R&S®CMW-KM750/-KM751
TD-SCDMA Firmware Applications
User Manual

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Test & Measurement

User Manual

ROHDE&SCHWARZ

This user manual describes the following R&S®CMW options:

- R&S®CMW-KM750 (TD-SCDMA, TX measurement, uplink)
- R&S®CMW-KM751 (TD-SCDMA enhancement, TX measurement, uplink)

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The following abbreviations are used throughout this manual: R&S®CMW is abbreviated as R&S CMW.

Contents

1 Preface

The operation of the R&S CMW is described in several user manuals:

- The R&S CMW user manual describes the base software, common features of the firmware applications and basic principles for manual operation and remote control.
- Additional user manuals, like this document, describe the firmware applications.

Rohde & Schwarz provides registered users a "CMW Customer Web" section on GLORIS, the Global Rohde & Schwarz Information System: https://extranet.rohde-schwarz.com. From this resource you can download software updates, waveform library updates and documentation updates, e.g. updates of this document.

1.1 How to Read Firmware Application Chapters

Each firmware application is described in a separate chapter. These chapters can be read independently of each other. However, they are all organized as follows:

1. General Description
2. Application Sheets (optional)
3. GUI Reference
4. Programming Examples
5. Command Reference

The chapters "System Overview" and "Remote Control" in the R&S CMW user manual provide additional important information independent of the individual firmware applications. The most important parts are referenced by the firmware application descriptions.

1.1.1 General Description

This section provides a general description of the firmware application, independent of a specific operation mode (manual or remote control). It gives a high-level introduction to the capabilities of the firmware application. Background information related to the network standard is given as far as it is directly related to administrable parameters. For measurement applications a detailed description of measurement results and a description of configurable limits is given, including the relation to conformance requirements defined in network standard specifications.

1.1.2 Application Sheets

This optional section provides short application examples for select issues and related background information.

1.1.3 GUI Reference

The GUI reference describes the manual operation of the firmware application via the Graphical User Interface (GUI).

The description of a configuration dialog usually starts with a screenshot presenting the preset values of the parameters (sometimes preset values are modified to enable hidden parts of a dialog). Below the screenshot all shown parameters are described. For each single parameter a link to the corresponding command description in the "Command Reference" is provided. Ranges for numeric parameters and reset values are given there.

For measurement results links to the corresponding command descriptions are provided (commands to retrieve the results). The measurement results are described in detail in the "General Description".

1.1.4 Programming Examples

The programming examples show how to control and configure the firmware application via a remote-control program and how to retrieve measurement results. The examples consist of comprehensive command sequences. You can check just a single command of a sequence to get an example for the syntax of this single command. But you can also consider an entire sequence showing the commands in the context of a command script, under consideration of dependencies and required orders of the commands.

The command sequences are written with the intention to list most commands of the firmware application. They do not show the fastest way for a given configuration task. The fastest way would use many reset values and omit the corresponding commands.

The examples are referenced by the command descriptions of the "Command Reference".

1.1.5 Command Reference

The command reference provides information on the remote commands of the firmware application. The commands are grouped according to their function.

Each command description indicates the syntax of the command header and of the parameters. For input parameters the allowed ranges, reset values and default units are listed, for returned values the expected ranges and default units. Most commands have a command form and a query form. Exceptions are marked by "Setting only", "Query only" or "Event". Furthermore a link to the "Programming Examples" is provided and the first software version supporting the command is indicated.

2 What's New in this Revision

This revision describes version 3.0.30 and later of the "TD-SCDMA Measurement" firmware application. Compared to version 3.0.20 it provides the following new features:

- List mode enhancements, see Multi Evaluation List Mode:
  - Increased maximum number of segments to 500
  - Increased maximum number of subframes to 1600

Software Version

To check your R&S CMW software version, open the "Setup" dialog and click "HW/SW Equipment". The initial software version for each remote control command is quoted in the reference description.

3 General Description

The "TD-SCDMA measurement" firmware application (option R&S CMW-KM750) provides quick and flexible TX tests on TD-SCDMA uplink signals and an RX test (Bit Error Rate and Block Error Ratio).

Option R&S CMW-KM750 allows to measure QPSK modulated signals only. To measure 16-QAM modulated signals, option R&S CMW-KM751 is required additionally.

The tests cover the following UE transmitter properties:

- UE output power over a wide range of slots
- Modulation accuracy
- Spectrum emissions
- Code Domain Power (CDP) and Code Domain Error (CDE)

Many of the tests and conformance requirements are specified in 3GPP TS 34.122, "Universal Mobile Telecommunications System (UMTS); Terminal conformance specification; Radio transmission and reception (TDD)".

The following sections describe how to perform and configure the measurement.

3.1 TD-SCDMA TX Tests

TX tests have many characteristics in common. The following sections describe these characteristics and show how to perform TX tests.

3.1.1 Test Setup

The external RF signal source (mobile station, signal generator etc.) is connected to one of the RF input connectors (RF COM) at the front panel of the R&S CMW. No additional cabling and no external trigger is needed.

The input level ranges of all RF COM connectors are identical.

See also: "RF Connectors" in the R&S CMW user manual, chapter "Getting Started"

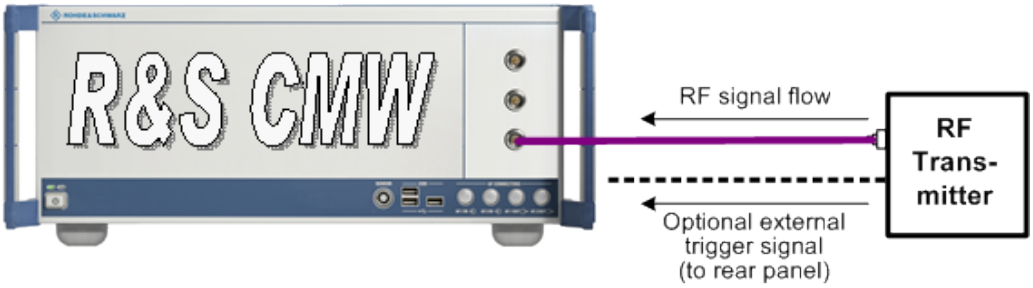


Fig. 3-1: Connecting an RF transmitter to the instrument

3.1.2 Measuring an Uplink TD-SCDMA Signal

After connecting your TD-SCDMA UE to the R&S CMW you have to adjust the following analyzer settings to the properties of the analyzed UL TD-SCDMA signal:

- The analyzer "Frequency"
- The "Expected Nominal Power" and (optional) a "User Margin" and "External Attenuation". Recommended values: "Expected Nominal Power" = peak power of the UE signal over the entire measurement range; "User Margin" = 0 dB (the smallest possible value ensures maximum dynamic range).

For synchronization to the received signal and proper decoding, the "UE Signal Info" settings in the configuration dialog must be in accordance with the measured signal. In particular, ensure that the following parameters match up:

- The "First Active Uplink Slot Number"
- The position of the duplex "Switching Point"
- The "Scrambling Code" and the "User Number"
- The "Modulation Type"

The R&S CMW can auto-detect the spreading factors and channelization codes of the channels.

With matching "UE Signal Info" settings, the R&S CMW is able to decode the signal and determine its slot timing. No additional measurement trigger is required. Non-matching "UE Signal Info" settings generally result in large EVM results.

3.1.3 Defining the Scope of the Measurement

The R&S CMW can measure up to 16 consecutive TD-SCDMA subframes (112 slots) in a single measurement cycle and store the measurement results for each slot. The total number of slots per measurement cycle is termed the "Measurement Length".

Within this measurement interval, two individual slots are selected for a more detailed analysis:

- The "Preselected Slot" is used for single slot measurements, e.g. to measure the Adjacent Channel Leakage power Ratio (ACLR), the spectrum emissions and single slot modulation measurements (vs. chip results).
  Any uplink slot within the measurement interval can be selected.

- For the multislot measurements statistical results are measured for all slots and are displayed for one slot at a time, the "Scalar Slot". Statistical results are relevant in particular if the "Measurement Length" is measured repeatedly.
  Any slot within the measurement interval can be selected.

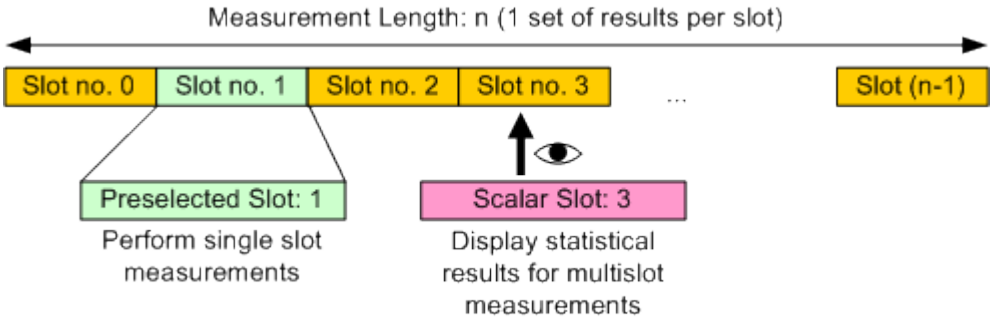


Fig. 3-2: Preselected Slot and Scalar Slot

The "Preselected Slot" and the "Scalar Slot" are completely independent from each other.

If the "Preselected Slot" can not be measured correctly, this results in an error message (for example "Underdriven" or "Sync Error"). If there are problems in another slot, but the "Preselected Slot" is measured correctly, no error message is displayed and the reliability indicator returned with measurement results equals zero.

3.1.4 Trigger Modes

The TD-SCDMA "Multi Evaluation" measurement can be performed in the following trigger modes (trigger source settings):

- Free Run: The measurement starts immediately after it is initiated. The R&S CMW decodes the signal to derive its slot and frame timing so that the "Measurement Length" can start at a frame boundary of the UL TD-SCDMA signal.
- IF Power: With an internal IF power trigger, the measurement is triggered by the power ramp of the received bursts.
- External Trigger A/B: External trigger signal fed in via TRIG A or TRIG B on the rear panel of the instrument. Without a configured trigger delay, a subframe trigger signal is expected.
- Additional trigger modes: Other firmware applications, e.g. the GPRF generator may provide additional trigger modes. Refer to the documentation of the corresponding firmware application for a description of these trigger modes. Without a configured trigger delay, a subframe trigger signal is expected.

For configuration see chapter 4.2.4, "Trigger Settings", on page 44.

3.2 TD-SCDMA RX Tests

RX tests can be carried out in parallel to the TX tests. The following sections describe how to perform RX tests.

3.2.1 Test Setup

The downlink RF generator signal of the R&S CMW is fed to the input of the DUT. The R&S CMW measures the uplink signal. Most conveniently, a bi-directional connection with a single coax cable is used. The DUT is connected to one of the RF input connectors (RF COM) at the front panel of the R&S CMW. No additional cabling and no external trigger is needed.

The input level ranges of all RF COM connectors are identical.

See also: "RF Connectors" in the R&S CMW user manual, chapter "Getting Started"

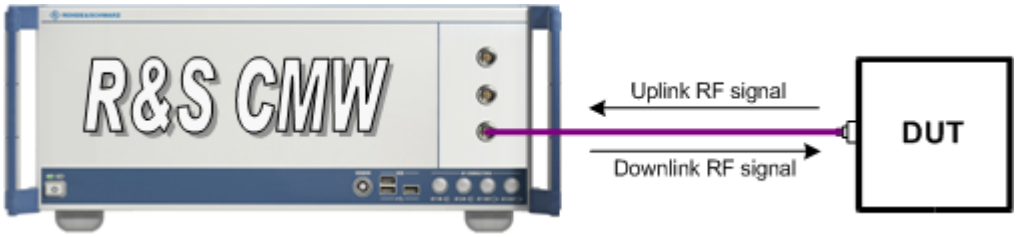


Fig. 3-3: Test setup for RX tests

3.2.2 Performing a TD-SCDMA RX Test

For an RX measurement you need to generate a TD-SCDMA downlink signal with an information bit rate of 12.2 kbps. The DTCH must transport one of the supported data patterns (see "BER > Data Pattern" on page 43). The signal may contain either a Reference Measurement Channel (RMC) including both DTCH and DCCH or it may contain user data only (DTCH only, no DCCH), see "BER > TrCH Mode" on page 43.

The downlink signal can be generated using the GPRF generator and an ARB file. Order the UE to loop back the received data, using a test mode and measure the resulting uplink signal using the multi evaluation measurement.

The components of this scenario have to be configured as follows:

- ARB file:
  For transport channel mode "RMC" you can use the ARB file named `TD-SCDMA-DL_12k2.wv` (uses all 1 pattern).
  Alternatively (and for transport channel mode "USER") you can generate an ARB file using R&S WinIQSIM2 and the following settings:
  – Configuration of cell 1 > enhanced channel settings > show DCH details:
    Select a 12.2 kbps RMC as coding type.
    For transport channel mode "USER", disable the DCCH (the coding type changes to "User").
    Select a data source for the transport channel.
  – Marker settings:
    Set the user period of marker 4 to 25600 chips (4 subframes).
  – Filter/Clipping/ARB settings:
    Enter a sequence length of 2 frames (4 subframes).
- GPRF generator:

Select an ARB file (see above) and generate the TD-SCDMA downlink signal.

- UE:
  Select an appropriate test mode, so that the UE loops back the received data, via a 12.2 kbps RMC or DTCH (like downlink signal).
- Measurement:
  Adjust the settings so that the uplink signal can be measured (see chapter 3.1.2, "Measuring an Uplink TD-SCDMA Signal", on page 11). Select the GPRF generator as trigger source. Select the data pattern and transport channel mode corresponding to the data source used for the ARB file.

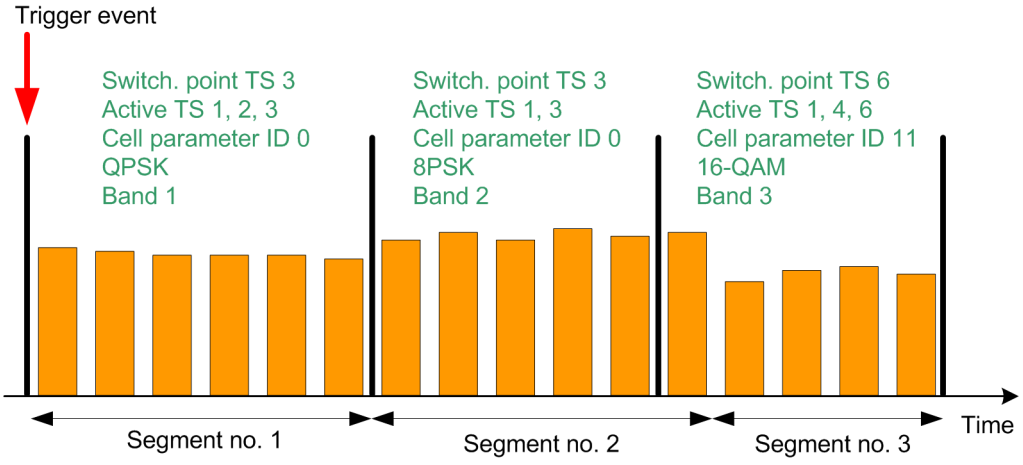
The measurement compares the received data with the expected data pattern and provides the resulting error rates, asuming that all bit errors are caused by the RX part of the UE. One data block contains 244 bits. They are mapped to four downlink timeslots located in four subframes. As the first received data block is discarded, the measurement length must comprise at least two data blocks (8 subframes) and the minimum measured number of subframes for RX measurements equals 8 (see parameter "No. of Subframes" on page 41). If a smaller value is set, 8 subframes are measured nevertheless.

Enable the BER view only when needed. It slows down the multi evaluation measurement considerably.

3.3 Multi Evaluation List Mode

The TD-SCDMA multi evaluation list mode requires option R&S CMW-KM012. In this mode the measurement interval is subdivided into segments, according to basic uplink signal properties. The list mode can be used to test different modes supported by a UE (e.g. subframe structures or modulation types) or to cover a wide range of expected nominal powers or RF frequencies in a single measurement.

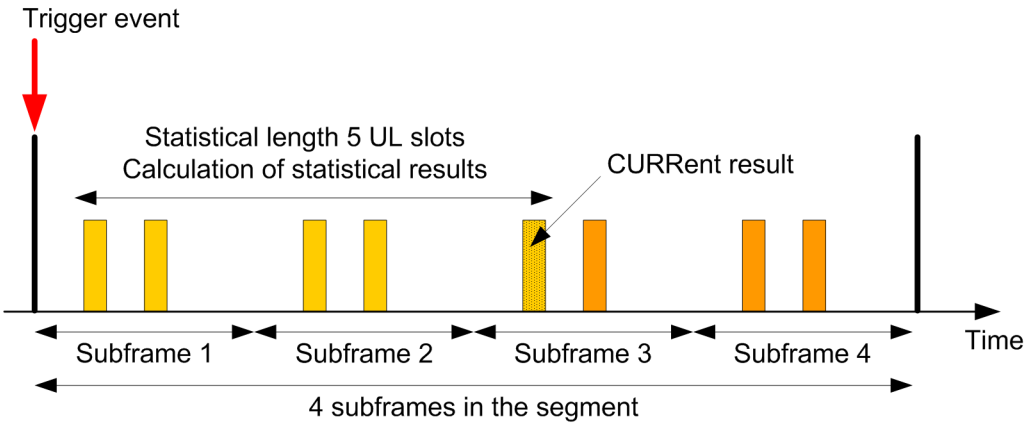
Each segment contains an integer number of subframes and is measured at constant analyzer settings. The figure below shows a series of three segments with different lengths, expected powers and the listed signal properties. Orange rectangles depict subframes. The maximum number of users per timeslot, the frequency band and the RF frequency can also be specified per segment.



One list mode measurement can cover up to 500 segments with in total up to 1600 subframes. Up to 6 uplink timeslots can be measured per subframe.

In list mode the R&S CMW can measure modulation results and spectrum results. The measured quantities can be enabled or disabled individually for each segment.

It is possible to limit the measurement to a number of active uplink slots (statistical length) at the beginning of the segment. The "current" result of a segment refers to the last measured slot of the statistical length. Additional statistical values (average, maximum and standard deviation) are calculated for the entire statistical length. The example below shows a segment with 4 subframes, each containing 2 active UL slots. The statistical length is set to 5 slots.



The statistical length and statistical values are not relevant for power monitor results. The power monitor provides a result for each active uplink slot of all measured segments, independent of the defined statistical length.

If a slot cannot be measured accurately, e.g. because of overflow, low signal or synchronization error, the behavior depends on the parameter Measure on Exception. If it is set to "Off", the measurement of a segment stops as soon as an error occurs and the measurement continues with the next segment. If it is set to "On", the measurement continues even when an error occurs. In both cases the reliability indicator for the measurement and the reliability indicator for the segment indicate the occurred error. Both reliability indicators are included in the measurement results.

Trigger modes

A list mode measurement can either be triggered only once, or it can be retriggered at the beginning of specified segments.

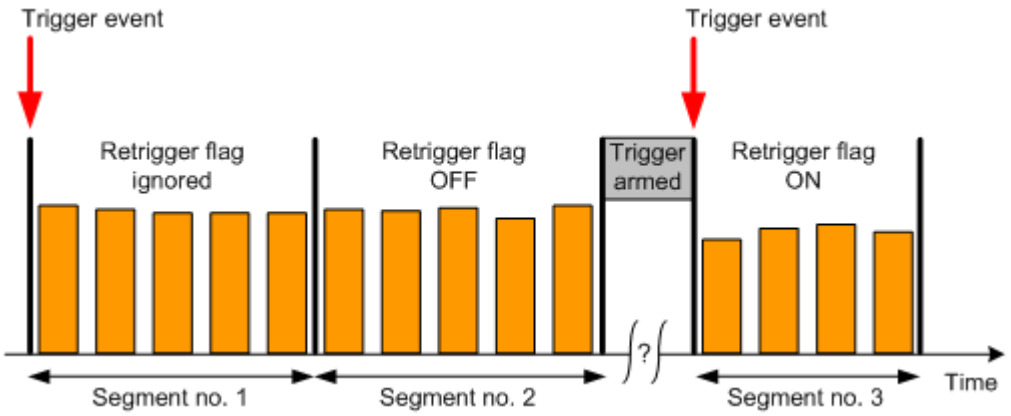
In "Once" mode a trigger event is only required to start the measurement. As a result the entire range of segments is measured without additional trigger event. The trigger is rearmed after the measurement has been finished. Specified retrigger flags are ignored.

The "Once" mode is recommended for UL signals with accurate timing over the entire range of segments.

In "Segment" mode the retrigger flag of each segment is evaluated. It defines whether the measurement waits for a trigger event before measuring the segment, or not. Retriggering the measurement is recommended if the timing of the first slot of a segment is

inaccurate, e.g. because of signal reconfiguration at the UE. Furthermore retriggering from time to time can compensate for a possible time drift of the UE. The retrigger flag of the first segment of the measurement is always ignored (implicitly set to ON).

In the example shown below the "Segment" mode is enabled. The retrigger flag is OFF for the second segment and ON for the third segment. Thus the measurement stops when the first and second segment have been captured and waits for a trigger event before capturing the third segment.



The list mode is essentially a single-shot remote control application. When a measurement is initiated in list mode, all defined segments are measured once. Afterwards the results can be retrieved using FETCh commands. The following remote control commands are used for list mode settings and result retrieval:

Parameters	SCPI commands
Activate / deactivate list mode	`CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST`
Number of segments	`CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:COUNt`
Segment configuration	`CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:SETup`
Statistical length and result activation per segment	`CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:MODulation` `CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:SPECtrum`
Select trigger mode	`TRIGger:TDSCdma:MEAS<i>:MEValuation:LIST:MODE`

Retrieve results	`FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<no>:...`
	`FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:...`
	See chapter 6.3.20, "List Mode Results (One Segment)", on page 123, chapter 6.3.21, "List Mode Results (All Segments, One Result)", on page 129 and chapter 6.3.22, "List Mode Results (All Segments, Result Groups)", on page 139.

The list mode can be deactivated via command (see table above) and also via the GUI:

1. Go to local using the corresponding hotkey.
   The active list mode is indicated at the top of the current view by the words "List Mode!".

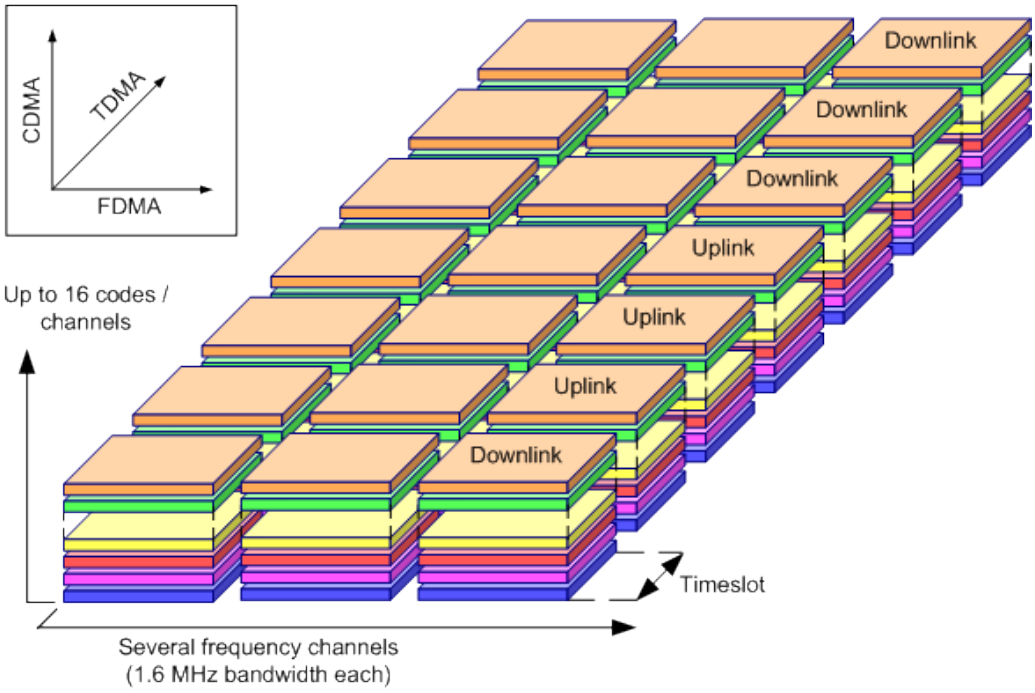
2. Open the configuration dialog and disable the list mode in section "Measurement Control".

Global and list mode parameters

The RF settings (expected power, RF frequency) and most of the "UE Signal Info" settings are special list mode settings. The R&S CMW ignores the corresponding "multi evaluation" parameters (e.g. first active uplink slot and switching point). All other settings are taken from the multi evaluation measurement, e.g. the trigger settings.

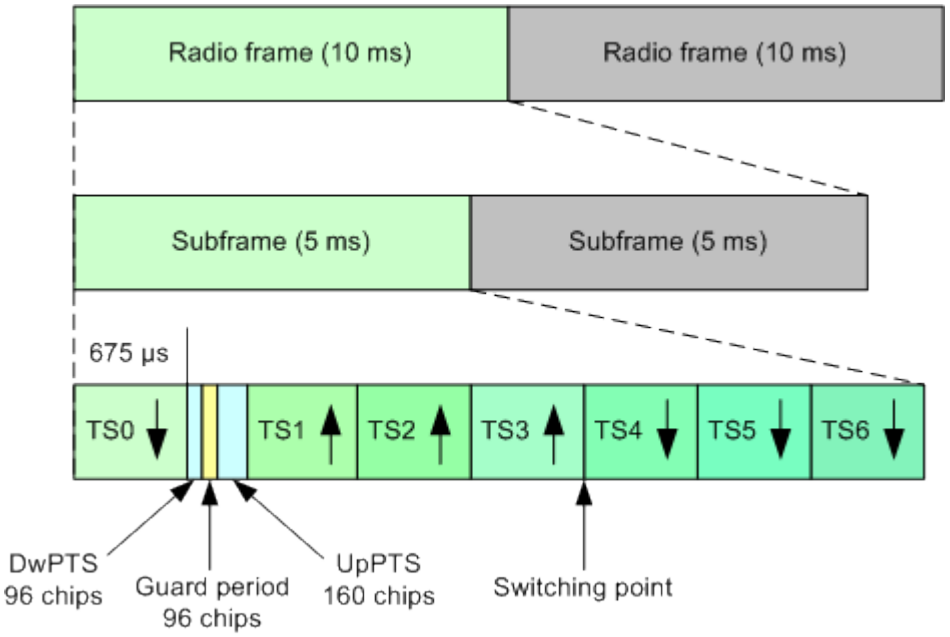
3.4 TD-SCDMA Signal Properties

TD-SCDMA is a mobile radio standard in which the available radio resources are divided among subscribers according to frequency (Frequency Division Multiple Access, FDMA), time (Time Division Multiple Access, TDMA) and code (Code Division Multiple Access, CDMA). The same frequency is used for uplink and downlink (Time Division Duplex, TDD).



3.4.1 Frames and Timeslots

A TD-SCDMA signal is a sequence of radio frames of 10 ms length, each divided into two subframes of 5 ms length. Each subframe comprises 7 traffic timeslots (TS0 to TS6) and two special timeslots (DwPTS and UpPTS) for synchronization.



TS0 is always allocated to the downlink, TS1 to the uplink. Timeslots 2 to 6 are divided between the two directions, separated by the switching point. By moving the switching point the ratio between uplink and downlink data rates can be adapted to increase the spectrum efficiency.

The downlink pilot timeslot (DwPTS) contains a 32 chip guard period and a 64 chip SYNC code. This code allows the user equipment (UE) to synchronize to the downlink signal and defines the value range for the scrambling code and the basic midamble code.

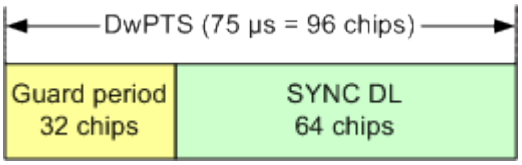


Fig. 3-4: Downlink pilot timeslot structure

The uplink pilot timeslot (UpPTS) contains a 128 chip SYNC code and a 32 chip guard period.

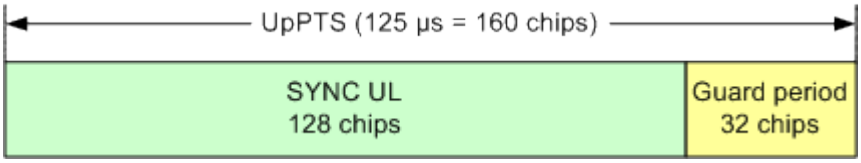


Fig. 3-5: Uplink pilot timeslot structure

A traffic timeslot contains two data fields, a midamble and a guard period.

The midamble is a training sequence allowing to perform traffic estimation. It is neither spread nor scrambled. The midamble is obtained from a basic midamble by periodic repetition and shifting. The basic midamble is a cell-specific bit pattern correlated to a certain scrambling code.

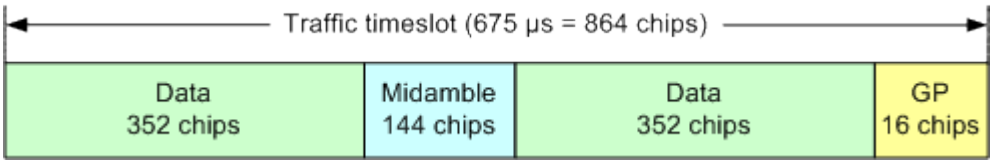
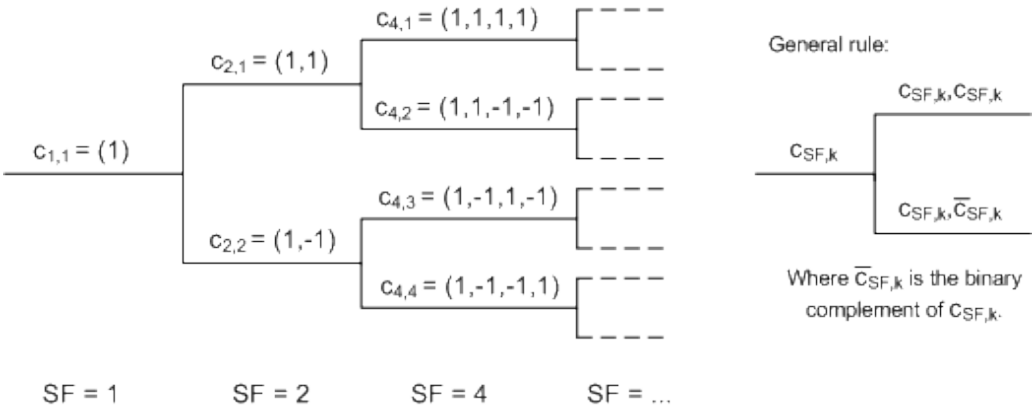


Fig. 3-6: Traffic timeslot structure

3.4.2 Channelization for CDMA

Channelization is applied to the data part of physical channels. This operation transforms each data symbol into a number of chips. The number of chips per data symbol is called Spreading Factor (SF). The symbol rate of the resulting channel equals the chip rate of the total signal divided by the spreading factor: Symbol rate (Channel) = 1.28 Mcps / SF (Channel). For uplink signals the allowed spreading factors are: 1, 2, 4, 8 and 16.

The transformation operation involves channelization codes $c_{SF,k}$ defined in terms of the spreading factor SF and the index k ranging from 1 to SF (also called channelization code number). The codes are defined in 3GPP TS 25.223 and are derived from a hierarchical tree:

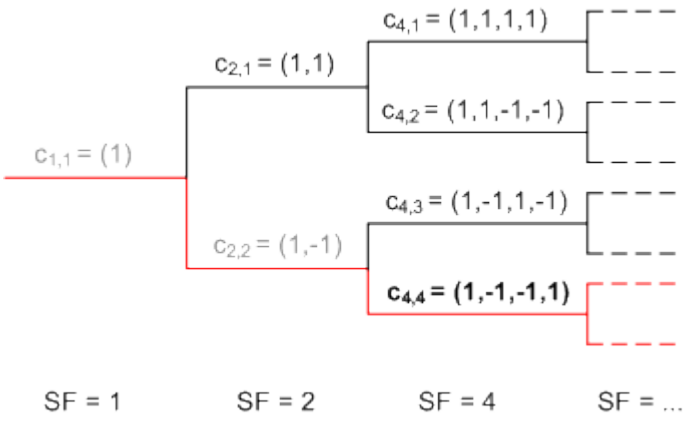


These codes are Orthogonal Variable Spreading Factor (OVSF) codes, allowing to superimpose channels with different spreading factors in the same timeslot while preserving the orthogonality. When assigning spreading factors and channelization codes (code numbers) to channels, one rule has to be observed to preserve orthogonality: Within each branch only one code can be used at the same time.

This means:

- Other codes on the path between the code and the root of the tree must not be used.
- Codes in sub-branches of the code (to the right of the code) must not be used.

For an example see the figure below. The red parts are blocked when $c_{4,4}$ is used.



3.5 Limit Settings and Conformance Requirements

Conformance requirements for TD-SCDMA transmitter tests are specified in 3GPP TS 34.122, section 5, "Transmitter Characteristics".

The following sections give an overview of the R&S CMW limit settings and the related test requirements.

3.5.1 Transmit Modulation Limits

A poor modulation accuracy of the UE transmitter increases the transmission errors in the uplink channel of the TD-SCDMA network. The Error Vector Magnitude (EVM) is the critical quantity to assess the modulation accuracy of a TD-SCDMA UE.

According to 3GPP, the EVM measured at UE output powers ≥ −20 dBm and under normal operating conditions shall not exceed 17.5 %. In addition, the Peak Code Domain Error, which is the maximum EVM of all code channels, shall not exceed –20 dB. The frequency error shall not exceed ±0.1 ppm. These limits can be set in the configuration dialog, along with limits for the other measured quantities.

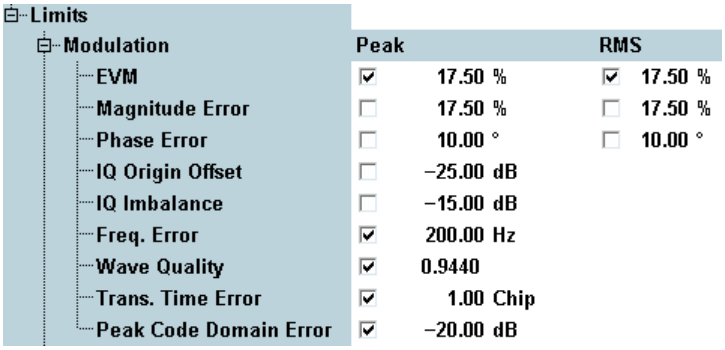


Fig. 3-7: Modulation limit settings

The table below lists the test requirements of 3GPP TS 34.122.

Characteristics	Refer to 3GPP TS 34.122, section...	Specified Limit
EVM (RMS)	5.7.1 Error Vector Magnitude	≤ 17.5 %
Peak Code Domain Error	5.7.2 Peak code domain error	≤ –20 dB
Frequency Error	5.3 Frequency Error	< 0.1 ppm

3.5.2 Power Templates

The TD-SCDMA power templates specify the dynamic structure (power/time relationship) of transmitted TD-SCDMA bursts. The burst is subdivided into different time intervals (areas) with specified upper and lower transmitter output power. The entire power template is defined relative to the average burst power.

The figure below shows the test requirements of 3GPP TS 34.122, sections 5.4.3 and 5.4.4. The transmission period refers to the burst without guard period for a single transmission slot, and to the period from the beginning of the burst in the first transmission slot to the end of the burst without guard period in the last transmission timeslot for consecutive transmission slots.

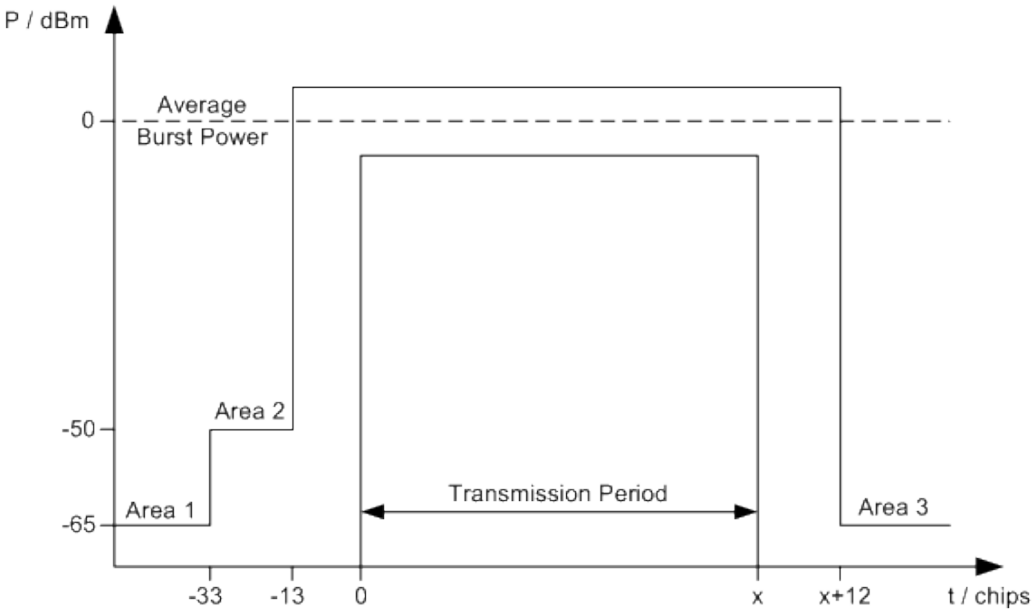


Fig. 3-8: Power template according to 3GPP

The default limit settings comply with 3GPP. The limits within the three areas and the borders (chip positions) of the areas can be modified.

Limits		
Modulation		
Power vs. Time		
Area 1 (AB)		
Enable	☑	
Template Position	Relative Time	Absolute Level
Start	−60 Chip	−65.00 dBm
End	−33 Chip	−65.00 dBm
Area 2(CE)		
Enable	☑	
Template Position	Relative Time	Absolute Level
Start	−33 Chip	−50.00 dBm
End	−13 Chip	−50.00 dBm
Area 3(FH)		
Enable	☑	
Template Position	Relative Time	Absolute Level
Start	12 Chip	−65.00 dBm
End	45 Chip	−65.00 dBm

Fig. 3-9: Power vs time limit settings

3.5.3 ACLR Limits

The energy that spills outside the designated radio channel increases the interference with adjacent channels and decreases the system capacity. The amount of unwanted off-carrier energy is assessed by the out-of-band emissions (excluding spurious emissions) that are specified in terms of the Adjacent Channel Leakage power Ratio (ACLR) and the Spectrum Emission Mask.

The ACLR limits are defined in the configuration dialog.

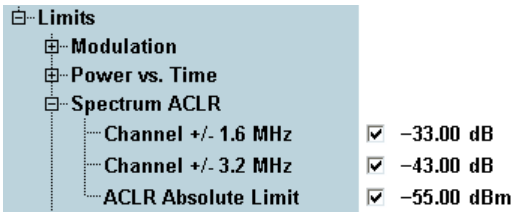


Fig. 3-10: Spectrum ACLR limit settings

The ACLR shall not exceed –33 dB at frequencies ±1.6 MHz from the carrier (channels ±1) and –43 dB at frequencies ±3.2 MHz from the carrier (channels ±2). The limits must be met if the adjacent channel power is larger than –55 dBm (absolute limit); they must hold even in the presence of switching transients.

Characteristics	Refer to 3GPP TS 34.122, section...	Specified Limit[1)]
ACLR	5.5.2.2 Adjacent Channel Leakage power Ratio (ACLR)	≤ –33 dB (channels ±1) ≤ –43 dB (channels ±2)

Note 1) For compatibility with other R&S CMW measurements, we define the ACLR and the limits with a relative minus sign compared to the 3GPP specification.

3.5.4 Spectrum Emission Mask

The spectrum emission mask and the Occupied Bandwidth (OBW) complement the ACLR Limits. The limit lines of the mask and the OBW limit are defined in the configuration dialog.

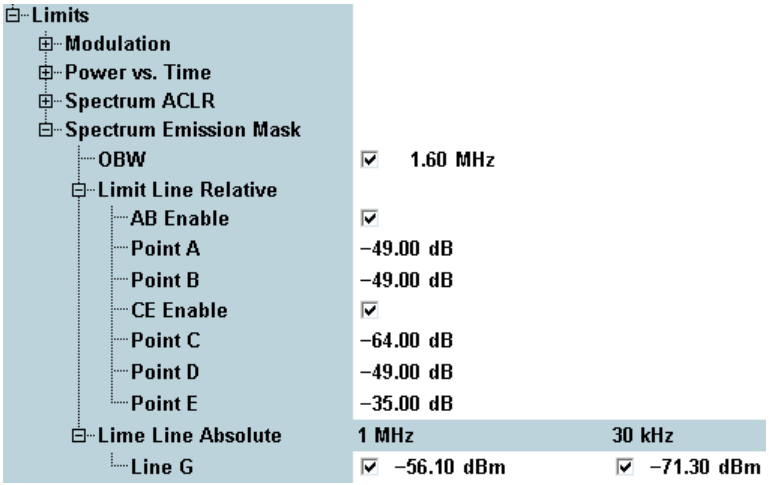


Fig. 3-11: Spectrum emission mask limit settings

The OBW shall not exceed 1.6 MHz (see 3GPP TS 34.122, section 5.5.1). The emission mask is defined in 3GPP TS 34.122, section 5.5.2.1, as shown below. The corresponding R&S CMW settings (points) are also indicated.

Frequency Offset from carrier Δf	Minimum requirement	Measurement bandwidth
0.8 MHz to 1.8 MHz	–35 dBc – 14*(Δf/MHz – 0.8) dBc (--> **Point E, D**)	30 kHz[2)]
1.8 MHz to 2.4 MHz	–49 dBc – 17*(Δf/MHz – 1.8) dBc (--> **Point D, C**)	30 kHz[2)]
2.4 MHz to 4.0 MHz	–44 dBc (--> **Point B, A**)	1 MHz[3)]

Note 1) Δf is the separation between the carrier frequency and the center of the measurement bandwidth. Each linear limit line section is defined by a pair of points (A, B), (C, D), (D, E), assuming a linear power/frequency dependence.

Note 2) The first and last measurement position with a 30 kHz filter is 0.815 MHz and 2.385 MHz.

Note 3) The first and last measurement position with a 1 MHz filter is 2.9 MHz and 3.5 MHz.

Note 4) The limit specifications above only apply if the power in the measured frequency range exceeds the absolute limit of –55 dBm referenced to a 1.28 MHz filter (--> **Line G**). This implies that the absolute lower spectrum emission limits must be:

$$-55\,\mathrm{dBm} + 10 \cdot \log_{10}\left(\frac{1}{1.28}\right)\mathrm{dB} \approx -56.1\,\mathrm{dBm}$$

in frequency domains where they are measured with a 1 MHz filter, and

$$-55\,\mathrm{dBm} + 10 \cdot \log_{10}\left(\frac{0.03}{1.28}\right)\mathrm{dB} \approx -71.3\,\mathrm{dBm}$$

in frequency domains where they are measured with a 30 kHz filter.

Signals with smaller powers always pass the entire limit check.

The complete spectrum emission mask is shown in the figure below.

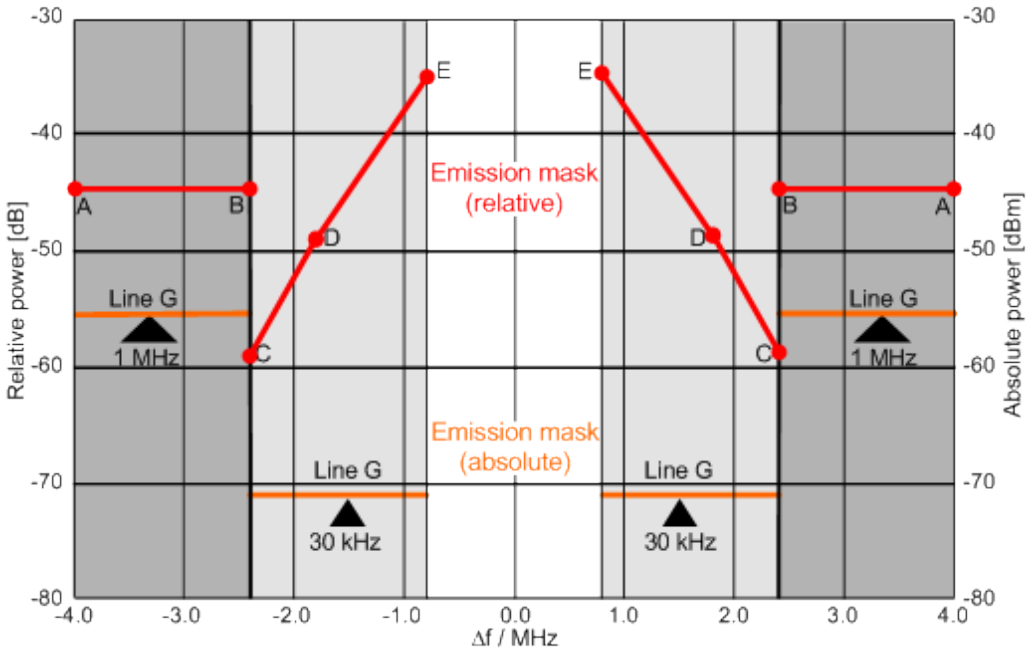


Fig. 3-12: Spectrum emission mask

3.6 Measurement Results

The results of the TD-SCDMA multi evaluation measurement are displayed in several different views. Use the "Display" parameters to select the views and to change the appearance and contents of the views. The views are described in the following sections.

3.6.1 Overview

In the overview a selection of the following results can be displayed:

- Error Vector Magnitude
- Magnitude Error
- Phase Error
- Code Domain Monitor (CDM)
- Code Domain Power (CDP)
- Code Domain Error (CDE)

- Power vs. Time (PvT)
- ACLR
- Spectrum Emission Mask
- Most important results of detailed views "Mod. Scalar" and "BER"

See also: "TX Measurements" in the R&S CMW user manual, chapter "System Overview"

Fig. 3-13: TD-SCDMA Multi Evaluation: Overview

The results to be measured and displayed in the overview can be limited using the hotkey "Assign Views", see also parameter "Assign Views" on page 43.

You can enlarge one of the diagrams in the overview and show a detailed view with additional measurement results, see chapter 3.6.6, "Selecting and Modifying Views", on page 31.

The traces and bar graphs are described in the "Detailed Views" sections.

3.6.2 Detailed Views: Modulation, CDP and CDE, Power vs Time

This section applies to the following detailed views:

- Error Vector Magnitude
- Magnitude Error
- Phase Error
- Code Domain Monitor

- Code Domain Power (CDP)
- Code Domain Error (CDE)
- Power vs. Time

Each of the detailed views shows one or two diagrams and a statistical overview of single-slot results (except Code Domain Monitor).

Fig. 3-14: TD-SCDMA Multi Evaluation: Magnitude Error

- Error Vector Magnitude, Magnitude Error, and Phase Error
  The diagrams labeled "Preselected Slot" cover up to 848 chips of this slot (all 864 chips of the slot excluding the 16 chip guard period at the end) and contain one measurement result per chip.
  The diagrams labeled "Multi Slot" cover up to 112 timeslots and contain one measurement result per slot.
- Code Domain Monitor
  The diagrams display the Code Domain Power (CDP) and Code Domain Error (CDE) for all code channels, measured in the "Preselected Slot". The results are determined assuming a selectable uniform spreading factor (SF) for all channels. The number of displayed bars (code channels) corresponds to the selected SF. A signal component with a spreading factor smaller than the selected SF occupies several adjacent bars.
- Code Domain Power (CDP), Code Domain Error (CDE)
  The diagrams labeled "Preselected Slot" display the CDP and CDE for all physical channels (DPCHs and SICH), measured in this slot. Each diagram contains 16 bars, corresponding to up to 16 channels. Channels with a spreading factor smaller than

16 occupy several adjacent bars (e.g. SF8 = 2 bars, SF4 = 4 bars). The position of the SICH is indicated if it has been defined in the configuration dialog.
The diagrams labeled "Multi Slot" display the CDP and CDE of a selectable code channel for up to 112 timeslots (one result per slot).

- Power vs. Time
  The "Power vs. Time" diagram covers a time interval up to 6400 chips (1 complete TD-SCDMA subframe, comprising 7 traffic timeslots). The burst power is displayed with an oversampling factor of 4 (4 samples per symbol period) and normalized to the average burst power (0-dB reference).

For modification of the views including selection of an SF for Code Domain Monitor and of a code channel for CDP/CDE multislot refer to chapter 3.6.6, "Selecting and Modifying Views", on page 31.

For additional information refer to chapter 3.6.8, "Common View Elements", on page 32.

3.6.3 Detailed Views: ACLR

The ACLR results are measured in the "Preselected Slot". The results are displayed in a bar graph and as a table of statistical results.

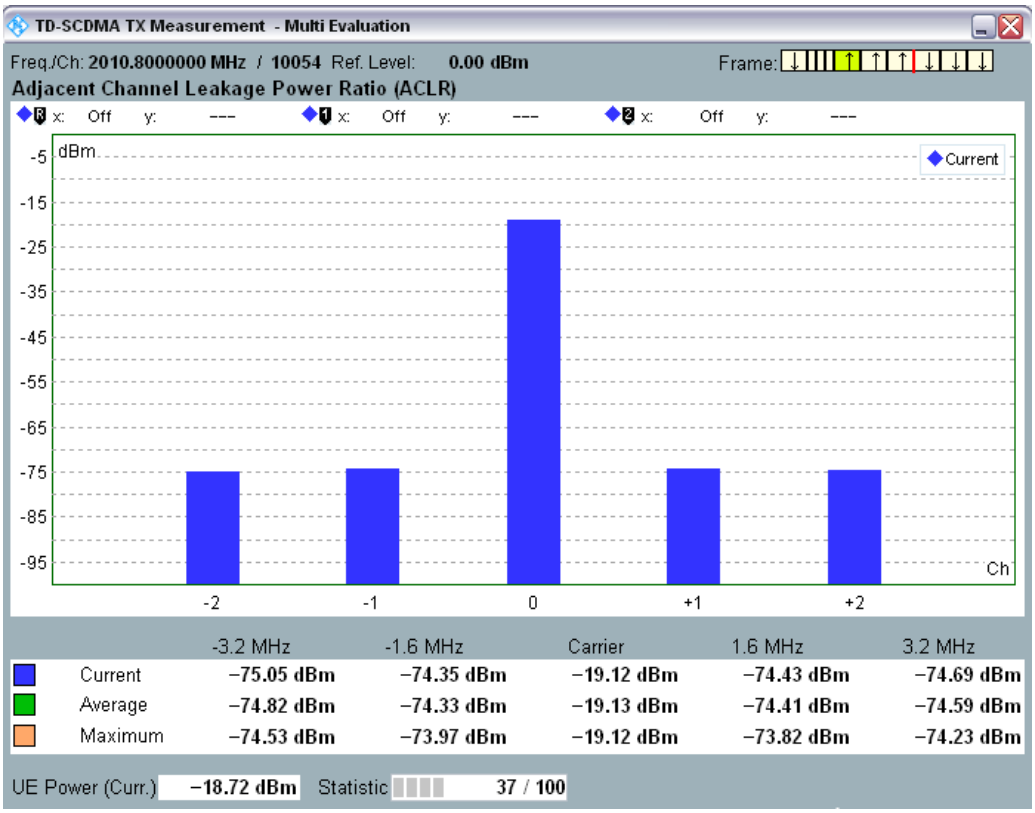


Fig. 3-15: TD-SCDMA Multi Evaluation: ACLR

The method of measurements ensures that the results correspond to the ACLR specified in 3GPP TS 34.122 where a TD-SCDMA channel filter is used.

The central bar shows the power at the nominal carrier frequency (UL Frequency); the bars ±1 correspond to the 1st adjacent channels (±1.6 MHz from the UL frequency) and the 2nd adjacent channels (±3.2 MHz from the UL frequency). Either the "Current", "Average" or "Maximum" values can be displayed in the bar graph. The table below the bar graph provides all these values.

For additional information refer to chapter 3.6.8, "Common View Elements", on page 32.

3.6.4 Detailed Views: Spectrum Emission Mask

The spectrum emission of the UE is measured in the "Preselected Slot". The results are displayed in a diagram and as a table of statistical results.

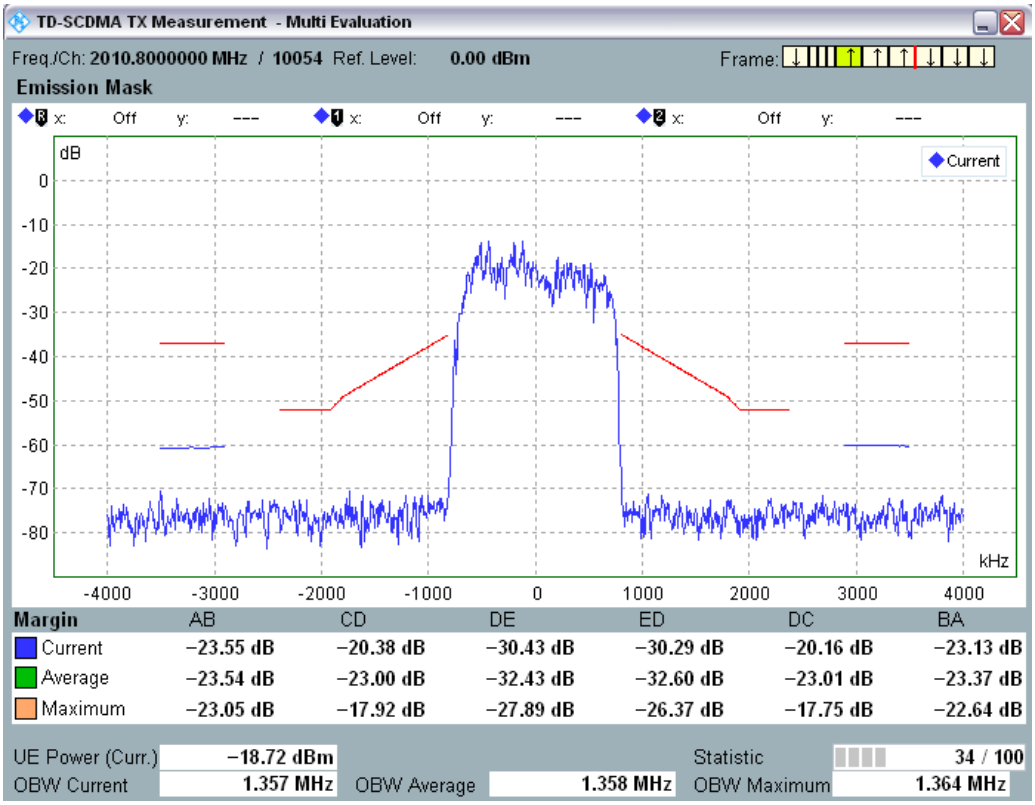


Fig. 3-16: TD-SCDMA Multi Evaluation: Emission Mask

The measurement covers a symmetric, 9 MHz wide frequency range around the UE center carrier frequency. The maximum display range is [carrier frequency – 4.5 MHz, carrier frequency + 4.5 MHz]. According to 3GPP TS 34.122, a resolution filter of Gaussian shape with a bandwidth of 30 kHz (for frequencies between 0.815 MHz and 2.385 MHz from the carrier) or 1 MHz (for frequencies between 2.9 MHz and 3.5 MHz) is used. All measured spectrum emission values are relative to the UE output power measured in a 1.28 MHz bandwidth (reference power).

The example shows the results measured with the 30 kHz filter bandwidth (lower blue curve, including the center) and the 1 MHz bandwidth (upper curves at offset frequencies

around 3 MHz). The table below the diagram contains values which are relevant for the limit check. The values are calculated and displayed per limit line section ("AB", "CD", ...). See also chapter 3.5, "Limit Settings and Conformance Requirements", on page 20.

Below the table the Occupied Bandwidth (OBW) is displayed. It is defined as width of a frequency range around the assigned channel frequency containing 99% of the total integrated power of the transmitted spectrum.

For additional information refer to chapter 3.6.8, "Common View Elements", on page 32.

3.6.5 Mod. Scalar and BER

This view contains tables of statistical results for the TX and RX measurements.

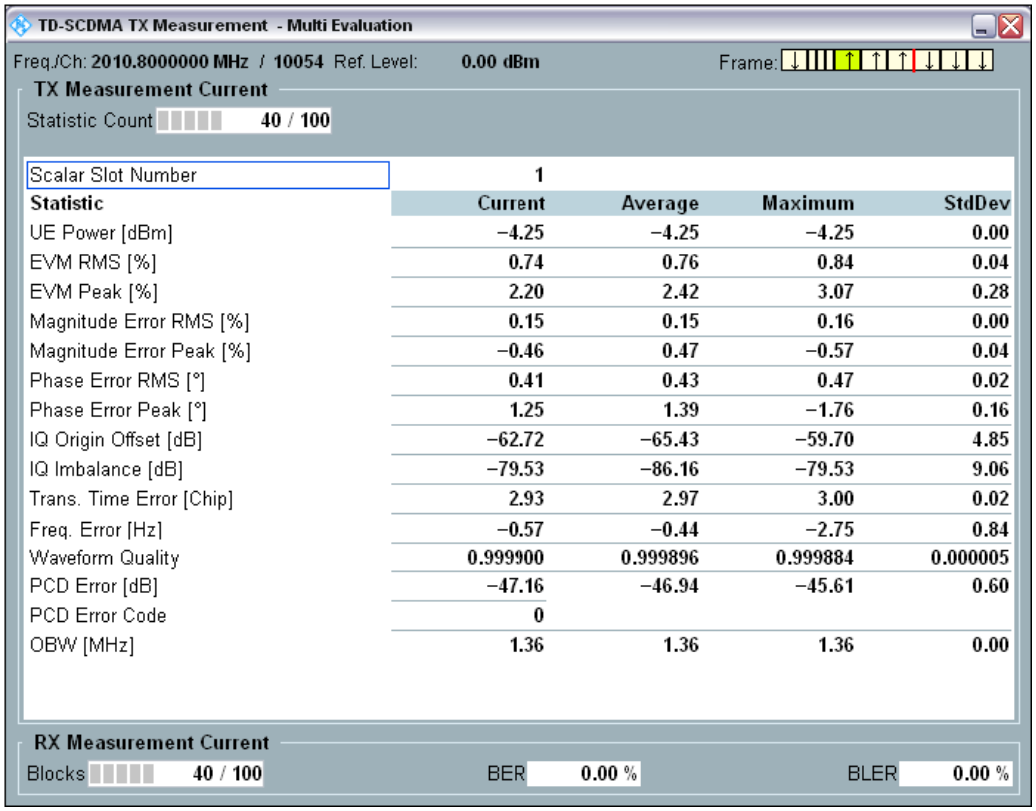


Fig. 3-17: TD-SCDMA Multi Evaluation: Mod. Scalar

TX Measurement

The table provides an overview of statistical values measured in the "Scalar Slot". Other detailed views provide a subset of these values:

- UE Power: Transmitter output power of the UE, measured in a bandwidth of 2.1 MHz (Band pass: 2.1 MHz, RRC, roll-off factor = 0.22).

- EVM, Magnitude Error, Phase Error, I/Q Origin Offset, I/Q Imbalance, Frequency Error, Waveform Quality, Transmit Time Error (relative to an external trigger event) and Peak Code Domain Error.
- Occupied Bandwidth (OBW): width of a frequency range around the assigned channel frequency containing 99% of the total integrated power of the transmitted spectrum.

See also: "TX Measurements" in the R&S CMW user manual, chapter "System Overview"

RX Measurement

For information about this measurement refer to chapter 3.2, "TD-SCDMA RX Tests", on page 12.

The table provides the following results:

- Blocks: Number of transport data blocks received since the start of the measurement
- Bit Error Rate (BER): Percentage of received data bits that were erroneous
- Block Error Ratio (BLER): Percentage of received transport data blocks containing at least one erroneous bit. One data block contains 244 bits.

For additional information refer to chapter 3.6.8, "Common View Elements", on page 32.

3.6.6 Selecting and Modifying Views

Use the "Display" parameters to select the views and to change the appearance and contents of the views. Depending on the selected view the following "Display" hotkeys are available at the bottom of the GUI:

Hotkey	Description
"Select View ..."	Switch to a certain detailed view or overview. Alternatively select a diagram in the overview and press ENTER or the rotary knob.
"Select Trace ..."	Select the trace types to be displayed in the view.
"Select Diagram ..."	Select the diagrams (preselected slot / multislot) to be displayed.
"X Scale... / Y Scale..."	Modify the ranges of the X-axis and the Y-axis.
"Scalar Slot ..."	Modify the slot used for statistical evaluation of single-slot results.
"Spreading Factor..."	Select the spreading factor used to determine the CDP and CDE results displayed in the Code Domain Monitor.
"Channel Index ..."	Modify the code channel displayed in the CDP or CDE multislot diagram.
"Select Unit ..."	Selects the unit of the Y-axis of the ACLR diagram: dBm or dB (relative to carrier power)

Additional options are available in the "Measurement Control" section of the configuration dialog.

3.6.7 Using Markers

Use the "Marker" parameters to activate markers and to modify their position. The following "Marker" hotkeys are available at the bottom of the GUI:

Hotkey	Description
"Ref. Marker ..."	Enable or disable the reference marker, select a trace and the marker position on that trace.
"Marker 1 /2 ..."	Enable or disable marker 1 or 2 and define the marker position (absolute or relative to the reference marker). Depending on the trace mode, a trace can also be selected.
"Select Trace Mode"	Define whether all markers are collectively set to the same trace or to individual traces.

See also: "Markers" in the R&S CMW user manual, chapter "System Overview"

3.6.8 Common View Elements

Below the title bar, all views show the most important RF and analyzer settings as shown below.

For configuration see chapter 4.2.1, "Signal Routing and Analyzer Settings", on page 35.

Tables

Most detailed views show tables providing a statistical evaluation of results measured in a selected slot. For multislot measurements the "Scalar Slot" is used and displayed above the table while for single slot measurements (e.g. "Emission Mask") the "Preselected Slot" is used.

Modify the "Scalar Slot" to display the results of another slot. A restart of the measurement is not required.

The statistical values in the tables are calculated as follows:

- **Current:** Value of the result obtained in the last measurement interval. For some modulation results a current RMS value (the average over all samples in the measured slot except the guard period) and a current peak value (the peak of all samples in the measured slot except the guard period) is available.
- **Average:** Average of all "Current" values referenced to the last statistics cycle.
- **Maximum:** Largest or smallest "Current" value that the R&S CMW obtained since the start of the measurement. For errors the Max result is the biggest absolute value with the correct sign.
- **Std Dev:** Standard deviation of all "Current" values since the start of the measurement.

All statistical results (statistical tables and "Average" or "Max" traces) are calculated according to the general rules for statistical results.

See also: "Statistical Results" in the R&S CMW user manual, chapter "System Overview"

Statistic Count

Progress bar for the measurement, displayed in all detailed views. During the first single shot after the start of the measurement, the bar shows the number of elapsed measurement intervals relative to the "Statistic Count". A filled progress bar indicates that the first shot is complete and the statistical depth has been reached.

See also: "Statistical Settings" in the R&S CMW user manual, chapter "System Overview"

4 GUI Reference

The following sections provide detailed reference information on the Graphical User Interface (GUI) and the parameters of the "TD-SCDMA measurement" firmware application.

4.1 Measurement Control

The measurement is turned on or off using the ON | OFF or RESTART | STOP keys.

See also: "Measurement Control" in the R&S CMW user manual, chapter "System Overview"

Multi Evaluation (Softkey)
The softkey shows the current measurement state. Additional measurement substates may be retrieved via remote control.

Remote command:

```
INITiate:TDSCdma:MEAS<i>:MEValuation
ABORt:TDSCdma:MEAS<i>:MEValuation
STOP:TDSCdma:MEAS<i>:MEValuation
FETCh:TDSCdma:MEAS<i>:MEValuation:STATe?
FETCh:TDSCdma:MEAS<i>:MEValuation:STATe:ALL?
```

4.2 Parameters and Settings

The most important settings of the "TD-SCDMA Multi Evaluation" measurement are displayed in the measurement dialog.

The "Frame" parameter in the figure above represents one TD-SCDMA frame with slot 0 to slot 6. Uplink and downlink slots are indicated by arrows. The preselected slot (uplink) is highlighted.

See also chapter 3.4.1, "Frames and Timeslots", on page 17 and chapter 3.1.3, "Defining the Scope of the Measurement", on page 11

All settings are defined via softkeys and hotkeys or using the "TD-SCDMA Multi Evaluation Configuration" dialog. The configuration dialog is described in the following sections.

4.2.1 Signal Routing and Analyzer Settings

The following parameters configure the RF input path.

See also: "Connection Control (Measurements)" in the R&S CMW user manual, chapter "System Overview"

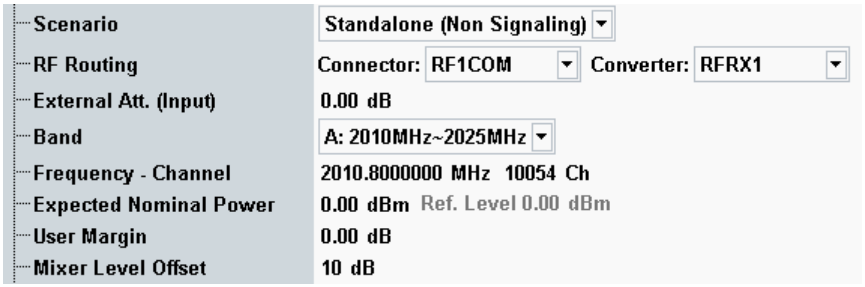


Fig. 4-1: Signal routing and analyzer settings

Scenario
This software version supports only a standalone scenario.

Remote command:
`ROUTe:TDSCdma:MEAS<i>:SCENario:SALone`
`ROUTe:TDSCdma:MEAS<i>:SCENario?`
`ROUTe:TDSCdma:MEAS<i>?`

RF Routing
Selects the input path for the measured RF signal, i.e. the input connector and the RX module to be used.

Depending on your hardware configuration there may be dependencies between both parameters. Select the RF connector first. The "Converter" parameter offers only values compatible with the selected RF connector.

Remote command:
`ROUTe:TDSCdma:MEAS<i>:SCENario:SALone`

External Attenuation (Input)
Defines the value of an external attenuation (or gain, if the value is negative) in the input path. The power readings of the R&S CMW are corrected by the external attenuation value.

The external attenuation value is also used in the calculation of the maximum input power that the R&S CMW can measure.

If a correction table for frequency-dependent attenuation is active for the chosen connector, then the table's name and a button are displayed. Press the button to display the table entries.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:RFSettings:EATTenuation`

Band / Frequency - Channel
Center frequency of the RF analyzer. Set this frequency to the frequency of the measured RF signal to obtain a meaningful measurement result.

You can specify the RF frequency in two ways:

- Enter the frequency directly. The band and channel settings can be ignored or used for validation of the entered frequency. For validation select the designated band. The channel number resulting from the selected band and frequency is displayed. For an invalid combination no channel number is displayed.
- Select a band and enter a channel number valid for this band. The R&S CMW calculates the resulting frequency.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:RFSettings:BAND`
`CONFigure:TDSCdma:MEAS<i>:RFSettings:FREQuency`

Expected Nominal Power
Defines the nominal power of the RF signal to be measured. An appropriate value for TD-SCDMA signals is the peak output power at the DUT during the measurement interval. The "Ref. Level" is calculated as follows:

Reference Level = Expected Nominal Power + User Margin

Note: The actual input power at the connectors (i.e. the "Reference Level" minus the "External Attenuation (Input)" value, if all power settings are configured correctly) must be within the level range of the selected RF input connector; refer to the data sheet.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:RFSettings:ENPower`

User Margin
Margin that the R&S CMW adds to the "Expected Nominal Power" in order to determine its reference power ("Ref. Level"). The "User Margin" is typically used to account for the known variations of the RF input signal power, e.g. the variations due to a specific channel configuration.

The appropriate values depend on the configuration of the UL TD-SCDMA signal, e.g. on the active channels and gain factors. For a 12.2 kbps Reference Measurement Channel (RMC), a value of 5 dB is appropriate.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:RFSettings:UMARgin`

Mixer Level Offset
Varies the input level of the mixer in the analyzer path. A negative offset reduces the mixer input level, a positive offset increases it. Optimize the mixer input level according to the properties of the measured signal.

Mixer Level Offset	Advantages	Possible Shortcomings
< 0 dB	Suppression of distortion (e.g. of the inter-modulation products generated in the mixer)	Lower dynamic range (due to smaller signal-to-noise ratio)
> 0 dB	High signal-to-noise ratio, higher dynamic range	Risk of intermodulation, smaller overdrive reserve

Remote command:
`CONFigure:TDSCdma:MEAS<i>:RFSettings:MLOFfset`

4.2.2 UE Signal Info

The "UE Signal Info" parameters describe properties of the measured uplink TD-SCDMA signal that the R&S CMW needs for synchronization and decoding.

See also chapter 3.4, "TD-SCDMA Signal Properties", on page 17

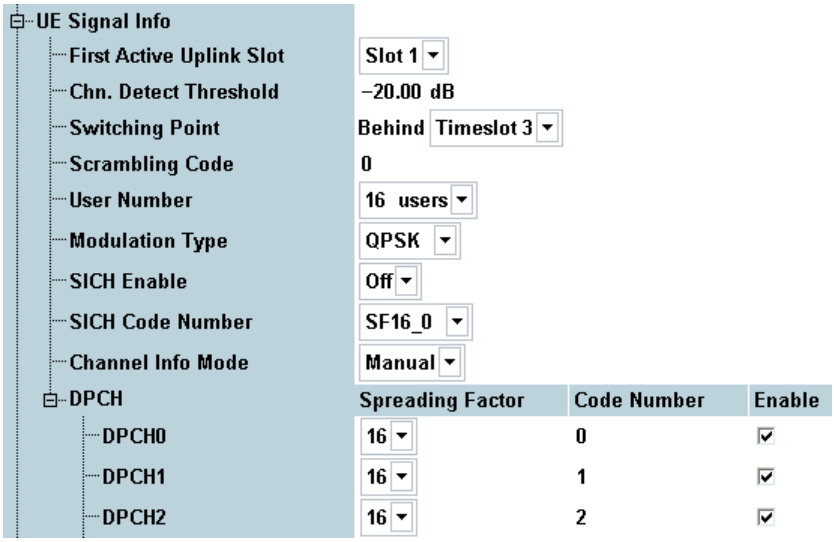


Fig. 4-2: UE Signal Info settings

First Active Uplink Slot
First active uplink timeslot in a subframe. This parameter must be set correctly if an IF power trigger is used.

It has no effect for external trigger signals and waveform markers (subframe trigger expected).

Remote command:
`CONFigure:TDSCdma:MEAS<i>:UESignal:FAUSlot`

Chn. Detect Threshold
Minimum signal strength of each DPCH in the TD-SCDMA signal to be detected in the automatic channelization code search (Channel Info Mode = Auto). The threshold is defined as a ratio of the individual DPCH power to the total power expressed in dB. The power threshold is important to distinguish the real DPCH from unwanted signals, e.g. noise or non-orthogonal components that may be detected as fictitious DPCHs.

A low threshold value represents a weaker selection criterion and increases the risk of detecting unwanted signals. On the other hand a high threshold may prevent the real DPCH signals from being detected and cause a failure of the channelization code search.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:UESignal:CDTHreshold`

Switching Point
Position of the duplex switching point, separating timeslots used for uplink and timeslots used for downlink in a subframe.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:UESignal:SPOint`

Scrambling Code
Cell parameters ID in the range between 0 and 7F (hex) corresponding to 0 to 127 decimal. The cell parameters ID identifies the cell and determines for example the scrambling code and the basic midamble code.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:UESignal:SCODe`

User Number
Maximum number of users for one timeslot. The number of users influences the used midamble sequences.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:UESignal:NUSers`

Modulation Type
Selects the type of modulation: QPSK, 8PSK or 16-QAM.

Option R&S CMW-KM751 is required for 8PSK and 16-QAM.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:UESignal:MTYPe`

SICH Enable
Defines whether the uplink signal contains a shared information channel (HS-SICH, related to a high speed downlink shared channel). This parameter is only relevant for Channel Info Mode "Auto". It cannot be set to "On" for Channel Info Mode "Manual".

Remote command:
`CONFigure:TDSCdma:MEAS<i>:UESignal:ECHannel:SICH`

SICH Code Number
Channelization code number of the shared information channel (HS-SICH). The spreading factor of the HS-SICH equals 16. The resulting channelization code is $c_{16,<Index>}$. As a result of this setting the channel with this code number is labeled as "SICH" in the Code Domain Error and Code Domain Power result presentations.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:UESignal:CNUMber:SICH`

Channel Info Mode
Channel information mode "Manual" or "Auto". In "Auto" mode the instrument determines the DPCH configuration automatically (e.g. spreading factors and channelization code numbers). In "Manual" mode these parameters have to be entered manually (see "DPCH" in this dialog). The "Manual" mode is faster but requires correct "DPCH" settings. It can only be set when SICH Enable is "Off".

Remote command:
`CONFigure:TDSCdma:MEAS<i>:UESignal:CIMode`

DPCH
Dedicated physical channel (DPCH) settings. This entry is only available for Channel Info Mode=Manual. The spreading factors and channelization code numbers of all active channels must be compatible. Each code number can only be assigned to one channel. The spreading factor settings must comply to 3GPP TS 25.223, see also chapter 3.4.2, "Channelization for CDMA", on page 19.

For administration it may be required to deactivate channels temporarily. Activation of a channel with inconsistent settings is rejected.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:UESignal:ECHannel`
`CONFigure:TDSCdma:MEAS<i>:UESignal:ECHannel:ALL`
`CONFigure:TDSCdma:MEAS<i>:UESignal:ECHannel:DPCH<chidx>`
`CONFigure:TDSCdma:MEAS<i>:UESignal:CNUMber`
`CONFigure:TDSCdma:MEAS<i>:UESignal:CNUMber:DPCH<chidx>`
`CONFigure:TDSCdma:MEAS<i>:UESignal:SFACtor`
`CONFigure:TDSCdma:MEAS<i>:UESignal:SFACtor:DPCH<chidx>`

4.2.3 Measurement Control Settings

The "Measurement Control" parameters configure the scope of the TD-SCDMA multi evaluation measurement.

See also: "Statistical Settings" in the R&S CMW user manual, chapter "System Overview"

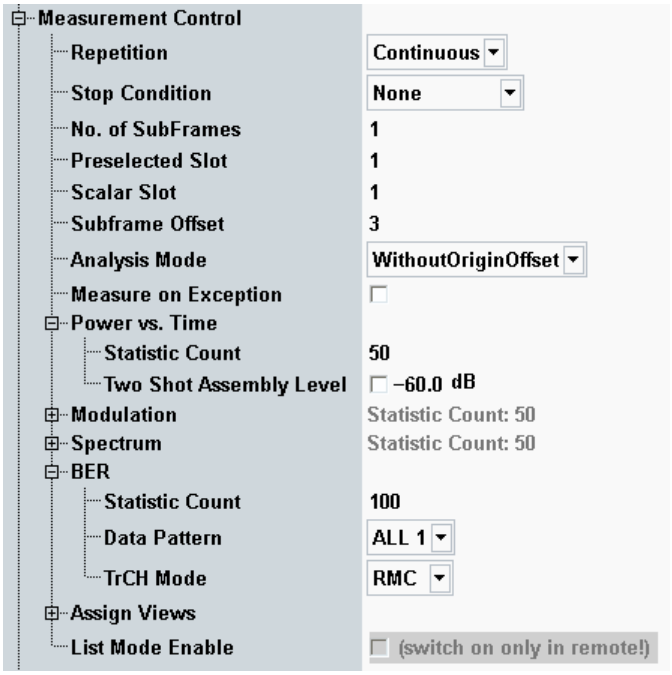


Fig. 4-3: Measurement control settings

Repetition
Defines how often the measurement is repeated if it is not stopped explicitly or by a failed limit check.

- **Continuous:** The measurement is continued until it is explicitly terminated; the results are periodically updated.
- **Single-Shot:** The measurement is stopped after one statistics cycle.

Single-shot is preferable if only a single measurement result is required under fixed conditions, which is typical for remote-controlled measurements. Continuous mode is suitable for monitoring the evolution of the measurement results in time and observe how they depend on the measurement configuration, which is typically done in manual control. The reset/preset values therefore differ from each other.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:MEValuation:REPetition`

Stop Condition
Specifies the conditions for an early termination of the measurement:

- **None:** The measurement is performed according to its "Repetition" mode and "Statistic Count", irrespective of the limit check results.
- **On Limit Failure:** The measurement is stopped as soon as one of the limits is exceeded, irrespective of the repetition mode set. If no limit failure occurs, it is performed according to its "Repetition" mode and "Statistic Count". Use this setting for measurements that are essentially intended for checking limits, e.g. production tests.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:MEValuation:SCONdition`

No. of Subframes
Defines the number of consecutive subframes (7 timeslots per subframe) that form a single measurement interval, also called "Measurement Length". The measured subframes can be displayed in the following diagrams: "Error Vector Magnitude", "Magnitude Error", "Phase Error", "CDE Power" and "Code Domain Power".

See also chapter 3.1.3, "Defining the Scope of the Measurement", on page 11

Remote command:
`CONFigure:TDSCdma:MEAS<i>:MEValuation:NFRames`

Preselected Slot
Selects the uplink slot to be used for single slot measurements, including ACLR and spectrum emission.

See also chapter 3.1.3, "Defining the Scope of the Measurement", on page 11

Remote command:
`CONFigure:TDSCdma:MEAS<i>:MEValuation:PSLot`

Scalar Slot
Selects a particular slot within the "Measurement Length" where the R&S CMW displays the statistical measurement results. These results are measured for all slots and can be displayed for one slot at a time.

See also chapter 3.1.3, "Defining the Scope of the Measurement", on page 11

Remote command:
`CONFigure:TDSCdma:MEAS<i>:MEValuation:SSLot`

Subframe Offset
Allows to compensate a subframe number mismatch for RX measurements. There are four subframes in a TTI, so the subframe numbers are 0 to 3. Specify the number of the subframe that contains the data expected in subframe number 0.

Example: The expected subframe numbers are 012301230123 and so on. If the UE loops back the data using the subframe numbers 230123012301 instead, specify a subframe offset of 2 to compensate the mismatch.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:MEValuation:SFOFfset`

Analysis Mode
Defines whether a possible origin offset is included in the measurement results or subtracted out. The analysis mode affects the EVM, magnitude and phase error results.

See also: "I/Q Offset, I/Q Imbalance, Waveform Quality" in the R&S CMW user manual, chapter "System Overview"

- **With Origin Offset:**
  The results for the EVM, phase error and magnitude error include a possible origin offset. This mode conforms to 3GPP specifications.
- **No Origin Offset:**
  The origin offset is subtracted out.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:MEValuation:AMODe`

Measure on Exception
Specifies whether measurement results that the R&S CMW identifies as faulty or inaccurate are rejected. A faulty result occurs e.g. when an overload is detected. In remote control, the cause of the error is indicated by the "reliability indicator".

- **Off:** Faulty results are rejected. The measurement is continued; the statistical counters are not re-set. Use this mode to ensure that a single faulty result does not affect the entire measurement.
- **On:** Results are never rejected. Use this mode e.g. for development purposes, if you want to analyze the reason for occasional wrong transmissions.

Remote command:
`CONFigure:TDSCdma:MEAS<i>:MEValuation:MOEXception`

Power vs Time / Modulation / Spectrum / BER > Statistic Count
Defines the number of measurement intervals per measurement cycle (statistics cycle, single-shot measurement). This value is also relevant for continuous measurements, because the averaging procedures depend on the statistic count.

In the TD-SCDMA multi evaluation measurement, the measurement interval is completed when the R&S CMW has measured the full subframe sequence ("No. of Subframes"). The measurement provides independent statistic counts for the modulation results, the spectrum results and the power vs. time results. In single-shot mode and with a shorter spectrum statistic count, the ACLR evaluation is stopped while the R&S CMW still continues providing new modulation results.

See also: "Statistical Results" in the R&S CMW user manual, chapter "System Overview"

Remote command:
`CONFigure:TDSCdma:MEAS<i>:MEValuation:SCOunt:MODulation`
`CONFigure:TDSCdma:MEAS<i>:MEValuation:SCOunt:SPECtrum`
`CONFigure:TDSCdma:MEAS<i>:MEValuation:SCOunt:PVTime`
`CONFigure:TDSCdma:MEAS<i>:MEValuation:SCOunt:BER`

Power vs Time > Two Shot Assembly Level
Enables or disables the two-shot measurement mode for high dynamic range and defines an assembly level for the two consecutive measurement results.

In the two-shot measurement the multislot range is measured in two frames using two different "Expected Nominal Power" settings. The results of the two stages are combined and displayed together in the "Power vs. Time" diagram.

The two maximum levels differ by 30 dB, which means that – depending on the level range of the UE under test and the external test setup – a gain in dynamic range up to 30 dB can be achieved. The two stage measurement ensures a sufficient dynamic range for arbitrary slot powers but increases the measurement time by a factor of 2.

The assembly level is defined as signal level relative to the reference level (the "Expected Nominal Power" plus the "User Margin") where the two results obtained in a two stage measurement are joined together: All trace points above the assembly level are obtained with a large "Expected Nominal Power", the ones below are measured with lower "Expected Nominal Power".

The assembly level is ignored as long as the two-shot mode is disabled.

Remote command:
CONFigure:TDSCdma:MEAS<i>:MEValuation:HDALevel

BER > Data Pattern
Selects the expected data pattern for looped-back RX test signals. Set this parameter according to the data pattern used for generating the downlink signal (the ARB file).

The data pattern consists of zeros (ALL 0), ones (ALL 1), alternating zero one (01), alternating one zero (10) or pseudo-random bit sequences of variable length (PN9, PN15).

Remote command:
CONFigure:TDSCdma:MEAS<i>:MEValuation:BER:DATA

BER > TrCH Mode
Selects the expected transport channel configuration for looped-back RX test signals. Set this parameter according to the downlink signal (the ARB file).

"RMC" The downlink signal contains both the Dedicated Traffic Channel (DTCH) and the Dedicated Control Channel (DCCH).

"USER" The downlink signal contains the DTCH, but no DCCH.

Remote command:
CONFigure:TDSCdma:MEAS<i>:MEValuation:TRCHmode

Assign Views
Selects the view types to be displayed in the overview. The R&S CMW does not evaluate the results for disabled views. Therefore, limiting the number of assigned views can speed up the measurement.

Remote command:
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:ALL
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:EVMagnitude
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:MERRor
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:PERRor
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:CDMonitor
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:CDPower
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:CDERror
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:PVTime
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:ACLR
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:EMASk
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:MSCalar
CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:BER

List Mode Enable
Shows whether the list mode is enabled and disables an enabled list mode. Enabling the list mode is only possible via the remote control command below. The list mode is essentially a remote control feature; for an introduction see chapter 3.3, "Multi Evaluation List Mode", on page 14.

Option R&S CMW-KM012 required.

Remote command:

```
CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST
```

4.2.4 Trigger Settings

The "Trigger" parameters configure the trigger system for the TD-SCDMA multi evaluation measurement.

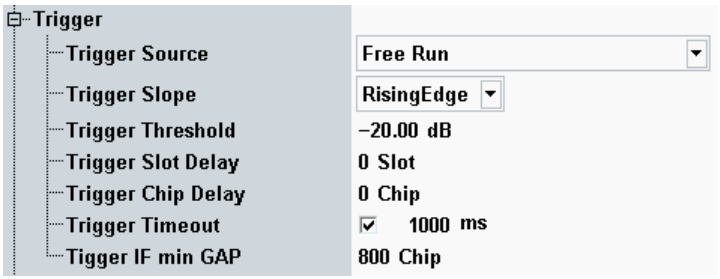


Fig. 4-4: Trigger settings

Trigger Source
Selects the source of the trigger event. Some of the trigger sources require additional options.

- **Free Run:**
  The measurement starts immediately after it is initiated. The R&S CMW decodes the signal to derive its slot and frame timing. This procedure is repeated after each measurement cycle.
- **IF Power:**
  The measurement is triggered by the power of the received signal, converted into an IF signal. The trigger event coincides with the rising or falling edge of the detected TD-SCDMA burst.
- **…External…:**
  External trigger signal fed in via TRIG A or TRIG B on the rear panel of the instrument.

Remote command:

```
TRIGger:TDSCdma:MEAS<i>:MEValuation:SOURce
TRIGger:TDSCdma:MEAS<i>:MEValuation:CATalog:SOURce?
```

Trigger Slope
Qualifies whether the trigger event is generated at the rising or at the falling edge of the trigger pulse. This setting has no influence on "Free Run" measurements and for evaluation of trigger pulses provided by other firmware applications.

Remote command:

```
TRIGger:TDSCdma:MEAS<i>:MEValuation:SLOPe
```

Trigger Threshold
Defines the input signal power where the trigger condition is satisfied and a trigger event is generated. The trigger threshold is valid for power trigger sources. It is a dB value, relative to the reference level minus the external attenuation (<Ref. Level> – <External Attenuation (Input)> – <Frequency Dependent External Attenuation>). If the reference level is set to the actual maximum output power of the DUT, and the external attenuation settings are in accordance with the test setup, then the trigger threshold is referenced to the actual maximum RF input power at the R&S CMW.

A low threshold may be required to ensure that the R&S CMW can always detect the input signal. A higher threshold can prevent unintended trigger events.

Remote command:
`TRIGger:TDSCdma:MEAS<i>:MEValuation:THReshold`

Trigger Slot / Chip Delay
Defines a time delaying the start of the measurement relative to the trigger event. This setting has no influence on "Free Run" measurements.

Remote command:
`TRIGger:TDSCdma:MEAS<i>:MEValuation:SDELay`
`TRIGger:TDSCdma:MEAS<i>:MEValuation:CDELay`

Trigger Timeout
Sets a time after which an initiated measurement must have received a trigger event. If no trigger event is received, a trigger timeout is indicated in manual operation mode. In remote control mode the measurement is automatically stopped. The parameter can be disabled so that no timeout occurs.

This setting has no influence on "Free Run" measurements.

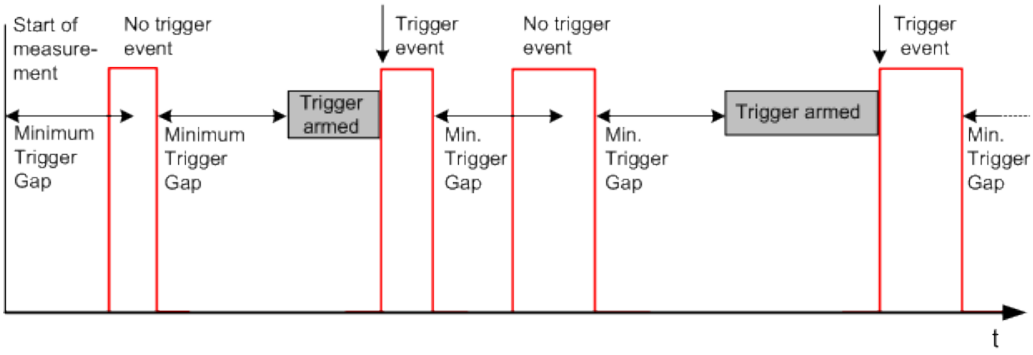
Remote command:
`TRIGger:TDSCdma:MEAS<i>:MEValuation:TOUT`

Trigger IF Min Gap
Defines a minimum duration of the power-down periods (gaps) between two triggered power pulses. This setting is valid for an "(IF) Power" trigger source.

The trigger system is controlled by means of a timer which is reset to zero in the following instances:

- At the IF power-down ramp of each triggered or untriggered pulse, even though the previous counter may not have elapsed yet. A power-down ramp is detected when the signal power falls below the trigger threshold.
- At the beginning of each measurement: The minimum gap defines the minimum time between the start of the measurement and the first trigger event.

The trigger system is re-armed as soon as the timer has reached the specified minimum gap.



This parameter can be used to prevent unwanted trigger events due to fast power variations.

Remote command:

`TRIGger:TDSCdma:MEAS<i>:MEValuation:MGAP`

4.2.5 Limit Settings

The "Limits" in the "Multi Evaluation Configuration" dialog define lower and/or upper limits for the modulation, code domain, power vs. time and spectrum results.

For details see chapter 3.5, "Limit Settings and Conformance Requirements", on page 20.

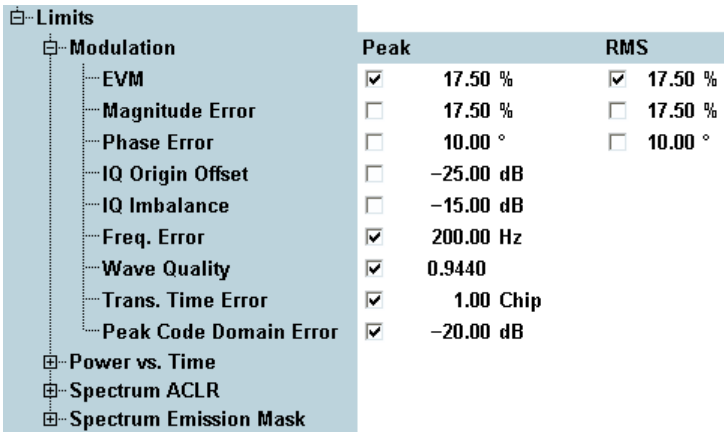


Fig. 4-5: Limit settings

Limits

The limits can be configured via the remote commands described in the following sections:

- chapter 6.3.6, "Limits (Modulation)", on page 95
- chapter 6.3.7, "Limits (Power vs. Time)", on page 98
- chapter 6.3.8, "Limits (Spectrum ACLR)", on page 100
- chapter 6.3.9, "Limits (Spectrum Emission)", on page 102

Some examples are listed below.

Remote command:

```
CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:MERRor
CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:PVTime:EAReas
CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:ACLR:YRELative
CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:EMASk:YABSolute
```

4.3 Measurement Results

The results of the TD-SCDMA multi evaluation measurement are displayed in several different views.

For detailed description see chapter 3.6, "Measurement Results", on page 25.

The multi evaluation measurement provides an overview dialog and a detailed view for each diagram in the overview. The overview dialog shows the modulation, code domain, power and spectrum results as traces or histograms. A selection of statistical results of TX and RX measurements is also shown.

Fig. 4-6: TD-SCDMA Multi Evaluation: Overview

Each of the detailed views shows one or more diagrams and a statistical overview of single-slot results.

Fig. 4-7: TD-SCDMA Multi Evaluation: Magnitude Error

Traces and Bar Graphs
The results can be retrieved via the following remote commands.

Remote command:
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDMonitor:CDPower?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDMonitor:CDERror?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PVTime:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude[:RMS]:MSLot:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor[:RMS]:MSLot:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor[:RMS]:MSLot:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MSLot:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MSLot:CURRent?` etc.

Statistical Overviews and Limit Checks
The results can be retrieved via the following remote commands.

Remote command:
`FETCh:TDSCdma:MEAS<i>:MEValuation:MODulation:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:SPECtrum:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:PVTime:CURRent?` etc.
`FETCh:TDSCdma:MEAS<i>:MEValuation:LIMit:PVTime:FAILure?`
`FETCh:TDSCdma:MEAS<i>:MEValuation:BER?` etc.

5 Programming

The following sections provide programming examples for the TD-SCDMA multi evaluation measurement.

The examples have been tested with the aid of a simple software tool.

See also: "Remote Control" in the R&S CMW user manual

5.1 General Examples

The TD-SCDMA multi evaluation measurement is programmed as follows:

- The measurement is controlled by SCPI commands with the following syntax: `...TDSCdma:MEAS:MEValuation...`
- Use general commands of the type `...:TDSCdma:MEAS...` (no `:MEValuation` mnemonic) to define the signal routing and perform RF and analyzer settings.
- Use general commands of the type `...:TDSCdma:MEAS:UESignal...` (no `:MEValuation` mnemonic) to inform the R&S CMW about the basic properties of the measured TD-SCDMA signal.
- After a `*RST`, the measurement is switched off. Use `READ:TDSCdma:MEAS:MEValuation...?` to initiate a single-shot measurement and retrieve the results. You can also start the measurement using `INIT:TDSCdma:MEAS:MEValuation` and retrieve the results using `FETCh:TDSCdma:MEAS:MEValuation...?`.
- For synchronization and proper decoding, some UE signal settings must be in accordance with the measured signal; see chapter 5.1.2, "Specifying Required Settings", on page 51.

5.1.1 Specifying General Measurement Settings

```
// ***************************************************************************
// System-Reset
// ***************************************************************************
*RST; *OPC?
*CLS; *OPC?

// ***************************************************************************
// Define signal routing, perform RF and analyzer settings for a TD-SCDMA
// signal with a carrier frequency of 1900 MHz and a peak power of 7 dBm,
// allowing for a 5 dB user margin
// ***************************************************************************
ROUTe:TDSCdma:MEAS:SCENario:SALone RF1C, RX1
CONFigure:TDSCdma:MEAS:RFSettings:EATTenuation 2
```

```
CONFigure:TDSCdma:MEAS:RFSettings:ENPower 7
CONFigure:TDSCdma:MEAS:RFSettings:UMARgin 5
CONFigure:TDSCdma:MEAS:RFSettings:FREQuency 1900E+6
CONFigure:TDSCdma:MEAS:RFSettings:MLOFfset 1

// ***************************************************************************
// Redefine the frequency entering band and channel number
// ***************************************************************************
CONFigure:TDSCdma:MEAS:RFSettings:BAND B2
CONFigure:TDSCdma:MEAS:RFSettings:FREQuency 10100 CH
```

5.1.2 Specifying Required Settings

```
// ***************************************************************************
// Specify number of first active uplink timeslot, switching point,
// scrambling code (via cell parameter ID), number of users, modulation type,
// presence and channelization code number of SICH
// ***************************************************************************
CONFigure:TDSCdma:MEAS:UESignal:FAUSlot SL2
CONFigure:TDSCdma:MEAS:UESignal:SPOint TS4
CONFigure:TDSCdma:MEAS:UESignal:SCODe 11
CONFigure:TDSCdma:MEAS:UESignal:NUSers US8
CONFigure:TDSCdma:MEAS:UESignal:MTYPe QAM
CONFigure:TDSCdma:MEAS:UESignal:ECHannel:SICH ON
CONFigure:TDSCdma:MEAS:UESignal:CNUMber:SICH SC1

// ***************************************************************************
// Switch to manual mode and deactivate all DPCHs for administration.
// Define channelization code numbers and spreading factors.
// Activate the required DPCHs.
// ***************************************************************************
CONFigure:TDSCdma:MEAS:UESignal:ECHannel:SICH OFF
CONFigure:TDSCdma:MEAS:UESignal:CIMode MANual
CONFigure:TDSCdma:MEAS:UESignal:ECHannel:ALL OFF,OFF,OFF,OFF,OFF,OFF,OFF,OFF,
    OFF,OFF,OFF,OFF,OFF,OFF,OFF,OFF
CONFigure:TDSCdma:MEAS:UESignal:CNUMber 0,1,2,4,0,0,0,0,0,0,0,0,0,0,0,0
CONFigure:TDSCdma:MEAS:UESignal:CNUMber:DPCH4 3
CONFigure:TDSCdma:MEAS:UESignal:SFACtor SF4,SF4,SF4,SF4,SF1,SF1,SF1,SF1,SF1,
    SF1,SF1,SF1,SF1,SF1,SF1,SF1
CONFigure:TDSCdma:MEAS:UESignal:ECHannel:DPCH1 ON
CONFigure:TDSCdma:MEAS:UESignal:ECHannel:DPCH2 ON
CONFigure:TDSCdma:MEAS:UESignal:ECHannel:DPCH3 ON
CONFigure:TDSCdma:MEAS:UESignal:ECHannel:DPCH4 ON

// ***************************************************************************
// Decide to use automatic mode and set the corresponding threshold
// ***************************************************************************
```

```
CONFigure:TDSCdma:MEAS:UESignal:CIMode AUTO
CONFigure:TDSCdma:MEAS:UESignal:CDTHreshold -30
```

5.1.3 Specifying Additional Measurement-Specific Settings

```
// ********************************************************************************
// Define stop condition (stop on limit failure), analysis mode, error handling
// and two-shot assembly level.
// Select data pattern and transport channel mode for RX measurements.
// Select a measurement length of 2 subframes,
// using slot number 3 as preselected slot and 4 as scalar slot.
// Define a subframe number offset of 0 for RX measurements.
// ********************************************************************************
CONFigure:TDSCdma:MEAS:MEValuation:SCONdition OLFail
CONFigure:TDSCdma:MEAS:MEValuation:AMODe WOOFfset
CONFigure:TDSCdma:MEAS:MEValuation:MOEXception ON
CONFigure:TDSCdma:MEAS:MEValuation:HDALevel -30
CONFigure:TDSCdma:MEAS:MEValuation:BER:DATA ZERO
CONFigure:TDSCdma:MEAS:MEValuation:TRCHmode RMC
CONFigure:TDSCdma:MEAS:MEValuation:NFRames 2
CONFigure:TDSCdma:MEAS:MEValuation:PSLot 3
CONFigure:TDSCdma:MEAS:MEValuation:SSLot 4
CONFigure:TDSCdma:MEAS:MEValuation:SFOFfset 0

// ********************************************************************************
// Specifiy statistic counts
// ********************************************************************************
CONFigure:TDSCdma:MEAS:MEValuation:SCOunt:MODulation 20
CONFigure:TDSCdma:MEAS:MEValuation:SCOunt:SPECtrum 20
CONFigure:TDSCdma:MEAS:MEValuation:SCOunt:PVTime 20
CONFigure:TDSCdma:MEAS:MEValuation:SCOunt:BER 50
```

5.1.4 Configuring the Trigger System

```
// ********************************************************************************
// Define IF power trigger with slope, threshold, slot delay,
// timeout and minimum gap
// ********************************************************************************
TRIGger:TDSCdma:MEAS:MEValuation:SOURce 'IF Power'
TRIGger:TDSCdma:MEAS:MEValuation:SLOPe REDGe
TRIGger:TDSCdma:MEAS:MEValuation:THReshold -15
TRIGger:TDSCdma:MEAS:MEValuation:SDELay 3
TRIGger:TDSCdma:MEAS:MEValuation:TOUT 1
TRIGger:TDSCdma:MEAS:MEValuation:MGAP 500
```

5.1.5 Specifying Limits

```
// ***************************************************************************
// Define modulation limits
// ***************************************************************************
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:MERRor 20, OFF
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:EVMagnitude 10, 20
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:PERRor 20, OFF
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:IQOFfset -20
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:IQIMbalance ON
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:FERRor 150
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:TERRor 2
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:PCDerror -10
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:WQUality 0.95

// ***************************************************************************
// Define power vs. time limits
// ***************************************************************************
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:PVTime:YABSolute -70,-60,-70
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:PVTime:XRELative -55,-33,-13,12,45
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:PVTime:EAReas ON,ON,ON

// ***************************************************************************
// Define ACLR limits
// ***************************************************************************
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:ACLR:OBW 1.4
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:ACLR:YABSolute ON
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:ACLR:YRELative -33, -43

// ***************************************************************************
// Define spectrum emission mask
// ***************************************************************************
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:EMASk:YABSolute -55.8,-71.1
CONFigure:TDSCdma:MEAS:MEValuation:LIMit:EMASk:YRELative -42,-42,-57,-47,-33.1
```

5.1.6 Performing Single-Shot Measurements

```
// ***************************************************************************
// Enable all measurements and select a code channel for the CDP
// multislot results.
// ***************************************************************************
CONFigure:TDSCdma:MEAS:MEValuation:RESult ON
CONFigure:TDSCdma:MEAS:MEValuation:CDPower:MSLot:CINDex 10

// ***************************************************************************
// Start single-shot measurement, return magnitude error trace.
// Query the measurement state (should be "RDY").
// ***************************************************************************
READ:TDSCdma:MEAS:MEValuation:TRACe:MERRor:AVERage?
```

```
FETCh:TDSCdma:MEAS:MEValuation:STATe?

// ****************************************************************************
// Read the current single-slot traces obtained in the last measurement
// without re-starting the measurement
// ****************************************************************************
FETCh:TDSCdma:MEAS:MEValuation:TRACe:CDPower:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:CDPower:SDEViation?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:CDERror:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:CDERror:SDEViation?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:CDMonitor:CDPower? SF1
FETCh:TDSCdma:MEAS:MEValuation:TRACe:CDMonitor:CDERror? SF2
FETCh:TDSCdma:MEAS:MEValuation:TRACe:EMASk:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:PVTime:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:EVMagnitude:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:MERRor:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:PERRor:CURRent?

// ****************************************************************************
// Read the current multislot traces obtained in the last measurement
// without re-starting the measurement
// ****************************************************************************
FETCh:TDSCdma:MEAS:MEValuation:TRACe:CDPower:MSLot:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:CDPower:MSLot:SDEViation?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:CDERror:MSLot:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:CDERror:MSLot:SDEViation?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:EVMagnitude:MSLot:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:EVMagnitude:MSLot:SDEViation?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:MERRor:MSLot:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:MERRor:MSLot:SDEViation?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:PERRor:MSLot:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:PERRor:MSLot:SDEViation?

// ****************************************************************************
// Read statistical results obtained in the last measurement
// without re-starting the measurement
// ****************************************************************************
FETCh:TDSCdma:MEAS:MEValuation:SPECtrum:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:MODulation:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:PVTime:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:BER?

// ****************************************************************************
// Read limit check results obtained in the last measurement
// without re-starting the measurement
// ****************************************************************************
CALCulate:TDSCdma:MEAS:MEValuation:SPECtrum:CURRent?
CALCulate:TDSCdma:MEAS:MEValuation:MODulation:CURRent?
```

```
CALCulate:TDSCdma:MEAS:MEValuation:BER?
FETCh:TDSCdma:MEAS:MEValuation:LIMit:PVTime:FAILure?
```

5.1.7 Single-Shot and Continuous Measurements

```
// ***************************************************************************
// Start single-shot measurement, return magnitude error trace.
// Return maximum magnitude error trace and maximum phase (without repeating
// the measurement. Query the measurement state (should be "RDY").
// ***************************************************************************
INIT:TDSCdma:MEAS:MEValuation
FETCh:TDSCdma:MEAS:MEValuation:TRACe:MERRor:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:MERRor:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:TRACe:PERRor:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:STATe?

// ***************************************************************************
// Start continuous measurement; wait for 5 ms and return average result.
// Query measurement state and substates (should be "RUN,ADJ,ACT").
// ***************************************************************************
CONFigure:TDSCdma:MEAS:MEValuation:REPetition CONTinuous
INIT:TDSCdma:MEAS:MEValuation
Pause 5000
FETCh:TDSCdma:MEAS:MEValuation:TRACe:EVMagnitude:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:STATe:ALL?
```

5.2 Using the TD-SCDMA List Mode

The TD-SCDMA multi evaluation list mode is programmed as follows:

- The measurement is controlled by SCPI commands with the following syntax: `...TDSCdma:MEAS:MEValuation:LIST...`
- Use general commands of the type `...:TDSCdma:MEAS...` (no `:MEValuation` mnemonic) to define the signal routing and perform general RF and analyzer settings.
- After a `*RST`, the measurement is switched off and list mode is disabled. Use `CONFigure:TDSCdma:MEAS:MEValuation:LIST ON` to enable the list mode and `INIT:TDSCdma:MEAS:MEValuation` to initiate a single-shot measurement.
- Use `FETCh:TDSCdma:MEAS:MEValuation:LIST:...?` commands to retrieve the results.

Speed considerations

The following measurement settings have an impact on the measurement speed:

- The number and size of the segments and the number of measured subframes in each segment
- The number and type of results that the R&S CMW needs to calculate

5.2.1 Specifying Global Measurement Settings

```
// ***************************************************************************
// System-Reset
// ***************************************************************************
*RST; *OPC?
*CLS; *OPC?

// ***************************************************************************
// Define signal routing and external attenuation
// (Note: The general RF frequency and expected power settings are
// not used in list mode)
// ***************************************************************************
ROUTe:TDSCdma:MEAS:SCENario:SALone RF1C, RX1
CONFigure:TDSCdma:MEAS:RFSettings:EATTenuation 2
```

5.2.2 Specifying List Mode Settings

```
// ***************************************************************************
// Define 2 segments with a length of 20 subframes each
// and different signal properties.
// ***************************************************************************
CONFigure:TDSCdma:MEAS:MEValuation:LIST:COUNt 2
CONF:TDSC:MEAS:MEV:LIST:SEGM1:SETup 20,TS6,64,US2,QPSK,#B111111,5,1900E+6,B1,OFF
CONF:TDSC:MEAS:MEV:LIST:SEGM2:SETup 20,TS6,64,US2,QAM,#B111111,5,2350E+6,B3,OFF

// ***************************************************************************
// Enable  modulation and spectrum results for all segments.
// Specify a statistical length of 50 slots.
// Enable the list mode.
// ***************************************************************************
CONFigure:TDSCdma:MEAS:MEValuation:LIST:SEGMent1:MODulation 50,ON,ON,ON,ON,ON,ON
CONFigure:TDSCdma:MEAS:MEValuation:LIST:SEGMent2:MODulation 50,ON,ON,ON,ON,ON,ON
CONFigure:TDSCdma:MEAS:MEValuation:LIST:SEGMent1:SPECtrum 50,ON,ON,ON
CONFigure:TDSCdma:MEAS:MEValuation:LIST:SEGMent2:SPECtrum 50,ON,ON,ON
CONFigure:TDSCdma:MEAS:MEValuation:LIST ON

// ***************************************************************************
// Use a power trigger without retriggering to start the measurement.
// ***************************************************************************
TRIGger:TDSCdma:MEAS:MEValuation:LIST:MODE ONCE
TRIGger:TDSCdma:MEAS:MEValuation:SOURce 'IF Power'
```

5.2.3 Performing Single-Shot Measurements

```
// ***************************************************************************
// Start single-shot measurement.
// Return results of segment 1 and 2:
```

```
// current and average modulation and spectrum results
// Query the measurement state (should be "RDY").
// ******************************************************************************
INIT:TDSCdma:MEAS:MEValuation
FETCh:TDSCdma:MEAS:MEValuation:LIST:SEGMent1:MODulation:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SEGMent1:MODulation:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SEGMent1:SPECtrum:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SEGMent1:SPECtrum:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SEGMent2:MODulation:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SEGMent2:MODulation:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SEGMent2:SPECtrum:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SEGMent2:SPECtrum:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:STATe?

// ******************************************************************************
// Alternatively use segment-independent commands
// to retrieve the results for all segments.
// ******************************************************************************
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:AVERage?
```

5.2.4 Retrieving Single Results for All Segments

```
// ******************************************************************************
// Return selected modulation results.
// ******************************************************************************
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:EVM:RMS:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:EVM:PEAK:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:MERRor:RMS:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:MERRor:PEAK:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:PERRor:RMS:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:PERRor:PEAK:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:IQOFfset:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:IQIMbalance:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:CFERror:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:TERRor:CURRent?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:UEPower:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:WQUality:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:PCDE:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:MODulation:PCDE:AVERage?

// ******************************************************************************
// Return selected spectrum results.
// ******************************************************************************
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:ABSPower:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:ACLR:CPOWer:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:ACLR:LCHannel1:AVERage?
```

```
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:ACLR:LCHannel2:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:ACLR:RCHannel1:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:ACLR:RCHannel1:AVERage?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:OBW:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:EMASk:MARGin:AB:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:EMASk:MARGin:CD:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:EMASk:MARGin:DE:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:EMASk:MARGin:ED:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:EMASk:MARGin:DC:MAXimum?
FETCh:TDSCdma:MEAS:MEValuation:LIST:SPECtrum:EMASk:MARGin:BA:MAXimum?

// ****************************************************************************
// Return the individual segment reliability indicators
// ****************************************************************************
FETCh:TDSCdma:MEAS:MEValuation:LIST:SRELiability?
```

6 Command Reference

The following sections provide detailed reference information on the remote control commands of the "TD-SCDMA Measurements" application.

6.1 Conventions and General Information

The following sections describe the most important conventions and general informations concerning the command reference.

6.1.1 MEAS<i>

MEAS<i> is used as abbreviation of "MEASurement<instance>". For better readability only the abbreviated form (which is also accepted by the instrument) is given in the command reference.

The <instance> is relevant for instruments supporting several instances of the same firmware application. It can be omitted if the instrument supports only one instance, or to address the first instance.

See also: "Firmware Applications" in the R&S CMW user manual, chapter "Remote Control"

6.1.2 FETCh, READ and CALCulate Commands

All commands are used to retrieve measurement results:

- `FETCh...` returns the results of the current measurement cycle (single-shot measurement) after they are valid. `FETCh...` must be used after the measurement has been started (`INITiate...`, measurement states RUN or RDY).
- `READ...` starts a new single-shot measurement and returns the results.
- `CALCulate...` returns one limit check result per `FETCh` result:
  - **OK**: The `FETCh` result is located within the limits or no limit has been defined/ enabled for this result.
  - **ULEU** (User limit exceeded upper): An upper limit is violated. The `FETCh` result is located above the limit.
  - **ULEL** (User limit exceeded lower): A lower limit is violated. The `FETCh` result is located below the limit.

See also: "Retrieving Measurement Results" in the R&S CMW user manual, chapter "Remote Control"

6.1.3 Current and Statistical Results

The R&S CMW repeats measurements according to the selected statistic count and repetition mode. Consecutive measurement values are stored and used to calculate statistical results, e.g. average, minimum, maximum and standard deviation.

See also: "Statistical Results" in the R&S CMW user manual, chapter "System Overview"

6.1.4 Reliability Indicator

The first value in the output arrays of `FETCh...?, READ...?` and `CALCulate...?` queries indicates the most severe error that has occurred during the measurement.

Example for an output array: 0, 10.22, 10.15, 10.01, 10.29, 100 (reliability = 0, followed by 5 numeric measurement values).

If the preselected slot can not be measured correctly, this results in a reliability indicator value greater than zero. If there are problems in another slot, but the preselected slot is measured correctly, the reliability indicator value equals zero.

The reliability indicator has one of the following values:

- **0 (OK)**:
  Measurement values available, no error detected.
- **1 (Measurement Timeout)**:
  The measurement has been stopped after the (configurable) measurement timeout. Measurement results may be available, however, at least a part of the measurement provides only INValid results or has not completed the full statistic count.
- **2 (Capture Buffer Overflow)**:
  The measurement configuration results in a capture length exceeding the available memory.
- **3 (Overdriven) / 4 (Underdriven)**:
  The accuracy of measurement results may be impaired because the input signal level was too high / too low.
- **6 (Trigger Timeout)**:
  The measurement could not be started or continued because no trigger event was detected.
- **7 (Acquisition Error)**:
  The R&S CMW could not properly decode the RF input signal.
- **8 (Sync Error)**:
  The R&S CMW could not synchronize to the RF input signal.
- **9 (Uncal)**:
  Due to an inappropriate configuration of resolution bandwidth, video bandwidth or sweep time, the measurement results are not within the specified data sheet limits.
- **15 (Reference Frequency Error)**:
  The instrument has been configured to use an external reference signal but the reference oscillator could not be phase locked to the external signal (e.g. signal level too low, frequency out of range or reference signal not available at all).
- **16 (RF Not Available)**:

The measurement could not be started because the configured RF input path was not active. This problem may occur e.g. when a measurement is started in combined signal path mode and the master application has not yet activated the input path. The LEDs above the RF connectors indicate whether the input and output paths are active.

- **17 (RF Level not Settled) / 18 (RF Frequency not Settled)**:
  The measurement could not be started because the R&S CMW was not yet ready to deliver stable results after a change of the input signal power / the input signal frequency.
- **19 (Call not Established)**:
  For measurements: The measurement could not be started because no signaling connection to the DUT was established.
  For DAU IMS service: Establishing a voice over IMS call failed.
- **20 (Call Type not Usable)**:
  For measurements: The measurement could not be started because the established signaling connection had wrong properties.
  For DAU IMS service: The voice over IMS settings could not be applied.
- **21 (Call Lost)**:
  For measurements: The measurement was interrupted because the signaling connection to the DUT was lost.
  For DAU IMS service: The voice over IMS call was lost.
- **23 (Missing Option)**:
  The ARB file can not be played by the GPRF generator due to a missing option.
- **26 (Resource Conflict)**:
  The application could not be started or has been stopped due to a conflicting hardware resource or software option that is allocated by another application.
  Please stop the application that has allocated the conflicting resources and try again.
- **27 (No Sensor Connected)**:
  The GPRF External Power Sensor measurement could not be started due to missing power sensor.
- **40 (ARB File CRC Error)**:
  The ARB file CRC check failed. The ARB file is corrupt and not reliable.
- **42 (ARB Header Tag Invalid)**:
  The ARB file selected in the GPRF generator contains an invalid header tag.
- **43 (ARB Segment Overflow)**:
  The number of segments in the multi-segment ARB file is higher than the allowed maximum.
- **44 (ARB File not Found)**:
  The selected ARB file could not be found.
- **50 (Startup Error)**:
  The Data Application Unit (DAU), a DAU service or a DAU measurement could not be started. Please execute a DAU selftest.
- **51 (No Reply)**:
  The DAU has received no response, for example for a ping request.
- **52 (Connection Error)**:

The DAU could not establish a connection to internal components. Please restart the instrument.

- **53 (Configuration Error)**:
  The current DAU configuration by the user is incomplete or wrong and could not be applied. Check especially the IP address configuration.
- **54 (Filesystem Error)**:
  The hard disk of the DAU is full or corrupt. Please execute a DAU selftest.
- **101 (Firmware Error)**:
  Indicates a firmware or software error. If you encounter this error for the first time, restart the instrument.
  If the error occurs again, consider the following hints:
  – Firmware errors can often be repaired by restoring the factory default settings. To restore these settings, restart your instrument and press the "Factory Default" softkey during startup.
  – If a software package (update) has not been properly installed this is often indicated in the "Setup" dialog, section "SW/HW-Equipment > Installed Software".
  – A software update correcting the error may be available. Updates are e.g. provided in the "CMW Customer Web" on GLORIS (registration required): https://extranet.rohde-schwarz.com.

  If you get firmware errors even with the properly installed latest software version, please send a problem report including log files to Rohde & Schwarz.
- **102 (Unidentified Error)**:
  Indicates an error not covered by other reliability values. For troubleshooting please follow the steps described for "101 (Firmware Error)".
- **103 (Parameter Error)**:
  Indicates that the measurement could not be performed due to internal conflicting parameter settings.
  A good approach to localize the conflicting settings is to start with a reset or preset or even restore the factory default settings. Then reconfigure the measurement step by step and check when the error occurs for the first time.
  If you need assistance to localize the conflicting parameter settings please contact Rohde & Schwarz (see http://www.service.rohde-schwarz.com).

6.2 General Measurement Settings

The commands valid for all TD-SCDMA measurements are divided into the groups listed below.

6.2.1 Signal Routing

The following commands configure the scenario, select the input path for the measured signal and define an external attenuation value.

ROUTe:TDSCdma:MEAS<i>:SCENario:SALone <RXConnector>, <RXConverter>

Activates the standalone scenario and selects the RF input path for the measured RF signal, i.e. the RF connector and the RX module.

Depending on the installed hardware and the active sub-instrument or instance <i> only a subset of the described parameter values is allowed. The *RST values and the mapping of virtual connector names to physical connectors also depend on the active sub-instrument or instance <i>.

All instruments are equipped with the RF 1 and RF 2 connectors and one RX and TX module. Additional RF connectors and RX/TX modules are optionally available for R&S CMW270 and R&S CMW500, but not for R&S CMW280.

See also: "Signal Path Settings" in the R&S CMW user manual, chapter "Remote Control"

Parameters:

<RXConnector> RF1C | RF2C | RF3C | RF4C | RFAC | RFBC

RF1C, RF2C, RF3C, RF4C:
RF 1 COM to RF 4 COM front panel connectors

RFAC, RFBC:
Virtual names for the RF COM connectors

<RXConverter> RX1 | RX2 | RX3 | RX4

RX module for the input path

Example: See Specifying General Measurement Settings

Firmware/Software: V1.0.15.20
V2.0.10: additional values

Manual operation: See "Scenario" on page 35

ROUTe:TDSCdma:MEAS<i>:SCENario?

Returns the active scenario.

Return values:

<Scenario> SALone

SALone: Standalone (Non Signaling)

Usage: Query only

Firmware/Software: V2.0.10

Manual operation: See "Scenario" on page 35

ROUTe:TDSCdma:MEAS<i>?

Returns the configured routing settings.

Return values:

<Scenario> SALone
SALone: Standalone (Non Signaling)

<Controller> For future use - returned value not relevant

<RXConnector> RF1C | RF2C | RF3C | RF4C
RF 1 COM to RF 4 COM front panel connectors

<RXConverter> RX1 | RX2 | RX3 | RX4
RX module for the input path

Usage: Query only

Firmware/Software: V2.0.10

Manual operation: See "Scenario" on page 35

CONFigure:TDSCdma:MEAS<i>:RFSettings:EATTenuation <RFInputExtAtt>

Defines an external attenuation (or gain, if the value is negative), to be applied to the RF input connector.

Parameters:

<RFInputExtAtt> Range: -50 dB to 90 dB
*RST: 0 dB
Default unit: dB

Example: See Specifying General Measurement Settings

Firmware/Software: V1.0.2.7

Manual operation: See "External Attenuation (Input)" on page 35

6.2.2 Analyzer Settings

The following commands configure the RF input path.

CONFigure:TDSCdma:MEAS<i>:RFSettings:BAND <Band>

Selects the frequency band.

Parameters:

<Band> B1 | B2 | B3

B1: Band 1 (F), 1880 MHz to 1920 MHz
B2: Band 2 (A), 2010 MHz to 2025 MHz
B3: Band 3 (E), 2300 MHz to 2400 MHz

*RST: B2

Example: See Specifying General Measurement Settings

Firmware/Software: V1.0.4.11
V3.0.10: modifying the band does no longer modify the channel/ frequency

Manual operation: See "Band / Frequency - Channel" on page 36

CONFigure:TDSCdma:MEAS<i>:RFSettings:FREQuency <Frequency>

Selects the center frequency of the RF analyzer.

Parameters:

<Frequency> Range: 100E+6 Hz to 6E+9 Hz
*RST: 2.0108E+9 Hz
Default unit: Hz
Using the unit CH the frequency can be set via the channel number. The allowed range depends on the frequency band:
Band 1 (F): 9400 to 9600
Band 2 (A): 10050 to 10125
Band 3 (E): 11500 to 12000

Example: See Specifying General Measurement Settings

Firmware/Software: V1.0.2.7
V3.0.10: modifying the frequency does no longer modify the band; unit CH allows to set the frequency via the channel number

Manual operation: See "Band / Frequency - Channel" on page 36

CONFigure:TDSCdma:MEAS<i>:RFSettings:ENPower <ExpNomPow>

Sets the expected nominal power of the measured RF signal.

Parameters:

<ExpNomPow> The range of the expected nominal power can be calculated as follows:
Range (Expected Nominal Power) = Range (Input Power) + External Attenuation - User Margin

Range: –47 dBm to 35 dBm for the input power at the RF COM connectors (please notice also the ranges quoted in the data sheet).
*RST: 0 dBm
Default unit: dBm

Example: See Specifying General Measurement Settings

Firmware/Software: V1.0.2.7

Manual operation: See "Expected Nominal Power" on page 36

CONFigure:TDSCdma:MEAS<i>:RFSettings:UMARgin <UserMargin>

Sets the margin that the R&S CMW adds to the expected nominal power in order to determine its reference power. The reference power minus the external input attenuation must be within the power range of the selected input connector; refer to the data sheet.

Parameters:

<UserMargin>
Range: 0 dB to (34 dB + External Attenuation - Expected Nominal Power)
*RST: 0 dB
Default unit: dB

Example: See Specifying General Measurement Settings

Firmware/Software: V1.0.2.7

Manual operation: See "User Margin" on page 36

CONFigure:TDSCdma:MEAS<i>:RFSettings:MLOFfset <MLOffset>

Varies the input level of the mixer in the analyzer path.

Parameters:

<MLOffset>
Range: -10 dB to 10 dB
*RST: 10 dB
Default unit: dB

Example: See Specifying General Measurement Settings

Firmware/Software: V2.0.10

Manual operation: See "Mixer Level Offset" on page 36

6.2.3 UE Signal Info

The following commands define the (expected) properties of the UE signal. The R&S CMW must know these properties in order to analyze the UE signal.

CONFigure:TDSCdma:MEAS<i>:UESignal:FAUSlot <FstActUpSlot>

Specifies the first active uplink timeslot in the subframe (relevant for IF trigger source).

Parameters:

<FstActUpSlot> SL1 | SL2 | SL3 | SL4 | SL5 | SL6
Timeslot 1 ... 6
*RST: SL1

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "First Active Uplink Slot" on page 37

CONFigure:TDSCdma:MEAS<i>:UESignal:CDTHreshold <ChnDetThres>

Selects the threshold for automatic channelization code search. The threshold determines whether a signal is evaluated or rejected (noise, non-orthogonal components).

Parameters:

<ChnDetThres> Range: -128 dB to 127 dB
*RST: -20 dB
Default unit: dB

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "Chn. Detect Threshold" on page 38

CONFigure:TDSCdma:MEAS<i>:UESignal:SPOint <SwitchPoint>

Selects the position of the duplex switching point in the subframe.

Parameters:

<SwitchPoint> TS1 | TS2 | TS3 | TS4 | TS5 | TS6
Duplex switching point is located after the selected timeslot, e.g. TS2 means after timeslot 2
*RST: TS3

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "Switching Point" on page 38

CONFigure:TDSCdma:MEAS<i>:UESignal:SCODe <ScrCode>

Selects the cell parameter ID identifying the cell and determining the scrambling code.

Parameters:

<ScrCode> Range: 0 to 127
*RST: 0

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "Scrambling Code" on page 38

CONFigure:TDSCdma:MEAS<i>:UESignal:NUSers <NumOfUser>

Selects the maximum number of users for one timeslot.

Parameters:

<NumOfUser> US2 | US4 | US6 | US8 | US10 | US12 | US14 | US16
Maximum 2, 4,..., 16 users
*RST: US16

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "User Number" on page 38

CONFigure:TDSCdma:MEAS<i>:UESignal:MTYPe <ModType>

Selects the modulation type.

Parameters:

<ModType> QPSK | EPSK | QAM
QPSK: quadrature phase shift keying
EPSK: eight phase shift keying (8PSK)
QAM: quadrature amplitude modulation (16-QAM)
*RST: QPSK

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11
V2.1.10: QAM added
V3.0.10: EPSK added

Options: R&S CMW-KM751 required for EPSK and QAM

Manual operation: See "Modulation Type" on page 38

CONFigure:TDSCdma:MEAS<i>:UESignal:ECHannel:SICH <SICHEnable>

Defines whether the uplink signal contains a shared information channel (HS-SICH, related to a high speed downlink shared channel).

Parameters:

<SICHEnable> OFF | ON

OFF: HS-SICH not used
ON: HS-SICH used

*RST: OFF

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "SICH Enable" on page 38

CONFigure:TDSCdma:MEAS<i>:UESignal:CNUMber:SICH <SICHCodeNum>

Selects the channelization code number of the shared information channel (HS-SICH). The spreading factor of the HS-SICH equals 16. The resulting channelization code is $c_{16,<SICHCodeNum>}$.

Parameters:

<SICHCodeNum> SC1 | SC2 | SC3 | SC4 | SC5 | SC6 | SC7 | SC8 | SC9 | SC10 | SC11 | SC12 | SC13 | SC14 | SC15 | SC16

SC1 ... SC16: code number 0 ... 15

*RST: SC1

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "SICH Code Number" on page 39

CONFigure:TDSCdma:MEAS<i>:UESignal:CIMode <ChnInfoMode>

Selects the channel information mode.

Parameters:

<ChnInfoMode> MANual | AUTO

MANual: the channelization code numbers and spreading factors defined via the commands above are used
AUTO: the channelization codes and spreading factors are determined automatically

*RST: AUTO

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "Channel Info Mode" on page 39

CONFigure:TDSCdma:MEAS<i>:UESignal:SFACtor <DPCHSF>(16)

Selects the spreading factors of all channels. The spreading factors assigned to the active channels must always be consistent. It may be required to disable channels temporarily for administration.

Parameters:

<DPCHSF> SF1 | SF2 | SF4 | SF8 | SF16

16 values for channel 1 to channel 16
SF1 ... SF16: spreading factor = 1, 2, 4, 8, 16

*RST: SF16, SF16, ... (16 times SF16)

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "DPCH" on page 39

CONFigure:TDSCdma:MEAS<i>:UESignal:SFACtor:DPCH<chidx> <DPCHSFIdx>

Selects the spreading factor of the channel with the indicated <chidx>. The spreading factors assigned to the active channels must always be consistent. It may be required to disable channels temporarily for administration.

Suffix:

<chidx> 1..16
number of the DPCH

Parameters:

<DPCHSFIdx> SF1 | SF2 | SF4 | SF8 | SF16

Spreading factor 1, 2, 4, 8, 16

*RST: SF16

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "DPCH" on page 39

CONFigure:TDSCdma:MEAS<i>:UESignal:CNUMber <DPCHCodeNum>(16)

Selects the channelization code numbers of all dedicated physical channels. The resulting channelization code of a channel is $c_{SF,<DPCHCodeNum>}$ where SF indicates the spreading factor of the channel.

The code numbers and spreading factors assigned to active channels must always be compatible. It may be required to disable channels temporarily for administration. For compatibility of settings see chapter 3.4.2, "Channelization for CDMA", on page 19.

Parameters:

<DPCHCodeNum> 16 values for channel 1 to channel 16

Range: 0 to SF-1 (where SF is the spreading factor of the channel)

*RST: 0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "DPCH" on page 39

CONFigure:TDSCdma:MEAS<i>:UESignal:CNUMber:DPCH<chidx>
<DPCHCodeNumIdx>

Selects the channelization code number of the dedicated physical channel with the indicated <chidx>. The resulting channelization code of the channel is $c_{SF,<DPCHCodeNumIdx>}$ where SF indicates the spreading factor of the channel. The code numbers and spreading factors assigned to active channels must always be consistent. It may be required to disable channels temporarily for administration.

For compatibility of settings see chapter 3.4.2, "Channelization for CDMA", on page 19.

Suffix:

<chidx> 1..16
number of the DPCH

Parameters:

<DPCHCodeNumIdx> Range: 0 to SF-1 (where SF is the spreading factor of the channel)

*RST: <chidx>-1

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "DPCH" on page 39

CONFigure:TDSCdma:MEAS<i>:UESignal:ECHannel <DPCH>

Selects or deselects all dedicated physical channels of the uplink. The selection of channels with incompatible settings (spreading factor and channelization code number) is rejected. For compatibility of settings see chapter 3.4.2, "Channelization for CDMA", on page 19.

Setting parameters:

<DPCH> OFF | ON

OFF: deselect all channels
ON: select all channels

*RST: n/a

Return values:
<DPCHEnable> OFF | ON
List of 16 values for DPCH1 to DPCH16
*RST: ON

Firmware/Software: V1.0.4.11

Manual operation: See "DPCH" on page 39

CONFigure:TDSCdma:MEAS<i>:UESignal:ECHannel:ALL <DPCH>(16)

Selects or deselects dedicated physical channels. The selection of channels with incompatible settings (spreading factor and channelization code number) is rejected. For compatibility of settings see chapter 3.4.2, "Channelization for CDMA", on page 19.

Parameters:
<DPCH> OFF | ON
16 values for DPCH1 to DPCH16
OFF: deselect channel
ON: select channel
*RST: ON, ON, ... (16 times ON)

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "DPCH" on page 39

CONFigure:TDSCdma:MEAS<i>:UESignal:ECHannel:DPCH<chidx> <DPCHIdx>

Selects or deselects the dedicated physical channel with the specified <chidx>. The selection of channels with incompatible settings (spreading factor and channelization code number) is rejected. For compatibility of settings see chapter 3.4.2, "Channelization for CDMA", on page 19.

Suffix:
<chidx> 1..16
number of the DPCH

Parameters:
<DPCHIdx> OFF | ON
ON: select channel
OFF: deselect channel
*RST: ON

Example: See Specifying Required Settings

Firmware/Software: V1.0.4.11

Manual operation: See "DPCH" on page 39

6.3 Multi Evaluation Measurement Commands

The commands for the TD-SCDMA "Multi Evaluation" measurement are divided into the groups listed below. The general measurement settings also affect the measurement, see chapter 6.2, "General Measurement Settings", on page 62.

6.3.1 Measurement Control and States

The following commands control the measurement and return the current measurement state.

INITiate:TDSCdma:MEAS<i>:MEValuation
STOP:TDSCdma:MEAS<i>:MEValuation
ABORt:TDSCdma:MEAS<i>:MEValuation

Starts, stops, or aborts the measurement:

- `INITiate...` starts or restarts the measurement; the R&S CMW enters the "RUN" state.
- `STOP...` causes a running measurement to stop after the current evaluation period is terminated and valid results are available; the R&S CMW enters the "RDY" state.

- `ABORt...` causes a running measurement to stop immediately; the R&S CMW enters the "OFF" state.

Use `FETCh...STATe?` to query the current measurement state.

See also: "Measurement Control" in the R&S CMW user manual, chapter "Remote Control"

Example: See Single-Shot and Continuous Measurements

Usage: Event

Firmware/Software: V1.0.2.7

Manual operation: See "Multi Evaluation (Softkey)" on page 34

FETCh:TDSCdma:MEAS<i>:MEValuation:STATe?

Queries the main measurement state. Use `FETCh:...:STATe:ALL?` to query the measurement state including the substates. Use `INITiate..., STOP..., ABORt...` to change the measurement state.

See also: "Measurement Control" in the R&S CMW user manual, chapter "Remote Control"

Return values:

<MeasState> OFF | RUN | RDY

OFF: measurement switched off, no resources allocated, no results available (when entered after `ABORt...`)
RUN: measurement running (after `INITiate..., READ...`), synchronization pending or adjusted, resources active or queued
RDY: measurement has been terminated, valid results may be available

*RST: OFF

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.2.7

Manual operation: See "Multi Evaluation (Softkey)" on page 34

FETCh:TDSCdma:MEAS<i>:MEValuation:STATe:ALL?

Queries the main measurement state and the measurement substates. Both measurement substates are relevant for running measurements only. Use `FETCh:...:STATe?` to query the main measurement state only. Use `INITiate..., STOP..., ABORt...` to change the measurement state.

See also: "Measurement Control" in the R&S CMW user manual, chapter "Remote Control"

Return values:

<MainState> OFF | RDY | RUN

OFF: measurement switched off, no resources allocated, no results available (when entered after `STOP...`)
RDY: measurement has been terminated, valid results may be available
RUN: measurement running (after `INITiate..., READ...`), synchronization pending or adjusted, resources active or queued

*RST: OFF

<SyncState> PEND | ADJ | INV

PEND: waiting for resource allocation, adjustment, hardware switching ("pending")
ADJ: all necessary adjustments finished, measurement running ("adjusted")
INV: not applicable because <MainState>: OFF or RDY ("invalid")

<ResState> QUE | ACT | INV

QUE: measurement without resources, no results available ("queued")
ACT: resources allocated, acquisition of results in progress but not complete ("active")
INV: not applicable because <MainState>: OFF or RDY ("invalid")

Example: See Single-Shot and Continuous Measurements

Usage: Query only

Firmware/Software: V1.0.2.7

Manual operation: See "Multi Evaluation (Softkey)" on page 34

6.3.2 Enabling Results and Views

The following commands select the evaluated results and the displayed views.

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:ALL <EVMEnable>, <MagErrEnable>, <PhaErrEnable>, <CDMEnable>, <CDPEnable>, <CDEEnable>, <PvTEnable>, <ACLREnable>, <EmiMaskEnable>, <ModScalarEnable>, <BEREnable>

Enables or disables the evaluation of results and shows or hides the views in the multi evaluation measurement. This command combines all other `CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult...` commands.

Parameters:

<EVMEnable> OFF | ON
Error Vector Magnitude
OFF: Do not evaluate results, hide the view
ON: Evaluate results and show the view
*RST: ON

<MagErrEnable> OFF | ON
Magnitude Error
*RST: OFF

<PhaErrEnable> OFF | ON
Phase Error
*RST: OFF

<CDMEnable> OFF | ON
Code Domain Monitor
*RST: OFF

<CDPEnable> OFF | ON
Code Domain Power
*RST: OFF

<CDEEnable> OFF | ON
Code Domain Error
*RST: OFF

<PvTEnable> OFF | ON
Power vs. Time
*RST: ON

<ACLREnable> OFF | ON
Adjacent Channel Leakage Power Ratio
*RST: ON

<EmiMaskEnable> OFF | ON
Spectrum Emission Mask
*RST: OFF

<ModScalarEnable> OFF | ON
Modulation Scalar Results
*RST: ON

<BEREnable> OFF | ON
Bit Error Rate
*RST: OFF

Firmware/Software: V1.0.2.7
V1.0.5.3: <BEREnable>

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult <ResEnable>

Enables or disables the evaluation of all results and shows or hides the views in the multi evaluation measurement.

Setting parameters:
<ResEnable> OFF | ON
ON: Evaluate all results and show all views
OFF: Do not evaluate any results, hide all views

Return values:
<ResEnable> OFF | ON
A list of states is returned, corresponding to the values returned by `CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:ALL`.

Example: See Performing Single-Shot Measurements

Firmware/Software: V1.0.2.7

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:EVMagnitude <EVMEnable>

Enables or disables the evaluation of results and shows or hides the error vector magnitude view in the multi evaluation measurement.

Parameters:
<EVMEnable> OFF | ON
OFF: Do not evaluate results, hide the view
ON: Evaluate results and show the view
*RST: ON

Firmware/Software: V1.0.2.7

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:MERRor <MagErrEnable>

Enables or disables the evaluation of results and shows or hides the magnitude error view in the multi evaluation measurement.

Parameters:
<MagErrEnable> OFF | ON

OFF: Do not evaluate results, hide the view
ON: Evaluate results and show the view

*RST: OFF

Firmware/Software: V1.0.2.7

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:PERRor <PhaErrEnable>

Enables or disables the evaluation of results and shows or hides the phase error view in the multi evaluation measurement.

Parameters:
<PhaErrEnable> OFF | ON

OFF: Do not evaluate results, hide the view
ON: Evaluate results and show the view

*RST: OFF

Firmware/Software: V1.0.2.7

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:CDMonitor <CDMEnable>

Enables or disables the evaluation of results and shows or hides the code domain monitor view in the multi evaluation measurement.

Parameters:
<CDMEnable> OFF | ON

OFF: Do not evaluate results, hide the view
ON: Evaluate results and show the view

*RST: OFF

Firmware/Software: V1.0.2.7

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:CDPower <CDPEnable>

Enables or disables the evaluation of results and shows or hides the code domain power view in the multi evaluation measurement.

Parameters:
<CDPEnable> OFF | ON

OFF: Do not evaluate results, hide the view
ON: Evaluate results and show the view

*RST: OFF

Firmware/Software: V1.0.2.7

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:CDERror <CDEEnable>

Enables or disables the evaluation of results and shows or hides the code domain error view in the multi evaluation measurement.

Parameters:
<CDEEnable> OFF | ON

OFF: Do not evaluate results, hide the view
ON: Evaluate results and show the view

*RST: OFF

Firmware/Software: V1.0.2.7

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:PVTime <PvTEnable>

Enables or disables the evaluation of results and shows or hides the power vs. time view in the multi evaluation measurement.

Parameters:
<PvTEnable> OFF | ON

OFF: Do not evaluate results, hide the view
ON: Evaluate results and show the view

*RST: ON

Firmware/Software: V1.0.2.7

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:ACLR <ACLREnable>

Enables or disables the evaluation of results and shows or hides the Adjacent Channel Leakage Power Ratio (ACLR) view in the multi evaluation measurement.

Parameters:
<ACLREnable> OFF | ON

OFF: Do not evaluate results, hide the view
ON: Evaluate results and show the view

*RST: ON

Firmware/Software: V1.0.2.7

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:EMASk <EmiMaskEnable>

Enables or disables the evaluation of results and shows or hides the spectrum emission mask view in the multi evaluation measurement.

Parameters:

<EmiMaskEnable> OFF | ON

OFF: Do not evaluate results, hide the view
ON: Evaluate results and show the view

*RST: OFF

Firmware/Software: V1.0.2.7

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:MSCalar
<ModScalarEnable>

Enables or disables the evaluation of results and shows or hides the modulation scalar results view in the multi evaluation measurement.

Parameters:

<ModScalarEnable> OFF | ON

OFF: Do not evaluate results, hide the view
ON: Evaluate results and show the view

*RST: ON

Firmware/Software: V1.0.2.7

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:RESult:BER <BEREnable>

Enables or disables the evaluation of results and shows or hides the bit error rate view in the multi evaluation measurement.

Parameters:

<BEREnable> OFF | ON

OFF: Do not evaluate results, hide the view
ON: Evaluate results and show the view

*RST: OFF

Firmware/Software: V1.0.5.3

Manual operation: See "Assign Views" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:CDERror:MSLot:CINDex
<CDEMultSlotChId>

Selects the code channel to be displayed in the code domain error multislot diagrams.

Parameters:
<CDEMultSlotChId> Range: 0 to 15
*RST: 0

Firmware/Software: V1.0.4.11

CONFigure:TDSCdma:MEAS<i>:MEValuation:CDPower:MSLot:CINDex
<CDPMultSlotChId>

Selects the code channel to be displayed in the code domain power multislot diagrams.

Parameters:
<CDPMultSlotChId> Range: 0 to 15
*RST: 0

Example: See Performing Single-Shot Measurements

Firmware/Software: V1.0.4.11

6.3.3 Measurement Parameters

The following commands define general settings for the multi evaluation measurement.

CONFigure:TDSCdma:MEAS<i>:MEValuation:TOUT <TCDTimeout>

Defines a timeout for the measurement. The timer is started when the measurement is initiated via a `READ` or `INIT` command. It is not started if the measurement is initiated manually (ON/OFF key or RESTART/STOP key).

When the measurement has completed the first measurement cycle (first single shot), the statistical depth is reached and the timer is reset.

If the first measurement cycle has not been completed when the timer expires, the measurement is stopped. The measurement state changes to `RDY` and the reliability indicator is set to 1, indicating that a measurement timeout occurred. Still running `READ`, `FETCh` or `CALCulate` commands are completed, returning the available results. At least for some results there are no values at all or the statistical depth has not been reached.

A timeout of 0 s corresponds to an infinite measurement timeout.

Parameters:

<TCDTimeout> *RST: 0 s
Default unit: s

Firmware/Software: V2.0.10
V3.0.20: *RST added

CONFigure:TDSCdma:MEAS<i>:MEValuation:REPetition <MeasEvlRept>

Specifies the repetition mode of the measurement. The repetition mode specifies whether the measurement is stopped after a single-shot or repeated continuously. Use `CONFigure:..:MEAS<i>:...:SCOunt` to determine the number of measurement intervals per single shot.

See also: "Statistical Settings" in the R&S CMW user manual, chapter "Remote Control"

Parameters:

<MeasEvlRept> SINGleshot | CONTinuous

SINGleshot: Single-shot measurement
CONTinuous: Continuous measurement

*RST: SING

Example: See Single-Shot and Continuous Measurements

Firmware/Software: V1.0.2.7

Manual operation: See "Repetition" on page 40

CONFigure:TDSCdma:MEAS<i>:MEValuation:SCONdition <StopCond>

Qualifies whether the measurement is stopped after a failed limit check or continued. `OLFail` means that the measurement is stopped (`STOP: ... MEAS<i>...`) and reaches the `RDY` state as soon as one of the results exceeds the limits.

Parameters:

<StopCond> NONE | OLFail

NONE: Continue measurement irrespective of the limit check
OLFail: Stop measurement on limit failure

*RST: NONE

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V1.0.2.7

Manual operation: See "Stop Condition" on page 40

CONFigure:TDSCdma:MEAS<i>:MEValuation:NFRames <NumOfFrame>

Selects the total number of measured subframes. One subframe contains 7 timeslots.

Parameters:

<NumOfFrame>	Range:	1 subframe to 16 subframes
	*RST:	1 subframe

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V1.0.2.7

Manual operation: See "No. of Subframes" on page 41

CONFigure:TDSCdma:MEAS<i>:MEValuation:PSLot <PreSelSlot>

Selects the so-called "Preselected Slot", i.e. an uplink slot number for display of single slot measurement results, e.g. ACLR measurement, EVM vs.chip.

The allowed range of values depends on the number of measured subframes (`CONFigure:TDSCdma:MEAS<i>:MEValuation:NFRames`) and on the position of the switching point (`CONFigure:TDSCdma:MEAS<i>:UESignal:SPOint`). You can select any measured uplink slot, so any slot within the measured subframes, between slot 1 and the switching point position of the subframe.

Example: 4 measured subframes, switching point position after slot 3, so slot 1 to 3 of each subframe can be selected, allowed value range = 1,2,3,8,9,10,15,16,17,22,23,24

See also chapter 3.1.3, "Defining the Scope of the Measurement", on page 11

Parameters:

<PreSelSlot>	Range:	1 to 7 * <measured subframes> - 1 (only UL slots)
	*RST:	1

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V1.0.2.7

Manual operation: See "Preselected Slot" on page 41

CONFigure:TDSCdma:MEAS<i>:MEValuation:SSLot <ScalarSlot>

Selects the so-called "Scalar Slot", i.e. the number of the slot where the R&S CMW calculates "single value" results (also called "scalar results"). The allowed range of values depends on the number of measured subframes (`CONFigure:TDSCdma:MEAS<i>:MEValuation:NFRames`).

See also chapter 3.1.3, "Defining the Scope of the Measurement", on page 11

Parameters:

<ScalarSlot> Range: 0 to 7 * <measured subframes> - 1
*RST: 1

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V1.0.4.11

Manual operation: See "Scalar Slot" on page 41

CONFigure:TDSCdma:MEAS<i>:MEValuation:SFOFfset <SubframeOffset>

Specifies a subframe number mismatch to be compensated for RX measurements. Set the number of the subframe that contains the looped back data expected in subframe number 0.

Parameters:

<SubframeOffset> Range: 0 to 3
*RST: 3

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V3.0.10

Manual operation: See "Subframe Offset" on page 41

CONFigure:TDSCdma:MEAS<i>:MEValuation:AMODe <AnaMode>

Defines whether a possible origin offset is included in the measurement results (WOOFfset) or subtracted out (NOOFfset).

Parameters:

<AnaMode> NOOFfset | WOOFfset

NOOFfset: No origin offset
WOOFfset: With origin offset

*RST: NOOF

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V1.0.2.7

Manual operation: See "Analysis Mode" on page 41

CONFigure:TDSCdma:MEAS<i>:MEValuation:MOEXception <MeasOnExp>

Specifies whether measurement results that the R&S CMW identifies as faulty or inaccurate are rejected.

Parameters:

<MeasOnExp> OFF | ON

OFF: Faulty results are rejected.
ON: Results are never rejected.

*RST: OFF

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V1.0.2.7

Manual operation: See "Measure on Exception" on page 42

CONFigure:TDSCdma:MEAS<i>:MEValuation:SCOunt:MODulation <StatCntMod>

Specifies the statistic count of the measurement. The statistic count is equal to the number of measurement intervals per single shot. Use `CONFigure:...:MEAS<i>:...:REPetition SINGleshot | CONTinuous` to select either single-shot or continuous measurements.

See also: "Statistical Settings" in the R&S CMW user manual, chapter "Remote Control"

Parameters:

<StatCntMod> Number of measurement intervals.

Range: 1 to 1000
*RST: 10

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V1.0.2.7

Manual operation: See "Power vs Time / Modulation / Spectrum / BER > Statistic Count" on page 42

CONFigure:TDSCdma:MEAS<i>:MEValuation:SCOunt:PVTime <StatCntPvT>

Specifies the statistic count of the measurement. The statistic count is equal to the number of measurement intervals per single shot. Use `CONFigure:...:MEAS<i>:...:REPetition SINGleshot | CONTinuous` to select either single-shot or continuous measurements.

See also: "Statistical Settings" in the R&S CMW user manual, chapter "Remote Control"

Parameters:

<StatCntPvT> Number of measurement intervals.

Range: 1 to 1000
*RST: 10

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V1.0.2.7

Manual operation: See "Power vs Time / Modulation / Spectrum / BER > Statistic Count" on page 42

CONFigure:TDSCdma:MEAS<i>:MEValuation:HDALevel <HighDynAsemLev>

Defines a signal level relative to the "Expected Nominal Power" (see `CONFigure:TDSCdma:MEAS<i>:RFSettings:ENPower` on page 65) where the two results obtained in a two stage measurement are joined together.

Parameters:

<HighDynAsemLev> Range: -60 dB to -10 dB
*RST: -60 dB, OFF
Default unit: dB
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V1.0.4.11

Manual operation: See "Power vs Time > Two Shot Assembly Level" on page 42

CONFigure:TDSCdma:MEAS<i>:MEValuation:SCOunt:SPECtrum <StatCntSpec>

Specifies the statistic count of the measurement. The statistic count is equal to the number of measurement intervals per single shot. Use `CONFigure:...:MEAS<i>:...:REPetition SINGleshot | CONTinuous` to select either single-shot or continuous measurements.

See also: "Statistical Settings" in the R&S CMW user manual, chapter "Remote Control"

Parameters:

<StatCntSpec> Number of measurement intervals.
Range: 1 to 1000
*RST: 10

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V1.0.2.7

Manual operation: See "Power vs Time / Modulation / Spectrum / BER > Statistic Count" on page 42

CONFigure:TDSCdma:MEAS<i>:MEValuation:SCOunt:BER <StatCntBER>

Specifies the statistic count of the measurement. The statistic count is equal to the number of measurement intervals per single shot. Use `CONFigure:...:MEAS<i>:...:REPetition SINGleshot | CONTinuous` to select either single-shot or continuous measurements.

See also: "Statistical Settings" in the R&S CMW user manual, chapter "Remote Control"

Parameters:

<StatCntBER> Number of measurement intervals.
Range: 1 to 1000
*RST: 100

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V1.0.5.3

Manual operation: See "Power vs Time / Modulation / Spectrum / BER > Statistic Count" on page 42

CONFigure:TDSCdma:MEAS<i>:MEValuation:BER:DATA <Data Pattern>

Selects the expected data pattern for looped-back RX test signals.

Parameters:

<Data Pattern> ONE | ZERO | ZONE | ONEZero | PN9 | PN15

ONE: all 1
ZERO: all 0
ZONE: alternating 01
ONEZero: alternating 10
PN9 | PN15: pseudo-random bit sequences generated with the indicated number of shift-register stages

*RST: ONE

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V2.1.10

Manual operation: See "BER > Data Pattern" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:TRCHmode <TrCHMode>

Selects the expected transport channel configuration for looped-back RX test signals. Set this parameter according to the downlink signal (the ARB file).

Parameters:

<TrCHMode> RMC | USER

RMC: DTCH and DCCH
USER: DTCH only

Example: See Specifying Additional Measurement-Specific Settings

Firmware/Software: V3.0.10

Manual operation: See "BER > TrCH Mode" on page 43

6.3.4 List Mode Settings

The following commands configure the list mode. For retrieving list mode results see chapter 6.3.20, "List Mode Results (One Segment)", on page 123 and subsequent sections.

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST <ListmodeEnable>

Enables or disables the list mode.

Parameters:

<ListmodeEnable> OFF | ON

OFF: Disable list mode
ON: Enable list mode

*RST: OFF

Example: See Using the TD-SCDMA List Mode

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

Manual operation: See "List Mode Enable" on page 43

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:COUNt <Segments>

Defines the number of segments in the entire measurement interval.

Parameters:

<Segments> Range: 1 to 500
*RST: 2

Example: See Using the TD-SCDMA List Mode

Firmware/Software: V3.0.10
V3.0.30: maximum increased to 500

Options: R&S CMW-KM012

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:SETup
<SegmentLength>, <SwitchPoint>, <CellParameterID>, <MidambleK>, <MTYPe>, <ActiveSlots>[, <Level>, <Frequency>, <Band>, <RetriggerOpition>]

Defines the segment length, the signal properties and the analyzer settings for a selected segment. In general this command must be sent for all segments to be measured.

Suffix:

<Segno> 1..500

Parameters:

<SegmentLength> Number of measured subframes in the segment. The sum of the length of all segments must not exceed 1600.

Range: 1 to 1600
*RST: -1

<SwitchPoint> TS1 | TS2 | TS3 | TS4 | TS5 | TS6

Position of the duplex switching point in the subframe. TSn means after timeslot n.

*RST: TS3

<CellParameterID> Cell parameter ID, identifying the cell and determining the scrambling code.

Range: 0 to 127
*RST: 0

<MidambleK> US2 | US4 | US6 | US8 | US10 | US12 | US14 | US16

Maximum number of users for one timeslot (2 to 16 users). The value has an impact on the used midamble sequences.

*RST: US16

<MTYPe> QPSK | EPSK | QAM

Modulation type
QPSK: quadrature phase shift keying
EPSK: eight phase shift keying (8PSK)
QAM: quadrature amplitude modulation (16-QAM)

*RST: QPSK

<ActiveSlots> Bit pattern indicating the active uplink slots to be measured
0 = inactive / 1 = active, leading zeros may be omitted
From right to left, the bits correspond to the first to sixth uplink slot, relative to the trigger event
Example 1:
Slot 3 and slot 5 are active, but only slot 5 shall be measured. An IF trigger is used, so the trigger event occurs before slot 3.
Correct bit pattern: #B000100 (or #B100)
Example 2:
Same signal (slot 5 shall be measured), but an external trigger or waveform marker is used, so the trigger event is expected before slot 0.
Correct bit pattern: #B010000 (or #B10000)

Range: #B000000 to #B111111
*RST: #B1

<Level> Expected nominal power in the segment. The range of the expected nominal power can be calculated as follows:
Range (Expected Nominal Power) = Range (Input Power) + External Attenuation - User Margin

Range: –47 dBm to 35 dBm for the input power at the RF COM connectors (please notice also the ranges quoted in the data sheet).
*RST: 0 dBm
Default unit: dBm

<Frequency> Center frequency of the RF analyzer

Range: 100E+6 Hz to 6E+9 Hz
*RST: 2.0108E+9 Hz
Default unit: Hz

<Band> B1 | B2 | B3

B1: Band 1 (F), 1880 MHz to 1920 MHz
B2: Band 2 (A), 2010 MHz to 2025 MHz
B3: Band 3 (E), 2300 MHz to 2400 MHz

*RST: B1

<Retrigger> OFF | ON

Specifies whether a trigger event is required for the segment or not. The setting is ignored for the first segment of a measurement and for trigger mode ONCE (see `TRIGger:TDSCdma:MEAS<i>:MEValuation:LIST:MODE` on page 92).
OFF: measure the segment without retrigger
ON: wait for trigger event before measuring the segment

*RST: OFF

Example: See Using the TD-SCDMA List Mode

Firmware/Software: V3.0.10
V3.0.20: added <Level>, <Frequency>, <Band> and <Retrigger>
V3.0.30: max. no. of segments increased to 500 / subframes increased to 1600

Options: R&S CMW-KM751 required for modulation type EPSK and QAM
R&S CMW-KM012

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:
MODulation <ModStatistics>, <EnableEVM>, <EnableMagError>, <EnablePhaseError>, <EnableIQ>, <EnableModScalar>, <EnablePMonitor>

Defines the statistical length for the `AVERage`, `MAXimum`, and `SDEViation` calculation and enables the calculation of the different modulation results in segment <Segno>.

Suffix:
<Segno> 1..500

Parameters:
<ModStatistics> Statistical length in slots. The maximum possible value depends on the number of subframes in the segment and on the number of active uplink slots per subframe, see `CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:SETup` on page 88.

Range: 1 to 1000
*RST: 10

<EnableEVM> OFF | ON

OFF: Disable measurement of EVM
ON: Enable measurement of EVM

*RST: ON

<EnableMagError> OFF | ON
Disable or enable measurement of magnitude error
*RST: ON

<EnablePhaseError> OFF | ON
Disable or enable measurement of phase error
*RST: ON

<EnableIQ> OFF | ON
Disable or enable measurement of I/Q origin offset and imbalance
*RST: OFF

<EnableModScalar> OFF | ON
Disable or enable measurement of the other modulation results
*RST: OFF

<EnablePMonitor> OFF | ON
Disable or enable the power monitor
*RST: OFF

Example: See Using the TD-SCDMA List Mode

Firmware/Software: V3.0.10
V3.0.30: maximum number of segments increased to 500

Options: R&S CMW-KM012

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:SPECtrum <SpecStatistics>, <EnableACLR>, <EnableEMask>, <EnableOBW>

Defines the statistical length for the `AVERage` and `MAXimum` calculation and enables the calculation of the different spectrum results in segment <Segno>.

Suffix:
<Segno> 1..500

Parameters:
<SpecStatistics> Statistical length in slots. The maximum possible value depends on the number of subframes in the segment and on the number of active uplink slots per subframe, see `CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:SETup` on page 88.
Range: 1 to 1000
*RST: 10

<EnableACLR> OFF | ON
OFF: Disable ACLR measurement
ON: Enable ACLR measurement
*RST: ON

<EnableEMask> OFF | ON
Disable or enable emission mask measurement
*RST: ON

<EnableOBW> OFF | ON
Disable or enable measurement of occupied bandwidth
*RST: ON

Example: See Using the TD-SCDMA List Mode

Firmware/Software: V3.0.10
V3.0.30: maximum number of segments increased to 500

Options: R&S CMW-KM012

TRIGger:TDSCdma:MEAS<i>:MEValuation:LIST:MODE <TriggerMode>

Specifies the trigger mode for list mode measurements. For configuration of retrigger flags see `CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:SETup` on page 88.

Parameters:
<TriggerMode> ONCE | SEGMent
ONCE: A trigger event is only required to start the measurement. As a result the entire range of segments to be measured is captured without additional trigger event. The retrigger flags of the segments are ignored.
SEGMent: The retrigger flag of each segment is evaluated. It defines whether the measurement waits for a trigger event before capturing the segment, or not.
*RST: ONCE

Example: See Using the TD-SCDMA List Mode

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

6.3.5 Trigger Settings

The following commands define the trigger parameters.

TRIGger:TDSCdma:MEAS<i>:MEValuation:CATalog:SOURce?

Lists all trigger source values that can be set using `TRIGger:TDSCdma:MEAS<i>:MEValuation:SOURce`.

Return values:

<TriggerName> Comma separated list of all supported values. Each value is represented as a string.

Usage: Query only

Firmware/Software: V1.0.4.11

Manual operation: See "Trigger Source" on page 44

TRIGger:TDSCdma:MEAS<i>:MEValuation:SOURce <TriggerSource>

Selects the source of the trigger events. Some values are always available in this firmware application. They are listed below. Depending on the installed options additional values may be available. A complete list of all supported values can be displayed using `TRIGger:...:CATalog:SOURce?`.

Parameters:

<TriggerSource>
'Free Run': Free Run (untriggered)
'IF Power': Power trigger (received RF power)
'Base1: External TRIG A': External trigger fed in at TRIG A connector
'Base1: External TRIG B': External trigger fed in at TRIG B connector

*RST: 'Free Run'

Example: See Configuring the Trigger System

Firmware/Software: V1.0.4.11

Manual operation: See "Trigger Source" on page 44

TRIGger:TDSCdma:MEAS<i>:MEValuation:SLOPe <TriggerSlope>

Qualifies whether the trigger event is generated at the rising or at the falling edge of the trigger pulse (valid for external and power trigger sources).

Parameters:

<TriggerSlope> REDGe | FEDGe

REDGe: Rising edge
FEDGe: Falling edge

*RST: REDG

Example: See Configuring the Trigger System

Firmware/Software: V1.0.4.11

Manual operation: See "Trigger Slope" on page 44

TRIGger:TDSCdma:MEAS<i>:MEValuation:THReshold <TriggerThres>

Defines the trigger threshold for power trigger sources.

Parameters:

<TriggerThres>
Range: -50 dB to 0 dB
*RST: -20 dB
Default unit: dB (full scale, i.e. relative to reference level minus external attenuation)

Example: See Configuring the Trigger System

Firmware/Software: V1.0.4.11

Manual operation: See "Trigger Threshold" on page 45

TRIGger:TDSCdma:MEAS<i>:MEValuation:SDELay <TrigSlotDelay>

Defines a delay time (integer number of timeslots) for all trigger sources except "Free Run". The parameter delays the start of the measurement relative to the trigger event.

Parameters:

<TrigSlotDelay>
Range: 0 slots to 7 slots
*RST: 0 slots
Default unit: slots

Example: See Configuring the Trigger System

Firmware/Software: V1.0.4.11

Manual operation: See "Trigger Slot / Chip Delay" on page 45

TRIGger:TDSCdma:MEAS<i>:MEValuation:CDELay <TrigChipDelay>

Defines a delay time (integer number of chips) for all trigger sources except "Free Run". The parameter delays the start of the measurement relative to the trigger event.

Parameters:

<TrigChipDelay>
Range: -432 chips to 432 chips
*RST: 0 chips
Default unit: chips

Firmware/Software: V1.0.4.11

Manual operation: See "Trigger Slot / Chip Delay" on page 45

TRIGger:TDSCdma:MEAS<i>:MEValuation:TOUT <TriggerTimeout>

Selects the maximum time that the R&S CMW will wait for a trigger event before it stops the measurement in remote control mode or indicates a trigger timeout in manual operation mode. This setting has no influence on "Free Run" measurements.

Parameters:

<TriggerTimeout> Range: 0.01 s to 300 s
*RST: 1 s
Default unit: s
Additional parameters: OFF | ON (disables | enables the timeout)

Example: See Configuring the Trigger System

Firmware/Software: V1.0.4.11
V3.0.10: OFF | ON added, changed unit, *RST value and range

Manual operation: See "Trigger Timeout" on page 45

TRIGger:TDSCdma:MEAS<i>:MEValuation:MGAP <MinIFTrigGAP>

Sets a minimum time during which the IF signal must be below the trigger threshold before the trigger is armed so that an IF power trigger event can be generated.

Parameters:

<MinIFTrigGAP> Range: 1 chip to 6400 chips
*RST: 800 chips
Default unit: chips

Example: See Configuring the Trigger System

Firmware/Software: V1.0.10.1

Manual operation: See "Trigger IF Min Gap" on page 45

6.3.6 Limits (Modulation)

The following commands define limits for results which characterize the modulation accuracy.

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:MERRor <MagErrRMS>, <MagErrPeak>

Defines upper limits for the RMS and peak values of the magnitude error.

Parameters:

<MagErrRMS> Range: 0 % to 20 %
*RST: 17.5 %
Default unit: %
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

<MagErrPeak> Range: -20 % to 20 %
*RST: 17.5 %
Default unit: %
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.2.7

Manual operation: See "Limits" on page 46

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:EVMagnitude <EVMRMS>, <EVMPeak>

Defines upper limits for the RMS and peak values of the error vector magnitude (EVM).

Parameters:

<EVMRMS> Range: 0 % to 20 %
*RST: 17.5 %
Default unit: %
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

<EVMPeak> Range: 0 % to 20 %
*RST: 17.5 %
Default unit: %
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.2.7

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:PERRor <PhaErrRMS>, <PhaErrPeak>

Defines a symmetric limit for the RMS and peak values of the phase error. The limit check fails if the absolute value of the measured phase error exceeds the specified value.

Parameters:

<PhaErrRMS> Range: 0 deg to 20 deg
*RST: 10 deg
Default unit: deg
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

<PhaErrPeak> Range: 0 deg to 20 deg
*RST: 10 deg
Default unit: deg
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.2.7

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:IQOFfset <IQOffset>

Defines an upper limit for the I/Q origin offset.

Parameters:
<IQOffset> Range: -80 dB to 0 dB
*RST: -25 dB
Default unit: dB
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.2.7

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:IQIMbalance <IQImbalance>

Defines an upper limit for the I/Q imbalance.

Parameters:
<IQImbalance> Range: -99 dB to 0 dB
*RST: -15 dB
Default unit: dB
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.2.7

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:FERRor <FreqError>

Defines an upper limit for the carrier frequency error.

Parameters:
<FreqError> Range: 0 Hz to 4000 Hz
*RST: 200 Hz
Default unit: Hz
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.2.7

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:TERRor <TimeError>

Defines an upper limit for the transmit time error.

Parameters:

<TimeError> Range: -4 chips to 4 chips
*RST: 1 chip
Default unit: chips
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.2.7

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:PCDerror <PeakCDELimit>

Defines an upper limit for the peak code domain error.

Parameters:

<PeakCDELimit> Range: -100 dB to 0 dB
*RST: -20 dB
Default unit: dB
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.2.7

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:WQUality <WfQualityLimit>

Defines a lower limit for the waveform quality. For an ideal transmitter the waveform quality equals 1.

Parameters:

<WfQualityLimit> Range: 0.9 to 0.9999
*RST: 0.944
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.4.11

6.3.7 Limits (Power vs. Time)

The following commands define the power template for power vs. time measurements.

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:PVTime:YABSolute
<PvTYAbsALimit>, <PvTYAbsCLimit>, <PvTYAbsGLimit>

Defines upper limits (Y-values) for the areas of the power template, see chapter 3.5.2, "Power Templates", on page 21.

Parameters:

<PvTYAbsALimit> Limit area 1

Range: -80 dBm to 0 dBm
*RST: -65 dBm
Default unit: dBm

<PvTYAbsCLimit> Limit area 2

Range: -70 dBm to 0 dBm
*RST: -50 dBm
Default unit: dBm

<PvTYAbsGLimit> Limit area 3

Range: -70 dBm to 0 dBm
*RST: -65 dBm
Default unit: dBm

Example: See Specifying Limits

Firmware/Software: V1.0.4.11

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:PVTime:XRELative
<PvTXRelALimit>, <PvTXRelBLimit>, <PvTXRelDLimit>, <PvTXRelFLimit>, <PvTXRelHLimit>

Defines the borders (X-values) of the areas of the power template, see chapter 3.5.2, "Power Templates", on page 21.

Parameters:

<PvTXRelALimit> Start of area 1

Range: -70 chips to -50 chips
*RST: -60 chips
Default unit: chips

<PvTXRelBLimit> End of area 1 (and start of area 2)

Range: -40 chips to -20 chips
*RST: -33 chips
Default unit: chips

<PvTXRelDLimit> End of area 2

Range: -20 chips to -10 chips
*RST: -13 chips
Default unit: chips

<PvTXRelFLimit> Start of area 3

Range: 0 chips to 20 chips
*RST: 12 chips
Default unit: chips

<PvTXRelHLimit> End of area 3

Range: 35 chips to 60 chips
*RST: 45 chips
Default unit: chips

Example: See Specifying Limits

Firmware/Software: V1.0.4.11

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:PVTime:EAReas <PvTEnbAB>, <PvTEnbCE>, <PvTEnbFH>

Activates or deactivates the limit check for the individual areas of the power template, see chapter 3.5.2, "Power Templates", on page 21.

Parameters:

<PvTEnbAB> OFF | ON
Area 1
*RST: ON

<PvTEnbCE> OFF | ON
Area 2
*RST: ON

<PvTEnbFH> OFF | ON
Area 3
*RST: ON

Example: See Specifying Limits

Firmware/Software: V1.0.5.3

Manual operation: See "Limits" on page 46

6.3.8 Limits (Spectrum ACLR)

The following commands define limits for the Adjacent Channel Leakage Power Ratio (ACLR).

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:ACLR:OBW <ACLROBWLimit>

Defines the upper limit for the ACLR occupied bandwidth.

Parameters:

<ACLROBWLimit> Range: 0 MHz to 1.6 MHz
*RST: 1.6 MHz
Default unit: Hz
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.2.7

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:ACLR:YABSolute
<ACLRAbsLimit>

Defines the absolute upper limit for the ACLR. Channel-dependent upper limits can be defined relative to this limit using `CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:ACLR:YRELative`.

Parameters:

<ACLRAbsLimit> Range: -100 dBm to 0 dBm
*RST: -55 dBm
Default unit: dBm
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.4.11

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:ACLR:YRELative
<ACLR1stRelLimit>, <ACLR2ndRelLimit>

Defines the upper limit for the ACLR in the first and second adjacent channel (at ±1.6 MHz and ±3.2 MHz from the carrier) relative to the absolute limit defined by `CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:ACLR:YABSolute`.

Parameters:

<ACLR1stRelLimit> Range: -100 dB to 0 dB
*RST: -33 dB
Default unit: dB
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

<ACLR2ndRelLimit> Range: -100 dB to 0 dB
*RST: -43 dB
Default unit: dB
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.4.11

Manual operation: See "Limits" on page 46

6.3.9 Limits (Spectrum Emission)

The following commands define limits for the spectrum emission.

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:EMASk:YABSolute
<EMAbsG1MLimit>, <EMAbsG30KLimit>

Defines the absolute limit line G for the spectrum emission curves, see also chapter 3.5.4, "Spectrum Emission Mask", on page 23.

Parameters:

<EMAbsG1MLimit> Line G referenced to a 1 MHz filter

Range: -100 dBm to 0 dBm
*RST: -56.1 dBm
Default unit: dBm
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

<EMAbsG30KLimit> Line G referenced to a 30 kHz filter

Range: -100 dBm to 0 dBm
*RST: -71.3 dBm
Default unit: dBm
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.4.11

Manual operation: See "Limits" on page 46

CONFigure:TDSCdma:MEAS<i>:MEValuation:LIMit:EMASk:YRELative
<EMRelALimit>, <EMRelBLimit>, <EMRelCLimit>, <EMRelDLimit>, <EMRelELimit>

Defines relative limits for the spectrum emission curves, see also chapter 3.5.4, "Spectrum Emission Mask", on page 23.

Parameters:

<EMRelALimit> Limit at point A

Range: -100 dB to 0 dB
*RST: -49 dB
Default unit: dB
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

<EMRelBLimit> Limit at point B

Range: -100 dB to 0 dB
*RST: -49 dB
Default unit: dB
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

<EMRelCLimit> Limit at point C

Range: -100 dB to 0 dB
*RST: -64 dB
Default unit: dB
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

<EMRelDLimit> Limit at point D

Range: -100 dB to 0 dB
*RST: -49 dB
Default unit: dB
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

<EMRelELimit> Limit at point E

Range: -100 dB to 0 dB
*RST: -35 dB
Default unit: dB
Additional parameters: OFF | ON (disables | enables the limit check using the previous/default limit values)

Example: See Specifying Limits

Firmware/Software: V1.0.4.11

6.3.10 EVM Results (Traces)

The following commands return the EVM trace results of the multi evaluation measurement.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude:MAXimum?

Returns the values of the RMS EVM vs. chip traces, measured in the preselected slot (see `CONFigure:TDSCdma:MEAS<i>:MEValuation:PSLot` on page 83).

One value per chip is returned. The results of the current, average and maximum traces can be retrieved.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Return values:

<Reliability> Reliability Indicator

<EVM1> ... <EVM848> Range: 0 % to 100 %
Default unit: %

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.2.7

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude[:RMS]:MSLot:
CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude[:RMS]:MSLot:
AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude[:RMS]:MSLot:
EXTReme?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude[:RMS]:MSLot:
SDEViation?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude[:RMS]:MSLot:
CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude[:RMS]:MSLot:
AVERage?

READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude[:RMS]:MSLot:EXTReme?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EVMagnitude[:RMS]:MSLot:SDEViation?

Returns the values of the RMS EVM vs. slot traces.

Each trace contains 112 values, one per slot. The number of measured slots is related to the number of measured subframes (see `CONFigure:TDSCdma:MEAS<i>:MEValuation:NFRames` on page 83). For not measured slots the value "NCAP" is returned.

The results of the current, average, extreme and standard deviation traces can be retrieved.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Return values:

<Reliability> Reliability Indicator

<EVM1> ... <EVM112> Range: 0 % to 100 % (SDEViation: 0 % to 50 %)
Default unit: %

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.4.11

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

6.3.11 Magnitude Error Results (Traces)

The following commands return the magnitude error trace results of the multi evaluation measurement.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor:MAXimum?

Returns the values of the RMS magnitude error vs. chip traces, measured in the preselected slot (see `CONFigure:TDSCdma:MEAS<i>:MEValuation:PSLot` on page 83).

One value per chip is returned. The results of the current, average and maximum traces can be retrieved.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Return values:

<Reliability> Reliability Indicator

<MagErr1> ... <MagErr848> Range: -100 % to 100 %
Default unit: %

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.2.7

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor[:RMS]:MSLot:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor[:RMS]:MSLot:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor[:RMS]:MSLot:EXTReme?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor[:RMS]:MSLot:SDEViation?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor[:RMS]:MSLot:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor[:RMS]:MSLot:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor[:RMS]:MSLot:EXTReme?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:MERRor[:RMS]:MSLot:SDEViation?

Returns the values of the RMS magnitude error vs. slot traces.

Each trace contains 112 values, one per slot. The number of measured slots is related to the number of measured subframes (see `CONFigure:TDSCdma:MEAS<i>:MEValuation:NFRames` on page 83). For not measured slots the value "NCAP" is returned.

The results of the current, average, extreme and standard deviation traces can be retrieved.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Return values:

<Reliability> Reliability Indicator

<MagErr1> ... <MagErr112> Range: -100 % to 100 % (AVERage: 0 % to 100 %, SDEViation: 0 % to 50 %)
Default unit: %

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.4.11

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

6.3.12 Phase Error Results (Traces)

The following commands return the phase error trace results of the multi evaluation measurement.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor:MAXimum?

Returns the values of the RMS phase error vs. chip traces, measured in the preselected slot (see `CONFigure:TDSCdma:MEAS<i>:MEValuation:PSLot` on page 83).

One value per chip is returned. The results of the current, average and maximum traces can be retrieved.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Return values:

<Reliability> Reliability Indicator

<PhaseErr1> ... <PhaseErr848> Range: -180 deg to 180 deg
Default unit: deg

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.2.7

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor[:RMS]:MSLot:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor[:RMS]:MSLot:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor[:RMS]:MSLot:EXTReme?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor[:RMS]:MSLot:SDEViation?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor[:RMS]:MSLot:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor[:RMS]:MSLot:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor[:RMS]:MSLot:EXTReme?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:PERRor[:RMS]:MSLot:SDEViation?

Returns the values of the RMS phase error vs. slot traces.

Each trace contains 112 values, one per slot. The number of measured slots is related to the number of measured subframes (see `CONFigure:TDSCdma:MEAS<i>:MEValuation:NFRames` on page 83). For not measured slots the value "NCAP" is returned.

The results of the current, average, extreme and standard deviation traces can be retrieved.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Return values:

<Reliability> Reliability Indicator

<PhaseErr1> ... <PhaseErr112>
Range: -180 deg to 180 deg (AVERage: 0 deg to 180 deg, SDEViation: 0 deg to 90 deg)
Default unit: deg

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.4.11

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

6.3.13 CDP Results (Traces)

The following commands return the Code Domain Power (CDP) trace results of the multi evaluation measurement. Both the manual and the code domain monitor traces can be retrieved.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDMonitor:CDPower? <SF>
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDMonitor:CDPower? <SF>

Returns the values of the code domain power monitor diagrams. A separate diagram is available for each spreading factor.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Query parameters:

<SF> SF1 | SF2 | SF4 | SF8 | SF16
Selects the spreading factor for which the trace shall be retrieved
*RST: n/a

Return values:

<Reliability> Reliability Indicator

<CDP_1> ... <CDP_SF> One value per code channel. The number of values/channels corresponds to the spreading factor (e.g. 8 values/channels for SF8).
Range: -100 dB to 0 dB
Default unit: dB

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.2.7

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MINimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:SDEViation?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MINimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:SDEViation?

Returns the values of the Code Domain Power (CDP) single slot diagrams of the physical channels. The results of the current, average, minimum, maximum and standard deviation diagrams can be retrieved.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Return values:

<Reliability> Reliability Indicator

<CDP_1> ... <CDP_16> Range: -60 dB to 0 dB (SDEViation: 0 dB to 30 dB)
Default unit: dB

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.2.7

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MSLot:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MSLot:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MSLot:MINimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MSLot:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MSLot:SDEViation?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MSLot:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MSLot:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MSLot:MINimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MSLot:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDPower:MSLot:SDEViation?

Returns the values of the Code Domain Power (CDP) multislot traces of the physical channels. Each trace contains 112 values, one per slot.

The number of measured slots is related to the number of measured subframes (see `CONFigure:TDSCdma:MEAS<i>:MEValuation:NFRames` on page 83). For not measured slots the value "NCAP" is returned.

The results of the current, average, minimum, maximum and standard deviation traces can be retrieved.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Return values:

<Reliability> Reliability Indicator

<CDP1> ... <CDP112> Range: -60 dB to 0 dB (SDEViation: 0 dB to 30 dB)
Default unit: dB

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.4.11

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

6.3.14 CDE Results (Traces)

The following commands return the Code Domain Error (CDE) trace results of the multi evaluation measurement. Both the manual and the code domain monitor traces can be retrieved.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDMonitor:CDERror? <SF>
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDMonitor:CDERror? <SF>

Returns the values of the code domain error monitor diagrams. A separate diagram is available for each spreading factor.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Query parameters:

<SF> SF1 | SF2 | SF4 | SF8 | SF16

Selects the spreading factor for which the trace shall be retrieved

*RST: n/a

Return values:

<Reliability> Reliability Indicator

<CDE_1> ... <CDE_SF> One value per code channel. The number of values/channels corresponds to the spreading factor (e.g. 8 values/channels for SF8).

Range: -100 dB to 0 dB
Default unit: dB

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.2.7

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MINimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:SDEViation?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:AVERage?

READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MINimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:SDEViation?

Returns the values of the Code Domain Error (CDE) single slot diagrams of the physical channels. The results of the current, average, minimum, maximum and standard deviation diagrams can be retrieved.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Return values:

<Reliability> Reliability Indicator

<CDE_1> ... <CDE_16> Range: -60 dB to 0 dB (SDEViation: 0 dB to 30 dB)
Default unit: dB

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.2.7

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MSLot:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MSLot:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MSLot:MINimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MSLot:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MSLot:SDEViation?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MSLot:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MSLot:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MSLot:MINimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MSLot:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:CDERror:MSLot:SDEViation?

Returns the values of the Code Domain Error (CDE) multislot traces of the physical channels. Each trace contains 112 values, one per slot.

The number of measured slots is related to the number of measured subframes (see `CONFigure:TDSCdma:MEAS<i>:MEValuation:NFRames` on page 83). For not measured slots the value "NCAP" is returned.

The results of the current, average, minimum, maximum and standard deviation traces can be retrieved.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Return values:

<Reliability> Reliability Indicator

<CDE_1> ... <CDE_112> Range: -60 dB to 0 dB (SDEViation: 0 dB to 30 dB)
Default unit: dB

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.4.11

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

6.3.15 Power vs Time Results (Traces + Limits)

The following commands return the power vs. time trace and limit check results of the multi evaluation measurement.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PVTime:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PVTime:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PVTime:MINimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:PVTime:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:PVTime:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:PVTime:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:PVTime:MINimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:PVTime:MAXimum?

Returns the values of the power vs. time traces. Each trace covers one subframe. The results of the current, average minimum and maximum traces can be retrieved.

See also chapter 3.6.2, "Detailed Views: Modulation, CDP and CDE, Power vs Time", on page 26

Return values:

<Reliability> Reliability Indicator

<PvT1> ... <PvT25728> 25728 power results (6432 chips, 4 samples per chip)
Range: -100 dBm to 35 dBm
Default unit: dBm

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.2.7

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

FETCh:TDSCdma:MEAS<i>:MEValuation:LIMit:PVTime:FAILure?

Queries whether the power vs. time limit check has been passed (results within limits) or failed (limits exceeded).

Return values:

<Reliability> Reliability Indicator

<PvtState> PASS | FAIL

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V2.1.10

Manual operation: See "Statistical Overviews and Limit Checks" on page 49

FETCh:TDSCdma:MEAS<i>:MEValuation:PVTime:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:PVTime:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:PVTime:MINimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:PVTime:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:PVTime:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:PVTime:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:PVTime:MINimum?
READ:TDSCdma:MEAS<i>:MEValuation:PVTime:MAXimum?

Return the OFF power measured in the three areas of the defined power vs. time template. The results can be retrieved for the current, average, minimum and maximum power vs. time traces.

A power vs. time trace covers one subframe. The power template is applied to each burst in this subframe. A burst can comprise one active uplink slot or several adjacent active uplink slots. So within one subframe there can be up to three bursts, e.g. slot 1, slot 3 and slot 5 or slot1+2, slot 4 and slot 6.

The number of returned values is fixed. For "missing" bursts NCAP values are returned.

The number to the left of each result parameter is provided for easy identification of the parameter position within the result array.

Return values:

<1_Reliability> Reliability Indicator

<2_Burst1AB>
<3_Burst1CE>
<4_Burst1FH>
OFF power for the first burst, template areas AB, CE and FH
Range: -100 dBm to 35 dBm
Default unit: dBm

<5_Burst2AB>
<6_Burst2CE>
<7_Burst2FH>
OFF power for second burst
Range: -100 dBm to 35 dBm
Default unit: dBm

<8_Burst3AB>
<9_Burst3CE>
<10_Burst3FH>
OFF power for third burst
Range: -100 dBm to 35 dBm
Default unit: dBm

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V3.0.11

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

6.3.16 Spectrum Emission Results (Traces)

The following commands return the spectrum emission trace results of the multi evaluation measurement.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MAXimum?

Returns the values of the spectrum emission 1 MHz and 30 kHz traces. The results of the current, average and maximum traces can be retrieved.

See also chapter 3.6.4, "Detailed Views: Spectrum Emission Mask", on page 29

Return values:

<Reliability> Reliability Indicator

<MHzLeft_1> ... <MHzLeft_20> Left section of the 1 MHz trace.
These values correspond to test points that are separated by 30 kHz. The covered frequency range is -3485 kHz to -2915 kHz from the carrier.

Range: -100 dB to 0 dB
Default unit: dB

<MHzRight_1> ... <MHzRight_20>
Right section of the 1 MHz trace.
These values correspond to test points that are separated by 30 kHz. The covered frequency range is +2915 kHz to +3485 kHz from the carrier.

Range: -100 dB to 0 dB
Default unit: dB

<kHz_1> ... <kHz_1066>
30 kHz trace.
These values correspond to test points that are separated by 7.5 kHz. The covered frequency range is –3997.5 kHz to +3990 kHz from the carrier.

Range: -100 dB to 0 dB
Default unit: dB

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.2.7

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MFLeft:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MFLeft:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MFLeft:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MFRight:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MFRight:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MFRight:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MFLeft:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MFLeft:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MFLeft:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MFRight:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MFRight:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:MFRight:MAXimum?

Returns the values of the spectrum emission 1 MHz traces. The left section and the right section of each trace are retrieved by separate commands (distinguished by the terms MFLeft and MFRight). The results of the current, average and maximum traces can be retrieved.

See also chapter 3.6.4, "Detailed Views: Spectrum Emission Mask", on page 29

Return values:

<Reliability>
Reliability Indicator

<Value1> ... <Value20>
These values correspond to test points that are separated by 30 kHz. The covered frequency ranges are:
Left section: -3485 kHz to -2915 kHz from the carrier
Right section: +2915 kHz to +3485 kHz from the carrier

Range: -100 dB to 0 dB
Default unit: dB

Usage: Query only

Firmware/Software: V1.0.2.7

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:KFILter:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:KFILter:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:KFILter:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:KFILter:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:KFILter:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:TRACe:EMASk:KFILter:MAXimum?

Returns the values of the spectrum emission 30 kHz traces. The results of the current, average and maximum traces can be retrieved.

See also chapter 3.6.4, "Detailed Views: Spectrum Emission Mask", on page 29

Return values:

<Reliability> Reliability Indicator

<Value1> ... <Value1066> These values correspond to test points that are separated by 7.5 kHz and cover the frequency range between -3997.5 kHz and +3990 kHz from the carrier.

Range: -100 dB to 0 dB
Default unit: dB

Usage: Query only

Firmware/Software: V1.0.2.7

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

6.3.17 Modulation Results (Single Values)

The following commands return the results of the modulation multi evaluation measurement, measured in the "scalar slot" (see `CONFigure:TDSCdma:MEAS<i>:MEValuation:SSLot` on page 83).

FETCh:TDSCdma:MEAS<i>:MEValuation:MODulation:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:MODulation:MAXimum?
CALCulate:TDSCdma:MEAS<i>:MEValuation:MODulation:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:MODulation:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:MODulation:CURRent?
CALCulate:TDSCdma:MEAS<i>:MEValuation:MODulation:CURRent?

Return the current and maximum modulation single value results.

The values described below are returned by `FETCh` and `READ` commands. `CALCulate` commands return limit check results instead, one value for each result listed below.

The number to the left of each result parameter is provided for easy identification of the parameter position within the result array.

Return values:

<1_Reliability> Reliability Indicator

<2_EVMRMS>
<3_EVMPeak> Error vector magnitude RMS and peak value
Range: 0 % to 100 %
Default unit: %

<4_MagErrRMS> Magnitude error RMS value
Range: 0 % to 100 %
Default unit: %

<5_MagErrPeak> Magnitude error peak value
Range: -100 % to 100 %
Default unit: %

<6_PhaseErrRMS> Phase error RMS value
Range: 0 deg to 180 deg
Default unit: deg

<7_PhaseErrPeak> Phase error peak value
Range: -180 deg to 180 deg
Default unit: deg

<8_IQOriginOffset> I/Q origin offset
Range: -100 dB to 0 dB
Default unit: dB

<9_IQImbalance> I/Q imbalance
Range: -100 dB to 0 dB
Default unit: dB

<10_TransTimeErr> Transmit time error
Range: -500 chips to 500 chips
Default unit: chips

<11_CarrFreqError> Carrier frequency error
Range: -5000 Hz to 5000 Hz
Default unit: Hz

<12_UEpower> User equipment power
Range: -100 dBm to 35 dBm
Default unit: dBm

<13_Slot> Number of measured slot
Range: 0 to 111

<14_PCDE> Peak code domain error
Range: -60 dB to 0 dB
Default unit: dB

<15_PCDEcode> Number of the code channel where the PCDE occurred.
Range: 0 to 15

<16_WaveformQual> Waveform quality
Range: 0 to 1

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.10.1
V3.0.10: added <16_WaveformQual>

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

FETCh:TDSCdma:MEAS<i>:MEValuation:MODulation:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:MODulation:SDEViation?
READ:TDSCdma:MEAS<i>:MEValuation:MODulation:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:MODulation:SDEViation?
CALCulate:TDSCdma:MEAS<i>:MEValuation:MODulation:AVERage?
CALCulate:TDSCdma:MEAS<i>:MEValuation:MODulation:SDEViation?

Return the average and standard deviation modulation single value results.

The values described below are returned by `FETCh` and `READ` commands. `CALCulate` commands return limit check results instead, one value for each result listed below.

The ranges indicated below apply to all results except standard deviation results. The minimum for standard deviation results equals 0. The maximum equals the width of the indicated range divided by two. Exceptions are explicitly stated.

The number to the left of each result parameter is provided for easy identification of the parameter position within the result array.

Return values:
<1_Reliability> Reliability Indicator

<2_EVMRMS>
<3_EVMPeak>
Error vector magnitude RMS and peak value
Range: 0 % to 100 %
Default unit: %

<4_MagErrRMS>
<5_MagErrPeak>
Magnitude error RMS and peak value
Range: 0 % to 100 %
Default unit: %

<6_PhaseErrRMS>
<7_PhaseErrPeak>
Phase error RMS and peak value
Range: 0 deg to 180 deg
Default unit: deg

<8_IQOriginOffset>
I/Q origin offset
Range: -100 dB to 0 dB
Default unit: dB

<9_IQImbalance>
I/Q imbalance
Range: -100 dB to 0 dB
Default unit: dB

<10_TransTimeErr>
Transmit time error
Range: -500 chips to 500 chips
Default unit: chips

<11_CarrFreqError>
Carrier frequency error
Range: -5000 Hz to 5000 Hz
Default unit: Hz

<12_UEpower>
User equipment power
Range: -100 dBm to 35 dBm
Default unit: dBm

<13_Slot>
Number of measured slot
Range: 0 to 111

<14_PCDE>
Peak code domain error
Range: -60 dB to 0 dB
Default unit: dB

<15_PCDECode>
Number of the code channel where the PCDE occurred
Range: NAV (no average / standard deviation result)

<16_WaveformQual>
Waveform quality
Range: 0 to 1

Usage:
Query only

Firmware/Software:
V1.0.10.1
V3.0.10: added <16_WaveformQual>
V3.0.20: added <15_PCDECode>

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

6.3.18 Spectrum Results (Single Values)

The following commands return the results of the spectrum multi evaluation measurement, measured in the "scalar slot" (see `CONFigure:TDSCdma:MEAS<i>:MEValuation:SSLot` on page 83).

FETCh:TDSCdma:MEAS<i>:MEValuation:SPECtrum:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:SPECtrum:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:SPECtrum:MAXimum?
READ:TDSCdma:MEAS<i>:MEValuation:SPECtrum:CURRent?
READ:TDSCdma:MEAS<i>:MEValuation:SPECtrum:AVERage?
READ:TDSCdma:MEAS<i>:MEValuation:SPECtrum:MAXimum?
CALCulate:TDSCdma:MEAS<i>:MEValuation:SPECtrum:CURRent?
CALCulate:TDSCdma:MEAS<i>:MEValuation:SPECtrum:AVERage?
CALCulate:TDSCdma:MEAS<i>:MEValuation:SPECtrum:MAXimum?

Returns the ACLR power and spectrum emission single value results of the multi evaluation measurement. The current, average and maximum values can be retrieved.

The values described below are returned by `FETCh` and `READ` commands. `CALCulate` commands return limit check results instead, one value for each result listed below.

The number to the left of each result parameter is provided for easy identification of the parameter position within the result array.

Return values:

<1_Reliability> Reliability Indicator

<2_CarrierPower> Power at the nominal carrier frequency (UL Frequency)
Range: -100 dBm to 35 dBm
Default unit: dBm

<3_ACLRL2>
<4_ACLRL1>
<5_ACLRR1>
<6_ACLRR2>
Power of the first and second left and right adjacent channels (±1st at ±1.6 MHz from UL frequency, ±2nd at ±3.2 MHz from UL frequency)
Range: -100 dBm to 35 dBm
Default unit: dBm

<7_OBW> Occupied bandwidth
Range: 0 MHz to 4 MHz
Default unit: Hz

<8_MarginAB>
<9_MarginCD>
<10_MarginDE>
<11_MarginED>
<12_MarginDC>
<13_MarginBA>
Limit line margin values in the 6 emission mask areas
Range: -100 dB to 100 dB
Default unit: dB

<14_UEpower> User equipment power
Range: -100 dBm to 35 dBm
Default unit: dBm

<15_FreqAB>
<16_FreqCD>
<17_FreqDE>
<18_FreqED>
<19_FreqDC>
<20_FreqBA>

Frequency offsets at which the limit line margin values in the 6 emission mask areas have been found.

Range: -4.5E+6 Hz to 4.5E+6 Hz
Default unit: Hz

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.10.1
V3.0.11: added result <15_FreqAB> to <20_FreqBA>

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

6.3.19 RX Results (Single Values)

The following commands return the results of the RX measurements.

FETCh:TDSCdma:MEAS<i>:MEValuation:BER?
READ:TDSCdma:MEAS<i>:MEValuation:BER?
CALCulate:TDSCdma:MEAS<i>:MEValuation:BER?

Returns the bit error rate and the block error ratio.

The values described below are returned by `FETCh` and `READ` commands. `CALCulate` commands return limit check results instead, one value for each result listed below.

Return values:

<Reliability> Reliability Indicator

<BER> Percentage of received data bits that were erroneous

Range: 0 % to 100 %
Default unit: %

<BLER> Percentage of received transport data blocks containing at least one erroneous bit

Range: 0 % to 100 %
Default unit: %

Example: See Performing Single-Shot Measurements

Usage: Query only

Firmware/Software: V1.0.10.1

For additional information concerning syntax elements and returned values refer to Conventions and General Information.

6.3.20 List Mode Results (One Segment)

The following commands return the list mode results for a selected segment.

To configure the list mode use the commands described in chapter 6.3.4, "List Mode Settings", on page 87.

For a description of the list mode see chapter 3.3, "Multi Evaluation List Mode", on page 14.

Indicated ranges apply to all statistical results except standard deviation results. The minimum for standard deviation results equals 0. The maximum equals the width of the indicated range divided by two. Exceptions are explicitly stated.

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:MODulation:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:MODulation:MAXimum?

Return current and maximum modulation single value results for segment <Segno> in list mode.

Suffix:

<Segno> 1..500

Return values:

<1_Reliability> Reliability Indicator
In list mode, a zero reliability indicator indicates that the results in all measured segments are valid. A non-zero value indicates that an error occurred in at least one of the measured segments.

<2_SegReliability> Reliability indicator for the segment. The meaning of the returned values is the same as for the common reliability indicator, see previous parameter.

<3_EVMRMS>
<4_EVMPeak> Error vector magnitude RMS and peak value
Range: 0 % to 100 %
Default unit: %

<5_MagErrRMS> Magnitude error RMS value
Range: 0 % to 100 %
Default unit: %

<6_MagErrPeak> Magnitude error peak value
Range: -100 % to 100 %
Default unit: %

<7_PhaseErrRMS> Phase error RMS value
Range: 0 deg to 180 deg
Default unit: deg

<8_PhaseErrPeak> Phase error peak value
Range: -180 deg to 180 deg
Default unit: deg

<9_IQOriginOffset> I/Q origin offset
Range: -100 dB to 0 dB
Default unit: dB

<10_IQImbalance> I/Q imbalance
Range: -100 dB to 0 dB
Default unit: dB

<11_TransTimeErr> Transmit time error
Range: -500 chips to 500 chips
Default unit: chips

<12_CarrFreqError> Carrier frequency error
Range: -5000 Hz to 5000 Hz
Default unit: Hz

<13_UEpower> User equipment power
Range: -100 dBm to 35 dBm
Default unit: dBm

<14_PCDE> Peak code domain error
Range: -60 dB to 0 dB
Default unit: dB

<15_PCDECode> Number of the code channel where the PCDE occurred
Range: 0 to 15

<15_WaveformQual> Waveform quality
Range: 0 to 1

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10
V3.0.30: maximum number of segments increased to 500

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:MODulation:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:MODulation:SDEViation?

Return average and standard deviation modulation single value results for segment <Segno> in list mode.

Suffix:
<Segno> 1..500

Return values:
<1_Reliability> Reliability Indicator
In list mode, a zero reliability indicator indicates that the results in all measured segments are valid. A non-zero value indicates that an error occurred in at least one of the measured segments.

<2_SegReliability> Reliability indicator for the segment. The meaning of the returned values is the same as for the common reliability indicator, see previous parameter.

<3_EVMRMS>
<4_EVMPeak> Error vector magnitude RMS and peak value
Range: 0 % to 100 %
Default unit: %

<5_MagErrRMS>
<6_MagErrPeak> Magnitude error RMS and peak value
Range: 0 % to 100 %
Default unit: %

<7_PhaseErrRMS>
<8_PhaseErrPeak> Phase error RMS and peak value
Range: 0 deg to 180 deg
Default unit: deg

<9_IQOriginOffset> I/Q origin offset
Range: -100 dB to 0 dB
Default unit: dB

<10_IQImbalance> I/Q imbalance
Range: -100 dB to 0 dB
Default unit: dB

<11_TransTimeErr> Transmit time error
Range: -500 chips to 500 chips
Default unit: chips

<12_CarrFreqError> Carrier frequency error
Range: -5000 Hz to 5000 Hz
Default unit: Hz

<13_UEpower> User equipment power
Range: -100 dBm to 35 dBm
Default unit: dBm

<14_PCDE> Peak code domain error
Range: -60 dB to 0 dB
Default unit: dB

<15_PCDECode> Number of the code channel where the PCDE occurred
Range: NAV (no average / standard deviation result)

<16_WaveformQual> Waveform quality
Range: 0 to 1

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10
V3.0.20: added <15_PCDECode>
V3.0.30: maximum number of segments increased to 500

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:PMONitor?

Return power monitor results for segment <Segno> in list mode. The power is returned per slot - for each subframe of the segment 6 results (slot 1 to slot 6). The number of subframes n is defined via `CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:SETup`.

<Power> = {<Power>$_{slot\ 1}$, <Power>$_{slot\ 2}$, <Power>$_{slot\ 3}$, <Power>$_{slot\ 4}$, <Power>$_{slot\ 5}$, <Power>$_{slot\ 6}$}$_{subframe\ 1}$, {…}$_{subframe\ 2}$, …, {…}$_{subframe\ n}$

Suffix:
<Segno> 1..500

Return values:
<Reliability> Reliability Indicator
In list mode, a zero reliability indicator indicates that the results in all measured segments are valid. A non-zero value indicates that an error occurred in at least one of the measured segments.

<SegReliablity> Reliability indicator for the segment. The meaning of the returned values is the same as for the common reliability indicator, see previous parameter.

<Power> Range: -100 dBm to 35 dBm
Default unit: dBm

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10
V3.0.30: maximum number of segments increased to 500

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:SPECtrum:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:SPECtrum:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SEGMent<Segno>:SPECtrum:MAXimum?

Return spectrum single value results for segment <Segno> in list mode.

Suffix:
<Segno> 1..500

Return values:
<1_Reliability> Reliability Indicator
In list mode, a zero reliability indicator indicates that the results in all measured segments are valid. A non-zero value indicates that an error occurred in at least one of the measured segments.

<2_SegReliablity> Reliability indicator for the segment. The meaning of the returned values is the same as for the common reliability indicator, see previous parameter.

<3_UEpower> User equipment power
Range: -100 dBm to 35 dBm
Default unit: dBm

<4_CarrierPower> Power at the nominal carrier frequency (UL Frequency)
Range: -100 dBm to 35 dBm
Default unit: dBm

<5_ACLRMinus2> Power of adjacent channel at -3.2 MHz from UL frequency
Range: -100 dBm to 35 dBm
Default unit: dBm

<6_ACLRMinus1> Power of adjacent channel at -1.6 MHz from UL frequency
Range: -100 dBm to 35 dBm
Default unit: dBm

<7_ACLRPlus2> Power of adjacent channel at +3.2 MHz from UL frequency
Range: -100 dBm to 35 dBm
Default unit: dBm

<8_ACLRPlus1> Power of adjacent channel at +1.6 MHz from UL frequency
Range: -100 dBm to 35 dBm
Default unit: dBm

<9_OBW> Occupied bandwidth
Range: 0 MHz to 4 MHz
Default unit: Hz

<10_MarginAB>
<11_MarginCD>
<12_MarginDE>
<13_MarginED>
<14_MarginDC>
<15_MarginBA>

Limit line margin values in the 6 emission mask areas

Range: -100 dB to 100 dB
Default unit: dB

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10
V3.0.30: maximum number of segments increased to 500

Options: R&S CMW-KM012

6.3.21 List Mode Results (All Segments, One Result)

Each of the following commands returns a selected list mode result for all measured segments. The number of returned results depends on the number of measured segments, see `CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:COUNt` on page 88.

To configure the list mode use the commands described in chapter 6.3.4, "List Mode Settings", on page 87.

For a description of the list mode see chapter 3.3, "Multi Evaluation List Mode", on page 14.

Indicated ranges apply to all statistical results except standard deviation results. The minimum for standard deviation results equals 0. The maximum equals the width of the indicated range divided by two. Exceptions are explicitly stated.

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SRELiability?

Returns the segment reliability for all measured list mode segments.

A common reliability indicator of zero indicates that the results in all measured segments are valid. A non-zero value indicates that an error occurred in at least one of the measured segments. If you get a non-zero common reliability indicator, you can use this command to retrieve the individual reliability values of all measured segments for further analysis.

Return values:

<Reliability> Reliability Indicator

<SegReliablity> Comma separated list of values, one per measured segment
The meaning of the returned values is the same as for the common reliability indicator, see previous parameter.

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.11

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:EVM:RMS:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:EVM:RMS:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:EVM:RMS:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:EVM:RMS:SDEViation?

Return error vector magnitude RMS values for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<EVMrms> Comma separated list of values, one per measured segment
Range: 0 % to 100 %
Default unit: %

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:EVM:PEAK:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:EVM:PEAK:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:EVM:PEAK:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:EVM:PEAK:SDEViation?

Return error vector magnitude peak values for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<EVMpeak> Comma separated list of values, one per measured segment
Range: 0 % to 100 %
Default unit: %

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:MERRor:RMS:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:MERRor:RMS:AVERage?

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:MERRor:RMS:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:MERRor:RMS:SDEViation?

Return magnitude error RMS values for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<MagErrorRMS> Comma separated list of values, one per measured segment
Range: 0 % to 100 %
Default unit: %

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:MERRor:PEAK:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:MERRor:PEAK:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:MERRor:PEAK:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:MERRor:PEAK:SDEViation?

Return magnitude error peak values for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<MagErrorPeak> Comma separated list of values, one per measured segment
Range: -100 % to 100 % (AVERage: 0% to 100 %, SDEViation: 0 % to 50 %)

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:PERRor:RMS:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:PERRor:RMS:AVERage?

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:PERRor:RMS:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:PERRor:RMS:SDEViation?

Return phase error RMS values for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<PhaseErrorRMS> Comma separated list of values, one per measured segment
Range: 0 deg to 180 deg
Default unit: deg

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:PERRor:PEAK:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:PERRor:PEAK:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:PERRor:PEAK:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:PERRor:PEAK:SDEViation?

Return phase error peak values for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<PhaseErrorPeak> Comma separated list of values, one per measured segment
Range: -180 deg to 180 deg (AVERage: 0 deg to 180 deg, SDEViation: 0 deg to 90 deg)
Default unit: deg

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:IQOFfset:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:IQOFfset:AVERage?

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:IQOFfset:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:IQOFfset:SDEViation?

Return I/Q origin offset values for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<IQoffset> Comma separated list of values, one per measured segment
Range: -100 dB to 0 dB
Default unit: dB

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:IQIMbalance:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:IQIMbalance:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:IQIMbalance:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:IQIMbalance:SDEViation?

Return I/Q imbalance values for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<IQimbalance> Comma separated list of values, one per measured segment
Range: -100 dB to 0 dB
Default unit: dB

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:CFERror:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:CFERror:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:CFERror:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:CFERror:SDEViation?

Return carrier frequency error values for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<CarrierFreqErr> Comma separated list of values, one per measured segment
Range: -5000 Hz to 5000 Hz
Default unit: Hz

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:TERRor:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:TERRor:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:TERRor:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:TERRor:SDEViation?

Return transmit time error values for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<TransmitTimeErr> Comma separated list of values, one per measured segment
Range: -500 chips to 500 chips
Default unit: chips

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:UEPower:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:UEPower:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:UEPower:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:UEPower:SDEViation?

Return user equipment power values for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<UEpower> Comma separated list of values, one per measured segment
Range: -100 dBm to 35 dBm
Default unit: dBm

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:WQUality:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:WQUality:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:WQUality:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:WQUality:SDEViation?

Return waveform quality values for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<WaveformQuality> Comma separated list of values, one per measured segment
Range: 0 to 1

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:PCDE:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:PCDE:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:PCDE:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:PCDE:SDEViation?

Return current, average, maximum or standard deviation peak code domain error results for all measured list mode segments. For each measured segment two values are returned:

<Reliability>, {<PCDError>, <PCDECode>}$_{seg\ 1}$, {<PCDError>, <PCDECode>}$_{seg\ 2}$, ...

Return values:

<Reliability> Reliability Indicator

<PCDError> Peak code domain error
Range: -60 dB to 0 dB
Default unit: dB

<PCDECode> Number of the code channel where the PCDE occurred
For AVERage and SDEViation commands NAV is returned (no result)
Range: 0 to 15

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10
V3.0.20: added <PCDECode> to AVERage and SDEViation commands

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:ABSPower:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:ABSPower:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:ABSPower:MAXimum?

Return the UE power for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<UEpower> Comma separated list of values, one per measured segment
Range: -100 dBm to 35 dBm
Default unit: dBm

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:ACLR:CPOWer:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:ACLR:CPOWer:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:ACLR:CPOWer:MAXimum?

Return the power at the nominal carrier frequency for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<CarrierPower> Comma separated list of values, one per measured segment
Range: -100 dBm to 35 dBm
Default unit: dBm

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:ACLR:
LCHannel<ChannelNo>:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:ACLR:
LCHannel<ChannelNo>:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:ACLR:
LCHannel<ChannelNo>:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:ACLR:
RCHannel<ChannelNo>:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:ACLR:
RCHannel<ChannelNo>:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:ACLR:
RCHannel<ChannelNo>:MAXimum?

Return the power of the adjacent channels for all measured list mode segments.

The adjacent channels are located at the following frequency relative to the carrier frequency:

- LCHannel1 = -1.6 MHz
- LCHannel2 = -3.2 MHz
- RCHannel1 = +1.6 MHz
- RCHannel2 = +3.2 MHz

Suffix:
<ChannelNo> 1..2

Return values:
<Reliability> Reliability Indicator

<ACLR> Comma separated list of values, one per measured segment
Range: -100 dBm to 35 dBm
Default unit: dBm

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:OBW:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:OBW:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:OBW:MAXimum?

Return the occupied bandwidth for all measured list mode segments.

Return values:
<Reliability> Reliability Indicator

<OBW> Comma separated list of values, one per measured segment
Range: 0 MHz to 4 MHz
Default unit: Hz

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:AB:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:AB:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:AB:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:CD:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:CD:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:CD:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:DE:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:DE:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:DE:MAXimum?

Return the limit line margin values in the 3 emission mask areas below the carrier frequency for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<EMaskMargin> Comma separated list of values, one per measured segment

Range: -100 dB to 100 dB
Default unit: dB

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:ED:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:ED:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:ED:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:DC:CURRent?

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:DC:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:DC:MAXimum?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:BA:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:BA:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:EMASk:MARGin:BA:MAXimum?

Return the limit line margin values in the 3 emission mask areas above the carrier frequency for all measured list mode segments.

Return values:

<Reliability> Reliability Indicator

<EMaskMargin> Comma separated list of values, one per measured segment
Range: -100 dB to 100 dB
Default unit: dB

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

6.3.22 List Mode Results (All Segments, Result Groups)

The following commands return groups of list mode results for all segments.

To configure the list mode use the commands described in chapter 6.3.4, "List Mode Settings", on page 87.

For a description of the list mode see chapter 3.3, "Multi Evaluation List Mode", on page 14.

Indicated ranges apply to all statistical results except standard deviation results. The minimum for standard deviation results equals 0. The maximum equals the width of the indicated range divided by two. Exceptions are explicitly stated.

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:MAXimum?

Return current and maximum modulation single value results in list mode.

The values listed below in curly brackets {} are returned for the segments $\{...\}_{seg\ 1}$, $\{...\}_{seg\ 2}$, ..., $\{...\}_{seg\ n}$, with n determined by `CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:COUNt`.

Return values:

<1_Reliability> Reliability Indicator
In list mode, a zero reliability indicator indicates that the results in all measured segments are valid. A non-zero value indicates that an error occurred in at least one of the measured segments.

{<2_SegReliability> Reliability indicator for the segment. The meaning of the returned values is the same as for the common reliability indicator, see previous parameter.

<3_EVMRMS>
<4_EVMPeak> Error vector magnitude RMS and peak value
Range: 0 % to 100 %
Default unit: %

<5_MagErrRMS> Magnitude error RMS value
Range: 0 % to 100 %
Default unit: %

<6_MagErrPeak> Magnitude error peak value
Range: -100 % to 100 %
Default unit: %

<7_PhaseErrRMS> Phase error RMS value
Range: 0 deg to 180 deg
Default unit: deg

<8_PhaseErrPeak> Phase error peak value
Range: -180 deg to 180 deg
Default unit: deg

<9_IQOriginOffset> I/Q origin offset
Range: -100 dB to 0 dB
Default unit: dB

<10_IQImbalance> I/Q imbalance
Range: -100 dB to 0 dB
Default unit: dB

<11_TransTimeErr> Transmit time error
Range: -500 chips to 500 chips
Default unit: chips

<12_CarrFreqError> Carrier frequency error
Range: -5000 Hz to 5000 Hz
Default unit: Hz

<13_UEpower> User equipment power
Range: -100 dBm to 35 dBm
Default unit: dBm

<14_PCDE> Peak code domain error
Range: -60 dB to 0 dB
Default unit: dB

<15_PCDECode> Number of the code channel where the PCDE occurred
Range: 0 to 15

<16_WaveformQual>} Waveform quality
Range: 0 to 1

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:MODulation:SDEViation?

Return average and standard deviation modulation single value results in list mode.

The values listed below in curly brackets {} are returned for the segments $\{...\}_{seg\ 1}$, $\{...\}_{seg\ 2}$, ..., $\{...\}_{seg\ n}$, with n determined by `CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:COUNt`.

Return values:

<1_Reliability> Reliability Indicator
In list mode, a zero reliability indicator indicates that the results in all measured segments are valid. A non-zero value indicates that an error occurred in at least one of the measured segments.

{<2_SegReliability> Reliability indicator for the segment. The meaning of the returned values is the same as for the common reliability indicator, see previous parameter.

<3_EVMRMS>
<4_EVMPeak> Error vector magnitude RMS and peak value
Range: 0 % to 100 %
Default unit: %

<5_MagErrRMS>
<6_MagErrPeak> Magnitude error RMS and peak value
Range: 0 % to 100 %
Default unit: %

<7_PhaseErrRMS> Phase error RMS and peak value
<8_PhaseErrPeak>
Range: 0 deg to 180 deg
Default unit: deg

<9_IQOriginOffset> I/Q origin offset
Range: -100 dB to 0 dB
Default unit: dB

<10_IQImbalance> I/Q imbalance
Range: -100 dB to 0 dB
Default unit: dB

<11_TransTimeErr> Transmit time error
Range: -500 chips to 500 chips
Default unit: chips

<12_CarrFreqError> Carrier frequency error
Range: -5000 Hz to 5000 Hz
Default unit: Hz

<13_UEpower> User equipment power
Range: -100 dBm to 35 dBm
Default unit: dBm

<14_PCDE> Peak code domain error
Range: -60 dB to 0 dB
Default unit: dB

<15_PCDECode> Number of the code channel where the PCDE occurred
Range: NAV (no average / standard deviation result)

<16_WaveformQual>} Waveform quality
Range: 0 to 1

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10
V3.0.20: added <15_PCDECode>

Options: R&S CMW-KM012

FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:CURRent?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:AVERage?
FETCh:TDSCdma:MEAS<i>:MEValuation:LIST:SPECtrum:MAXimum?

Return spectrum single value results in list mode.

The values listed below in curly brackets {} are returned for the segments $\{...\}_{seg\ 1}$, $\{...\}_{seg\ 2}$, ..., $\{...\}_{seg\ n}$, with n determined by `CONFigure:TDSCdma:MEAS<i>:MEValuation:LIST:COUNt`.

Return values:

<1_Reliability> Reliability Indicator
In list mode, a zero reliability indicator indicates that the results in all measured segments are valid. A non-zero value indicates that an error occurred in at least one of the measured segments.

{<2_SegReliablity> Reliability indicator for the segment. The meaning of the returned values is the same as for the common reliability indicator, see previous parameter.

<3_UEpower> User equipment power
Range: -100 dBm to 35 dBm
Default unit: dBm

<4_CarrierPower> Power at the nominal carrier frequency (UL Frequency)
Range: -100 dBm to 35 dBm
Default unit: dBm

<5_ACLRMinus2> Power of adjacent channel at -3.2 MHz from UL frequency
Range: -100 dBm to 35 dBm
Default unit: dBm

<6_ACLRMinus1> Power of adjacent channel at -1.6 MHz from UL frequency
Range: -100 dBm to 35 dBm
Default unit: dBm

<7_ACLRPlus2> Power of adjacent channel at +3.2 MHz from UL frequency
Range: -100 dBm to 35 dBm
Default unit: dBm

<8_ACLRPlus1> Power of adjacent channel at +1.6 MHz from UL frequency
Range: -100 dBm to 35 dBm
Default unit: dBm

<9_OBW> Occupied bandwidth
Range: 0 MHz to 4 MHz
Default unit: Hz

<10_MarginAB>
<11_MarginCD>
<12_MarginDE>
<13_MarginED>
<14_MarginDC>
<15_MarginBA>} Limit line margin values in the 6 emission mask areas
Range: -100 dB to 100 dB
Default unit: dB

Example: See Using the TD-SCDMA List Mode

Usage: Query only

Firmware/Software: V3.0.10

Options: R&S CMW-KM012

List of Commands

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