*	
CHPWRGSTD																	*	*	*	*	
CHPWRUNIT																	*	*	*	*	
CHTABLE	*	*	*	*	*		*	*	*	*	*				*		*	*	*	*	
CISPRBW		*																			
CNCHBW																	*	*	*	*	
CNCSTD																	*	*	*	*	
CNMANREFPWR																	*	*	*	*	
CNMEASMODE																	*	*	*	*	
CNMODE																	*	*	*	*	
CNNOISECOR																	*	*	*	*	
CNNORM																	*	*	*	*	
CNPILOTFRQ																	*	*	*	*	
CNPWRDISP																	*	*	*	*	
CNRATIOCHBW																	*	*	*	*	
CNREFMEASMODE																	*	*	*	*	
CNREFPWR																	*	*	*	*	
CNUNIT																	*	*	*	*	
CNVISIONFRQ																	*	*	*	*	
CTRFREQOFFS											*	*					*	*	*	*	
COUPLEDTOREF											*	*					*	*	*	*	
DELTA1	*	*							*	*	*	*	*	*	*	*	*	*	*	*	*
DELTA	*	*							*	*	*	*	*	*	*	*	*	*	*	*	*
DELTAALLON	*	*							*	*	*	*	*	*	*	*	*	*	*	*	*
DELTA1ON	*	*							*	*	*	*	*	*	*	*	*	*	*	*	*
DELTAON	*	*							*	*	*	*	*	*	*	*	*	*	*	*	*
DISPLAY	*	*	*			*							*	*	*	*	*	*	*	*	*
DTFMODE																					*

Parameter	Analyzer	Receiver Mode	DTV Measurement List	DTV Constellation Diagram	DTV Shoulder Attenuation	ATV Measurement List	ATV Video Scope	ATV Vision Modulation	ATV Carrier Measurements	ATV HUM Measurement	Cable TV CTB	Cable TV CSO	Tracking Gen.	Vector Voltmeter	Isotropic Antenna	Power Sensor	Carrier Noise	Channel Power	Occupied BW	TDMA Power	Distance to Fault	
DTV8VSBPFRQ			*		*																	
DTVQAM			*																			
DTVSBPOS			*		*																	
DTVSCNT			*																			
DTVSRATE			*																			
DTVSTD	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
DTVPERS			*																			
DTVVIEW					*																	
DTVPWRUNIT			*	*	*																	
DTVCHBW					*																	
DTVCHBWM					*																	
DTVDISP					*																	
DYNRANGE	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
EXTINPUT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
EXTINOUT			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
FREQ	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
FREQOFFS	*				*			*	*	*	*	*			*		*	*	*	*	*	*
FREQSTART		*																				
FREQSTOP		*																				
LENUNIT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
LIMDEF	*	*			*					*	*	*	*	*	*		*	*	*	*	*	*
LIMLOW	*	*			*					*	*	*	*	*	*		*	*	*	*	*	*
LIMUPP	*	*			*					*	*	*	*	*	*		*	*	*	*	*	*
LIMBEEP	*	*			*					*	*	*	*	*	*		*	*	*	*	*	*
LIMMSG	*	*			*					*	*	*	*	*	*		*	*	*	*	*	*
MARK1	*	*						*		*	*	*	*	*	*							*
MARK	*	*						*		*	*	*	*	*	*							*
MARKALLON	*	*											*	*	*							*
MARK1ON	*	*								*	*	*	*	*	*							*
MARKON	*	*								*	*	*	*	*	*							*
MARKMODE	*	*	*								*	*	*	*	*							*
MARKDEMODO	*	*													*							
MARKTIME	*	*													*							
MARKVOL	*	*													*							
MARKIMPREF													*	*								
MARKMEASY													*	*								
MATHMODE	*																					
MEAS	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MEASTIME		*														*					*	
NDBDOWNVAL	*												*	*								
OBWSTD																				*		
OBWCSTD																				*		
OBWCHBW																				*		
OFFSETLEN												*	*									
PREAMP	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Parameter	Analyzer	Receiver Mode	DTV Measurement List	DTV Constellation Diagram	DTV Shoulder Attenuation	ATV Measurement List	ATV Video Scope	ATV Vision Modulation	ATV Carrier Measurements	ATV HUM Measurement	Cable TV CTB	Cable TV CSO	Tracking Gen.	Vector Voltmeter	Isotropic Antenna	Power Sensor	Carrier Noise	Channel Power	Occupied BW	TDMA Power	Distance to Fault
PRESETSET	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
PWRSSTD															*						*
RANGE	*	*			*			*		*	*	*	*	*	*		*	*	*	*	*
RBW	*	*			*						*	*	*	*	*		*	*	*	*	*
REFLUNIT															*						
REFLVL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
REFLVLOFFS	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
RFINPUT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	*
SCANMODE		*																			
SCANSTART		*																			
SCANSTOP		*																			
SCANSTEP		*																			
SPAN	*				*						*	*	*		*		*	*	*	*	
SWPCONT	*	*			*			*		*	*	*	*	*	*		*	*	*	*	*
SWPTIME	*				*			*		*	*	*	*	*	*		*	*	*	*	*
TDMASTD																					*
TDMACSTD																					*
TGATT													*	*							
TGLVL													*	*							
TGMODE													*	*							
THRLOW		*																			
THRUPP		*																			
TRACEAVG	*				*	*		*			*	*	*	*	*		*	*	*	*	*
TRACEDET	*	*			*	*		*			*	*	*	*	*		*	*	*	*	*
TRACEMODE	*	*			*	*		*			*	*	*	*	*		*	*	*	*	*
TRD1	*	*	*	*	*	*	*	*			*	*					*	*	*	*	*
TRD1X															*						
TRD1Y															*						
TRD1Z															*						
TRD2	*	*	*	*	*	*	*	*			*	*			*		*	*	*	*	*
TRIGDEL	*							*		*			*	*	*		*	*	*	*	*
TRIGLN						*		*													
TRIGLVL	*							*					*	*	*		*	*	*	*	*
TRIGSRC	*	*			*	*		*		*	*	*	*	*	*		*	*	*	*	*
UNIT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
VBW	*				*			*		*	*	*	*	*	*		*	*	*	*	*
VISCARFREQ						*		*	*	*	*	*									
VVREF														*							

Get Parameter

Parameter	Analyzer	Receiver Mode	DTV Measurement List	DTV Constellation Diagram	DTV Shoulder Attenuation	ATV Measurement List	ATV Video Scope	ATV Vision Modulation	ATV Carrier Measurements	ATV HUM Measurement	Cable TV CTB	Cable TV CSO	Tracking Gen.	Vector Voltmeter	Isotropic Antenna	Power Sensor	Carrier Noise	Channel Power	Occupied BW	TDMA Power	Distance to Fault	
ATVREFLVL						*	*		*													
ATVCFO						*			*													
ATVVDET						*	*															
ATVSSEP						*	*	*		*												
ATVLBAR						*																
ATVSNBAR						*																
ATVSNNOM						*																
ATVAMCAR						*																
ATVFMCAR						*																
ATVFM1CAR						*																
ATVFM2CAR						*																
ATVNICAR						*																
ATVFMMODE						*																
ATVBTSCMODE						*																
ATVNIMODE						*																
ATVNIBER						*																
ATVRPC								*														
ATVMODDEPTH								*														
ATVHUM										*												
ATVFM PWR									*													
ATVFM OFFS									*													
ATVFMDEV																						
ATVFM1PWR									*													
ATVFM1OFFS									*													
ATVFM1DEV																						
ATVFM2PWR									*													
ATVFM2OFFS									*													
ATVFM2DEV																						
ATVAMPWR									*													
ATVAMOFF									*													
ATVNICAMPWR									*													
ATVVCLVL						*			*													
CABLELOSS													*	*								
CCORRTRACE													*	*								
CCORRTRACEBIN													*	*								
CBLREFVALUE										*	*											
CBLVALUE										*	*											
CHPWR																		*				
CNVALUE																	*					
CTRACE													*	*								*
CTRACEBIN													*	*								*
DELTAALL?	*	*											*	*	*							*

Parameter	Analyzer	Receiver Mode	DTV Measurement List	DTV Constellation Diagram	DTV Shoulder Attenuation	ATV Measurement List	ATV Video Scope	ATV Vision Modulation	ATV Carrier Measurements	ATV HUM Measurement	Cable TV CTB	Cable TV CSO	Tracking Gen.	Vector Voltmeter	Isotropic Antenna	Power Sensor	Carrier Noise	Channel Power	Occupied BW	TDMA Power	Distance to Fault	
DTVBER			*	*																		
DTVBERCOUNT			*	*																		
DTVBERMAX			*	*																		
DTVDBSTAT			*	*																		
DTVEVMDB			*	*																		
DTVEVMPCT			*	*																		
DTVFEC			*	*																		
DTVCONST			*	*																		
DTVDBSTAT			*	*																		
DTVMERDB			*	*																		
DTVMERPCT			*	*																		
DTVPERSER			*	*																		
DTVPCTSTAT			*	*																		
DTVPERSERCOUNT			*	*																		
DTVPERSERMAX			*	*																		
DTVREFLVL			*	*																		
DTVRFOFFS			*	*																		
DTVSYOFFS			*	*																		
DTVTSR			*	*																		
DTVPWR			*	*	*																	
DTVSHATLWR					*																	
DTVSHATUPP					*																	
ELCABLENVAL													*	*								
EXTREF	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
IDN?	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
LEVEL		*	*																			
LIMCHKREMOTE		*	*																			
LIMLIST	*	*			*			*		*	*	*	*	*	*		*	*	*	*	*	*
LIMPASS	*	*			*				*	*	*	*	*	*	*		*	*	*	*	*	*
MARKALL?	*	*						*					*	*	*							*
MTRACE	*	*			*			*		*	*	*	*	*	*		*	*	*	*	*	*
MTRACEBIN	*	*			*			*		*	*	*	*	*	*		*	*	*	*	*	*
OCCBW																			*			
NDBDOWN	*														*							
PRESCALRES	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
PWR																*						
REFL																*						
REFLCAL													*	*								*
REFLVECTCAL													*	*								*
STB?	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
TDMAPWR																				*		
TEMP	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
THRPASS		*	*																			
TRACE	*	*						*		*	*	*	*	*	*		*	*	*	*	*	*
TRACEBIN	*	*						*		*	*	*	*	*	*		*	*	*	*	*	*

Parameter	Analyzer	Receiver Mode	DTV Measurement List	DTV Constellation Diagram	DTV Shoulder Attenuation	ATV Measurement List	ATV Video Scope	ATV Vision Modulation	ATV Carrier Measurements	ATV HUM Measurement	Cable TV CTB	Cable TV CSO	Tracking Gen.	Vector Voltmeter	Isotropic Antenna	Power Sensor	Carrier Noise	Channel Power	Occupied BW	TDMA Power	Distance to Fault		
TRANSCAL													*	*									
TRANSVECTCAL													*	*									
TVCALRES	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
VECTVOLT													*										

CMD Commands

Parameter	Analyzer	Receiver Mode	DTV Measurement List	DTV Constellation Diagram	DTV Shoulder Attenuation	ATV Measurement List	ATV Video Scope	ATV Vision Modulation	ATV Carrier Measurements	ATV FUM Measurement	Cable TV CTB	Cable TV CSO	Tracking Gen.	Vector Voltmeter	Isotropic Antenna	Power Sensor	Carrier Noise	Channel Power	Occupied BW	TDMA Power	Distance to Fault	
ATVRESETMARK								*														
ATVSHOWMLST								*														
ATVHIDEMLST								*														
CALPRES	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
CAL_DTF																						*
CAL_TGSCLRFL													*	*								
CAL_TGSCLTRN													*	*								
CAL_TGVECRFL													*	*								
CAL_TGVECTRN													*	*								
INIT	*	*		*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
CALTV	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
LOCAL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
LVLADJUST			*	*	*	*	*	*	*	*	*	*					*	*	*	*	*	
DTVLVLADJUSTLWR					*																	
DTVLVLADJUSTUPP					*																	
MARKNXTPK	*	*							*	*	*	*	*	*	*							*
MARKPK	*	*							*	*	*	*	*	*	*							*
MARKMIN	*	*							*	*	*	*	*	*	*							*
MARKTOCENT	*								*	*	*	*	*	*	*							*
ATVMRKTOCTR							*															
LIMDEL	*	*		*					*	*	*	*	*	*	*		*	*	*	*	*	*
MARKTOLVL	*	*							*	*	*	*	*	*	*							*
MARKREF							*															
MARKABS							*															
MARKREL							*															
PRESET	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
PWRTOREF																*						
RECALL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
REMOTE	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
RESTART			*	*																		
SAVE	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
THROFF		*																				
TRACETOMEM	*																					
WAIT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ZERO																*						
DTVWAITMER			*	*																		
DTVWAITCD			*	*																		
VVTOREF														*								

Note: When the instrument is in the state standby (Off) only the parameters IDN?, BAUD and MEAS are available.

Command Description

General Commands

Command	Parameters	Unit	Comment
IDN?			GET command only
BAUD	0...4		SET command only
REMOTE			
LOCAL			
PRESETSET	0...1		
PRESET			
INIT			
WAIT			
STB?			GET command only
EXTINPUT	0, 1		
EXTINOUT	0...3		
SAVE	<string>		
RECALL	<string>		
EXTREF	0...3		GET command only
DISPLAY	0...1		
PRESFILTPATH	0, 1		
CALPRES			
CALTV			
PRESCALRES	0, 1, 100, 200, 300		GET command only
TVCALRES	0, 100, 200, 300		GET command only
TEMP			GET command only

IDN?

This command returns the instrument ID string.

This string contains: <manufacturer>,<model number>,<serial number>,<software version>.

<model number>: 63 for the according FSH3-TV model

Example:

```
get<cr>
0<cr>
idn?<cr>
0<cr>
Rohde&Schwarz, 63, 100212, V10.15
```

'query ID string
'responds parameter ok
'instrument ID string

BAUD (Serial baud rate)

This command sets the serial interface baud rate. The default baud rate is 19.200 Baud.

Value	Baud rate
0	19.200
1	38.400
2	57.600
3	115.200
4	9.600

Example:

```

set<cr>
0<cr>
baud,3<cr>           'set baud rate on 115.200
0<cr>                'responds ok with current baud rate
                    'instrument is set to new baud rate
    
```

REMOTE

This command sets the instrument to remote state. Front panel interaction is disabled.

Example:

```

cmd<cr>
0<cr>
remote<cr>           'set instrument to remote
0<cr>                'responds parameter ok
    
```

LOCAL

This command sets the instrument to local state. Front panel operation is enabled.

Example:

```

cmd<cr>
0<cr>
local<cr>            'set instrument to local
0<cr>                'responds parameter ok
    
```

PRESETSET (Preset Setting)

This command selects the preset settings. When selecting the Custom Preset Setting a Preset Dataset must be available.

Value	Preset Setting
0	Default
1	Custom

Example:

```
set<cr>
0<cr>
presetset,1<cr>
0<cr>
```

'use custom preset settings'
'responds parameter ok'

PRESET

This command sets the instrument to the preset settings.

Example:

```
cmd<cr>
0<cr>
preset<cr>
0<cr>
```

'set instrument to preset'
'responds parameter ok'

INIT

This command starts / re-starts a new sweep.

Example:

```
cmd<cr>
0<cr>
init<cr>
0<cr>
```

'start new sweep'
'responds parameter ok'

WAIT

This command is used to synchronize with the end of a sweep. After sending the WAIT command the <ack> acknowledge is holdoff until the sweep is complete.

Example:

```
cmd<cr>
0<cr>
wait<cr>
0<cr>
```

'wait for end of sweep'
'responds parameter ok, sweep complete'

Note 1: For DTV-LIST measurement the acknowledge is holdoff until valid power measurement results are available

Note 2: For DTV-CONSTELLATION measurement the acknowledge is holdoff until valid power measurement results are available.

Note 3: For ATV-LIST measurement the acknowledge is holdoff until valid vision carrier level measurement results are available.

Note 4: For CARRIER MEASUREMENTS measurement the acknowledge is holdoff until valid vision carrier level measurement results are available.

STB?

This command returns the instrument status. The status indicates any settings/conditions that causes measurements to be questionable (response: '1') or not (response '0').

Example:

```

get<cr>
0<cr>
stb?<cr>                                'query status
0<cr>                                    'responds parameter ok
0<cr>                                    'status: o.k.
```

EXTINPUT (External Input)

This command switches between external trigger input and external reference input on the external input connector. Default is 'External Trigger'.

Value	External Input Connector
0	External Trigger
1	External Reference

Example:

```

set<cr>
0<cr>
extinput,1<cr>                            'enable external reference on input connector
0<cr>                                    'responds parameter ok
```

EXTINOUT

This command switches input/output connector. Default is 'External Trigger (input)'.

Value	External Input/output Connector
0	External Trigger (input)
1	External Reference (input)
2	TS-ASI (output)
3	CCVS (output)

Example:

```

set<cr>
0<cr>
extinout,2<cr>                            'enable external TS-ASI on input/output connector
0<cr>                                    'responds parameter ok
```

SAVE

This command saves the current setting and measurement in the specified dataset. If the dataset exists it will be overwritten. Dataset names are not case sensitive.

Example:

```

cmd<cr>
0<cr>
save,mydata.001<cr>                       'save settings to dataset "MYDATA.001"
0<cr>                                    'responds parameter ok
```

RECALL

This command recalls a stored dataset. Dataset names are not case sensitive.

Example:

```
cmd<cr>
0<cr>
recall,mydata.001<cr>
0<cr>
```

'recall settings from dataset "MYDATA"
'responds parameter ok

EXTREF (External Reference status)

This command returns the external reference status.

Value	Status external reference
0	Disabled
1	Out of range
2	Catching
3	Locked

Example:

```
get<cr>
0<cr>
extref<cr>
0<cr>
1<cr>
```

'get status of external reference
'responds parameter ok
'response status out of range

DISPLAY

This command turns the display on or off.

Value	
0	Off
1	On

Example:

```
set<cr>
0<cr>
display,0<cr>
0<cr>
```

'turn display off
'responds parameter ok

PRESFILTPATH (PRESelector FILTER PATH)

This command sets the Preselector Filter Path.

Value	Filter Path
0	FILTER PATH
1	BYPASS PATH

Example:

```

set<cr>
0<cr>
presfiltpath,1<cr>      'set preselector to bypass path
0<cr>                  'responds ok
    
```

CALPRES (CALibrate PRESelector)

This command initiates a Preselector calibration.

Example:

```

cmd<cr>
0<cr>
calpres<cr>            'initiate preselector calibration
0<cr>                  'responds ok
    
```

Note 1: To check if the calibration is ready, the WAIT command can be used

Note 2: Remove all input signals before starting this calibration

Note 3: Calibration result can be queried via PRESCALRES command

CALTV (CALibrate TV)

This command initiates a calibration of ATV and DTV power measurements.

Example:

```

cmd<cr>
0<cr>
caltv<cr>              'initiate tv calibration
0<cr>                  'responds ok
    
```

Note 1: To check if the calibration is ready, the WAIT command can be used

Note 2: Remove all input signals before starting this calibration

Note 3: Calibration result can be queried via TVCALRES command

PRESCALRES (PRESelector CALibration RESult)

This command gets the Preselector Calibration Result.

Value	Filter Path
0	OK
1	GENERAL ERROR
100	CALIBRATION GENERATOR LEVEL OUT OF RANGE
200	GAIN OUT OF RANGE
300	ATTENUATION OUT OF RANGE

Example:

```

get<cr>
0<cr>
prescalres<cr>           'get preselector calibration result
0<cr>                   'responds ok
100<cr>                 'responds Generator level out of range

```

TVCALRES (TV CALibration RESult)

This command gets the TV Calibration Result.

Value	Filter Path
0	OK
100	DELTA TEMPERATURE DURING CALIBRATION TOO HIGH
200	ONE OR MORE MEASUREMENTS FAILED
300	CALIBRATION LEVEL OUT OF RANGE

Example:

```

get<cr>
0<cr>
tvcalsres<cr>           'get Tv calibration result
0<cr>                   'responds ok
100<cr>                 'responds Delta temp too high

```

TEMP (Temperature)

This command returns the current temperature inside the instrument.

Example:

```

get<cr>
0<cr>
temp<cr>                'query temperature
0<cr>                   'responds parameter ok
32.6                    'instrument temperature (Celsius)

```

Frequency and Span Settings

Command	Parameters	Unit	Comment
FREQ	<numeric value>	Hz	
FREQOFFS	<numeric value>	Hz	
SPAN	<numeric value>	Hz	
AUTOSPAN	0, 1		
CHANNEL	<numeric value>		
CHTABLE	<string>		
CHCFREQ	<numeric value>	Hz	
VISCARFREQ	<numeric value>	Hz	
CTRFREQOFFS	<numeric value>	Hz	

FREQ (Frequency)

This command sets the center frequency.

The start and stop frequency of the instrument is defined by the current center frequency and span.

Example:

```
set<cr>
0<cr>
freq,950E6<cr>           'set center frequency to 950 MHz
0<cr>                   'responds parameter ok
```

FREQOFFS (Frequency Offset)

This command sets the frequency offset.

The new center frequency is the current frequency plus the frequency offset.

Example:

```
set<cr>
0<cr>
freqoffs,10E6<cr>       'set frequency offset to 10 MHz
0<cr>                   'responds parameter ok
```

SPAN

This command sets the span.

The start and stop frequency of the instrument is defined by the current center frequency and span.

The <numeric value> = 0 is used for Zero Span.

Example:

```
set<cr>
0<cr>
span,20E6<cr>           'set span to 20 MHz
0<cr>                   'responds parameter ok
```

AUTOSPAN

This command switches span mode AUTO on/off (Measure Mode: Channel Power or Occupied BW)

Value	Span Mode
0	Auto Off
1	Auto On

Example:

```
set<cr>
0<cr>
autospan,1<cr> 'set Auto span On
0<cr>           'responds parameter ok
```

CHANNEL (Channel Number)

This command defines the channel number. Use CHTABLE command to select a channel table first.

Example:

```
set<cr>
0<cr>
channel,55<cr> 'selects channel no. 55
```

CHTABLE (Channel Table)

This command selects a channel table for the channel mode.

Example:

```
set<cr>
0<cr>
chtable,FMBand<cr> 'selects channel table "FMBand"
0<cr>              'responds parameter ok
```

CHCFREQ (CHannel Center FREQUENCY)

This command sets the channel center frequency.

Example:

```
set<cr>
0<cr>
chcfreq,950E6<cr> 'set channel center frequency to 950 MHz
0<cr>              'responds parameter ok
```

VISCARFREQ (VISION CARRIER FREQUENCY)

This command sets the vision carrier frequency.

Example:

```
set<cr>
0<cr>
viscarfreq,950E6<cr> 'set vision carrier center frequency to 950 MHz
0<cr>                'responds parameter ok
```

CTRFREQOFFS (Coupled To Reference channel - FREQuency OFFSet)

This command couples the frequency of the noise channel in Carrier / Noise measurements or the frequency of the CTB or CSO channel in Cable TV measurements to the frequency of the reference channel. The command sets the frequency offset of the noise, CTB or CSO channel from the reference channel.

Example:

```

set<cr>
0<cr>
ctrfreqoffs,16E6<cr> 'set frequency offset from ref. channel to 16 MHz
0<cr>                 'responds parameter ok
    
```

COUPLEDTOREF (Coupled To Reference channel)

This command couples the frequency of the noise channel in Carrier / Noise measurements or the frequency of the CTB or CSO channel in Cable TV measurements to the frequency of the reference channel.

Value	CoupledToRef
0	Off
1	On

Example:

```

set<cr>
0<cr>
1coupledtoref,1<cr> 'set coupled to on
0<cr>                 'responds parameter ok
    
```

Amplitude Settings

Command	Parameters	Unit	Comment
REFLVL	<numeric value>		Uses current unit
REFLVLOFFS	<numeric value>	dB	
RANGE	0...36, 253...255		
DYNRANGE	0, 2		
UNIT	0...8		
RFINPUT	0, 1		
PREAMP	0, 1		

REFLVL (Reference Level)

This command sets the reference level using the current unit.

Example:

```
set<cr>
0<cr>
reflvl,-30<cr>      'set reference level to -30dBm
0<cr>              'responds parameter ok
```

REFLVLOFFS (Reference Level Offset)

This command sets the reference level offset in dB.
The new reference level is the current reference level plus the reference level offset.

Example:

```
set<cr>
0<cr>
reflvloffs,-6<cr>  'set reference level offset to -6 dB
0<cr>              'responds parameter ok
```

RANGE

This command defines the range.

Value	Range
0	10 dB/DIV
1	5 dB/DIV
2	2 dB/DIV
3	1 dB/DIV
4	LIN 0-100%
5	VSWR 1-6 (Tracking Gen, DTF)
6	VSWR 1-2 (Tracking Gen, DTF)
7	VSWR 1-1.5 (Tracking Gen, DTF)
8	VSWR 1-1.1 (Tracking Gen, DTF)
9	Smith Chart
10	0,001 Rho/DIV
11	0,01 Rho/DIV
12	0,1 Rho/DIV
13	1 Rho/DIV
14	1 mRho/DIV
15	10 mRho/DIV
16	100 mRho/DIV
17	1000 mRho/DIV
18	0,1 dB/DIV
19	VSWR 1-10 (Tracking Gen, DTF)
20	VSWR 1-20 (Tracking Gen, DTF)
21	Degrees
22	1 ns/DIV
23	2 ns/DIV
24	5 ns/DIV
25	10 ns/DIV
26	20 ns/DIV
27	50 ns/DIV
28	100 ns/DIV
29	0,003 Rho/DIV
30	0,03 Rho/DIV
31	0,3 Rho/DIV
32	3 mRho/DIV
33	30 mRho/DIV
34	300 mRho/DIV
35	0,2 dB/DIV
36	0,5 dB/DIV

Example:

```
set<cr>
0<cr>
range,2<cr>
0<cr>
```

'set range to 2 dB/DIV
'responds parameter ok

DYNRANGE (Dynamic Range)

This command defines the dynamic range. Default on Preset is 'Low Distortion'.

Value	Range
0	Low Distortion
1	Low Noise
2	High Dynamic

Example:

```
set<cr>
0<cr>
dynrange,1<cr>
0<cr>
```

'set dynamic range to 'Low Noise'
'responds parameter ok

UNIT

This command defines the unit of the level.

Value	Unit
0	dBm
1	dBmV
2	dB μ V
3	dB μ V/m
4	dB μ A/m
5	dB
6	Volt
7	Watt
8	V/m

Example:

```
set<cr>
0<cr>
unit,2<cr>
0<cr>
```

'set unit to dB μ V
'responds parameter ok

RFINPUT (RF Input Impedance)

This command defines the input impedance.

Value	Input Impedance
0	50 Ω
1	75 Ω

Example:

```
set<cr>
0<cr>
rfinput,1<cr>
0<cr>
```

'set input impedance to 75 Ω
'responds parameter ok

PREAMP (Preamplifier)

This command switches the preamplifier on/off. Default on Preset is 'Preamp OFF'

Value	Preamp
0	OFF
1	ON

Example:

```
set<cr>
0<cr>
preamp,1<cr> 'turns the preamp on
0<cr> 'responds parameter ok
```


Bandwidth Settings

Command	Parameters	Unit	Comment
AUTORBW	0, 1		
RBW	0...10		
AUTOVBW	0, 1		
VBW	0...12		
AUTO CISPRBW	0, 1		Receiver Mode only (R&S FSH-K3)
CISPRBW	0...3		Receiver Mode only (R&S FSH-K3)

AUTORBW (Auto Resolution Bandwidth)

This command switches the auto coupling of the resolution bandwidth on/off. If AUTORBW is active the current setting of the resolution bandwidth can be queried with the GET RBW command.

Value	Auto Resolution Bandwidth
0	OFF
1	ON

Example:

```
set<cr>
0<cr>
autorbw,1<cr>      'turns the RBW auto coupling on
0<cr>              'responds parameter ok
```

RBW (Resolution Bandwidth)

This command sets the resolution bandwidth.

Value	Resolution Bandwidth
0	Auto (Set only)
1	100 Hz (Not available for model 13)
2	300 Hz (Not available for model 13)
3	1 kHz
4	3 kHz
5	10 kHz
6	30 kHz
7	100 kHz
8	300 kHz
9	1 MHz
10	200 kHz

Example:

```
set<cr>
0<cr>
rbw,4<cr>          'set resolution bandwidth to 3 kHz
0<cr>              'responds parameter ok
```

AUTOVBW (Auto Video Bandwidth)

This command switches the auto coupling of the video bandwidth on/off. If AUTOVBW is active the current setting of the video bandwidth can be queried with the GET VBW command.

Value	Auto Video Bandwidth
0	OFF
1	ON

Example:

```
set<cr>
0<cr>
autovbw,1<cr>
0<cr>
```

'turns the VBW auto coupling on
'responds parameter ok

VBW (Video Bandwidth)

This command sets the video bandwidth.

Value	Video Bandwidth
0	Auto (Set only)
1	10 Hz
2	30 Hz
3	100 Hz
4	300 Hz
5	1 kHz
6	3 kHz
7	10 kHz
8	30 kHz
9	100 kHz
10	300 kHz
11	1 MHz
12	3 MHz

Example:

```
set<cr>
0<cr>
vbw,5<cr>
0<cr>
```

'set video bandwidth to 1 kHz
'responds parameter ok

AUTOCISPRBW (Auto CISPR Bandwidth)

This command switches the auto setting of the CISPR bandwidth on/off. If AUTOCISPRBW is active the current setting of the CISPR bandwidth can be queried with the GET CISPRBW command. This command is available in Receiver Mode only (R&S FSH-K3).

Value	Auto CISPR Bandwidth
0	OFF
1	ON

Example:

```
set<cr>
0<cr>
autocisprbw,1<cr>
0<cr>
```

'turns the CISPRBW auto coupling on
'responds parameter ok

CISRBW (CISPR Bandwidth)

This command sets the CISPR bandwidth. This command is available in Receiver Mode only (R&S FSH-K3).

Value	CISPR Bandwidth
0	200 Hz
1	9 kHz
2	120 kHz
3	1 MHz

Example:

```
set<cr>
0<cr>
cisprbw,2<cr>
0<cr>
```

'set CISPR bandwidth to 120 kHz
'responds parameter ok

Sweep Settings

Command	Parameters	Unit	Comment
AUTOSWPTIME	0, 1		Value 0: Auto
SWPTIME	<numeric value>	s	
SWPCONT	0, 1		
TRIGSRC	0...3		
TRIGLVL	<numeric value>	%	
TRIGDEL	<numeric value>	s	

AUTOSWPTIME (Auto Sweep Time)

This command switches the auto coupling of the sweep time on/off. If AUTOSWPTIME is active the current setting of the sweep time can be queried with the GET SWPTIME command.

Value	Auto Sweep Time
0	OFF
1	ON

Example:

```

set<cr>
0<cr>
autoswptime,1<cr>      'turns the sweep time auto on
0<cr>                  'responds parameter ok
    
```

SWPTIME (Sweep Time)

This command sets the sweep time. The value 0 sets the sweep time to Auto.

Example:

```

set<cr>
0<cr>
swptime,0.2<cr>        'set resolution bandwidth to 200 ms
0<cr>                  'responds parameter ok
    
```

SWPCONT (Sweep Continuous)

This command sets the instrument to single sweep or continuous sweep.

Value	Sweep
0	Single
1	Continuous

Example:

```

set<cr>
0<cr>
swpcont,0<cr>          'set to single sweep
0<cr>                  'responds parameter ok
    
```

TRIGSRC (Trigger Source)

This command selects the trigger source.

Value	Trigger Source
0	Free run
1	Video
2	External - Rise
3	External - Fall
4	TV line
5	TV all lines
6	TV line external
7	TV all lines external
8	External Gate

Example:

```
set<cr>
0<cr>
trigsrc,1<cr>
0<cr>
```

'set to video trigger
'responds parameter ok

TRIGLVL (Trigger Level)

This command defines the video trigger level (0...100%).

Example:

```
set<cr>
0<cr>
trigLVL,50<cr>
0<cr>
```

'set video trigger level to 50%
'responds parameter ok

TRIGDEL (Trigger Delay)

This command defines the trigger delay.

Example:

```
set<cr>
0<cr>
trigdel,100E-6<cr>
0<cr>
```

'set trigger delay to 100 μ s
'responds parameter ok

TRIGLN (Trigger LiNe)

This command defines the trigger line in case of TV line triggering.

Example:

```
set<cr>
0<cr>
trigln,55<cr>
0<cr>
```

'set trigger line to 55
'responds parameter ok

Trace Settings

Command	Parameters	Unit	Comment
TRACEMODE	0..4		
WRAPPHASE	0,1		
TRACEDET	0..6		
TRACEAVG	2...999		
TRACE	<numeric value>,....		GET command only
TRACEBIN	<value>,...		GET command only
TRACETOMEM			CMD command only
CCORRTRACE	<numeric value>,....		GET command only
CCORRTRACEBIN	<value>,...		GET command only
CTRACE	<numeric value>,....		GET command only
CTRACEBIN	<value>,...		GET command only
MATHMODE	<numeric value>		
MTRACE	<string>		GET command only
MTRACEBIN	<string>		GET command only

TRACEMODE

This command defines the trace mode.

Value	Trace Mode
0	Clear Write
1	Average
2	Max Hold
3	Min Hold
4	View

Example:

```
set<cr>
0<cr>
tracemode,2<cr>
0<cr>
```

'set trace mode to "Max Hold"
'responds parameter ok

WRAPPHASE (Phase Wrapping)

This command defines the phase wrapping.

Value	Phase Wrapping
0	Unwrap
1	Wrap

Example:

```
set<cr>
0<cr>
wrapphase,0<cr>
0<cr>
```

'set wrap phase to unwrap
'responds parameter ok

Note: This command is available in Tracking Generator only with measurement modes Smith Chart, Phase or Vector Magnitude active.

TRACEDET (Trace Detector)

This command defines the detector used. The Average and Quasi-Peak detector are available in Receiver Mode (R&S FSH-K3) only.

Value	Detector
0	Auto Peak
1	Min Peak
2	Max Peak / Peak
3	Sample
4	RMS
5	Average
6	Quasi-Peak

Example:

```

set<cr>
0<cr>
tracedet,3<cr>
0<cr>

```

'responds parameter ok
'selects sample detector
'responds parameter ok

TRACEAVG (Trace Average)

This command sets the number of traces used to calculate the trace average

Example:

```

set<cr>
0<cr>
traceavg,50<cr>
0<cr>

```

'calculate trace average over 50 traces
'responds parameter ok

TRACE (Trace Data)

This command reads out the trace data in alphanumeric format.

The current unit is used for the values. A trace consists of 301 data values. If the Auto Peak detector is used, both max and min values are returned (602 values: 301 min values then 301 max values).

Example:

```

get<cr>
0<cr>
trace<cr>
0<cr>
-103.22,-106.88,-96.27,.....

```

'readout trace data
'responds parameter ok

Note: In case of TRG measMode Phase, the phase data in unit radiants is returned. Dependent on the wrap mode the wrapped or unwrapped phase values are provided.

TRACEBIN (Trace Data Binary)

This command reads out the trace data in binary format. Each sample consists of 4 bytes with the LSB send first. The 4 bytes represent the measured power in the current unit. The sample values are multiplied to provide the highest resolution possible.

Value	Binary values
0	dBm * 1000
1	dBmV * 1000
2	dBµV * 1000
3	dBµV/m * 1000
4	dBµA/m * 1000
5	dB * 1000
6	Volt * 1000000
7	Watt * 1000000000
8	Degrees * 1000
9	Seconds * 1000000

A trace consists of 301 samples. If the Auto Peak detector is used, both Max and Min values are returned (602 samples: 301 min values then 301 max values).

Example:

```

get<cr>
0<cr>
tracebin<cr>           'readout binary trace data
0<cr>                 'responds parameter ok
<sample><sample>....
    
```

TRACETOMEM (Copy current trace to memory)

This command stores the current trace to memory.

Example:

```

cmd<cr>
0<cr>                 'responds parameter ok
tracetomem<cr>       'store the current trace to memory
0<cr>                 'responds parameter ok
    
```

CCORRTRACE (Complex Corrected Trace Data)

This command reads out the corrected magnitude and phase values in alphanumeric format. The magnitude unit is dB, the phase unit is radians. Dependant on the wrap mode the wrapped or unwrapped phase values are provided.

A complex trace consists of 301 magnitude and 301 phase values.

Example:

```

get<cr>
0<cr>
ccorrtrace<cr>       'readout corrected trace data
0<cr>                 'responds parameter ok
-103.22,-106.88,-96.27,.....
    
```

Note: This command is only supported in Tracking Generator Measurement when vector calibrated and not in measMode groupDelay.

CCORRTRACEBIN (Complex Corrected Trace Data Binary)

This command reads out the corrected magnitude and phase values in binary format. Dependent on the wrap mode the wrapped or unwrapped phase values are provided.

Value	Binary values
0	dB * 1000
1	Radians * 1000

A complex trace consists of 301 magnitude and 301 phase values.

Example:

```

get<cr>
0<cr>
ccorrtracebin<cr>           'readout corrected binary trace data
0<cr>                       'responds parameter ok
<sample><sample>....

```

Note: This command is only supported in Tracking Generator Measurement when vector calibrated and not in measMode groupDelay.

CTRACE (Complex Trace Data)

This command reads out the magnitude and phase values in alphanumeric format. The magnitude unit is dBm, the phase unit is radians. A complex trace consists of 301 magnitude and 301 phase values. If In DTF mode CTRACE will return 1024 magnitude and 1024 phase values.

Example:

```

get<cr>
0<cr>
ctrace<cr>                   'readout magnitude and phase values
0<cr>                         'responds parameter ok
-103.22, -106.88, -96.27, .....

```

Note: This command is only supported in DTF measurement and in Tracking Generator Measurement when vector calibrated.

CTRACEBIN (Complex Trace Data Binary)

This command reads out the magnitude and phase values in binary format. A complex trace consists of 301 magnitude and 301 phase sample values. If In DTF mode CTRACE will return 1024 magnitude and 1024 phase sample values. Each sample consists of 4 bytes with the LSB send first.

Value	Binary values
0	dB * 1000
1	Radiants * 1000000

Example:

```

get<cr>
0<cr>
ctracebin<cr>           'readout binary complex trace data
0<cr>                   'responds parameter ok
<sample><sample>....
    
```

Note: This command is only supported in DTF measurement and in Tracking Generator Measurement when vector calibrated.

MATHMODE (Math Mode)

This command defines the math mode used for analyzer measurements.

Value	Math Mode
0	Math mode OFF
1	Memory trace – Trace
2	Trace – Memory trace

Example:

```

set<cr>
0<cr>
mathmode,1<cr>         'set math mode to "mem. trace – trace"
0<cr>                   'responds parameter ok
    
```

MTRACE (Trace Data from saved Data Set)

This command reads out the trace data in alphanumeric format from a previously saved data set. The current unit is used for the values. A trace consists of 301 data values. If the Auto Peak detector is used, both max and min values are returned (602 values: 301 min values then 301 max values).

Example:

```

get<cr>
0<cr>
mtrace,mydata.001<cr>  'readout trace data from data set "mydata.001"
0<cr>                   'responds parameter ok
-103.22,-106.88,-96.27,.....
    
```

Note: In case of TRG measMode Phase, the phase data in unit radiants is returned. Dependent on the wrap mode the wrapped or unwrapped phase values are provided.

MTRACEBIN (Trace Data Binary from saved Data Set)

This command reads out the trace data in binary format from a previously saved data set. Each sample consists of 4 bytes with the LSB send first. The 4 bytes represent the measured power in the current unit. The sample values are multiplied to provide the highest resolution possible.

Value	Binary values
0	dBm * 1000
1	dBmV * 1000
2	dB μ V * 1000
3	dB μ V/m * 1000
4	dB μ A/m * 1000
5	dB * 1000
6	Volt * 1000000
7	Watt * 1000000000
8	Degrees * 1000
9	Seconds * 1000000

A trace consists of 301 samples. If the Auto Peak detector is used, both Max and Min values are returned (602 samples: 301 min values then 301 max values).

Example:

```
get<cr>
0<cr>
mtracebin,mydata.001<cr>      'readout binary trace data from data set
0<cr>                          'responds parameter ok
<sample><sample>....
```

Marker

Command	Parameters	Unit	Comment
MARK1ON	0, 1		
MARK1	<numeric value>		
MARKON	<1...6>, 0, 1		
MARK	<1...6>, <numeric value>		
DELTA1ON	0, 1		
DELTA1	<numeric value>		
DELTAON	<1...6>, 0, 1		
DELTA	<2...6>, <numeric value>		
MARKALLON	0, 1		SET command only
DELTAALLON	0, 1		SET command only
MARKALL?			GET command only
DELTAALL?			GET command only
MARKPK	[1...6]		CMD command only
MARKNXTPK	[1...6]		CMD command only
MARKMIN	[1...6]		CMD command only
MARKTOCENT	[1...6]		CMD command only
MARKTOLVL	[1...6]		CMD command only
MARKMODE	0...4		
MARKDEMODO	0...2		
MARKTIME	< numeric value>	s	
MARKVOL	0...100	%	
MARKREF			CMD command only
MARKABS			CMD command only
MARKREL			CMD command only
ATVMRKTCTR			CMD command only
MARKIMPREF	< numeric value>	Ω	
MARKMEASY	[0...6]		
NDBDOWN			GET command only
NDBDOWNVAL	< numeric value >	dB	

MARK1ON (Marker On)

This command turns the marker on / off.

Value	Marker
0	OFF
1	ON

Example:

```
set<cr>
0<cr>
mark1on,1<cr>           'turns marker on
0<cr>                   'responds parameter ok
```

MARK1 (Marker)

This command sets the marker to the specified position or queries the current marker value. The marker unit depends on the unit of the x-axis which can be Hz, seconds or meter/feet depending of the measurement mode. The unit of the second value in the GET command response depends on the current unit of the y-axis. If Smith Chart is active, the second and third values are the complex impedance.

Example:

```
set<cr>
0<cr>
mark1,100E6<cr>         'set marker to 100 MHz
0<cr>                   'responds parameter ok
```

Example 2:

```
get<cr>
0<cr>
mark1<cr>               'query current marker value
0<cr>                   'responds parameter ok
947.25e6,-79.28<cr>    'returns Marker frequency and level
```

MARKON (Multimarker On)

This command turns the corresponding (multi) marker on / off. MARKON,1 is used for the marker in normal and in multi marker mode. MARKON,2 to MARKON,6 are available in multi marker mode only.

Param 1		Param 2	
Value	Marker No	Value	Marker Mode
1...6	Marker 1 ... 6	0	OFF
		1	ON

Example:

```
set<cr>
0<cr>
markon,3,1<cr>         'turns multi marker 3 on
0<cr>                   'responds parameter ok
```

MARK (Multimarker)

This command sets the corresponding (multi) marker to the specified position or queries the current marker value.

The marker unit depends on the unit of the x-axis which can be Hz, seconds or meter/feet depending of the measurement mode. The unit of the second value in the GET command response depends on the current unit of the y-axis.

If Smith Chart is active, the second and third values are the complex impedance.

Value	Multimarker
1...6	Marker 1...6

MARK,1 is used for the marker in normal and multi marker mode, MARK,2 to MARK,6 are available in multi marker mode only.

Example:

```

set<cr>
0<cr>
mark,2,100E6<cr>           'set multi marker 2 to 100 MHz
0<cr>                       'responds parameter ok
    
```

Example 2:

```

get<cr>
0<cr>
mark,2<cr>                 'query multi marker 2 value
0<cr>                       'responds parameter ok
947.25e6,-79.28<cr>       'returns Marker frequency and level
    
```

DELTA1ON (Deltamarker On)

This command turns the marker on / off.

Value	Deltamarker
0	OFF
1	ON

Example:

```

set<cr>
0<cr>
deltalon,1<cr>            'turns deltamarker on
0<cr>                       'responds parameter ok
    
```

DELTA1 (Deltamarker)

This command sets the deltamarker to the specified position in relation to the marker or queries the current deltamarker value.

The deltamarker unit depends on the unit of the x-axis which can be Hz, seconds or meter/feet depending of the measurement mode. The unit of the second value in the GET command response depends on the current unit of the y-axis.

If Smith Chart is active, the second and third values are the complex impedance.

Example:

```
set<cr>
0<cr>
delta1,-100E3<cr>      'set deltamarker to 100 kHz below the marker
0<cr>                  'responds parameter ok
```

Example 2:

```
get<cr>
0<cr>
delta1<cr>              'query current marker value
0<cr>                  'responds parameter ok
-100e3,-8.23<cr>       'returns deltamarker frequency and relative level
```

DELTAON (Delta Multimarker On)

This command turns the corresponding deltamarker on / off. DELTAON,1 is used for the deltamarker in normal and in multi marker mode. DELTAON,2 to DELTAON,6 are available in multi marker mode only

Param 1		Param 2	
Value	Deltamarker No	Value	Deltamarker
1...6	Deltamarker 1...6	0	OFF
		1	ON

Example:

```
set<cr>
0<cr>
deltaon,2,1<cr>        'turns deltamarker 2 on
0<cr>                  'responds parameter ok
```

DELTA (Delta Multimarker)

This command sets the corresponding deltamarker to the specified position in relation to the marker or queries the current deltamarker value.

The deltamarker unit depends on the unit of the x-axis which can be Hz, seconds or meter/feet depending of the measurement mode. The unit of the second value in the GET command response depends on the current unit of the y-axis.

If Smith Chart is active, the second and third values are the complex impedance.

Value	Deltamarker
2...6	Deltamarker 2...6

DELTA,2 is used for the deltamarker in normal and multi marker mode, DELTA,3 to DELTA,6 are available in multi marker mode only.

Example:

```
set<cr>
0<cr>
delta,2,-100E3<cr>
0<cr>
```

 'set deltamarker 2 to 100 kHz below the marker
 'responds parameter ok

Example 2:

```
get<cr>
0<cr>
delta,2<cr>
0<cr>
-100e3,-8.23<cr>
```

 'query delta marker 2 value
 'responds parameter ok
 'returns deltamarker frequency and relative level

MARKALLON (All Multimarker On)

This command turns all multimarker on / off. This command is available in multi marker mode only.

Value	All Marker
0	OFF
1	ON

Example:

```
set<cr>
0<cr>
markallon,1<cr>
0<cr>
```

 'turns all multi marker on
 'responds parameter ok

DELTAALLON (All Deltamarker On)

This command turns all deltamarker on / off. This command is available in multi marker mode only.

Value	All Deltamarker
0	OFF
1	ON

Example:

```
set<cr>
0<cr>
deltaallon,1<cr>
0<cr>
```

 'turns all deltamarker on
 'responds parameter ok

MARKALL? (Multimarker)

This command queries the current list of multimarkers. Each multimarker returns three numbers: multimarker number, x-axis value, y-axis value. This GET command is available in multi marker mode only.

The unit of the second number in the GET command response depends on the unit of the x-axis which can be Hz, seconds or meter/feet depending of the measurement mode. The unit of the third value in the GET command response depends on the current unit of the y-axis.

Example:

```
get<cr>
0<cr>
markall?<cr>           'query multi marker list (e.g. 2 multimarkers)
0<cr>                   'responds parameter ok
1,103.4e6,-45.66,2,110.8e6,-23.67<cr>
```

DELTAALL? (Multi Deltamarker)

This command queries the current list of multi deltamarker values. Each delta multimarker returns three numbers: delta multimarker number, x-axis value, y-axis value. This GET command is available in multi marker mode only.

The unit of the second number in the GET command response depends on the unit of the x-axis which can be Hz, seconds or meter/feet depending of the measurement mode. The unit of the third value in the GET command response depends on the current unit of the y-axis.

Example:

```
get<cr>
0<cr>
deltaall?<cr>          'query delta marker list (e.g. 3 delta multimarker)
0<cr>                   'responds parameter ok
1,-100.0e3,-6.02,2,100.5e3,-3.67,3,300.4e6,-12.5<cr>
```

MARKPK (Marker Peak)

This command sets the current or corresponding marker to the peak (highest signal).

Optional Value	Marker
1...6	Marker 1...6

Example:

```
cmd<cr>
0<cr>
markpk<cr>             'set marker to peak
0<cr>                   'responds parameter ok
```

Example 2:

```
cmd<cr>
0<cr>
markpk,4<cr>          'set multi marker 4 to peak
0<cr>                   'responds parameter ok
```

MARKNTPK (Marker Next Peak)

This command sets the current or corresponding marker to the next peak.

Optional Value	Marker
1...6	Marker 1...6

Example:

```
cmd<cr>
0<cr>
marknxtpk<cr>           'set marker to next peak
0<cr>                   'responds parameter ok
```

MARKMIN (Marker Minimum)

This command sets the current or corresponding marker to the minimum (lowest signal).

Optional Value	Marker
1...6	Marker 1...6

Example:

```
cmd<cr>
0<cr>
markmin<cr>             'set marker to minimum
0<cr>                   'responds parameter ok
```

MARKTOCENT (Marker Frequency To Center Frequency)

This command sets the current or corresponding marker as center frequency.

Optional Value	Marker
1...6	Marker 1...6

Example:

```
cmd<cr>
0<cr>
marktocent<cr>         'set marker frequency to center frequency
0<cr>                   'responds parameter ok
```

MARKTOLVL (Marker Level To Reference Level)

This command sets the current or corresponding marker level as reference level.

Optional Value	Marker
1...6	Marker 1...6

Example:

```
cmd<cr>
0<cr>
marktolvl<cr>          'set marker level to reference level
0<cr>                   'responds parameter ok
```

Example 2:

```
cmd<cr>
0<cr>
marktolvl,4<cr>        'set multi marker 4 level to reference level
0<cr>                   'responds parameter ok
```

MARKMODE (Marker Mode)

This command defines the marker mode.

Value	Marker Mode
0	Normal
1	Noise
2	Frequency Count
3	Multimarker
4	n dB Down

Example:

```
set<cr>
0<cr>
markmode,2<cr>           'turns on frequency count
0<cr>                   'responds parameter ok
```

MARKDEMODO (Marker Demodulation)

This command defines the marker demodulation mode.

Value	Demodulation
0	OFF
1	AM
2	FM

Example:

```
set<cr>
0<cr>
markdemod,2<cr>        'turns on FM demodulation
0<cr>                   'responds parameter ok
```

MARKTIME (Marker Demodulation Time)

This command defines the demodulation time at the current marker position. The demodulation time range is 0.1 sec to 500 sec.

Example:

```
set<cr>
0<cr>
marktime,2.5<cr>      'set demod time at marker position to 2.5 sec
0<cr>                 'responds parameter ok
```

MARKVOL (Marker Demodulation Volume)

This command sets the volume of the demodulation AF output. The range is 1 to 100% in 1% steps.

Example:

```
set<cr>
0<cr>
markvol,50<cr>       'set volume of AF output to 50%
0<cr>                 'responds parameter ok
```

FMARKREF (Set new reference value)

This command sets the new reference value

Example:

```
cmd<cr>
0<cr>
markref<cr>           'sets new ref
0<cr>                 'responds parameter ok
```

MARKABS (Marker Mode Absolute)

This command sets the markermode to Absolute

Example:

```
cmd<cr>
0<cr>
markabs<cr>          'sets markermode to ABS
0<cr>                'responds parameter ok
```

MARKREL (Marker Mode Relative)

This command sets the markermode to Relative

Example:

```
cmd<cr>
0<cr>
markrel<cr>         'sets markermode to REL
0<cr>               'responds parameter ok
```

ATVMRKTOCTR (Set Marker to Center position)

This command sets the marker to the center of the screen

Example:

```
cmd<cr>
0<cr>
atvmrktocr<cr>     'set marker to center of the screen
0<cr>               'responds parameter ok
```

MARKIMPREF (Marker Impedance Reference)

This command sets or gets the impedance reference in Ohm.

Example:

```
set<cr>
0<cr>
markimpref,50000<cr> 'set impedance reference to 50 kΩ
0<cr>                 'responds parameter ok
```

MARKMEASY (Marker Measurement Mode)

This command sets or gets the Marker Format.

Value	Marker Meas Mode
0	dB MAG AND PHASE
1	LIN MAG AND PHASE
2	REAL AND IMG
3	R+jX
4	G+jB
5	(R+jX)/Z0
6	(G+jB)/Y0

Example:

```
set<cr>
0<cr>
markmeasy,4<cr>
0<cr>
```

'set impedance G+jB.
'responds parameter ok

NDBDOWN

This command returns the measured 'n dB down' bandwidth value.

Example:

```
get<cr>
0<cr>
ndbdown<cr>
0<cr>
123.456e3
```

'get n dB down value
'responds parameter ok
'bandwidth is 123.456 kHz

NDBDOWNVAL

This command defines the 'n dB down' value. The range is -100.0 dB to 100.0 dB with a resolution of 0.1 dB. This command will automatically set the maker mode to 'n db down'.

Example:

```
set<cr>
0<cr>
ndbdownval,5<cr>
0<cr>
```

'set n dB down on 5 dB
'responds parameter ok

Measurement

Command	Parameters	Unit	Comment
MEAS	0...10, 247...255		
TRD1	<string>		Not in Isotropic Antenna mode
TRD1X	<string>		Isotropic Antenna mode only
TRD1Y	<string>		Isotropic Antenna mode only
TRD1Z	<string>		Isotropic Antenna mode only
TRD2	<string>		
ACCESSORY	<numeric value>		
LIMDEF	<name>, <description>, <x-unit>, <x-scale>, <y-unit>, <x0>, <y0>[, <xn>, <yn>]		
LIMDEL	<name>		CMD command only
LIMLIST			GET command only
LIMLOW	<string>		
LIMUPP	<string>		
LIMBEEP	0, 1		
LIMMSG	0, 1		
LIMPASS			GET command only
LIMCHKREMOTE	0, 1		Receiver Mode only (R&S FSH-K3)
THRLOW	<numeric value>		Receiver Mode only (R&S FSH-K3)
THRUPP	<numeric value>		Receiver Mode only (R&S FSH-K3)
THRPASS			Receiver Mode only (R&S FSH-K3) GET command only
THROFF			Receiver Mode only (R&S FSH-K3) CMD command only

MEAS (Measurement Mode)

This command defines the measurement mode.

Value	Measurement
0	Off
1	Analyzer
2	Tracking Generator (Model 13, 23 and 26)
3	Power Sensor
4	Channel Power
5	Occupied Bandwidth
6	TDMA Power
7	Distance to Fault (R&S FSH-B1)
8	Receiver Mode (R&S FSH-K3)
9	Carrier / Noise
10	Isotropic Antenna
255	Digital TV Receiver Measurement List
254	Digital TV Receiver Constellation Diagram
253	Analog TV Receiver Measurement List
252	Analog TV Receiver Video Scope
250	Analog TV Receiver Carrier Measurements
248	Digital TV Receiver Shoulder Attenuation
247	Analog TV Receiver Vision Modulation
246	Cable TV CSO
245	Cable TV CTB
244	Analog TV Receiver HUM

Using the value 0 the instrument can be turned off if the power adapter is connected. If the instrument is OFF it can be turned on programmatically by selecting one of the measurement modes.

Example:

```
set<cr>
0<cr>
meas,4<cr>           'selects channel power measurement
0<cr>                'responds parameter ok
```

TRD1 (Transducer)

This command selects a transducer. To turn a transducer off, use the string 'NONE':

Example:

```
set<cr>
0<cr>
trd1,h1223<cr>      'selects transducer table "HL223"
0<cr>                'responds parameter ok
```

Example 2:

```
set<cr>
0<cr>
trd1,none<cr>       'de-activates any transducer
0<cr>                'responds parameter ok
```

TRD1X (Transducer X – dB μ V/m)

This command selects an X-direction transducer (dB μ V/m only) for the Isotropic Antenna measurement. To turn a transducer off, use the string 'NONE':

Example:

```
set<cr>
0<cr>
trdlx,ts-emf-x<cr>    'selects transducer table "TS-EMF-X"
0<cr>                 'responds parameter ok
```

Example 2:

```
set<cr>
0<cr>
trdlx,none<cr>       'de-activates any transducer
0<cr>                 'responds parameter ok
```

TRD1Y (Transducer Y – dB μ V/m)

This command selects a Y-direction transducer (dB μ V/m only) for the Isotropic Antenna measurement. To turn a transducer off, use the string 'NONE':

Example:

```
set<cr>
0<cr>
trdly,ts-emf-y<cr>   'selects transducer table "TS-EMF-Y"
0<cr>                 'responds parameter ok
```

Example 2:

```
set<cr>
0<cr>
trdly,none<cr>       'de-activates any transducer
0<cr>                 'responds parameter ok
```

TRD1Z (Transducer Z – dB μ V/m)

This command selects a Z-direction transducer (dB μ V/m only) for the Isotropic Antenna measurement. To turn a transducer off, use the string 'NONE':

Example:

```
set<cr>
0<cr>
trdlz,ts-emf-z<cr>   'selects transducer table "TS-EMF-Z"
0<cr>                 'responds parameter ok
```

Example 2:

```
set<cr>
0<cr>
trdlz,none<cr>       'de-activates any transducer
0<cr>                 'responds parameter ok
```

TRD2 (Transducer – dB)

This command selects a transducer (dB only). To turn a transducer off, use the string 'NONE':

Example:

```
set<cr>
0<cr>
trd1,preamp<cr>      'selects transducer table "preamp"
0<cr>                 'responds parameter ok
```

ACCESSORY (Connected Accessory)

This command gets or sets the connected accessory.

Value	Accessory
0	Auto Detect
1	None
2	Bridge FSH-Z2
3	Bridge FSH-Z3
4	Power sensor
5	Isotropic Antenna
6	Preselector

Example:

```
set<cr>
0<cr>
accessory,0<cr>
0<cr>
```

'Sets auto detection of accessory"
'responds parameter ok

LIMDEF (Define Limit Line)

This command defines a limit line. The list of parameters are the following:

<name>,<description>,<x-unit>,<x-scale>,<y-unit>,<x0>,<y0>[,...<xn>,<yn>]

The parameter <name> and <description> are strings. The parameters x-unit and y-unit are listed in the tables below:

Parameter x-unit:

Value	Unit
0	Hz
1	Seconds
2	Meter

The parameter x-scale defines whether the x values are absolute values or relative values according to the center x value:

Value	x-scale
0	Absolute
1	Relative

Parameter y-unit:

Value	Unit
0	dB
1	dBm
2	dB μ V
3	dBmV
4	dB μ V/m
5	dB μ A/m
6	VSWR
7	Rho
8	Volt
9	Watt
10	Volt/m
11	Watt/m ²
12	Seconds
13	Degrees

The following example defines the limit line "LIMIT", with description "Max" in dBm on the frequency axis (Hz) as an absolute limit line with 4 values (100MHz -30dBm, 200MHz -10dBm, 300MHz -10dBm, 400MHz -30dBm):

```

Example:      set<cr>
                  0<cr>
                  limdef, LIMIT, Max, 0, 0, 1, 100e6, -30, 200e6, -10, 300e6,
                  -10, 400e6, -30<cr>
                                                    'defines limit line "LIMIT"
                  0<cr>                                                    'responds parameter ok
    
```

Note: To replace an existing limit line in the instrument it has to be deleted first by using the LIMDEL command described below.

LIMDEL (Delete Limit Line)

This command deletes a limit line.

Example:

```
cmd<cr>
0<cr>
limdel,LIMIT<cr>      'deletes limit line "LIMIT"
0<cr>                 'responds parameter ok
```

LIMLIST (Available Limit Line List)

This command returns the list with available limit lines

Example:

```
get<cr>
0<cr>
limlist<cr>           'gets the limit line list
0<cr>                 'responds parameter ok
upper limit, lower limit, absolute limit<cr>
```

LIMLOW (Lower Limit Line)

This command selects the lower limit line. To turn a limit line off, use the string 'NONE'.

Example:

```
set<cr>
0<cr>
limlow,lowtest<cr>   'selects lower limit line "LOWTEST"
0<cr>                 'responds parameter ok
```

LIMUPP (Upper Limit Line)

This command selects the upper limit line. To turn a limit line off, use the string 'NONE'.

Example:

```
set<cr>
0<cr>
limupp,highestest<cr> 'selects upper limit line "HIGHEST"
0<cr>                 'responds parameter ok
```

LIMPASS (Limits Passed Query)

This command returns the limit check status.

Value	Limit Check
0	Unkown
1	Failed
2	Passed

Example:

```
get<cr>
0<cr>
limpass<cr>          'query limit check
0<cr>                 'responds parameter ok
2<cr>                 'limit check passed
```

LIMCHKREMOTE (Limit Check Remote Message)

This command enables the remote message (frequency/channel + level) on limit check and/or on threshold limit fail. The instrument will send a message (frequency/channel and level) every time the limit is exceeded.

Value	Limit Check Remote
0	OFF
1	Limit Check – Remote message on fail

Example:

```

get<cr>
0<cr>
limchkremote,1<cr>      'enable remote message on limit fail
0<cr>                   'responds parameter ok
123.456E6,23.5<cr>      'limit exceeded
130.567E6,22.0<cr>      'limit exceeded.....
...
0<cr>                   'remote message on limit fail OFF
    
```

LIMBEEP

This command turns the limit line beep on or off.

Value	
0	Off
1	On

Example:

```

get<cr>
0<cr>
limbeep<cr>             'query if limit line beep is switched on'
0<cr>                   'responds parameter ok'
1<cr>                   'limit beep is switched on'
    
```

LIMMSG

This command turns the limit line message on or off.

Value	
0	Off
1	On

Example:

```

set<cr>
0<cr>
limmsg,1<cr>           'switch limit line message on'
0<cr>                   'responds parameter ok'
    
```

THRLOW (Lower Threshold Line)

This command defines the lower threshold line (value). The unit of the threshold value is specified with the Unit parameter. This command is available in Receiver / Scan Mode only.

Example:

```
set<cr>
0<cr>
thrlow,30<cr>           'specifies lower threshold line to -30 dBuV
0<cr>                   'responds parameter ok
```

THRUPP (Upper Threshold Line)

This command defines the upper threshold line (value). The unit of the threshold value is specified with the Unit parameter. Available in Receiver / Scan Mode only.

Example:

```
set<cr>
0<cr>
thrupp,70<cr>          'specifies upper threshold line to 70 dBuV
0<cr>                  'responds parameter ok
```

THRPASS (Threshold Line Passed Query)

This command returns the threshold line check status. Available in Receiver / Scan Mode only.

Value	Threshold Line Check
0	Unkown
1	Failed
2	Passed

Example:

```
get<cr>
0<cr>
thrpas<cr>             'query threshold line check
0<cr>                 'responds parameter ok
2<cr>                 'threshold check passed
```

Tracking Generator

Command	Parameters	Unit	Comment
CALKIT	[0...1]		
CALKITLEN	<numeric value>	m	
OFFSETLEN	<numeric value>	m	
CAL_TGSCLRFL			CMD command only
CAL_TGSCLTRN			CMD command only
CAL_TGVECRFL			CMD command only
CAL_TGVECTRN			CMD command only
TRANSCAL			GET command only
REFLCAL			GET command only
TRANSVECTCAL			GET command only Option R&S FSH-K2
REFLVECTCAL			GET command only Option R&S FSH-K2
TGATT	<numeric value>		
TGMODE	[0...4]		Option R&S FSH-K2
CABLELOSS			GET command only Option R&S FSH-K2
ELCABLENVAL	<numeric value>	m / feet	GET command only Option R&S FSH-K2
VECTVOLT	< numeric value>		
VVREF			
VVTOREF			CMD command only

CALKIT

This command sets the tracking generator CalKit.

Value	Reflection Vector Cal
0	FSH Calkit
1	User CalKit

Example:

```

get<cr>
0<cr>
calkit<cr>
0<cr>
0<cr>

```

'query the calkit
'responds parameter ok
'response: FSH CalKit selected

CALKITLEN

This command defines the user calkit length. When set, also the user calkit will be selected. The numeric values must be between 0 and 1 m with resolution of 0.01 mm.

Example:

```
set<cr>
0<cr>
calkitlen,1e-4<cr>    'sets the user calkit length to 0.1 mm
0<cr>                  'responds parameter ok
```

OFFSETLEN

This command defines the offset length. The numeric values must be between 0 and 100 m with resolution of 0.01 mm.

Example:

```
set<cr>
0<cr>
offsetlen,1<cr>      'sets the offset length to 1 m
0<cr>                'responds parameter ok
```

CAL_TGSCLRFL (Calibrate Tracking Generator Scalar Reflection)

This command initiates a scalar reflection calibration. This calibration contains two phases; OPEN phase and SHORT phase. Connect OPEN before initiating calibration command, after first phase reports ready connect SHORT and continue by issuing the command again.

Example:

```
cmd<cr>
0<cr>
cal_tgsclrfl<cr>    'initiate scalar reflection calibration (OPEN)
0<cr>               'responds parameter ok
0<cr>               'first phase ready
cal_tgsclrfl<cr>    'continue scalar reflection calibration (SHORT)
0<cr>               'responds parameter ok
0<cr>               'scalar reflection calibration ready
```

CAL_TGSCLTRN (Calibrate Tracking Generator Scalar Transmission)

This command initiates a scalar transmission calibration. This calibration contains one phase; calibrating THROUGH. Connect THROUGH before initiating calibration command.

Example:

```
cmd<cr>
0<cr>
cal_tgscltrn<cr>    'initiate scalar transmission calibration
0<cr>               'responds parameter ok
0<cr>               'scalar transmission calibration ready
```

CAL_TGVECRFL (Calibrate Tracking Generator Vector Reflection)

This command initiates a vector reflection calibration. This calibration contains three phases; OPEN phase, SHORT phase and a LOAD phase. Connect OPEN before initiating calibration command, after first phase reports ready connect SHORT and continue by issuing the command again. When OPEN calibration reports ready connect LOAD and resume calibration by issuing the command again.

Example:

```

cmd<cr>
0<cr>
cal_tgvecrfl<cr>           'initiate vector reflection calibration (OPEN)
0<cr>                     'responds parameter ok
0<cr>                     'first phase ready
cal_tgsclrfl<cr>          'continue scalar reflection calibration (SHORT)
0<cr>                     'responds parameter ok
0<cr>                     'second phase ready
cal_tgsclrfl<cr>          'continue scalar reflection calibration (LOAD)
0<cr>                     'responds parameter ok
0<cr>                     'vector reflection calibration ready
    
```

CAL_TGVECTRN (Calibrate Tracking Generator Vector Transmission)

This command initiates a vector transmission calibration. This calibration contains two phases; THROUGH phase and LOAD phase. Connect THROUGH before initiating calibration command, after first phase reports ready connect LOAD and continue by issuing the command again.

Example:

```

cmd<cr>
0<cr>
cal_tgvectrn<cr>          'initiate vector transmission calibration (THROUGH)
0<cr>                     'responds parameter ok
0<cr>                     'first phase ready
cal_tgvectrn<cr>          'continue vector transmission calibration (LOAD)
0<cr>                     'responds parameter ok
0<cr>                     'vector transmission calibration ready
    
```

TRANSCAL (Transmission Calibrated)

This command queries the state of the transmission calibration.

Value	Transmission Cal
0	Not calibrated
1	Calibrated

Example:

```

get<cr>
0<cr>
transcal<cr>              'query state of transmission calibration
0<cr>                     'responds parameter ok
1<cr>                     'response: transmission calibrated
    
```


REFLCAL (Reflection Calibrated)

This command queries the state of the reflection calibration.

Value	Reflection Cal
0	Not calibrated
1	Calibrated

Example:

```

get<cr>
0<cr>
reflcal<cr>           'query state of reflection calibration
0<cr>                'responds parameter ok
1<cr>                'response: reflection calibrated

```

TRANSVECTCAL (Transmission Vector Calibrated)

This command queries the state of the transmission vector calibration. Applies to option R&S FSH-K2 only.

Value	Transmission Vector Cal
0	Not calibrated
1	Calibrated

Example:

```

get<cr>
0<cr>
transvectcal<cr>     'query state of transmission vector calibration
0<cr>                'responds parameter ok
1<cr>                'response: transmission vector calibrated

```

REFLVECTCAL (Reflection Vector Calibrated)

This command queries the state of the reflection vector calibration. Applies to option R&S FSH-K2 only

Value	Reflection Vector Cal
0	Not calibrated
1	Calibrated

Example:

```

get<cr>
0<cr>
reflvectcal<cr>     'query state of reflection vector calibration
0<cr>                'responds parameter ok
1<cr>                'response: reflection vector calibrated

```

TGATT (Tracking Generator Level Attenuation)

This command defines the tracking generator output level attenuation. The numeric values vary between 0 dB and 20 dB in 1 db steps.

Example:

```

set<cr>
0<cr>
tgatt,6<cr>         'sets tracking generator attenuation to 6dB
0<cr>                'responds parameter ok

```

TGMODE (Tracking Generator Mode)

This command defines the tracking generator mode. Applies to option R&S FSH-K2 only. This command is only available when Vector calibrated.

Value	Tracking Generator Mode
0	Magnitude
1	Cable loss meas
2	Phase
3	Smith Chart
4	Group Delay
5	Vector Voltage

Example:

```
set<cr>
0<cr>
tgmodes, 1<cr>
0<cr>
```

'set tracking generator mode to cable loss meas
'responds parameter ok

CABLELOSS (Cable Loss)

This command queries the measured cable loss

Example:

```
get<cr>
0<cr>
cableloss<cr>
0<cr>
0.7<cr>
```

'query cable loss measurement result
'responds parameter ok
'response: cable loss

ELCABLENVAL (Electrical Cable Length)

This command queries the electrical cable length

Example:

```
get<cr>
0<cr>
elcablenval<cr>
0<cr>
5.12<cr>
```

'query electrical cable length measurement result
'responds parameter ok
'response: electrical cable length

Note: This command is only available when measurement mode is Phase and zero span is not active.

VECTVOLT (Vector Voltage)

This command queries the measured vector voltage values.

Example:

```
get<cr>
0<cr>
vectvolt<cr>
0<cr>
3.0, 45<cr>
```

'query vector voltage measurement result
'responds parameter ok
'response: magnitude (dB), phase (degrees)

VVREF (Vector Voltage Reference)

This command queries the vector voltage reference values. To disable the vector voltage reference set it to 0.

Example 1:

<code>get<cr></code>	
<code>0<cr></code>	
<code>vvref<cr></code>	'query vector voltage reference
<code>0<cr></code>	'responds parameter ok
<code>3.0, 45<cr></code>	'response: magnitude (dB), phase (degrees)

Example 2:

<code>set<cr></code>	
<code>0<cr></code>	
<code>vvref, 0<cr></code>	'disable vector voltage reference
<code>0<cr></code>	'responds parameter ok

VVTOREF (Vector Voltage To Reference)

This command will set the current vector voltage values as vector voltage reference. To disable the vector voltage reference use VECTVOLTREF.

Example get:

<code>cmd<cr></code>	
<code>0<cr></code>	
<code>vtoref<cr></code>	'set vector voltage reference
<code>0<cr></code>	'responds parameter ok

Power Sensor

Command	Parameters	Unit	Comment
PWR	<numeric value>		GET command only
REFL	<numeric value>		GET command only
ZERO			CMD command only
PWRTOREF			CMD command only
MEASTIME	0..2		
REFLUNIT	0, 1		R&S FSH-Z44 only
PWRSSD	0..7		R&S FSH-Z44 only

PWR (Power Level)

This command queries the power level measured by the sensor.

Example:

```

get<cr>
0<cr>
pwr<cr>           'query power level from sensor
0<cr>           'responds parameter ok
-33.45<cr>      'response: power
    
```

REFL (Reflection)

This command queries the reflection measured by the power sensor R&S FSH-Z44. The unit (dB or VSWR) depends on the setting of reflection unit (SET REFLUNIT command).

Example:

```

get<cr>
0<cr>
refl<cr>         'query reflection from sensor
0<cr>         'responds parameter ok
2.54<cr>       'response: reflection value
    
```

ZERO (Power Sensor Zeroing)

This command initiates the power sensor zeroing.

Example:

```

cmd<cr>
0<cr>
zero<cr>        'query power level from sensor
0<cr>        'responds parameter ok
    
```

PWRTOREF (Power to Reference)

This command defines the current power level as the reference value.

Example:

```

cmd<cr>
0<cr>
pwrtoref<cr>    'defines power level as reference value
0<cr>    'responds parameter ok
    
```

MEASTIME (Measurement Time)

This command defines the measurement time for the power sensor (R&S FSH-Z1 and R&S FSH-Z18).

Value	Measurement Time
0	Short
1	Normal
2	Long

Example:

```
set<cr>
0<cr>
meastime,2<cr>
0<cr>
```

'sets measurement time to "long"
'responds parameter ok

REFLUNIT (Reflection Unit)

This command defines the reflection unit for the power sensor R&S FSH-Z44.

Value	Reflection Unit
0	dB
1	VSWR

Example:

```
set<cr>
0<cr>
reflunit,1<cr>
0<cr>
```

'sets reflection unit to VSWR
'responds parameter ok

PWRSTTD (Power Sensor Standard)

This command defines the standard used for the power sensor R&S FSH-Z44 measurements.

Value	Channel Power Standard
0	User
1	GSM
2	EDGE
3	3GPP WCDMA
4	cdmaOne
5	cdma2000 1x
6	DVB-T
7	DAB

Example:

```
set<cr>
0<cr>
pwrstd,2<cr>
0<cr>
```

'select EDGE as standard
'responds parameter ok

Channel Power

Command	Parameters	Unit	Comment
CHPWR	<numeric value>		GET command only
CHPWRSTD	0...3		
CHPWRCSTD	<string>		
CHPWRUNIT	0...2		
CHPWRBW	<numeric value>	Hz	
LVLADJUST			CMD command only

CHPWR (Channel Power)

This command queries the measured channel power.

Example:

```

get<cr>
0<cr>
chpwr<cr>           'query power level from sensor
0<cr>              'responds parameter ok
-47.45<cr>         'response: channel power
    
```

CHPWRSTD (Channel Power Standard)

This command defines the standard used for the channel power measurement.

Value	Channel Power Standard
0	User
1	3GPP WCDMA
2	cdmaOne
3	cdma2000 1x

Example:

```

set<cr>
0<cr>
chpwrstd,2<cr>     'select cdmaOne as standard
0<cr>              'responds parameter ok
    
```

Note: If any customized standard was previously selected a value of '4' will be returned as a response to a GET CHPWRSTD query.

CHPWRCSTD (Channel Power Customized Standard)

This command selects the customized standard for the channel power measurement previously loaded with R&S FSHView software.

Example:

```

set<cr>
0<cr>
chpwrcstd,MyStd<cr> 'select MyStd as standard
0<cr>              'responds parameter ok
    
```

CHPWRUNIT (Channel Power Unit)

This command defines the unit used for the channel power measurement.

Value	Channel Power Unit
0	dBm
1	dBmV
2	dB μ V

Example:

```

set<cr>
0<cr>
chpwrunit,1<cr>           'set unit to dBmV
0<cr>                     'responds parameter ok

```

CHPWRBW (Channel Power Bandwidth)

This command defines the bandwidth used for channel power measurements.

Example:

```

set<cr>
0<cr>
chpwrbw,3.5E6<cr>        'set channel power bandwidth to 3.5 MHz
0<cr>                     'responds parameter ok

```

LVLADJUST (Level Adjust)

This command initiates a level adjustment for the channel power measurement.

Example:

```

cmd<cr>
0<cr>
lvladjust<cr>           'initiates level adjustment
0<cr>                   'responds parameter ok

```

Note: To check if the level adjustment is ready, the WAIT command can be used

Occupied Bandwidth

Command	Parameters	Unit	Comment
OBW	<numeric value>		GET command only
OBWSTD	0...3		
OBWCSTD	<string>		
OBWCHBW	<numeric value>	Hz	
LVLADJUST			CMD command only

OBW (Occupied Bandwidth)

This command queries the measured occupied bandwidth.

Example:

```

get<cr>
0<cr>
obw<cr>                                'query power level from sensor
0<cr>                                    'responds parameter ok
-22E6<cr>                                'response: occupied bandwidth
    
```

OBWSTD (Occupied Bandwidth Standard)

This command defines the standard used for the occupied bandwidth measurement.

Value	Occupied Bandwidth Standard
0	User
1	3GPP WCDMA
2	cdmaOne
3	cdma2000 1x

Example:

```

set<cr>
0<cr>
obwstd,1<cr>                            'select 3GPP WCDMA as standard
0<cr>                                    'responds parameter ok
    
```

Note: If any customized standard was previously selected a value of '4' will be returned as a response to a GET OBWSTD query.

OBWCSTD (Occupied Bandwidth Customized Standard)

This command selects the customized standard for the occupied bandwidth measurement previously loaded with R&S FSHView software.

Example:

```

set<cr>
0<cr>
obwcstd,MyStd<cr>                       'select MyStd as standard
0<cr>                                    'responds parameter ok
    
```


OBWCHBW (Occupied Bandwidth Channel Bandwidth)

This command defines the bandwidth used for occupied bandwidth measurements.

Example:

```
set<cr>
0<cr>
obwchbw, 5E6<cr>      'set channel bandwidth to 5 MHz
0<cr>                  'responds parameter ok
```

LVLADJUST (Level Adjust)

This command initiates a level adjustment for the occupied bandwidth measurement.

Example:

```
cmd<cr>
0<cr>
lvladjust<cr>         'initiates level adjustment
0<cr>                  'responds parameter ok
```

Note: To check if the level adjustment is ready, the WAIT command can be used

TDMA Power

Command	Parameters	Unit	Comment
TDMAPWR	<numeric value>		GET command only
TDMASTD	0...1		
MEASTIME	<numeric value>	s	
LVLADJUST			CMD command only

TDMAPWR (TDMA Power)

This command queries the measured TDMA power.

Example:

```

get<cr>
0<cr>
tdmapwr<cr>           'query power level from sensor
0<cr>                 'responds parameter ok
-32.45<cr>           'response: TDMA power
    
```

TDMASTD (TDMA Power Standard)

This command defines the standard used for the TDMA power measurement.

Value	TDMA Power Standard
0	User
1	GSM / EDGE

Example:

```

set<cr>
0<cr>
tdmastd,1<cr>        'select GSM/EDGE as standard
0<cr>                 'responds parameter ok
    
```

Note: If any customized standard was previously selected a value of '2' will be returned as a response to a GET TDMASTD query.

TDMACSTD (TDMA Customized Standard)

This command selects the customized standard for the TDMA power measurement previously loaded with R&S FSHView software.

Example:

```

set<cr>
0<cr>
tdmacstd,MyStd<cr>   'select MyStd as standard
0<cr>                 'responds parameter ok
    
```

MEASTIME (Measurement Time)

This command defines the measurement time for the TDMA power measurement.

Example:

```
set<cr>
0<cr>
meastime,500E-6<cr>    'sets measurement time to 500 µs
0<cr>                  'responds parameter ok
```

LVLADJUST (Level Adjust)

This command initiates a level adjustment for the TDMA power measurement.

Example:

```
cmd<cr>
0<cr>
lvladjust<cr>          'initiates level adjustment
0<cr>                  'responds parameter ok
```

Note: To check if the level adjustment is ready, the WAIT command can be used

Distance To Fault Measurement

The DTF Measurement requires the option R&S FSH-B1.

Command	Parameters	Unit	Comment
CABLEMOD	<string>		
CABLELEN	<numeric value>	m / feet	
CAL_DTF			
DTFMODE	0..2		
LENUNIT	<meter> <feet>		

CABLEMOD (Cable Model)

This command selects the cable model.
To turn cable model selection off, use the string 'NONE'.

Example:

```
set<cr>
0<cr>
cablemod, rg58c<cr>    'selects cable model "RG58C"
0<cr>                  'responds parameter ok
```

CABLELEN (Cable Length)

This command defines the cable length.
The unit of the length can either be Meter or Feet depending on the Length Unit setting. The cable length is converted and rounded to meters internally.

Example:

```
set<cr>
0<cr>
cablelen, 12<cr>      'sets cable length to 12 meter
0<cr>                'responds parameter ok
```

CAL_DTF (Calibrate Distance To Fault)

This command calibrates the distance to fault measurement.

Example:

```
cmd<cr>
0<cr>
cal_dtf<cr>          'Initiates the actual calibration
0<cr>                'responds parameter ok
0<cr>                'calibration ready
```

DTFMODE (DTF Measurement Mode) Power)

This command defines the measurement mode in DTF.

Value	Channel Power Standard
0	DTF
1	Reflection
2	Spectrum

Example:

```
set<cr>
0<cr>
dtfmode,2<cr>
0<cr>
```

'set DTF mode to "Spectrum"
'responds parameter ok

LENUNIT (Cable Length Unit)

This command sets the cable length unit to meters or feet.

Example:

```
set<cr>
0<cr>
lenunit,feet<cr>
0<cr>
```

'sets cable length unit to Feet
'responds parameter ok

Receiver Mode

The Receiver Mode requires the option R&S FSH-K3.

Command	Parameters	Unit	Comment
CHANNEL	<numeric value>		
CHMODE	0, 1		Fixed Channel Mode
CHTABLE	<string>		
LEVEL			GET command only
MEASTIME	<numeric value>	s	
SCANMODE	0, 1		
SCANSTART	<numeric value>		Freq Scan Mode
SCANSTOP	<numeric value>		Freq Scan Mode
SCANSTEP	<numeric value>		Freq Scan Mode
FREQSTART	<numeric value>		Channel Scan Mode
FREQSTOP	<numeric value>		Channel Scan Mode

CHMODE (Channel Mode)

This command switches between the channel mode and frequency mode. Use the command CHTABLE to define a channel table for the channel mode.

Value	Channel Mode
0	Frequency Mode
1	Channel Mode

Example:

```

set<cr>
0<cr>
chmode,1<cr>           'selects channel mode
0<cr>                 'responds parameter ok
    
```

CHANNEL (Channel Number)

This command defines the channel number. Use CHTABLE command to select a channel table first.

Example:

```

set<cr>
0<cr>
channel,55<cr>        'selects channel no. 55
    
```

CHTABLE (Channel Table)

This command selects a channel table for the channel mode.

Example:

```

set<cr>
0<cr>
chttable,FMBand<cr>  'selects channel table "FMBand"
0<cr>                 'responds parameter ok
    
```

LEVEL (Signal Level)

This command queries the signal level measured (fixed frequency/channel mode only).

Example:

```

get<cr>
0<cr>
level<cr>           'query signal level
0<cr>              'responds parameter ok
45.6<cr>           'response: signal level

```

MEASTIME (Measurement Time)

This command defines the measurement time for the receiver mode.

Example:

```

set<cr>
0<cr>
meastime,5E-3<cr>  'sets measurement time to 5 ms
0<cr>              'responds parameter ok

```

SCANMODE (Scan Mode)

This command switches between frequency/channel scan mode and fixed frequency/channel mode. Use the command CHMODE to toggle between frequency and channel mode.

Value	Scan Mode
0	Fixed Freq/Channel Mode
1	Feq/Channel Scan Mode

Example:

```

set<cr>
0<cr>
scanmode,1<cr>     'selects scan mode
0<cr>              'responds parameter ok

```

SCANSTART (Frequency Scan Start)

This command defines the scan start frequency for the frequency scan mode.

Example:

```

set<cr>
0<cr>
scanstart,88E6<cr> 'sets scan start frequency to 88 MHz
0<cr>              'responds parameter ok

```

SCANSTOP (Frequency Scan Stop)

This command defines the scan stop frequency for the frequency scan mode.

Example:

```

set<cr>
0<cr>
scanstop,108E6<cr> 'sets scan stop frequency to 108 MHz
0<cr>              'responds parameter ok

```

SCANSTEP (Frequency Scan Step)

This command defines the scan step frequency for the frequency scan mode.

Example:

```
set<cr>
0<cr>
scanstep,200E3<cr>    'sets scan step frequency to 200 kHz
0<cr>                 'responds parameter ok
```

FREQSTART (Channel Scan Start Frequency)

This command defines the start frequency for the channel scan mode.

Example:

```
set<cr>
0<cr>
freqstart,100E6<cr>   'sets scan start frequency to 100 MHz
0<cr>                 'responds parameter ok
```

FREQSTOP (Channel Scan Stop Frequency)

This command defines the stop frequency for the channel scan mode.

Example:

```
set<cr>
0<cr>
freqstop,1E9<cr>     'sets scan stop frequency to 1 GHz
0<cr>                 'responds parameter ok
```


Carrier / Noise Measurement

Command	Parameters	Unit	Comment
CNCHBW	<numeric value>	Hz	
CNCSTD	<string>		
CNMANREFPWR	0, 1		
CNMEASMODE	0...2		
CNMODE	0, 1		
CNNOISECOR	0, 1		
CNNORM	0, 1		
CNPILOTFRQ	<numeric value>	Hz	
CNPWRDISP	0, 1		
CNRATIOCHBW	<numeric value>	Hz	
CNREFMEASMODE	0, 1, 2		
CNREFPWR	<numeric value>		
CNUNIT	0...2		
CNVALUE			GET command only
CNVISIONFRQ	<numeric value>	Hz	
LVLADJUST			CMD command only

CNCHBW (Carrier Noise Channel Bandwidth)

This command defines the bandwidth used for carrier noise measurements. It defines the channel bandwidth of the reference measurement if the C/N reference measurement is selected and it defines the channel bandwidth of the noise measurement if the C/N noise measurement is selected. The measurement mode is selected by the command CNMODE.

Example:

```
set<cr>
0<cr>
cnchbw, 5E6<cr>           'set channel bandwidth to 5 MHz
0<cr>                       'responds parameter ok
```

CNCSTD (Carrier Noise Customized Standard)

This command selects the customized standard for the carrier noise measurement previously loaded with R&S FSHView software.

Example:

```

set<cr>
0<cr>
cncstd,MyStd<cr>      'select MyStd as standard
0<cr>                  'responds parameter ok
    
```

CNMANREFPWR (Carrier Noise Manual Ref Power Active)

This command defines if the manual ref power is active. If the manual reference power is selected a reference power must be set (CNREFPWR). Otherwise the reference power of the reference power measurement is applied.

Value	Manual Ref Power Active
0	OFF
1	ON

Example:

```

set<cr>
0<cr>
cnmanrefpwr,1<cr>    'select manual reference power
0<cr>                  'responds parameter ok
    
```

CNMEASMODE (Carrier Noise Measurement Mode)

This command defines the kind of reference measurement mode if the reference measurement mode is selected. It is used for the carrier noise measurement.

Value	Measurement Mode
0	Digital Tx
1	Analog TV
2	CW Tx

Example:

```

set<cr>
0<cr>
cnmeasmode,1<cr>    'select Analog TV as measurement mode
0<cr>                  'responds parameter ok
    
```

CNMODE (Carrier Noise Mode)

This command defines if the C/N reference measurement or the C/N noise measurement is active.

Value	C/N Noise Measurement Active
0	OFF
1	ON

Example:

```

set<cr>
0<cr>
cnmode,0<cr>         'select C/N reference measurement
0<cr>                  'responds parameter ok
    
```

CNNOISECOR (Carrier Noise NOISE CORrection)

This command defines if the C/N noise correction mode.

Value	C/N Noise Correction
0	OFF
1	ON

Example:

```

set<cr>
0<cr>
cnnoisecor,0<cr>           'disable C/N noise correction
0<cr>                       'responds parameter ok

```

CNNORM (Carrier Noise Norm)

This command defines the norm used for the noise measurement.

Value	Norm
0	C/N
1	C/No

Example:

```

set<cr>
0<cr>
cnnorm,1<cr>              'select C/No as norm
0<cr>                       'responds parameter ok

```

CNPILOTFRQ (Carrier Noise Pilot Frequency)

This command defines the pilot frequency used for digital TV carrier noise measurements. It is only available if the Digital TV standard 8-VSB/ATSC is selected. It defines the pilot frequency of the reference measurement if the C/N reference measurement is selected and it defines the pilot frequency of the noise measurement if the C/N noise measurement is selected. The measurement mode is selected by the command CNMODE.

Example:

```

set<cr>
0<cr>
cnpilotfrq,450E6<cr>     'set pilot frequency to 450 MHz
0<cr>                       'responds parameter ok

```

CNPWRDISP (Carrier Noise Power Display)

This command turns the C/N power display on or off.

Value	Power Display
0	OFF
1	ON

Example: set<cr>
 0<cr>
 cnpwrdisp,1<cr>
 0<cr> 'responds parameter ok

CNRATIOCHBW (Carrier Noise Ratio Channel Bandwidth)

This command defines the ratio channel bandwidth used for carrier noise measurements.

Example: set<cr>
 0<cr>
 cnratiochbw,5E6<cr> 'set ratio channel bandwidth to 5 MHz
 0<cr> 'responds parameter ok

CNREFMEASMODE (Carrier Noise Reference measurement mode)

This command sets the reference measurement mode.

Value	Reference Measurement Mode
0	Peak Power
1	Channel Power
2	Manual

Example: set<cr>
 0<cr>
 cnrefmeasmode,2<cr> 'set reference measurement mode to manual
 0<cr> 'responds parameter ok

CNREFPWR (Carrier Noise Ref Power)

This command defines the reference power used for carrier noise measurements.

Example: set<cr>
 0<cr>
 cnrefpwr,400E-3<cr> 'set ref power to 0.4
 0<cr> 'responds parameter ok

CNUNIT (Carrier Noise Unit)

This command defines the unit used for the reference.

Value	Unit
0	dBm
1	dBmV
2	dBuV

Example:

```
set<cr>
0<cr>
cnunit,1<cr>           'select dBmV as unit
0<cr>                 'responds parameter ok
```

CNVALUE (Carrier Noise Measurement Value)

This command queries the measured C/N value. The value depends on the CNMODE selected (either C/N reference measurement or C/N Noise measurement).

Example:

```
get<cr>
0<cr>
cnvalue<cr>           'query C/N measurement
0<cr>                 'responds parameter ok
-20.3<cr>             'response: C/N result
```

CNVISIONFRQ (Carrier Noise Vision Frequency)

This command defines the vision carrier frequency used for analog TV carrier noise measurements.

Example:

```
set<cr>
0<cr>
cnvisionfrq,450E6<cr> 'set vision carrier frequency to 450 MHz
0<cr>                 'responds parameter ok
```

LVLADJUST (Level Adjust)

This command initiates a level adjustment for carrier noise measurement. It is applied to the reference channel if the reference measurement is selected and it is applied to the noise channel if the noise measurement is selected.

Example:

```
cmd<cr>
0<cr>
lvladjust<cr>         'initiates level adjustment
0<cr>                 'responds parameter ok
```

Note: To check if the level adjustment is ready, the WAIT command can be used

Digital TV Receiver Measurement

Command	Parameters	Unit	Comment
DTVSTD	0...3		
DTVQAM	0...5		
DTVSBPOS	0...2		
DTVSRATE	<numeric value>	Hz	
DTVSCNT	<numeric value>		
DTV8VSBPFRQ	<numeric value>	Hz	
DTVCHBW	<numeric value>	Hz	
DTVCHBWM	0, 1		
DTVDISP	0, 1		
DTVPWRUNIT	0...2		
DTVDBSTAT	0...2		GET command only
DTVPCTSTAT	0...2		GET command only
DTVMERDB	<numeric value>	dB	GET command only
DTVMERPCT	<numeric value>	%	GET command only
DTVEVMDB	<numeric value>	dB	GET command only
DTVEVMPCT	<numeric value>	%	GET command only
DTVTSR	<numeric value>	Hz	GET command only
DTVSYOFFS	<numeric value>	Hz	GET command only
DTVFEC	0, 1		GET command only
DTVCONST	0, 1		GET command only
DTVRFOFFS	<numeric value>	Hz	GET command only
DTVBER	<numeric value>		GET command only
DTVBERCOUNT	<numeric value>		GET command only
DTVBERMAX	<numeric value>		GET command only
DTVPERSER	<numeric value>		GET command only
DTVPERSERCOUNT	<numeric value>		GET command only
DTVPERSERMAX	<numeric value>		GET command only
DTVREFLVL	0...2		GET command only
DTVPWR	<numeric value>	dBm	GET command only
DTVSHATUPP	<numeric value>	dB	GET command only
DTVSHATLWR	<numeric value>	dB	GET command only
LVLADJUST			CMD command only
LVLADJUSTUPP			CMD command only
LVLADJUSTLWR			CMD command only
RESTART			CMD command only

Command	Parameters	Unit	Comment
DTVWAITMER			CMD command only
DTVWAITCD			CMD command only

DTVSTD (Digital TV STanDard)

This command defines the Standard for Digital TV measurements.

Value	Digital TV Standard
0	QAM / DVB-C / J.83/A – EU CABLE
1	QAM / J.83/B – US CABLE
2	QAM / DVB-C / J.83/C – JAPANESE CABLE
3	8-VSB / ATSC

Example:

```

set<cr>
0<cr>
dtvstd,1<cr> 'set DTV standard to QAM / J.83/B – US CABLE
0<cr>         'responds parameter ok

```

DTVQAM (Digital TV QAM order)

This command defines QAM order for Digital TV Receiver.

Value	QAM order
0	QAM 4
1	QAM 16
2	QAM 32
3	QAM 64
4	QAM 128
5	QAM 256

Example:

```

set<cr>
0<cr>
dtvqam,5<cr> 'select QAM order 256
0<cr>         'responds parameter ok

```

DTVSBPOS (Digital TV SideBand POSition)

This command defines Sideband Position for Digital TV Receiver.

Value	Sideband position
0	AUTO
1	NORMAL
2	INVERTED

Example:

```
set<cr>
0<cr>
dtvsbpos,0<cr>           'select sideband position auto
0<cr>                     'responds parameter ok
```

Note: Get function returns the actual sideband position (always NORMAL or INVERTED).

DTVSRATE (Digital TV Symbol RATE)

This command defines the Symbol Rate for Digital TV Receiver.

Example:

```
set<cr>
0<cr>
dtvsrate,6.9E6<cr>      'set symbol rate to 6.9MHz
0<cr>                   'responds parameter ok
```

DTVSCNT (Digital TV Symbol CouNT)

This command defines the Symbol Count for Digital TV measurements.

Example:

```
set<cr>
0<cr>
dtvscnt,10000<cr>      'set symbol rate to 10000
0<cr>                  'responds parameter ok
```

DTV8VSBPFRQ (Digital TV 8VSB Pilot FReQuency)

This command defines the 8VSB Pilot Frequency for Digital TV Receiver.

Example:

```
set<cr>
0<cr>
dtv8vsbpfrq,1.5E9<cr>  'set 8VSB pilot frequency to 1.5 GHz
0<cr>                  'responds parameter ok
```

DTVCHBW (Digital TV CHannel BandWidth)

This command defines the Channel Bandwidth for Digital TV Receiver.

Example:

```
set<cr>
0<cr>
dtvchbw,8E6<cr>        'set channel bandwidth to 8 MHz
0<cr>                  'responds parameter ok
```


DTVCHBWM (Digital TV CHannel BandWidth Mode)

This command defines Channel Bandwidth Mode for Digital TV Receiver.

Value	Channel Bandwidth mode
0	AUTO
1	MANUAL

Example:

```
set<cr>
0<cr>
dtvchbwm,0<cr>
0<cr>
```

'select channel bandwidth auto
'responds parameter ok

DTVDISP (Digital TV DISPLAY mode)

This command defines Display mode for Digital TV Receiver.

Value	Display mode
0	OFF
1	ON

Example:

```
set<cr>
0<cr>
dtvdisp,0<cr>
0<cr>
```

'select display off
'responds parameter ok

DTVPWRUNIT (Digital TV PoWeR UNIT)

This command defines the power unit for Digital TV Receiver.

Value	Display mode
0	dBm
1	dBmV
2	dB μ V

Example:

```
set<cr>
0<cr>
dtvpwrunit,0<cr>
0<cr>
```

'select unit dBm
'responds parameter ok

DTVPWR (Digital TV PoWeR)

This command queries the measured Power value for Digital TV Receiver.

Example:

```
get<cr>
0<cr>
dtvpwr<cr>
0<cr>
-25.8<cr>
```

'query PWR value
'responds parameter ok
'response: PWR measurement result -25.8

DTVPWR (Digital TV SHoulder ATtenuation LoWeR)

This command queries the measured Lower Shoulder Attenuation value for Digital TV Receiver.

Example:

```

get<cr>
0<cr>
dtvshatlwr<cr>           'query Lower Shoulder value
0<cr>                   'responds parameter ok
54.8<cr>                 'response: measurement result 54.8
    
```

DTVPWR (Digital TV SHoulder ATtenuation UPPer)

This command queries the measured Upper Shoulder Attenuation value for Digital TV Receiver.

Example:

```

get<cr>
0<cr>
dtvshatupp<cr>          'query Upper Shoulder value
0<cr>                   'responds parameter ok
52.4<cr>                 'response: measurement result 52.4
    
```

DTVDBSTAT (Digital TV mer [DB] and evm [db] STATus)

This command queries the MER [dB] and EVM [dB] status for commands DTVMERDB and DTVEVMDB.

Value	MER status value
0	Equal
1	Greater
2	Smaller

Example:

```

get<cr>
0<cr>
dtvdbstat<cr>          'query MER [dB] and EVM [dB] status value
0<cr>                   'responds parameter ok
0<cr>                   'response: MER [dB] and EVM [dB]
                        'measurement equal to DTVMERDB and
                        'DTVEVMDB value
    
```

DTVMERDB (Digital TV MER in DB)

This command queries the measured MER (Modulation Error Ratio) value in dB for Digital TV Receiver.

Example:

```

get<cr>
0<cr>
dtvmerdb<cr>           'query MER value in dB
0<cr>                   'responds parameter ok
25.8<cr>               'response: MER measurement result in dB
    
```

DTVMERPCT (Digital TV MER in PerCent)

This command queries the measured MER (Modulation Error Ratio) value in percent for Digital TV Receiver.

Example:

```

get<cr>
0<cr>
dtvmerpct<cr>           'query MER measurement value in percent
0<cr>                   'responds parameter ok
3.77<cr>                'response: MER measurement result in percent

```

DTVPCTSTAT (Digital TV mer [PCT] and evm [pct] STATus)

This command queries the MER [%] and EVM [%] status for commands DTVMERPCT and DTVEVMABS.

Value	EVM status value
0	Equal
1	Greater
2	Smaller

Example:

```

get<cr>
0<cr>
dtvpctstat<cr>         'query MER [%] and EVM [%] status value
0<cr>                   'responds parameter ok
1<cr>                   'response: MER [%] and EVM [%] measurement
                        value is greater then DTVMERPCT and
                        DTVEVMABS value

```

DTVEVMDB (Digital TV EVM in DB)

This command queries the measured EVM (Error Vector Magnitude) value in dB for Digital TV Receiver.

Example:

```

get<cr>
0<cr>
dtvevmdb<cr>           'query EVM measurement value
0<cr>                   'responds parameter ok
21.3<cr>                'response: EVM measurement result in dB

```

DTVEVMABS (Digital TV EVM in PerCent)

This command queries the measured EVM (Error Vector Magnitude) value in percent for Digital TV Receiver.

Example:

```

get<cr>
0<cr>
dtvevmabs<cr>          'query EVM measurement value in percent
0<cr>                   'responds parameter ok
2.53<cr>                'response: EVM measurement result in percent

```

DTVTSR (Digital TV Transport Stream Rate)

This command queries the measured Transport Stream Rate value for Digital TV Receiver.

Example:

```

get<cr>
0<cr>
dtvtsr<cr>           'query TS rate measurement value
0<cr>               'responds parameter ok
25.984562<cr>      'response: TS rate measurement result in Mbit/s
    
```

DTVSYOFFS (Digital TV SYmbolrate OFFSet)

This command queries the measured Symbolrate Offset value for Digital TV Receiver.

Example:

```

get<cr>
0<cr>
dtvsyoffs<cr>       'query Symbolrate Offset measurement value
0<cr>               'responds parameter ok
-53<cr>             'response: Symbolrate Offset measurement
                    result in Hz
    
```

DTVFEC (Digital TV FEC decoder status)

This command queries the FEC decoder status for Digital TV Receiver.

Value	FEC Decoder status
0	UNLOCKED
1	LOCKED

Example:

```

get<cr>
0<cr>
dtvfec<cr>          'query FEC decoder status
0<cr>               'responds parameter ok
1<cr>               'response: FEC decoder status
    
```

DTVCONST (Digital TV Constalation status)

This command queries the constalation status for Digital TV Receiver.

Value	Constalation status
0	UNLOCKED
1	LOCKED

Example:

```

get<cr>
0<cr>
dtvconst<cr>       'query constalation status
0<cr>               'responds parameter ok
1<cr>               'response: constalation status
    
```

DTVRFOFFS (Digital TV RF OFFSet)

This command queries the measured Carrier Frequency Offset for Digital TV measurements.

Example:

```

get<cr>
0<cr>
dtvrfoffs<cr>           'query RF Offset measurement value
0<cr>                   'responds parameter ok
-144891<cr>             'response: RF Offset measurement result in Hz

```

DTVBER (Digital TV BER)

This command queries the measured BER before Reed-Solomon decoder result for Digital TV Receiver.

Example:

```

get<cr>
0<cr>
dtvber<cr>              'query BER before RS decoder measurement value
0<cr>                   'responds parameter ok
-1.4E-5<cr>             'response: BER measurement result

```

DTVBERCNT (Digital TV BER sample count)

This command queries number of samples used and gate count of the measured BER value.

Example:

```

get<cr>
0<cr>
dtvbercnt<cr>          'query samples used BER value
0<cr>                   'responds parameter ok
10.2E3,100E3<cr>      'response: number of samples, gate count

```

DTVPERSER (Digital TV Package Error Ratio / Digital TV Segment Error Ratio)

This command queries the measured PER result for Digital TV measurements in case of QAM (J.83/A and J.83/C) and SER in case of 8VSB/ATSC and QAM (J.83/B) for Digital TV Receiver.

Example:

```

get<cr>
0<cr>
dtvperser<cr>          'query PER/SER measurement value
0<cr>                   'responds parameter ok
1.4E-8<cr>             'response: PER/SER measurement result

```

DTVPERSERCNT (Digital TV PERSER sample count)

This command queries number of samples used and gate count of the measured PER/SER value.

Example:

```

get<cr>
0<cr>
dtvpersercnt<cr>      'query samples used BER value
0<cr>                   'responds parameter ok
10.2E3,100E3<cr>      'response: number of samples, gate count

```

DTVREFLVL (Digital TV REFerence LeVeL)

This command queries the Reference level status. When reference level status is ok then the response will include the reference level hint.

Value	Reference level status
0	REFERENCE LEVEL OK
1	REFERENCE LEVEL TOO HIGH
2	REFERENCE LEVEL TOO LOW

Example 1:

```

get<cr>
0<cr>
dtvreflvl<cr>           'query reference level status
0<cr>                   'responds parameter ok
0<cr>                   'response: reference level STATUS OK
3<cr>                   'response: reference level HINT +3dB
    
```

Example 2:

```

get<cr>
0<cr>
dtvreflvl<cr>           'query reference level status
0<cr>                   'responds parameter ok
1<cr>                   'response: reference level TOO HIGH
    
```

LVLADJUST (LeVeL ADJUST)

This command initiates a level adjustment for the Digital TV Receiver.

Example:

```

cmd<cr>
0<cr>
lvladjust<cr>           'initiates level adjustment
0<cr>                   'responds parameter ok
    
```

Note: To check if the level adjustment is ready, the WAIT command can be used

LVLADJUSTUPP (LeVeL ADJUST UPPer shoulder)

This command initiates an Upper Shoulder level adjustment for the Digital TV Receiver.

Example:

```

cmd<cr>
0<cr>
lvladjustupp<cr>       'initiates upper shoulder level adjustment
0<cr>                   'responds parameter ok
    
```

Note: To check if the level adjustment is ready, the WAIT command can be used

LVLADJUSTLWR (LeVeL ADJUST LoWeR shoulder)

This command initiates a Lower Shoulder level adjustment for the Digital TV Receiver.

Example:

```
cmd<cr>
0<cr>
lvladjustlwr<cr>      'initiates lower shoulder level adjustment
0<cr>                  'responds parameter ok
```

Note: To check if the level adjustment is ready, the WAIT command can be used

RESTART (RESTART measurement)

This command initiates a restart measurement for the Digital TV Receiver.

Example:

```
cmd<cr>
0<cr>
restart<cr>           'initiates restart measurement
0<cr>                 'responds parameter ok
```

DTVWAITMER (DTV WAIT MER measurement to be accurate)

This command is used to synchronize with an accurate MER measurement. After sending the WAIT command the <ack> acknowledge is holdoff until the MER measurement is accurate.

Example:

```
cmd<cr>
0<cr>
dtvwaitmer<cr>      'wait for mer to be accurate
0<cr>                'responds parameter ok
```

DTVWAITCD (DTV WAIT CD measurement to be accurate)

This command is used to synchronize with an accurate CD measurement. After sending the WAIT command the <ack> acknowledge is holdoff until the CD measurement is accurate.

Example:

```
cmd<cr>
0<cr>
dtvwaitcdt<cr>     'wait for cd to be accurate
0<cr>               'responds parameter ok
```

Analog TV Receiver Measurement

Command	Parameters	Unit	Comment
ATVIDSTD	0...7		
ATVGDEL	0...10		
ATVASTD	0...14		
ATVASRC	0...13		
ATVQFLD	0, 1		
ATVQLN	<numeric value>		
ATVTLN	0...2		
ATVNFLD	0, 1		
ATVNLN	<numeric value>		
ATVTB	0...5		
ATVVOL	<numeric value>	dB	
ATVUNIT	0, 1		
ATVXPOS	<numeric value>	μS	
ATVVCLVLUNIT	0, 1, 2, 6, 7		
ATVSBPOS	0, 1		
ATVSBPOSAUTO	0, 1		
ATVDISP	0, 1		
ATVSYNCRK	<numeric value>	Sec	
ATVWHTMRK	<numeric value>	Sec	
ATVVVCLVLUNIT	0...2		
ATVREFLVL	<numeric value>	dB	GET command only
ATVCFO	<numeric value>	Hz	GET command only
ATVVDET	0, 1		GET command only
ATVSSEP	0...2		GET command only
ATVLBAR	<numeric value>	dB	GET command only
ATVSNBAR	<numeric value>	dB	GET command only
ATVSNNOM	<numeric value>	dB	GET command only
ATVAMCAR	0, 1		GET command only
ATVFMCAR	0, 1		GET command only
ATVFM1CAR	0, 1		GET command only
ATVFM2CAR	0, 1		GET command only
ATVNICAR	1, 2		GET command only
ATVFMMODE	0...2		GET command only
ATVBTSCMODE	0...3		GET command only
ATVNIMODE	0...4		GET command only

Command	Parameters	Unit	Comment
ATVNIBER	<numeric value>		GET command only
ATVFMPOWER	<numeric value>	dBm	GET command only
ATVFMOFFS	<numeric value>	Hz	GET command only
ATVFMDEV	<numeric value>	Hz	GET command only
ATVFM1POWER	<numeric value>	dBm	GET command only
ATVFM1OFFS	<numeric value>	Hz	GET command only
ATVFM1DEV	<numeric value>	Hz	GET command only
ATVFM2POWER	<numeric value>	dBm	GET command only
ATVFM2OFFS	<numeric value>	Hz	GET command only
ATVFM2DEV	<numeric value>	Hz	GET command only
ATVAMPPOWER	<numeric value>	dBm	GET command only
ATVAMOFFS	<numeric value>	Hz	GET command only
ATVNICAMPPOWER	<numeric value>	dBm	GET command only
ATVVCLVL	<numeric value>	dBm	GET command only
ATVRPC	<numeric value>	%	GET command only
ATVMODDEPTH	<numeric value>	%	GET command only
ATVHUM	<numeric value>	dB	GET command only
ATVRESETMARK			CMD command only
ATVSHOWMLST			CMD command only
STVHIDEMLST			CMD command only

ATVVIDSTD (Analog TV VIDEO STandard)

This command defines the Analog TV video standard.

Value	Video standard
0	STANDARD VIDEO B
1	STANDARD VIDEO GH
2	STANDARD VIDEO DK
3	STANDARD VIDEO M NTSC
4	STANDARD VIDEO M PAL
5	STANDARD VIDEO N
6	STANDARD VIDEO I
7	STANDARD VIDEO L

Example:

```

set<cr>
0<cr>
atvvidstd,3<cr>
0<cr>
'select video standard M NTSC
'responds parameter ok
    
```

ATVGDEL (Analog TV Group DELay)

This command defines Analog TV group delay.

Value	Group delay
0	GROUP DELAY GENERAL
1	GROUP DELAY AUSTRALIA
2	GROUP DELAY SWEDEN FULL
3	GROUP DELAY NORWAY
4	GROUP DELAY DANMARK
5	GROUP DELAY NEWZEALAND
6	GROUP DELAY CCIR
7	GROUP DELAY OIRT
8	GROUP DELAY FLAT
9	GROUP DELAY FCC
10	GROUP DELAY TDF

Example:

```

set<cr>
0<cr>
atvgdel,5<cr>
0<cr>
    
```

'select Group delay New Zealand
'responds parameter ok

ATVSSD (Analog TV Audio STanDard)

This command defines Audio standard for Analog TV Measurements.

Value	Sound standard
0	AUDIO STANDARD FM55 5742
1	AUDIO STANDARD FM55 NICAM585
2	AUDIO STANDARD FM55 MONO
3	AUDIO STANDARD FM65 6742
4	AUDIO STANDARD FM65 6258
5	AUDIO STANDARD FM65 NICAM585
6	AUDIO STANDARD FM65 MONO
7	AUDIO STANDARD FM45 BTSC
8	AUDIO STANDARD FM45 EIAJ
9	AUDIO STANDARD FM45 4724
10	AUDIO STANDARD FM45 MONO
11	AUDIO STANDARD FM60 NICAM6552
12	AUDIO STANDARD FM60 MONO
13	AUDIO STANDARD AM65 NICAM585
14	AUDIO STANDARD AM65

Example:

```

set<cr>
0<cr>
atvastd,2<cr>
0<cr>
    
```

'select Audio standard FM55 MONO
'responds parameter ok

ATVASRC (Analog TV Audio SouRCe)

This command defines Analog TV Audio Source.

Value	Audio source
0	AUDIO SOURCE AUTO 1
1	AUDIO SOURCE AUTO 2
2	AUDIO SOURCE STEREO
3	AUDIO SOURCE SOUND 1
4	AUDIO SOURCE SOUND 2
5	AUDIO SOURCE MONO
6	AUDIO SOURCE NICAM SOUND 1
7	AUDIO SOURCE NICAM SOUND 2
8	AUDIO SOURCE NICAM MONO
9	AUDIO SOURCE FM MONO
10	AUDIO SOURCE AM MONO
11	AUDIO SOURCE AUTO STEREO SAP
12	AUDIO SOURCE AUTO SAP STEREO
13	AUDIO SOURCE SAP
14	AUDIO SOURCE SOUND 1 PLUS 2
15	AUDIO SOURCE NICAM SOUND 1 PLUS 2

Example:

```
set<cr>
0<cr>
atvasrc,7<cr>
0<cr>
```

'select Audio Source NICAM SOUND 2
'responds parameter ok

ATVQFLD (Analog TV Quiet FieLD)

This command defines the Field for the Quiet testline for Analog TV measurements.

Value	Field
0	FIELD 1
1	FIELD 2

Example:

```
set<cr>
0<cr>
atvqfld,1<cr>
0<cr>
```

'select FIELD 2 for Quiet testline
'responds parameter ok

ATVTLN (Analog TV Test LiNe)

This command defines the testline for Analog TV measurements in list viewer mode.

Value	Timebase
0	CCIR 17
1	NTC7 COMP
2	FCC COMP

Example:

```
set<cr>
0<cr>
atvtln,1<cr>
0<cr>
```

'select testline NTC7 COMP
'responds parameter ok

ATVNFLD (Analog TV Norm FiELD)

This command defines the Field for the Norm testline for Analog TV measurements.

Value	Field
0	FIELD 1
1	FIELD 2

Example:

```

set<cr>
0<cr>
atvqfld,0<cr>           'select FIELD 1 for Quiet testline
0<cr>                   'responds parameter ok
    
```

ATVQLN (Analog TV Quiet LiNe)

This command defines the Quiet testline for Analog TV measurements.

Example:

```

set<cr>
0<cr>
atvqln,21<cr>          'select line 21 as quiet line
0<cr>                   'responds parameter ok
    
```

ATVNLN (Analog TV Norm LiNe)

This command defines the Norm testline for Analog TV measurements.

Example:

```

set<cr>
0<cr>
atvnln,20<cr>          'select line 20 as norm line
0<cr>                   'responds parameter ok
    
```

ATVTB (Analog TV scope TimeBase)

This command defines the timebase for Analog TV measurements in scope viewer mode.

Value	Timebase
0	1μSEC/DIV
1	2μSEC/DIV
2	5μSEC/DIV
3	10μSEC/DIV
4	20μSEC/DIV
5	50μSEC/DIV

Example:

```

set<cr>
0<cr>
atvtb,5<cr>           'select timebase 50μSec/div
0<cr>                   'responds parameter ok
    
```

ATVVOL (Analog TV audio VOLume)

This command defines the Audio Volume for Analog TV measurements.

Example:

```
set<cr>
0<cr>
atvvol,0.0<cr>           'set audio volume to 0.0dB
0<cr>                   'responds parameter ok
```

ATVUNIT (Analog TV UNIT)

This command defines the Unit for Analog TV measurements.

Value	Unit
0	UNIT mV
1	UNIT IRE

Example:

```
set<cr>
0<cr>
atvunit,1<cr>           'select unit IRE
0<cr>                   'responds parameter ok
```

ATVXPOS (Analog TV X POSition)

This command defines the X Position for Analog TV measurements in Scope viewer mode.

Example:

```
set<cr>
0<cr>
atvxpos,10.0<cr>       'set x position to 10.0 μSec (move right)
0<cr>                   'responds parameter ok
```

ATVVCLVLUNIT (Analog TV Vision Carrier LeVeL UNIT)

This command defines the unit for the Vision Carrier Level parameter.

Value	Vision Carrier Level Unit
0	UNIT dBm
1	UNIT dBmV
2	UNIT dBuV
6	UNIT V
7	UNIT W

Example:

```
set<cr>
0<cr>
atvvclvlunit, 0<cr>   'select unit dBm
0<cr>                   'responds parameter ok
```

ATVSBPOS (Analog TV SideBand POSition)

This command defines the sideband position.

Value	Reference level status
0	UPPER
1	LOWER

Example:

```

set<cr>
0<cr>
atvsbpos, 1<cr> 'select sideband position lower
0<cr>           'responds parameter ok
    
```

ATVSBPOSAUTO (Analog TV SideBand POSition AUTO)

This command defines the sideband position.

Value	Reference level status
0	OFF
1	ON

Example:

```

set<cr>
0<cr>
atvsbpos, 1<cr> 'set sideband position to automatic
0<cr>           'responds parameter ok
    
```

ATVDISP (Analog TV DISPlay)

This command defines the sideband position.

Value	Reference level status
0	OFF
1	ON

Example:

```

set<cr>
0<cr>
atvsbpos, 1<cr> 'set display on
0<cr>           'responds parameter ok
    
```

ATVSYNCMRK (Analog TV SYNC MaRKer)

This command defines the position of the sync-marker.

Example:

```

set<cr>
0<cr>
atvsyncmrk, 2.2e-6<cr> 'set sync marker to 2.2µSec
0<cr>                 'responds parameter ok
    
```

ATVWHTMRK (Analog TV WHiTe MaRKer)

This command defines the position of the sync-marker.

Example:

```
set<cr>
0<cr>
atvwhtmrk, 2.4e-6<cr> 'set sync marker to 2.4µSec
0<cr> 'responds parameter ok
```

ATVREFLVL (Analog TV REFerence LeVeL)

This command queries the Reference level status. When reference level status is ok then the response will include the reference level hint.

Value	Reference level status
0	REFERENCE LEVEL OK
1	REFERENCE LEVEL TOO LOW
2	REFERENCE LEVEL TOO HIGH

Example 1:

```
get<cr>
0<cr>
atvreflvl<cr> 'query reference level status
0<cr> 'responds parameter ok
0<cr> 'response: reference level STATUS OK
3<cr> 'response: reference level HINT +3dB
```

Example 2:

```
get<cr>
0<cr>
atvreflvl<cr> 'query reference level status
0<cr> 'responds parameter ok
1<cr> 'response: reference level TOO LOW
```

ATVCFO (Analog TV Carrier Frequency Offset)

This command queries the measured Carrier Frequency Offset value.

Example:

```
get<cr>
0<cr>
atvcfo<cr> 'query carrier frequency offset measurement value
0<cr> 'responds parameter ok
39987<cr> 'response: carrier frequency offset measurement value
```

ATVVDET (Analog TV Vision DETector status)

This command queries the vision detector status for Analog TV measurements.

Value	Detector status
0	LOCKED
1	UNLOCKED

Example:

```
get<cr>
0<cr>
atvvdet<cr> 'query vision detector status
0<cr> 'responds parameter ok
1<cr> 'response vision detector status
```

ATVSSEP (Analog TV Sync SEPerator status)

This command queries the sync seperator status for Analog TV measurements.

Value	Separator status
0	SYNC SEPARATOR H & V
1	SYNC SEPARATOR NO V
2	SYNC SEPARATOR NO H

Example:

```

get<cr>
0<cr>
atvvdet<cr>           'query sync seperator status
0<cr>                 'responds parameter ok
2<cr>                 'response sync seperator status
    
```

ATVLBAR (Analog TV Luminance BAR)

This command queries the measured Luminance BAR for Analog TV measurements.

Example:

```

get<cr>
0<cr>
atvlbar<cr>           'query Luminance BAR measurement value
0<cr>                 'responds parameter ok
39.2<cr>              'response: Luminance BAR measurement value
    
```

ATVSNBAR (Analog TV SN BAR)

This command queries the measured SN BAR for Analog TV measurements.

Example:

```

get<cr>
0<cr>
atvsnbar<cr>         'query SN BAR measurement value
0<cr>                 'responds parameter ok
19.1<cr>             'response: SN BAR measurement value
    
```

ATVSNNOM (Analog TV SN NOM)

This command queries the measured SN NOM for Analog TV measurements.

Example:

```

get<cr>
0<cr>
atvsnnom<cr>        'query SN NOM measurement value
0<cr>                 'responds parameter ok
29.4<cr>            'response: SN NOM measurement value
    
```


ATVAMCAR (Analog TV AM CARrier status)

This command queries the AM Carrier status for Analog TV measurements.

Value	Carrier status
0	PRESENT
1	MISSING

Example:

```

get<cr>
0<cr>
atvamcar<cr>           'query am carrier status
0<cr>                 'responds parameter ok
1<cr>                 'response am carrier status

```

ATVFMCAR (Analog TV FM sound CARrier status)

This command queries the FM Carrier status for Analog TV measurements.

Value	Carrier status
0	PRESENT
1	MISSING

Example:

```

get<cr>
0<cr>
atvfmcar<cr>          'query fm carrier status
0<cr>                 'response parameter ok
0<cr>                 'response parameter carrier present

```

ATVFM1CAR (Analog TV FM1 sound CARrier status)

This command queries the FM1 Carrier status for Analog TV measurements.

Value	Carrier status
0	PRESENT
1	MISSING

Example:

```

get<cr>
0<cr>
atvfmcar<cr>          'query fm carrier 1 status
0<cr>                 'response parameter ok
0<cr>                 'response parameter carrier 1 present

```

ATVFM2CAR (Analog TV FM2 sound CARrier status)

This command queries the FM2 Carrier status for Analog TV measurements.

Value	Carrier status
0	PRESENT
1	MISSING

Example:

```

get<cr>
0<cr>
atvfmcar<cr>           'query fm carrier 2 status
0<cr>                 'response parameter ok
0<cr>                 'response parameter carrier 2 present
    
```

ATVNICAR (Analog TV Nicam CARrier status)

This command queries the Nicam Carrier status for Analog TV measurements.

Value	Carrier status
0	PRESENT
1	MISSING

Example:

```

get<cr>
0<cr>
atvnicar<cr>          'query Nicam carrier status
0<cr>                 'responds parameter ok
1<cr>                 'response Nicam carrier status
    
```

ATVFMMODE (Analog TV FM MODE)

This command queries the FM mode measurement value for Analog TV measurements.

Value	FM mode
0	FM MODE MONO
1	FM MODE STEREO
2	FM MODE DUAL

Example:

```

get<cr>
0<cr>
atvfmmode<cr>        'query FM mode measurement value
0<cr>                 'responds parameter ok
1<cr>                 'response FM mode measurement value
    
```

ATVBTSCMODE (Analog TV BTSC MODE)

This command queries the BTSC mode measurement value for Analog TV measurements.

Value	BTSC mode
0	BTSC MODE MONO
1	BTSC MODE STEREO
2	BTSC MODE SAP
3	BTSC MODE STEREO SAP

Example:

```

get<cr>
0<cr>
atvbtscmode<cr>
0<cr>
1<cr>

```

'query BTSC mode measurement value
'responds parameter ok
'response BTSC mode measurement value

ATVNIMODE (Analog TV Nicam MODE)

This command queries the Nicam mode measurement value for Analog TV measurements.

Value	NICAM mode
0	NICAM MODE MONO
1	NICAM MODE STEREO
2	NICAM MODE DUAL
3	NICAM MODE MONO DATA
4	NICAM MODE DATA ONLY

Example:

```

get<cr>
0<cr>
atvnimode<cr>
0<cr>
4<cr>

```

'query Nicam mode measurement value
'responds parameter ok
'response Nicam mode measurement value

ATVNIBER (Analog TV Nicam BER)

This command queries the measured Nicam BER for Analog TV measurements.

Example:

```

get<cr>
0<cr>
atvniber<cr>
0<cr>
2.4E-5<cr>

```

'query Nicam BER measurement value
'responds parameter ok
'response: Nicam BER measurement value

ATVVCLVL (Analog TV Vision Carrier LeVeL)

This command queries the Vision Carrier Level for Analog TV measurements.

Example:

```

get<cr>
0<cr>
atvvclvl<cr>
0<cr>
-44.1<cr>

```

'query value
'responds parameter ok
'response: Vision Carrier Level -44.1 dBm

ATVRPC (Analog TV Residual Picture Carrier)

This command queries the percentage of the RPC for Analog TV measurements.
The RPC = (Whitelevel/Synclevel) * 100%

Example:

```

get<cr>
0<cr>
atvrpc<cr>      'query value
0<cr>           'responds parameter ok
33.1<cr>        'response: Residual Picture Carrier 33.1%
```

ATVMODDEPTH (Analog TV MODulation DEPTH)

This command queries the percentage of the Modulation Depth for Analog TV measurements.

Example:

```

get<cr>
0<cr>
atvmoddepth<cr> 'query value
0<cr>           'responds parameter ok
14.4<cr>        'response: Modulation Depth 14.4%
```

ATVHUM (Analog TV HUM)

This command queries the HUM for the Analog TV measurement.

Example:

```

get<cr>
0<cr>
atvhum<cr>      'query value
0<cr>           'responds parameter ok
0.3<cr>         'response: HUM 0.3dB
```

LVLADJUST (Level Adjust)

This command initiates a level adjustment for the Analog TV measurement.

Example:

```

cmd<cr>
0<cr>
lvladjust<cr>   'initiates level adjustment
0<cr>           'responds parameter ok
```

Note: To check if the level adjustment is ready, the WAIT command can be used

ATVFMPWR (Analog TV vision/FM PoWeR ratio)

This command queries the Vision/FM Carrier Power Ratio for the Analog TV measurement.

Example:

```

get<cr>
0<cr>
atvfmpwr<cr>    'query value
0<cr>           'responds parameter ok
11.8<cr>        'response: ATVFMPWR 11.8 dB
```

ATVFMOFFS (Analog TV vision/FM carrier frequency OFFSet)

This command queries the Vision/FM Carrier Frequency Offset for the Analog TV measurement.

Example:

```

get<cr>
0<cr>
atvfmoff<cr>    'query value
0<cr>           'responds parameter ok
5500154<cr>     'response: ATVFMOFF 5500154 Hz

```

ATVFMDEV (Analog TV FM DEVIation)

This command queries the FM deviation for the analog TV measurement.

Example:

```

get<cr>
0<cr>
atvfmdev<cr>    'query value
0<cr>           'responds parameter ok
210<cr>         'response: ATVFMDEV 210 Hz

```

ATVFM1PWR (Analog TV vision/FM1 PoWeR ratio)

This command queries the Vision/FM 1 Carrier Power Ratio for the Analog TV measurement.

Example:

```

get<cr>
0<cr>
atvfm1pwr<cr>   'query value
0<cr>           'responds parameter ok
11.8<cr>        'response: ATVFM1PWR 11.8 dB

```

ATVFM1OFF (Analog TV vision/FM1 carrier frequency OFFSet)

This command queries the Vision/FM 1 Carrier Frequency Offset for the Analog TV measurement.

Example:

```

get<cr>
0<cr>
atvfm1loff<cr>  'query value
0<cr>           'responds parameter ok
5500154<cr>     'response: ATVFM1OFF 5500154 Hz

```

ATVFM1DEV (Analog TV FM1 DEVIation)

This command queries the FM1 deviation for the analog TV measurement.

Example:

```

get<cr>
0<cr>
atvfm1dev<cr>   'query value
0<cr>           'responds parameter ok
-11<cr>         'response: ATVFM1DEV -11 Hz

```

ATVFM2PWR (Analog TV vision/FM2 PoWeR ratio)

This command queries the Vision/FM 2 Carrier Power Ratio for the Analog TV measurement.

Example:

```
get<cr>
0<cr>
atvfm2pwr<cr>    'query value
0<cr>            'responds parameter ok
50.7<cr>         'response: ATVFM2PWR 50.7 dB
```

ATVFM2OFF (Analog TV vision/FM2 carrier frequency OFFSet)

This command queries the Vision/FM 2 Carrier Frequency Offset for the Analog TV measurement.

Example:

```
get<cr>
0<cr>
atvfm2off<cr>    'query value
0<cr>            'responds parameter ok
5742118<cr>      'response: ATVFM2OFF 5742118 Hz
```

ATVFM2DEV (Analog TV FM2 DEVIation)

This command queries the FM2 deviation for the analog TV measurement.

Example:

```
get<cr>
0<cr>
atvfm2dev<cr>    'query value
0<cr>            'responds parameter ok
121<cr>          'response: ATVFM2DEV 121 Hz
```

ATVAMPWR (Analog TV vision/AM PoWeR ratio)

This command queries the Vision/AM Carrier Power Ratio for the Analog TV measurement.

Example:

```
get<cr>
0<cr>
atvampwr<cr>     'query value
0<cr>            'responds parameter ok
67.0<cr>         'response: ATVAMPWR 67.0 dB
```

ATVAMOFFS (Analog TV vision/AM carrier frequency OFFSet)

This command queries the Vision/AM Carrier Frequency Offset for the Analog TV measurement.

Example:

```
get<cr>
0<cr>
atvamoff<cr>     'query value
0<cr>            'responds parameter ok
6501149<cr>      'response: ATVAMOFF 6501149 Hz
```

ATVNICAMPWR (Analog TV vision/NICAM PoWeR ratio)

This command queries the Vision/NICAM Carrier Power Ratio for the Analog TV measurement.

Example:

```
get<cr>
0<cr>
atvnicampwr<cr> 'query value
0<cr>           'responds parameter ok
53.3<cr>       'response: ATVNICAMPWR 53.3 dB
```

ATVRESETMARK (Analog TV RESET MARKers)

This command resets markers to their predefined position for the Analog TV Receiver.

Example:

```
cmd<cr>
0<cr>
atvresetmark<cr> 'reset marker to predefined position
0<cr>           'responds parameter ok
```

ATVSHOWMLST (Analog TV SHOW Marker LiST)

This command switches the displaying of markers lists on for the Analog TV Receiver.

Example:

```
cmd<cr>
0<cr>
atvshowmlst<cr> 'show marker list
0<cr>           'responds parameter ok
```

ATVHIDEMMLST (Analog TV HIDE Marker LiST)

This command switches the displaying of markers lists off for the Analog TV Receiver.

Example:

```
cmd<cr>
0<cr>
atvhidemmlst<cr> 'hide marker list
0<cr>           'responds parameter ok
```

Cable TV Measurement

Command	Parameters	Unit	Comment
CBLCAROFFS	0...5		
CBLCAROFFSMAN	<numeric value>	Hz	
CBLCHBW	<numeric value>	Hz	
CBLDISP	0, 1		
CBLCSTD	<string>		
CBLCTBMODE	0, 1		
CBLCSOMODE	0, 1		
CBLCTBNOISECOR	0, 1		
CBLCSOISECOR	0, 1		
CBLMANREFPWR	0, 1		
CBLREFPWR	<numeric value>	dB	
CBLREFUNIT	0...2		
CBLSBPOS	0, 1		
CBLSBPOSAUTO	0, 1		
CBLREFVALUE	<numeric value>	dB	GET command only
CBLVALUE	<numeric value>	dBc	GET command only

CBLCAROFFS (CaBLE TV CaRrier OFFSet)

This command defines the Carrier Offset for Cable TV measurements.

Value	Carrier Offset
0	-250 kHz
1	+250 kHz
2	-750 kHz
3	+750 kHz
4	-1.25 MHz
5	+1.25 MHz

Example:

```

set<cr>
0<cr>
cblcaroffs,3<cr>
0<cr>
'select Carrier Offset +750 kHz
'responds parameter ok
    
```


CBLCAROFFSMAN (CaBLE TV CARrier OFFSet MANual)

This command defines the Manual Carrier Offset for Cable TV measurements.

Example:

```
set<cr>
0<cr>
cblcaroffsman,7e6<cr> 'set Manual Carrier Offset 7 MHz
0<cr>                  'responds parameter ok
```

CBLCHBW (CaBLE TV CHannel BandWidth)

This command defines the Channel Bandwidth for Cable TV measurements.

Example:

```
set<cr>
0<cr>
cblchbw,8e6<cr>      'set channel bandwidth to 8 MHz
0<cr>                'responds parameter ok
```

CBLDISP (CaBLE TV DISPlay mode)

This command defines the Display mode for Cable TV measurements.

Value	Display Mode
0	OFF
1	ON

Example:

```
set<cr>
0<cr>
cbldisp,0<cr>      'select Display mode OFF
0<cr>              'responds parameter ok
```

CBLCSTD (CaBLE TV Customized STandard)

This command selects the customized standard for the Cable TV CTB/CSO measurement previously loaded with R&S FSHView software.

Example:

```
set<cr>
0<cr>
cblcstd,MyStd<cr>  'select MyStd as standard
0<cr>              'responds parameter ok
```

CBLCTBMODE (CaBLE TV CTB MODE)

This command defines the CTB MODE for Cable TV CTB measurements.

Value	CTB Mode
0	REF CHANNEL
1	CTB CHANNEL

Example:

```
set<cr>
0<cr>
cblctbmode,0<cr>   'select CTB REF CHANNEL measurement
0<cr>              'responds parameter ok
```

CBLCSOMODE (CaBLE TV CSO MODE)

This command defines the CSO MODE for Cable TV CSO measurements.

Value	CSO Mode
0	REF CHANNEL
1	CSO CHANNEL

Example:

```

set<cr>
0<cr>
cblcsomode,1<cr> 'select CSO CHANNEL measurement
0<cr> 'responds parameter ok
    
```

CBLCTBNOISECOR (CaBLE TV CTB NOISE CORrection)

This command defines the noise correction mode for Cable TV CTB measurements.

Value	Noise Correction
0	OFF
1	ON

Example:

```

set<cr>
0<cr>
cblctbnoisecor,0<cr> 'disable noise correction for CTB measurement
0<cr> 'responds parameter ok
    
```

CBLCSOISECOR (CaBLE TV CSO NOISE CORrection)

This command defines the noise correction mode for Cable TV CSO measurements.

Value	Noise Correction
0	OFF
1	ON

Example:

```

set<cr>
0<cr>
cblcsonoisecor,1<cr> 'enable noise correction for CSO measurement
0<cr> 'responds parameter ok
    
```

CBLMANREFPWR (CaBLE TV MANual REFerence PoWeR)

This command defines the Manual Reference Power mode for Cable TV measurements.

Value	Manual Reference Power
0	OFF
1	ON

Example:

```

set<cr>
0<cr>
cblmanrefpwr,0<cr> 'select Manual Reference Power OFF
0<cr> 'responds parameter ok
    
```

CBLREFPWR (CaBLE TV REFERENCE PoWeR)

This command defines the Reference Power for Cable TV measurements.

Example:

```
set<cr>
0<cr>
cblrefpwr,10.0<cr>    'set reference power to 10dB
0<cr>                 'responds parameter ok
```

CBLREFUNIT (CaBLE TV REFERENCE channel measurement UNIT)

This command defines the Unit for the Reference Channel Measurement for Cable TV measurements.

Value	Unit
0	dBm
1	dBmV
2	dB μ V

Example:

```
set<cr>
0<cr>
cblrefunit,0<cr>     'select Reference Unit dBm
0<cr>                 'responds parameter ok
```

CBLSBPOS (CaBLE TV SideBand POSition)

This command defines the Sideband position for Cable TV measurements.

Value	Sideband Position
0	UPPER
1	LOWER

Example:

```
set<cr>
0<cr>
cblsbpos,0<cr>       'select Sideband Position UPPER
0<cr>                 'responds parameter ok
```

CBLSBPOSAUTO (CaBLE TV SideBand POSition AUTOMATIC)

This command defines the Automatic Sideband position for Cable TV measurements.

Value	Automatic Sideband Position
0	OFF
1	ON

Example:

```
set<cr>
0<cr>
cblsbposauto,0<cr>   'select Sideband Position Auto OFF
0<cr>                 'responds parameter ok
```

CBLREFVALUE (CaBLe TV REFerence channel measurement VALUE)

This command queries the Reference Channel Measurement Value for Cable TV measurements.

Example:

get<cr>	
0<cr>	
cblrefvalue<cr>	'query reference channel measurement value
0<cr>	'responds parameter ok
-60,1<cr>	'responds -60,1 dBm

CBLVALUE (CaBLe TV measurement VALUE)

This command queries the Measurement Value for Cable TV measurements.

Example:

get<cr>	
0<cr>	
cblvalue<cr>	'query reference channel measurement value
0<cr>	'responds parameter ok
6,3<cr>	'responds 6,3 dBc

Programming Examples

The following examples are code snippets in Visual Basic (VB6).

Initialize Communication with R&S FSH3-TV

```
Public Function FSHInit(ByVal Port As Integer, ByVal Speed As Long,
                        Optional ByVal ErrorCode As String) As Boolean

Rem Initialize communication with FSH
Rem Return TRUE if device initialization was successful
Rem Return FALSE otherwise e.g. the device was not found

With MainForm.FSHCommC
    .CommPort = Port
    .Settings = Trim$(Str$(Speed)) + ",N,8,1"
    .InBufferSize = 1000
    .PortOpen = True
    .InBufferCount = 0
End With
InBuffer = vbNullString

End Function
\-----
```

Poll R&S FSH3-TV until <cr> received

```
Public Function PollFSH() As String

Dim CrPos As Long

With MainForm.FSHCommC
    Do
        InBuffer = InBuffer + .Input
        DoEvents
        CrPos = InStr(1, InBuffer, vbCr)
    Loop Until CrPos > 0
    PollFSH = Left$(InBuffer, CrPos - 1)
    InBuffer = Mid$(InBuffer, CrPos + 1)
End With

End Function
\-----
```

Send CMD Command to R&S FSH3-TV

```
Public Function FSHCmd(ByVal Command As String) As Boolean

Dim TempError As Integer

InBuffer = vbNullString
FSHCmd = False
With MainForm.FSHCommC
    .Output = "cmd" + vbCr
    TempError = Val(PollFSH)
    If TempError = 0 Then
        .Output = Command + vbCr
        TempError = Val(PollFSH)
        If TempError = 0 Then
            FSHCmd = True
        Else
            DebugMsg "CMD error" + Str(TempError) + " for command <" + Command + ">"
        End If
    Else
        DebugMsg "CMD error" + Str(TempError) + " for command <" + Command + ">"
    End If
End With

End Function
\-----
```

Send SET Command to R&S FSH3-TV

```
Public Function FSHSet(ByVal Command As String) As Boolean

Dim TempError As Integer

InBuffer = vbNullString
FSHSet = False
With MainForm.FSHCommC
    .Output = "set" + vbCr
    TempError = Val(PollFSH)
    If TempError = 0 Then
        .Output = Command + vbCr
        TempError = Val(PollFSH)
        If TempError = 0 Then
            FSHSet = True
        Else
            ErrorMessage "SET error" + Str(TempError) + " for command <" + Command + ">"
        End If
    Else
        ErrorMessage "SET error" + Str(TempError) + " for command <" + Command + ">"
    End If
End With

End Function
\-----
```

Send GET Command to R&S FSH3-TV and Read Response

```
Public Function FSHGet(ByVal Command As String, ByRef Buffer As String) As Boolean

Dim TempError As Integer

InBuffer = vbNullString
FSHGet = False
With MainForm.FSHCommC
    .Output = "get" + vbCr
    TempError = Val(PollFSH)
    If TempError = 0 Then
        .Output = Command + vbCr
        TempError = Val(PollFSH)
        If TempError = 0 Then
            Sleep 50
            Buffer = PollFSH
            FSHGet = True
        Else
            ErrorMessage "GET error" + Str(TempError) + " for command <" + Command + ">"
        End If
    Else
        ErrorMessage "GET error" + Str(TempError) + " for command <" + Command + ">"
    End If
End With

End Function
\-----
```

Example: Program Instrument Setup

```
Private Sub FSHSetup ()

Dim Buffer As String

FSHCmd "REMOTE"           \ Set FSH to Remote State
FSHGet "IDN?", Buffer       \ Query instrument ID
FSHCmd "PRESET"           \ Preset FSH settings
FSHSet "FREQ,950E6"        \ Set Center Frequency to 950 MHz
FSHSet "SPAN,5E6"         \ Set Span to 5 MHz
FSHCmd "LOCAL"           \ Return to Local Mode

End Sub
\-----
```

Read Binary Trace Data from R&S FSH3-TV

```

Public Function FSHGetTraceBin(ByRef Values() As Long) As Boolean

Dim InBuffer As String
Dim TempError As Integer

InBuffer = vbNullString
FSHGetTraceBin = False
With MainForm.FSHCommC
    .Output = "GET" + vbCr
    TempError = Val(PollFSH)
    If TempError = 0 Then
        .Output = "TRACEBIN" + vbCr
        TempError = Val(PollFSH)
        If TempError = 0 Then
            InBuffer = PollFSHBin(1205)           ` 4 x 301 bins with 4 bytes
            AsString.Buffer = StrConv(InBuffer, vbFromUnicode)
            LSet AsValues = AsString
            Values = AsValues.SValues
            ReDim Preserve Values(0 To 300)
            FSHGetTraceBin = True
        Else
            ErrorMessage "GET error" + Str(TempError) + " for command <TRACEBIN>"
        End If
    Else
        ErrorMessage "GET error" + Str(TempError) + " for command <TRACEBIN>"
    End If
End With

End Function
\-----

```

Poll Input Buffer until Number of Bytes are Received

```

Public Function PollFSHBin(ByVal BufferLen As Long) As String

Dim CrPos As Long

With MainForm.FSHCommC
    Do
        InBuffer = InBuffer + .Input
        DoEvents
        DebugMsg "BIN-BUFFER-LEN: " + Str(Len(InBuffer))
    Loop Until Len(InBuffer) >= BufferLen
    PollFSHBin = Left$(InBuffer, BufferLen)
    InBuffer = Mid$(InBuffer, BufferLen + 1)
End With

End Function

```