

R&S® SMBVB-K50/-K51

TD-SCDMA, incl. TD-SCDMA

Enhanced Features

User Manual



1178821302
Version 07

ROHDE & SCHWARZ
Make ideas real



This document describes the following software options:

- R&S®SMBVB-K50 TD-SCDMA (1423.7782.xx)
- R&S®SMBVB-K51 TD-SCDMA Enhanced Features (1413.7799.xx)

This manual describes firmware version FW 5.30.047.xx and later of the R&S®SMBV100B.

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The following abbreviations are used throughout this manual: R&S®SMBV100B is abbreviated as R&S SMBVB, R&S®WinIQSIM2™ is abbreviated as R&S WinIQSIM2; the license types 02/03/07/11/13/16/12 are abbreviated as xx.

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1 Welcome to the TD-SCDMA digital standard

The R&S SMBV100B-K50/-K51 are firmware applications that add functionality to generate signals in accordance with the TD-SCDMA (3GPP TDD LCR) standard.

TD-SCDMA (3GPP TDD LCR) designates a mobile radio transmission method developed for 3G mobile communication by the China Wireless Telecommunication Standard group (CWTS). This standard is similar to the 3GPP TDD proposition, but with greater emphasis placed on GSM compatibility and with a chip rate limited to 1.28 Mcps. TD-SCDMA is one option of UTRA-TDD, called 1.28Mcps TDD or low chip rate (LCR) TDD.

The R&S SMBV100B-K50 main features are:

- Configuration of up to four TD-SCDMA cells with variable switching point of uplink and downlink.
- Freely configurable channel table for each slot and simulation of the downlink and uplink pilot timeslot.
- Real time generation of one traffic channel and the SYNC channel on the downlink
- Slot modes "Dedicated" and "PRACH" on the uplink.
- Clipping for reducing the crest factor

The R&S SMBVB-K51 option TD-SCDMA (3GPP TDD LCR) enhanced MS/BS tests incl. HSDPA extends the TD-SCDMA signal generation with:

- Simulation of high-speed channels in the downlink (HS-SCCH, HS-PDSCH) and the uplink (HS-SICH)
- Channel coding for BCH in real time
- A reference measurement channel

This user manual contains a description of the functionality that the application provides, including remote control operation.

All functions not discussed in this manual are the same as in the base unit and are described in the R&S SMBV100B user manual. The latest version is available at:

www.rohde-schwarz.com/manual/SMBV100B

Installation

You can find detailed installation instructions in the delivery of the option or in the R&S SMBV100B service manual.

1.1 Accessing the TD-SCDMA dialog

To open the dialog with TD-SCDMA settings

- ▶ In the block diagram of the R&S SMBV100B, select "Baseband" > "TD-SCDMA".

A dialog box opens that displays the provided general settings.

The signal generation is not started immediately. To start signal generation with the default settings, select "State" > "On".

1.2 What's new

This manual describes firmware version FW 5.30.047.xx and later of the R&S®SMBV100B.

Compared to the previous version, it provides the new features listed below:

- Time-based triggering, see "[Time Based Trigger](#)" on page 23 and "[Trigger Time](#)" on page 23.
- Editorial changes

1.3 Documentation overview

This section provides an overview of the R&S SMBV100B user documentation. Unless specified otherwise, you find the documents at:

www.rohde-schwarz.com/manual/smbv100b

1.3.1 Getting started manual

Introduces the R&S SMBV100B and describes how to set up and start working with the product. Includes basic operations, typical measurement examples, and general information, e.g. safety instructions, etc. A printed version is delivered with the instrument.

1.3.2 User manuals and help

Separate manuals for the base unit and the software options are provided for download:

- Base unit manual
Contains the description of all instrument modes and functions. It also provides an introduction to remote control, a complete description of the remote control commands with programming examples, and information on maintenance, instrument interfaces and error messages. Includes the contents of the getting started manual.
- Software option manual
Contains the description of the specific functions of an option. Basic information on operating the R&S SMBV100B is not included.

The contents of the user manuals are available as help in the R&S SMBV100B. The help offers quick, context-sensitive access to the complete information for the base unit and the software options.

All user manuals are also available for download or for immediate display on the Internet.

1.3.3 Service manual

Describes the performance test for checking compliance with rated specifications, firmware update, troubleshooting, adjustments, installing options and maintenance.

The service manual is available for registered users on the global Rohde & Schwarz information system (GLORIS):

<https://gloris.rohde-schwarz.com>

1.3.4 Instrument security procedures

Deals with security issues when working with the R&S SMBV100B in secure areas. It is available for download on the internet.

1.3.5 Printed safety instructions

Provides safety information in many languages. The printed document is delivered with the product.

1.3.6 Data sheets and brochures

The data sheet contains the technical specifications of the R&S SMBV100B. It also lists the options and their order numbers and optional accessories.

The brochure provides an overview of the instrument and deals with the specific characteristics.

See www.rohde-schwarz.com/brochure-datasheet/smbv100b

1.3.7 Release notes and open source acknowledgment (OSA)

The release notes list new features, improvements and known issues of the current firmware version, and describe the firmware installation.

The software makes use of several valuable open source software packages. An open source acknowledgment document provides verbatim license texts of the used open source software.

See www.rohde-schwarz.com/firmware/smbv100b

1.3.8 Application notes, application cards, white papers, etc.

These documents deal with special applications or background information on particular topics.

See www.rohde-schwarz.com/application/smbv100b

1.3.9 Videos

Find various videos on Rohde & Schwarz products and test and measurement topics on YouTube: <https://www.youtube.com/@RohdeundSchwarz>



On the menu bar, search for your product to find related videos.



Figure 1-1: Product search on YouTube

1.4 Scope



Tasks (in manual or remote operation) that are also performed in the base unit in the same way are not described here.

In particular, it includes:

- Managing settings and data lists, like saving and loading settings, creating and accessing data lists, or accessing files in a particular directory.
- Information on regular trigger, marker and clock signals and filter settings, if appropriate.
- General instrument configuration, such as checking the system configuration, configuring networks and remote operation
- Using the common status registers

For a description of such tasks, see the R&S SMBV100B user manual.

1.5 Notes on screenshots

When describing the functions of the product, we use sample screenshots. These screenshots are meant to illustrate as many as possible of the provided functions and possible interdependencies between parameters. The shown values may not represent realistic usage scenarios.

The screenshots usually show a fully equipped product, that is: with all options installed. Thus, some functions shown in the screenshots may not be available in your particular product configuration.

2 About the TD-SCDMA options

2.1 Required options

The basic equipment layout for generating TD-SCDMA signals includes the:

- Base unit
- Baseband real-time extension (R&S SMBVB-K520)
- Digital standard TD-SCDMA (R&S SMBVB-K50)
- Option TD-SCDMA enhanced (R&S SMBVB-K51)

You can generate signals via play-back of waveform files at the signal generator. To create the waveform file using R&S WinIQSIM2, you do not need a specific option.

To play back the waveform file at the signal generator, you have two options:

- Install the R&S WinIQSIM2 option of the digital standard, e.g. R&S SMBVB-K255 for playing LTE waveforms
- If supported, install the real-time option of the digital standard, e.g. R&S SMBVB-K55 for playing LTE waveforms

For more information, see data sheet.

2.2 About TD-SCDMA

TD-SCDMA is a mobile radio standard in which available bandwidth is divided among subscribers according to frequency (FDMA), time (TDMA) and code (CDMA). The same frequency is used for both directions of transmission (TDD). Each resource (i.e. a combination of frequency, code and time slot) can be used simultaneously by several base stations or user equipment provided the scrambling codes differ. A cell is understood to be a base station and all user equipment communicating with this base station. The R&S SMBV100B simulates a maximum of four cells at the same frequency. The multi-carrier mode can be used to simulate more than four cells at the same frequency or cells at several frequencies.

HSDPA (high speed downlink packet access) mode enhances the TD-SCDMA standard by data channels with high data rates especially for multi-media applications.

The R&S SMBV100B generates the TD-SCDMA signals in a combination of realtime mode (real time channels) and arbitrary waveform mode. Simulation of bit and block errors can be activated for the channels generated in real time. In arbitrary waveform mode, the signal is first calculated and then output. The R&S SMBV100B simulates TD-SCDMA at the physical channel layer.

Parameters of the modulation system TD-SCDMA

Table 2-1: Parameters of the modulation system TD-SCDMA

Parameter	Value
Chip rate	1.28 Mcps
Carrier spacing	1.6 MHz
Data modulation	QPSK
Filter	Root-raised cosine (0.22)
Channel types	Downlink : <ul style="list-style-type: none"> • Primary Common Control Physical Channel (P-CCPCH) • Secondary Common Control Physical Channel (S-CCPCH) • Physical Forward Access Channel (F-FACH) • Downlink Pilot Time Slot (DwPTS) • Dedicated Physical Channel (DPCH) Uplink : <ul style="list-style-type: none"> • Physical Random Access Channel (P-RACH) • Uplink Pilot Time Slot (UpPTS) Dedicated Physical Channel (DPCH)
Data rates	17.6 kbps, 35.2 kbps, 70.4 kbps to 281.6 kbps depending on channel type
Number of channels	4 cells, each containing max. 7 active slots. Each slot with up to 16 DPCHs and 5 special channels.
Frame structure	Frame: 5 ms with 7 (traffic) time slots. Time slot (traffic): 675 μs Time slot (DwPTS): 75 μs Time slot (UpPTS): 125 μs The number of symbols transmitted in a slot depends on the symbol rate.
Scrambling code	128 different codes with length of 16 chips
SYNC codes	32 different codes with length of 64 chips
SYNC1 codes	256 different codes with length of 128 chips
Basic midamble codes	128 different codes with length of 128 chips
Spreading code	"Orthogonal Variable Spreading Factor Code (OVSF)"; spreading factors 1, 2, 4, 8, 16

2.3 Modulation system

2.3.1 TD-SCDMA signal structure (frames and time slots)

The TDSCDMA signal is organized in frames of 5 ms length. Each frame comprises seven traffic time slots (Ts0 to Ts6, each 0.675 ms) and two special time slots (DwPTS and UpPTS) for synchronization.

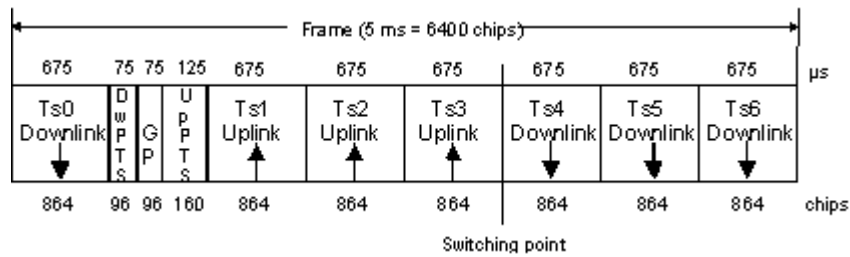


Figure 2-1: Structure of TDSCDMA frame

Ts0 is always allocated to the downlink, Ts1 to the uplink. The other time slots are divided between the two directions of transmission, the switching point being variable.

2.3.2 Dwpts and uppts

In the downlink pilot time slot (DwPTS), the base station sends one of 32 possible 64-chip SYNC codes. The SYNC code allows the user equipment to synchronize to the base station. At the same time, the SYNC code defines the value range for the scrambling code and the basic midamble code.

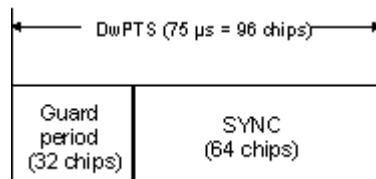


Figure 2-2: Structure of DwPTS

The real-valued SYNC sequence is converted into a complex-valued SYNC sequence by a rotating-vector operation.

This SYNC sequence is divided up into four symbols with 16 chips each. The symbols are phase-modulated (possible phases are 45°, 135°, 225° and 315°) in order to signal the frame number of the interleaver.

In the supplied software, all symbols are modulated with 45°.

The uplink pilot time slot (UpPTS) is sent by the user equipment to initiate a call with the base station (before a P-RACH is sent, for example). The transmitted SYNC1 code is randomly selected from eight possible codes. If the base station does not respond to the UpPTS, the UpPTS is repeated in the next frame.

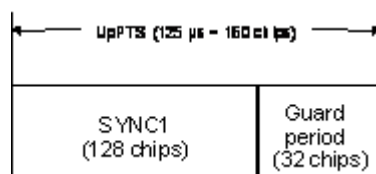


Figure 2-3: Structure of UpPTS

The UpPTS is a complex-valued signal resulting from the real SYNC1 sequence by a rotating-vector operation.

2.3.3 Structure of traffic burst

In time slots Ts0 to Ts6, bursts can be sent by the base station or the user equipment, i.e. in both directions of transmission. The burst structure is identical for both directions. There are two types of burst, however, which are described in the following.

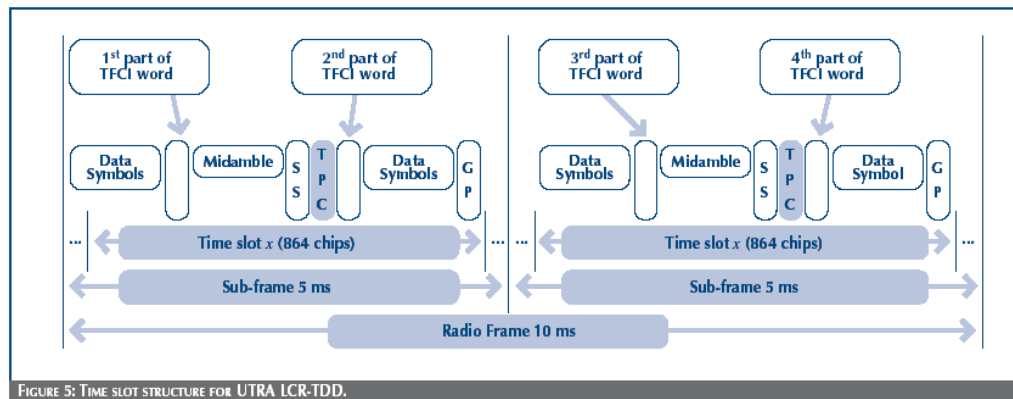


Figure 2-4: Burst without Layer 1 Control Information

2.3.3.1 Burst without layer 1 control information

This type of burst can be used for all physical channels. It comprises two data fields, a midamble and a guard period.

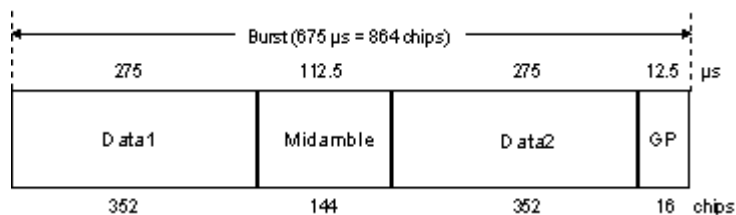


Figure 2-5: Traffic burst without layer 1 control information

The useful data are

- Alternately fed to the I and the Q path (QPSK data modulation),
- Mapped from the 0/1 plane into the $-1/+1$ plane,
- Spread with the complex spreading code (spreading factor SF = 1, 2, 4, 8 or 16),
- Scrambled with the real-valued scrambling code,
- Weighted with the channel power and
- Filtered (root-raised cosine 0.22)

Since each user sends only one burst per frame, the following gross data rate is obtained:

$$Gross_data_Rate = \frac{704 * 2}{SF * 5ms} = 281600/SF \text{ kbit/s}$$

The midamble is obtained from the basic midamble by periodic repetition and shifting. For some channels, the midamble shift can be set in steps of eight chips. The basic midamble is 128 chips long, while the length for the midamble field in the time slot is 144 chips. Each scrambling code (setting parameter at cell level) is assigned a basic midamble code.

The midamble is not spread or scrambled.

No signal is transmitted during the guard period. This avoids crosstalk of the burst into the next time slot at the receiver end.

2.3.3.2 Burst with layer 1 control information

This type of burst can be used only with DPCHs (dedicated physical channels). It differs from the "normal" burst only in that the data fields are shortened ahead of and after the midamble to enable the transmission of layer 1 control information.

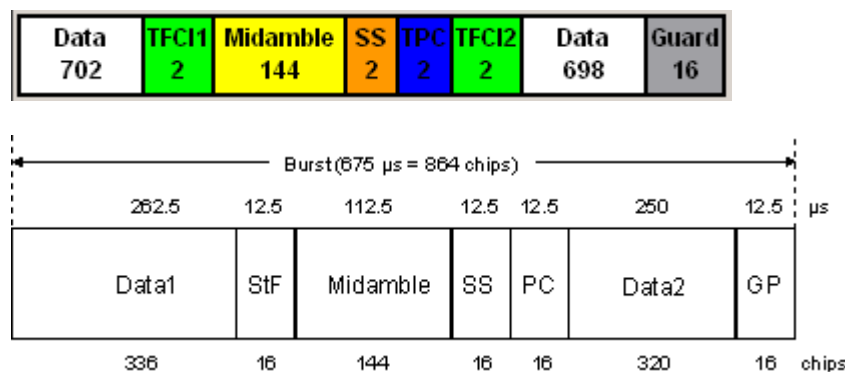


Figure 2-6: Traffic burst with layer 1 control information

The burst consists of two fields of data symbols, a fixed-length 144 chip midamble, and control fields for Synchronization Shift (SS), Transmit Power Control (TPC), and Transport Format Indicator (TFCI). The timeslot is delimited by a 16-chip guard period (GP).

Each data field consists of a maximum of 352 chips.

The Transport Format Indicator field (TFCI) conveys transport format information to the receiver, which is used by the channel decoder to recover transport channels. The information is distributed into two segments in one burst (four segments in two burst = one frame)

The synchronization shift (SS) field is used to inform the other station of a shift of the burst time ("00" means that the sync shift is increased, "11" that it is decreased). The bits are transmitted in M consecutive frames. The shift value is a multiple k of $T_{chip}/8$. M and k are transmitted by signaling. The value for M (Sync Shift Repetition) can be selected.

Analogously to the Sync Shift field, the power control (TPC) field is used to initiate an increase or decrease of transmit power.

If the spreading factor SF is lower than 16, the control symbols are transmitted $16/SF$ times. Control symbols are treated like data symbols, i.e. they are spread and scrambled.

3 TD-SCDMA configuration and settings

- ▶ To access the TD-SCDMA settings, select "Baseband > TD-SCDMA".

Tip: The dialog is comprehensive. To simplify the description and the orientation through this documentation, the headings of the following section follow a common naming convention:

`<DialogName/TabName>< - ><SourceDialog>`

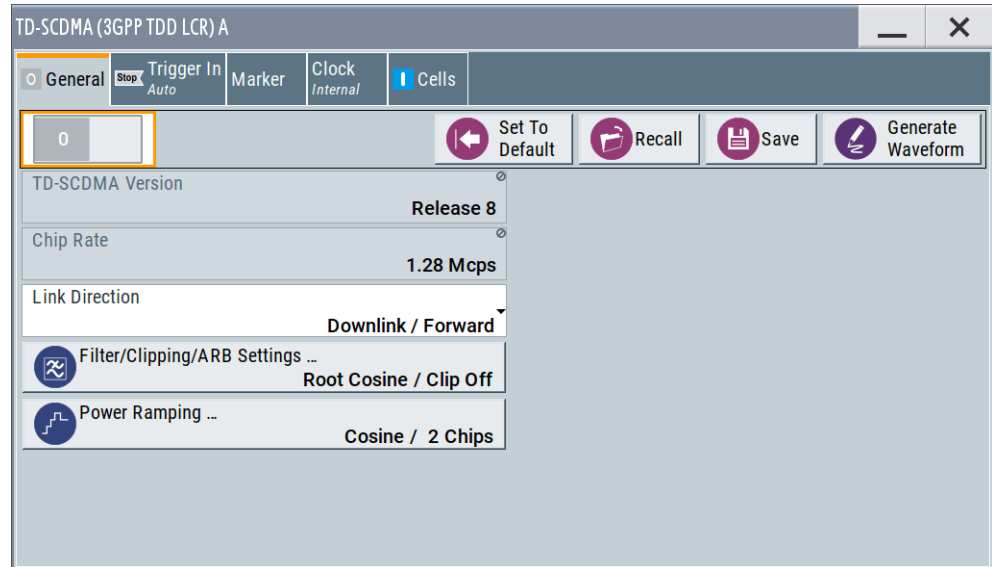
This common structure is intended to identify your current location in the dialog.

The remote commands required to define these settings are described in [Chapter 4, "Remote-control commands"](#), on page 92.

●	General settings	19
●	Trigger settings	21
●	Marker settings	26
●	Clock settings	28
●	Global connectors settings	29
●	Common cell configuration settings	29
●	Predefined settings	32
●	Cell configuration	33
●	Enhanced channels settings	37
●	HSDPA/HSUPA settings	52
●	Slot configuration	64
●	DPCCH settings	73
●	Slot mode PRACH settings	80
●	Filter / clipping / ARB settings	85
●	Power ramping	90

3.1 General settings

- To access this dialog, select "Baseband > TD-SCDMA > General".



This dialog comprises the standard general settings, valid for the signal in both transmission directions.

State

Activates the standard and deactivates all the other digital standards and digital modulation modes in the same path.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma :STATe` on page 99

Set to Default

Calls the default settings. The values of the main parameters are listed in the following table.

Parameter	Value
State	Not affected by "Set to Default"
Link Direction	Downlink/Forward
Filter	Root Cosine
Clipping	Off
Power ramping	Cosine / 2 chips
Trigger	Auto

Remote command:

`[:SOURce<hw>] :BB:TDSCdma :PRESet` on page 97

Save/Recall

Accesses the "Save/Recall" dialog, that is the standard instrument function for saving and recalling the complete dialog-related settings in a file. The provided navigation possibilities in the dialog are self-explanatory.

The settings are saved in a file with predefined extension. You can define the filename and the directory, in that you want to save the file.

See also, chapter "File and Data Management" in the R&S SMBV100B user manual.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:SETTing:CATalog?` on page 97

`[:SOURce<hw>] :BB:TDSCdma:SETTing:LOAD` on page 97

`[:SOURce<hw>] :BB:TDSCdma:SETTing:STORe` on page 98

Generate Waveform File

With enabled signal generation, triggers the instrument to save the current settings of an arbitrary waveform signal in a waveform file with predefined extension `*.wv`. You can define the filename and the directory, in that you want to save the file.

Using the ARB modulation source, you can play back waveform files and/or process the file to generate multi-carrier or multi-segment signals.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:WAVeform:CREate` on page 99

TD-SCDMA Version

Displays the current version of the TD-SCDMA standard.

The default settings and parameters provided are oriented towards the specifications of the version displayed.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:VERSion?` on page 99

Chip Rate

Displays the system chip rate. This is fixed at 1.28 Mcps.

The output chip rate can be varied in the Filter/Clipping/ARB Settings dialog (see [Chapter 3.14.1, "Filter settings"](#), on page 86).

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:CRATe?` on page 94

Link Direction

Selects the transmission direction.

The settings of the basestation or the user equipment are provided in the following dialog section in accordance with the selection.

"Downlink/Forward"	The transmission direction selected is basestation to user equipment. The signal corresponds to that of a base station.
"Uplink/Reverse"	The transmission direction selected is user equipment to base station. The signal corresponds to that of a user equipment.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:LINK` on page 95

Filter / Clipping / ARB Settings

Access to the dialog for setting baseband filtering, clipping and the sequence length of the arbitrary waveform component, see [Chapter 3.14, "Filter / clipping / ARB settings"](#), on page 85 .

Power Ramping...

Accesses the dialog for setting the power ramping, see [Chapter 3.15, "Power ramping"](#), on page 90.

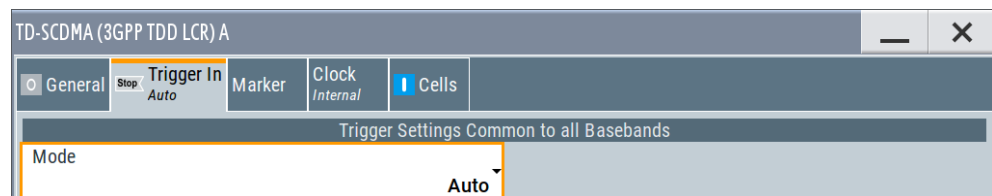
Remote command:

n.a.

3.2 Trigger settings

Access:

- ▶ Select "Baseband" > "TD-SCDMA" > "Trigger In".



This tab provides settings to select and configure the trigger, like trigger source, trigger mode and trigger delays, and to arm or trigger an internal trigger manually. The header of the tab displays the status of the trigger signal and trigger mode. As in the tabs "Marker" and "Clock", this tab provides also access to the settings of the related connectors.

Routing and activating a trigger signal

1. Define the effect of a trigger event and the trigger signal source.
 - a) Select "Trigger In" > "Mode".
 - b) Select "Trigger In" > "Source".
2. For external trigger signals, define the connector for signal input. See [Chapter 3.5, "Global connectors settings"](#), on page 29.
 You can map trigger signals to one or more User x connectors.
 Global connectors settings allow you to configure the signal mapping, the polarity, the trigger threshold and the input impedance of the input connectors.
3. Activate baseband signal generation. In the block diagram, set "Baseband" > "On".
 The R&S SMBV100B starts baseband signal generation after the configured trigger event.

About baseband trigger signals

This section focuses on the available settings.

For information on how these settings affect the signal, refer to section "Basics on ..." in the R&S SMBV100B user manual.

Settings:

Mode.....	22
Signal Duration Unit.....	22
Signal Duration.....	23
Running/Stopped.....	23
Time Based Trigger.....	23
Trigger Time.....	23
Arm.....	24
Execute Trigger.....	24
Source.....	24
Sync. Output to External Trigger/Sync. Output to Trigger.....	24
External Inhibit/Trigger Inhibit.....	25
External Delay/Trigger Delay.....	25

Mode

Selects trigger mode, i.e. determines the effect of a trigger event on the signal generation.

- "Auto"
The signal is generated continuously.
- "Retrigger"
The signal is generated continuously. A trigger event (internal or external) causes a restart.
- "Armed Auto"
The signal is generated only when a trigger event occurs. Then the signal is generated continuously.
An "Arm" stops the signal generation. A subsequent trigger event (internal or external) causes a restart.
- "Armed Retrigger"
The signal is generated only when a trigger event occurs. Then the signal is generated continuously. Every subsequent trigger event causes a restart.
An "Arm" stops signal generation. A subsequent trigger event (internal or external) causes a restart.
- "Single"
The signal is generated only when a trigger event occurs. Then the signal is generated once to the length specified at "Signal Duration".
Every subsequent trigger event (internal or external) causes a restart.

Remote command:

[:SOURce<hw>] :BB:TDSCdma [:TRIGger] :SEQuence on page 107

Signal Duration Unit

Defines the unit for describing the length of the signal sequence to be output in the "Single" trigger mode.

Remote command:

[\[:SOURce<hw>\]:BB:TDSCdma:TRIGger:SLUNit](#) on page 105

Signal Duration

Requires trigger "Mode" > "Single".

Enters the length of the trigger signal sequence.

Use this parameter, for example, for the following applications:

- To output the trigger signal partly.
- To output a predefined sequence of the trigger signal.

Remote command:

[\[:SOURce<hw>\]:BB:TDSCdma:TRIGger:SLENgth](#) on page 105

Running/Stopped

With enabled modulation, displays the status of signal generation for all trigger modes.

- "Running"
The signal is generated; a trigger was (internally or externally) initiated in triggered mode.
- "Stopped"
The signal is not generated and the instrument waits for a trigger event.

Remote command:

[\[:SOURce<hw>\]:BB:TDSCdma:TRIGger:RMODe?](#) on page 105

Time Based Trigger

Requires trigger "Mode" > "Armed Auto"/"Single".

Activates time-based triggering with a fixed time reference.

The R&S SMBV100B triggers signal generation when its operating system time ("Current Time") matches a specified time trigger ("Trigger Time"). As trigger source, you can use an internal trigger or an external global trigger.

How to: Chapter "Time-based triggering" in the R&S SMBV100B user manual.

Remote command:

[\[:SOURce<hw>\]:BB:TDSCdma:TRIGger:TIME\[:STATe\]](#) on page 108

Trigger Time

Requires trigger "Mode" > "Armed Auto"/"Single".

Sets date and time for a time-based trigger signal.

Set a trigger time that is later than the "Current Time". The current time is the operating system time of the R&S SMBV100B. If you set an earlier trigger time than the current time, time-based triggering is not possible.

How to: Chapter "Time-based triggering" in the R&S SMBV100B user manual.

"Date" Sets the date of the time-based trigger in format YYYY-MM-DD.

Remote command:

[\[:SOURce<hw>\]:BB:TDSCdma:TRIGger:TIME:DATE](#)
on page 107

"Time" Sets the time of the time-based trigger in format hh:mm:ss.
 Remote command:
[\[:SOURce<hw>\]:BB:TDSCdma:TRIGger:TIME:TIME](#)
 on page 108

Arm

Stops the signal generation until a subsequent trigger event occurs.

Remote command:

[\[:SOURce<hw>\]:BB:TDSCdma:TRIGger:ARM:EXECute](#) on page 104

Execute Trigger

For internal trigger source, executes trigger manually.

Remote command:

[\[:SOURce<hw>\]:BB:TDSCdma:TRIGger:EXECute](#) on page 105

Source

The following sources of the trigger signal are available:

- "Internal"
The trigger event is executed manually by the "Execute Trigger".
- "External Global Trigger"
The trigger event is the active edge of an external trigger signal provided and configured at the User x connectors.
- "Baseband Sync In"
In primary-secondary instrument mode, secondary instruments are triggered by the active edge of the synchronization signal.

How to: ["Routing and activating a trigger signal"](#) on page 21

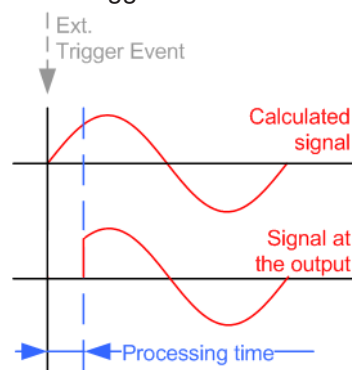
Remote command:

[\[:SOURce<hw>\]:BB:TDSCdma:TRIGger:SOURce](#) on page 106

Sync. Output to External Trigger/Sync. Output to Trigger

Enables signal output synchronous to the trigger event.

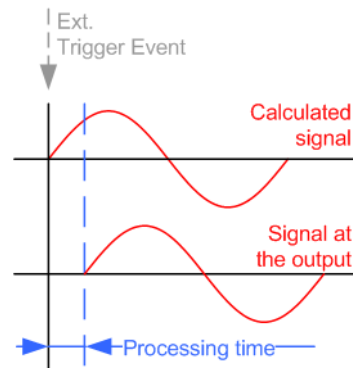
- "On"
Corresponds to the default state of this parameter.
The signal calculation starts simultaneously with the trigger event. Because of the processing time of the instrument, the first samples are cut off and no signal is output. After elapsing of the internal processing time, the output signal is synchronous to the trigger event.



- "Off"

The signal output begins after elapsing of the processing time. Signal output starts with sample 0. The complete signal is output.

This mode is recommended for triggering of short signal sequences. Short sequences are sequences with signal duration comparable with the processing time of the instrument.



In primary-secondary instrument mode, this setting ensures that once achieved, synchronization is not lost if the baseband signal sampling rate changes.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:TRIGger:EXTernal:SYNChronize:OUTPut`
on page 105

External Inhibit/Trigger Inhibit

Applies for external trigger signal.

Sets the duration with that any following trigger event is suppressed. In "Retrigger" mode, for example, a new trigger event does not cause a restart of the signal generation until the specified inhibit duration does not expire.

For more information, see chapter "Basics" in the R&S SMBV100B user manual.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:TRIGger [:EXTernal] :INHibit` on page 106

External Delay/Trigger Delay

Delays the trigger event of the signal from:

- The external trigger source

Use this setting to:

- Synchronize the instrument with the device under test (DUT) or other external devices
- Compensate delays and align the signal generation start in multi-instrument setup

For more information, see chapter "Basics on ..." in the R&S SMBV100B user manual.

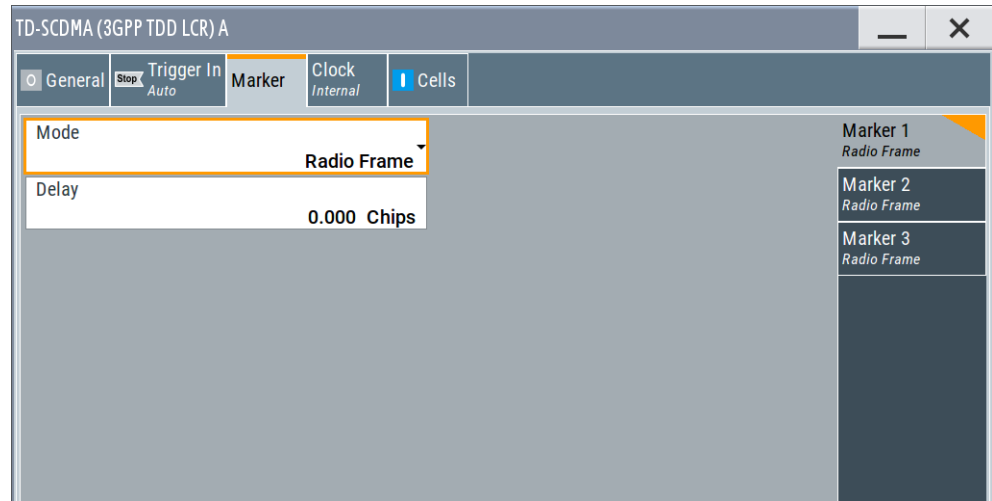
Remote command:

`[:SOURce<hw>] :BB:TDSCdma:TRIGger [:EXTernal] :DELay` on page 106

3.3 Marker settings

Access:

- ▶ Select "Baseband" > "TD-SCDMA" > "Marker".



This tab provides settings to select and configure the marker output signal including marker mode and marker delay.

Routing and activating a marker signal

1. To define the signal shape of an individual marker signal "x", select "Marker" > "Marker x" > "Mode".
2. Optionally, define the connector for signal output. See [Chapter 3.5, "Global connectors settings"](#), on page 29.
You can map marker signals to one or more User x connectors.
3. Activate baseband signal generation. In the block diagram, set "Baseband" > "On".
The R&S SMBV100B adds the marker signal to the baseband signal. Also, R&S SMBV100B outputs this signal at the configured User x connector.

About marker output signals

This section focuses on the available settings.

For information on how these settings affect the signal, refer to section "Basics on ..." in the R&S SMBV100B user manual.

Settings:

Mode.....	27
Delay.....	27

Mode

Marker configuration for up to 3 markers. The settings are used to select the marker mode defining the shape and periodicity of the markers. The contents of the dialog change with the selected marker mode.

How to: ["Routing and activating a marker signal"](#) on page 26

"Radio Frame" A marker signal is generated every 10 ms (traffic channel frame clock).

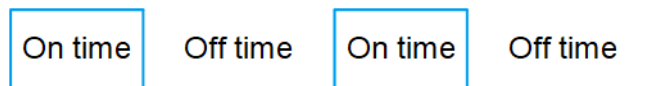
"Chip Sequence Period (ARB)"

A marker signal is generated at the beginning of every arbitrary waveform sequence (depending on the set sequence length). The marker signal is generated regardless of whether an ARB component is used.

"System Frame Number (SFN) Restart"

A marker signal is generated at the start of every SFN period (every 4096 frames).

"On/Off Ratio" A regular marker signal that is defined by an on/off ratio is generated. A period lasts one on and off cycle.



Remote command:

`[:SOURce<hw>] :BB:TDSCdma:TRIGger:OUTPut<ch>:ONTime` on page 109

`[:SOURce<hw>] :BB:TDSCdma:TRIGger:OUTPut<ch>:OFFTime` on page 109

"User Period" A marker signal is generated at the beginning of every user-defined period. The period is defined in "Period".

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:TRIGger:OUTPut<ch>:PERiod` on page 110

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:TRIGger:OUTPut<ch>:ONTime` on page 109

`[:SOURce<hw>] :BB:TDSCdma:TRIGger:OUTPut<ch>:OFFTime` on page 109

`[:SOURce<hw>] :BB:TDSCdma:TRIGger:OUTPut<ch>:PERiod` on page 110

`[:SOURce<hw>] :BB:TDSCdma:TRIGger:OUTPut<ch>:MODE` on page 109

Delay

Delays the marker signal at the marker output relative to the signal generation start.

Variation of the parameter "Marker x" > "Delay" causes signal recalculation.

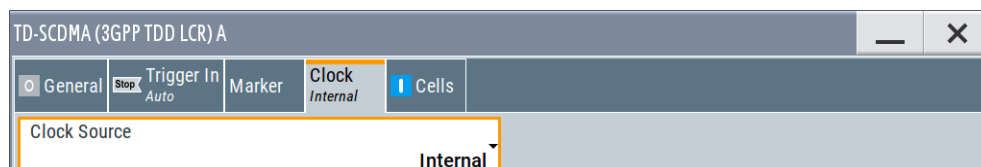
Remote command:

`[:SOURce<hw>] :BB:TDSCdma:TRIGger:OUTPut<ch>:DELay` on page 110

3.4 Clock settings

Access:

- ▶ Select "Baseband" > "TD-SCDMA" > "Clock".



This tab provides settings to select and configure the clock signal, like the clock source and clock mode.

Defining the clock

1. Select "Clock" > "Source" to define the source of clock signal.
2. For external clock signals, define the connector for signal input. See [Chapter 3.5, "Global connectors settings"](#), on page 29.
You can map clock signals to one or more User x connectors.
Global connectors settings allow you to configure the signal mapping, the polarity, the trigger threshold and the input impedance of the input connectors.
3. Activate baseband signal generation. In the block diagram, set "Baseband" > "On".
The R&S SMBV100B starts baseband signal generation with a symbol rate that equals the clock rate.

About clock signals

This section focuses on the available settings.

For information on how these settings affect the signal, refer to section "Basics on ..." in the R&S SMBV100B user manual.

Settings:

[Clock Source](#).....28

Clock Source

Selects the clock source.

- "Internal"
The instrument uses its internal clock reference.

How to: ["Defining the clock"](#) on page 28

Remote command:

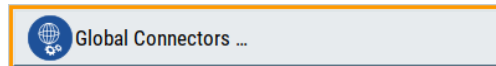
[:SOURce<hw>] :BB:TDSCdma:CLOCK:SOURce on page 110

3.5 Global connectors settings

Accesses a dialog to configure global connectors.

The button is available in the following dialogs or tabs:

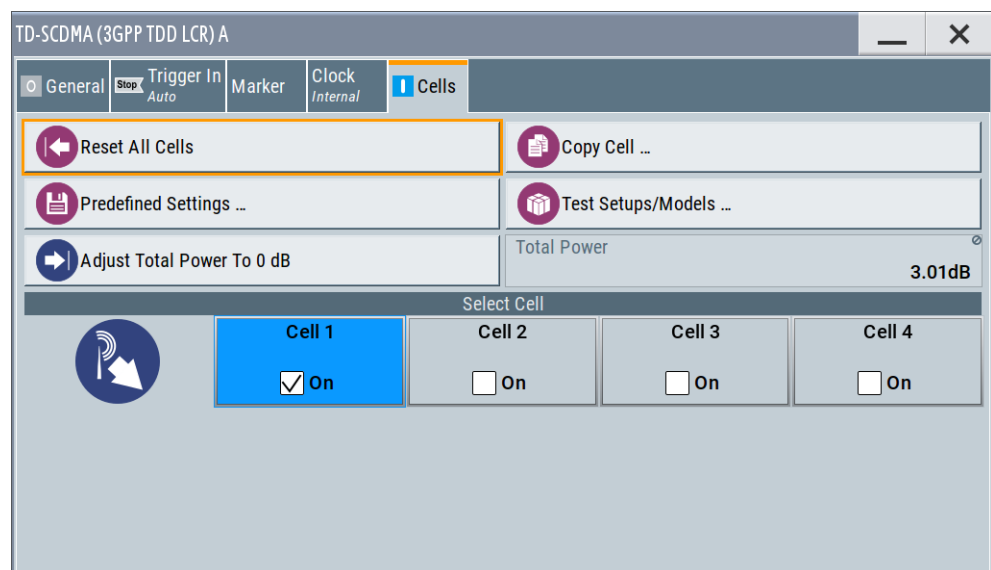
- "Trigger / Marker / Clock" dialog that is accessible via the "TMC" block in the block diagram.
- "Trigger In", "Marker" and "Clock" tabs that are accessible via the "Baseband" block in the block diagram.



See also chapter "Global connectors settings" in the user manual.

3.6 Common cell configuration settings

- ▶ To access this dialog select "Baseband > TD-SCDMA > Cells".



In this dialog, the cells can be set to the predefined settings, parameters of one cell can be copied to another cell, and the total power can be set to 0 dB. Each cell can be activated or deactivated. Active cells are highlighted in blue. Clicking a cell opens the configuration dialog for setting the cell parameters.

Provided are the following settings:

Reset All Cells

Resets all cells to the predefined settings. The reset applies to the selected link direction. The following table gives an overview of the settings. The preset value for each parameter is specified in the description of the remote-control commands.

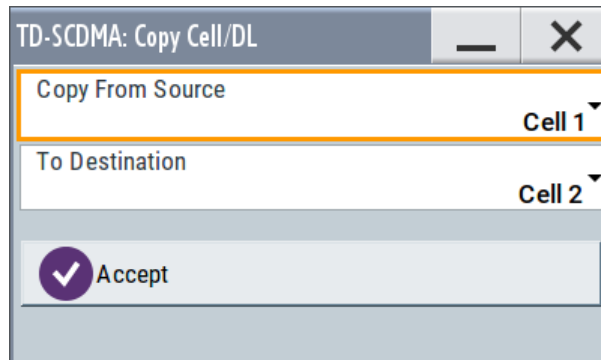
Parameter	Value
"Cell Configuration"	
State	Off
(Use) Scrambling Code	On
Scrambling Code (value)	0
SYNC-DL Code	0
SYNC-UL Code	0
Basic Midamble Code ID	0
Number of Users	16
Switching Point	3
DwPTS Power	0.0 dB
"Slot Configuration"	
State	Off
Slot Mode (only in uplink)	Dedicated
Channel Configuration	
State	Off
"Channel Type"	Depending on channel number
Current User	1
Slot Format	0
Spreading Factor	16
Spreading Code	0
Power	0 dB
Data Source	PRBS: PN9, Data Pattern: 0
Number of TFCI bits	0
TFCI Value	0
Number of Sync Shift & TPC bits	0 & 0
Sync Shift Pattern	1
Sync Shift Repetition M	1
TPC Source/TPC Pattern	01
Read Out Mode	Continuous

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:RESet on page 97

Copy Cell...

Copies the settings of a cell to a second cell.



"Copy From Source"

Selects the cell whose settings are to be copied.

"To Destination"

Selects the cell whose settings are to be overwritten.

"Accept"

Starts the copy process.

Remote command:

[\[:SOURCE<hw>\]:BB:TDSCdma:COPY:SOURce](#) on page 93

[\[:SOURCE<hw>\]:BB:TDSCdma:COPY:DESTination](#) on page 93

[\[:SOURCE<hw>\]:BB:TDSCdma:COPY:EXECute](#) on page 94

Predefined Settings

Access the dialog for setting predefined configurations, see [Chapter 3.7, "Predefined settings"](#), on page 32 .

Remote command:

n.a.

Test Setups/Models

Accesses the dialog for selecting one of the test models defined in the TD-SCDMA standard and the self-defined test setups.

Remote command:

[\[:SOURCE<hw>\]:BB:TDSCdma:SETTing:TMOdel](#) on page 98

Adjust Total Power to 0dB

Sets the power of an enabled channel so that the total power of all the active channels is 0 dB. This does not change the power ratio among the individual channels.

Remote command:

[\[:SOURCE<hw>\]:BB:TDSCdma:POWer:ADJust](#) on page 95

Total Power

Displays the total power of the active channels for the selected link direction.

The total power is calculated from the power ratio of the powered up code channels with modulation on. If the value is not equal to 0 dB, the individual code channels are internally adapted so that the "Total Power" for achieving the set output level is 0 dB. The power ratios are retained.

Remote command:

[\[:SOURCE<hw>\]:BB:TDSCdma:POWer\[:TOTal\]?](#) on page 95

Select Cell

Selects the cell and accesses the corresponding dialog with cell-related settings, see [Chapter 3.8, "Cell configuration"](#), on page 33.

Remote command:

n.a.

Cell On / Cell Off

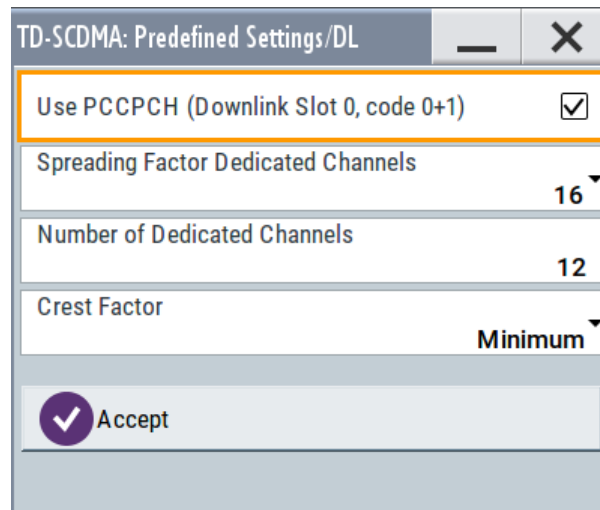
Activates or deactivates the cells.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:STATe on page 115

3.7 Predefined settings

- To access this dialog, select "TD-SCDMA > Cells > Predefined Settings".



The settings provided in this dialog depend on the link direction and apply only to cell1.

With the "Predefined Settings" function, it is possible to create highly complex scenarios with just a few keystrokes. This function is of use if, say, just the envelope of the signal is of interest.

Use PCCPCH (Downlink Slot 0, code 0+1)

(This feature is available in the downlink only.)

Selects, if P-CCPCH is used in the scenario or not.

If P-CCPCH is used, both P-CCPCHs are activated in slot 0 with spreading code 0+1.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN:PPARAmeter:PCCPch:STATe on page 112

Spreading Factor Dedicated Channels

Selects the spreading factor for the DPCHs.

The available spreading factors depend on the link direction.

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:DOWN | UP:PPARameter:DPCH:SFACTOR`

on page 112

Number of Dedicated Channels

Sets the number of activated DPCHs.

The minimum number is 1 and the maximum number depends on the spreading factor:

Max. No. DPCH = 3 x "Spreading Factor"

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:DOWN | UP:PPARameter:DPCH:COUNT` on page 111

Crest Factor

Selects the desired range for the crest factor scenario.

The crest factor of the signal is kept in the desired range by varying the distribution of the channels inside one slot and in between several slots.

"Minimum"	The crest factor is minimized. The channels are distributed uniformly over the slots and over the code domain of the individual slot.
"Average"	An average crest factor is set. The channels are distributed uniformly over the slots and successively in the code domain of the individual slot.
"Worst"	The crest factor is set to an unfavorable value (i.e. maximum). The channels are distributed in clusters over the slots and successively in the code domain of the individual slot.

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:DOWN | UP:PPARameter:DPCH:CRESt` on page 111

Accept

Presets the channel table of cell 1 with the parameters defined in the "Predefined Settings" dialog.

Remote command:

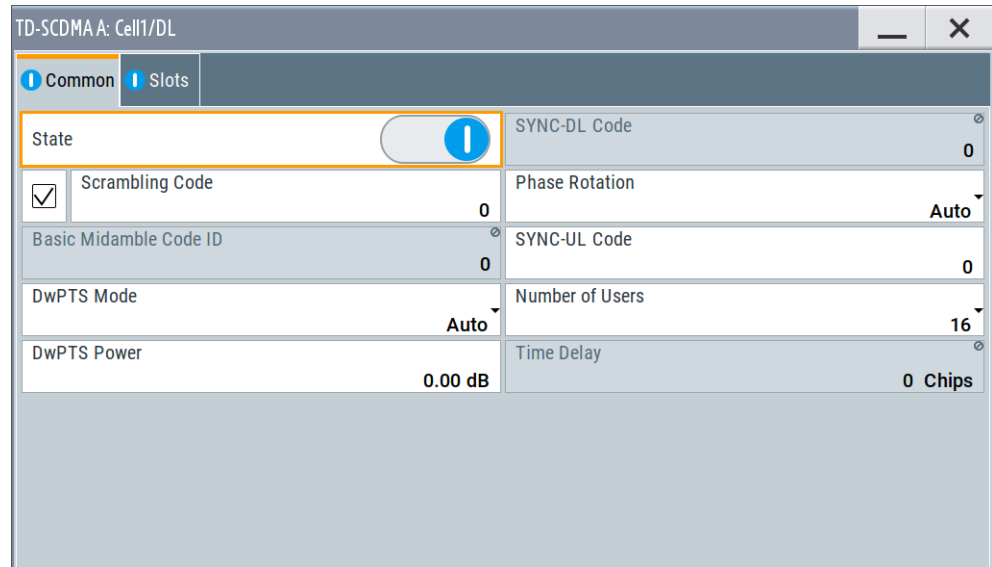
`[:SOURCE<hw>] :BB:TDSCdma:DOWN | UP:PPARameter:EXECute` on page 112

3.8 Cell configuration

The "Cell" dialog provides the parameters for configuring general cell settings, and specific slot-related settings.

3.8.1 Common settings

1. To access this dialog, select "Baseband > TD-SCDMA > Cells".
2. Select "Cell 1...Cell 4 > Common".



This dialog comprises the common parameters required for configuring the cell.

State

Activates or deactivates the selected cell.

The number of the selected cell is displayed in the dialog header.

Remote command:

[\[:SOURCE<hw>\]:BB:TDSCdma:DOWN|UP:CELL<st>:STATE](#) on page 115

Use (Scrambling Code)

Activates or deactivates the scrambling code.

The scrambling code is deactivated, for example, for test purposes.

Remote command:

[\[:SOURCE<hw>\]:BB:TDSCdma:DOWN|UP:CELL<st>:SCODE:STATE](#) on page 114

Scrambling Code

Sets the scrambling code. The scrambling code identifies the cell and is the starting value of the scrambling code generator.

The scrambling code is used for transmitter-dependent scrambling of the chip sequence. The value range is 0 to 127.

Remote command:

[\[:SOURCE<hw>\]:BB:TDSCdma:DOWN|UP:CELL<st>:SCODE](#) on page 114

Basic Midamble Code ID

Displays the basic midamble code ID of the cell.

The basic midamble code ID is derived from the scrambling code.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:MCODe?` on page 113

DwPTS Mode/ UpPTS Mode

Selects whether to use the pilot timeslot and its power or not. In "Auto" and "On", the DwPTS/UpPTS is used. This is indicated in the "Select Slot in Subframe to Configure" graph.

For details regarding the DwPTS/UpPTS, see [Chapter 2.3.2, "Dwpts and uppts"](#), on page 14.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:DWPTs:MODE` on page 113

`[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:DWPTs:STAtE?` on page 113

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:UPPTs:MODE` on page 113

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:UPPTs:STAtE?` on page 113

DwPTS Power/ UpPTS Power

Sets the power of the downlink/uplink pilot timeslot.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:UPPTs:MODE` on page 113

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:UPPTs:POWer` on page 113

`[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:DWPTs:POWer` on page 113

SYNC-DL Code

Displays the SYNC-DL code.

The SYNC-DL code is transmitted in the DwPTS (downlink pilot timeslot). It is used by the user equipment to synchronize to the base station.

The SYNC-DL code is derived from the scrambling code and the basic midamble code ID.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SDCOde?` on page 115

Phase Rotation

Selects the phase rotation for the downlink pilots.

"Auto" Sets the default phase rotation sequence according to the presence of the P-CCPCH.

"S1" There is a P-CCPCH in the next four subframes.

"S2" There is no P-CCPCH in the next four subframes.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:PROTation` on page 114

SYNC-UL Code

Sets the SYNC-UL code.

The SYNC-UL code is transmitted in the UpPTS. It is used by the base station to synchronize to the user equipment.

The SYNC-UL code is derived from the scrambling code and the basic midamble code ID.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SUCode on page 115

Number of Users

Selects the total number of users of the cell. The number of users influences the actual midamble sequence transmitted in the burst.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:USERS on page 116

Time Delay

(This feature is available for cell 2, 3, and 4 only)

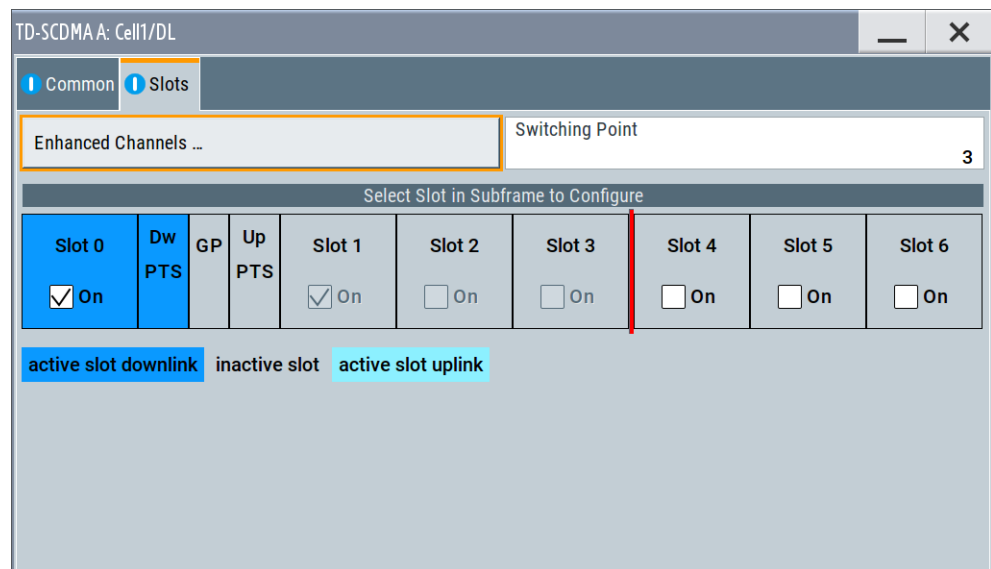
Enters the time delay of the signal of the selected cell compared to the signal of cell 1.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:TDElay on page 116

3.8.2 Slots

1. To access this dialog, select "Baseband > TD-SCDMA > Cells".
2. Select "Cell 1...Cell 4 > Slots".



In this dialog, the slots are selected for configuration.

Enhanced Channels...

(available for cell1 only)

Accesses the dialog for setting enhanced channel configurations, see [Chapter 3.9, "Enhanced channels settings"](#), on page 37.

Remote command:
n.a.

Switching Point

Sets the switching point between the uplink slots and the downlink slots in the frame.

Slot 0 is always allocated to the downlink, Slot 1 is always allocated to the uplink.

In the "Select Slot in Subframe to Configure" section, the switching point is indicated by a red bar. The slots to the left of the red bar are generated for link direction downlink, to the right of the red bar for link direction uplink. Only the slots for one link direction are active at a time, the slots of the other link direction are inactive.

The DwPTS is always active in downlink mode. The UpPTS is only active if PRACH is selected for the uplink slots.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SPOINT on page 115

Select Slot in Subframe to Configure

Displays the slots of the cell.

Active slots are highlighted blue (downlink) and green (uplink). Select a slot in the subframe to access the dialog for configuring the channels of the selected slot, see [Chapter 3.11, "Slot configuration"](#), on page 64.

Remote command:

n.a.

Slot Icon

Activates or deactivates the slot in the subframe.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:STATE on page 142

GP (Guard Period)

The base station sends 16 chips of GP in each subframe and is inserted between the DwPTS and UpPTS in each subframe. The GP is used to avoid the multipath interference.

Remote command:

n.a.

3.9 Enhanced channels settings

The "Enhanced Channels Settings" dialog provides the parameters required for configuring the enhanced state of the channel. The selected link direction determines the provided channel:

- For "Downlink / Forward" direction, the Broadcast Channels (BCH) parameters are provided
- For "Uplink / Reverse" direction, the Dedicated Channel (DCH) settings.

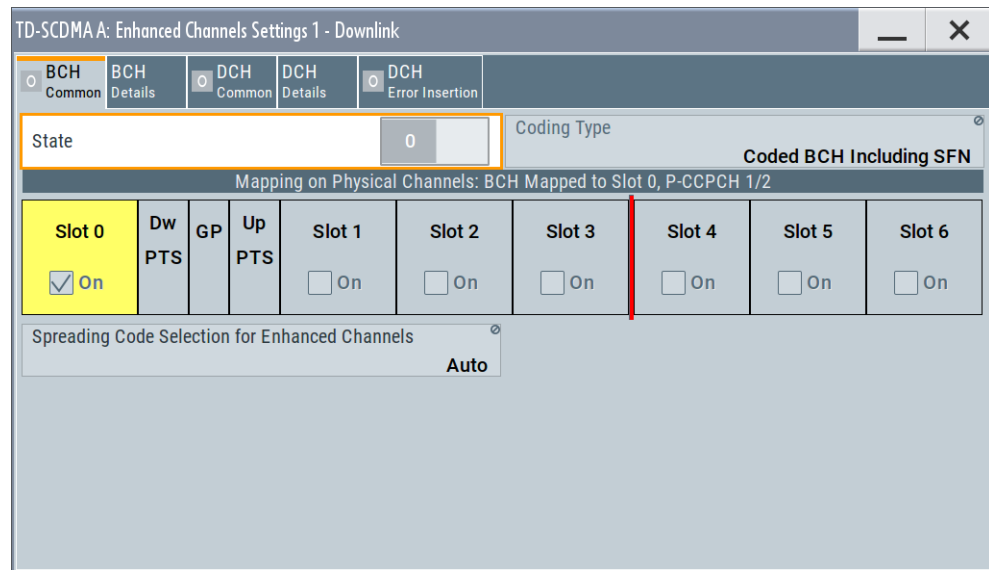
All further parameters are available for both link directions.

- [Broadcast channels \(BCH\) common settings](#)..... 38
- [Broadcast channels \(BCH\) details settings](#).....39
- [Dedicated channels \(DCH\) common settings](#)..... 40
- [Dedicated channels \(DCH\) details settings](#).....43
- [Transport channel](#)..... 45
- [RMC PLCCH channel settings](#).....48
- [RMC HS-SICH channel settings](#)..... 49
- [Bit and block error insertion](#)..... 50

3.9.1 Broadcast channels (BCH) common settings

Access:

1. Select "TD-SCDMA > General > Link Direction > Downlink / Forward"
2. In the "Cells" tab, select "Cell 1".
3. In the "Slots" tab, select "Enhanced Channels > BCH Common".



The "Broadcast Channels (BCH)" tab contains the common settings for configuring and activating the enhanced state of the channel.

State (BCH)

Activates or deactivates P-CCPCH 1/2 channel coding.

When activated, Slot 0 is active with P-CCPCH 1 and 2 switched on. The data source is fixed to BCH.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:STATE on page 131

Coding Type (BCH)

Displays the coding scheme.

The coding scheme of P-CCPCH (BCH) is specified in the standard. The channel is generated automatically with the counting system frame number (SFN). The system information after the SFN field is provided by the selected data source.

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:TYPE?` on page 132

Mapping On Physical Channels: BCH mapped to <Slot> 0, P-CCPCH1/2

Displays the slots of Cell 1 used to transmit the broadcast channels. For BCH, Slot 0 is always used.

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:SLOTstate<ch0>?`
on page 131

Spreading Code Selection (BCH)

Selects if the spreading code of the channels is set automatically or manually. For BCH, the spreading code is always set to "Auto" as the spreading code for the P-CCPCH is defined by the standard.

Remote command:

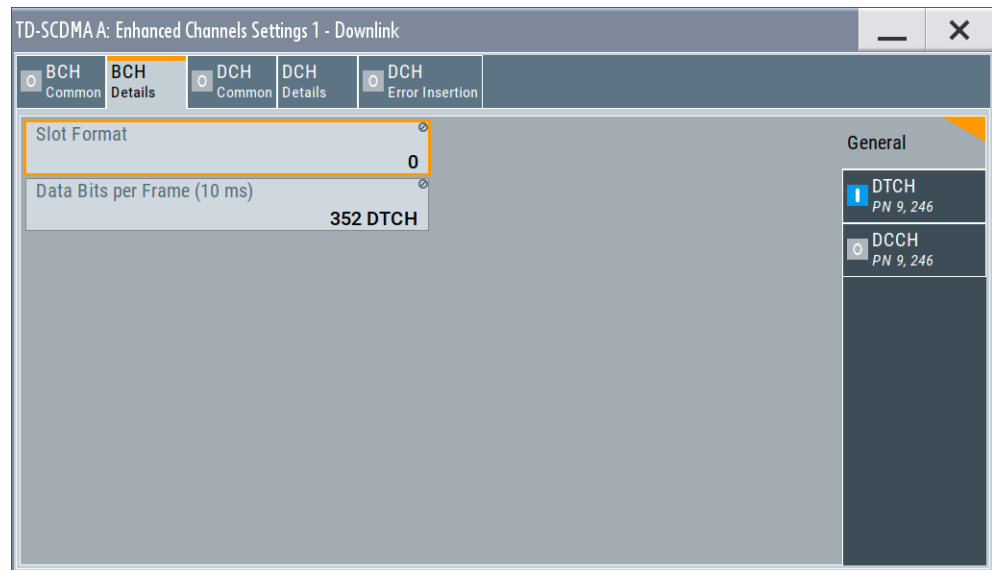
`[:SOURCE<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:SCSMode?`
on page 130

3.9.2 Broadcast channels (BCH) details settings

Access:

1. Select "TD-SCDMA > General > Link Direction > Downlink / Forward"
2. In the "Cells" tab, select "Cell 1".

- In the "Slots" tab, select "Enhanced Channels > BCH Details".



This dialog comprises the detailed settings required for BCH configuration.

Slot Format

Displays the slot format of the selected channel.

A slot format defines the complete structure of a slot made of data and control fields. The slot format depends on the coding type selected.

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:SFormat?`
on page 131

Data Bits Per Frame (10 ms)

Displays the data bits in the DPDCH component of the DPCH frame at physical level. The value depends on the slot format.

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:BPFrame?`
on page 127

3.9.3 Dedicated channels (DCH) common settings

Access:

- Select "TD-SCDMA > General > Link Direction > Downlink / Forward"
- In the "Cells" tab, select "Cell 1".

3. In the "Slots" tab, select "Enhanced Channels > DCH Common".

Slot 0	Dw PTS	GP	Up PTS	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
<input type="checkbox"/> On				<input type="checkbox"/> On	<input type="checkbox"/> On	<input type="checkbox"/> On	<input checked="" type="checkbox"/> On	<input checked="" type="checkbox"/> On	<input type="checkbox"/> On

The "Dedicated Channels (BCH)" tab contains the general settings for configuring and activating the enhanced state of the channel.

State (DCH)

Activates or deactivates DCH channel coding.

When the state is set to On, it activates the slots selected in the "Mapping On..." graph below. The number and configuration of the DPCHs is defined by the selected coding type. State and slot format of the channels are preset. The data source is fixed to DCH.

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:STATE
on page 126
```

Coding Type

Selects the channel coding.

The current TD-SCDMA specification defines four reference measurement channel (RMC) in the uplink. There are five measurement channel coding types in the downlink, which differ in the input data bit rate to be processed.

Also, special RMCs are defined for HSDPA, HSUPA, HS-SICH and PLCCH.

Select one of the predefined downlink RMCs to preconfigure the settings for UE tests according to 3GPP TS25.102, annex A.2.

Select one of the predefined uplink RMCs to preconfigure the settings for BS tests according to 3GPP TS25.142, annex A.

The selected coding type defines the number of slots selected in section "Mapping On Physical Channels: Select Slots To Use".

"RMC 12.2 kbps" Downlink/uplink 12.2 kbps measurement channel.

Note: If RMC12K2, RMC64K, RMC144K, or RMC384K are selected for the uplink, they are automatically converted to UP_RMCxxx.

"RMC 64 kbps"	Downlink/uplink 64 kbps measurement channel
"RMC 144 kbps"	Downlink/uplink 144 kbps measurement channel
"RMC 384 kbps"	Downlink/uplink 384 kbps measurement channel
"RMC 2048 kbps"	Downlink 2048 kbps measurement channel
"RMC PLCCH"	Downlink RMC PLCCH channel (see RMC PLCCH channel settings).
"HSDPA"	(downlink only) HSDPA reference measurement channel (see Chapter 3.10, "HSDPA/HSUPA settings" , on page 52).
"RMC HS-SICH"	Uplink RMC for transport channel HS-SICH (see Chapter 3.9.7, "RMC HS-SICH channel settings" , on page 49)
"HSUPA"	(uplink only) HSUPA reference measurement channel (see Chapter 3.10, "HSDPA/HSUPA settings" , on page 52).
"User"	The channel settings are user-definable

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:TYPE on page 127

Resource Units On Physical Layer

Displays the resource units on the physical layer needed to generate the selected channel.

The table below gives an overview of the used resource units (RU) depending on the selected *Coding Type*. The used "Number of Time Slots" and "Number of Channels" is also displayed by the corresponding parameters.

RMC	Resources units allocated	Description	Transport channels
Downlink			
RMC 12.2 Kbps	1TS (2*SF16) = 2RU/5ms	1 slot with 2 code channels using spreading factor 16	1DTCH + 1DCCH
RMC 64 Kbps	1TS (8*SF16) = 8RU/5ms	1 slot with 8 code channels using spreading factor 16	1DTCH + 1DCCH
RMC 144 Kbps	2TS (8*SF16) = 16RU/5ms	2 slots with 8 code channels using spreading factor 16	1DTCH + 1DCCH
RMC 384 Kbps	4TS (10*SF16) = 40RU/5ms	4 slots with 10 code channels using spreading factor 16	1DTCH + 1DCCH
RMC 2048 kbps	5TS (1*SF1) = 80RU/5ms (8PSK)	5 slots with 1 code channel using spreading factor 1	1DTCH + 1DCCH
RMC-PLCCH	1TS (1*SF16) = 1RU/5ms (QPSK)	1 slot with 1 code channel using spreading factor 16	1DTCH
Uplink			

RMC	Resources units allocated	Description	Transport channels
RMC 12.2 Kbps	1TS (1*SF8) = 2RU/5ms	1 slot with 1 code channel using spreading factor 8	1DTCH + 1DCCH
RMC 64 Kbps	1TS (1*SF2) = 8RU/5ms	1 slot with 1 code channel using spreading factor 2	1DTCH + 1DCCH
RMC 144 Kbps	2TS (1*SF2) = 16RU/5ms	2 slots with 1 code channel using spreading factor 2	1DTCH + 1DCCH
RMC 384 Kbps	4TS (1*SF2 + 1*SF8) = 40RU/5ms	4 slots with 2 code channel using spreading factor 2 and 8	1DTCH + 1DCCH
RMC HS-SICH	1TS (1*SF16) = 1RU/5ms	1 slot with 1 code channel using spreading factor 16	

See "[RMC Configuration](#)" on page 53 and "[E-DCH Fixed Reference Channel \(FRC\)](#)" on page 55 for an overview of the used resources units in HSDPA and HSUPA mode respectively.

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:DOWN | UP:CELL<st>:ENH:DCH:RUPLayer?
```

on page 125

Mapping On Physical Channels: Select Slots To Use

Displays the slots of Cell 1. The slots used to transmit the transport channel are highlighted.

The number of slots is determined by the selected coding type. If a slot is deactivated, another slot is activated automatically to keep the number of activated slots unchanged.

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:DOWN | UP:CELL<st>:ENH:DCH:SLOTstate<ch>
```

on page 126

Spreading Code Selection for Enhanced Channels

Selects the spreading code selection mode for the used transport channels.

"User" The spreading codes can be set manually.

"Auto" The spreading codes are distributed evenly over the slot domains to ensure the minimum crest factor.

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:DOWN | UP:CELL<st>:ENH:DCH:SCSMode
```

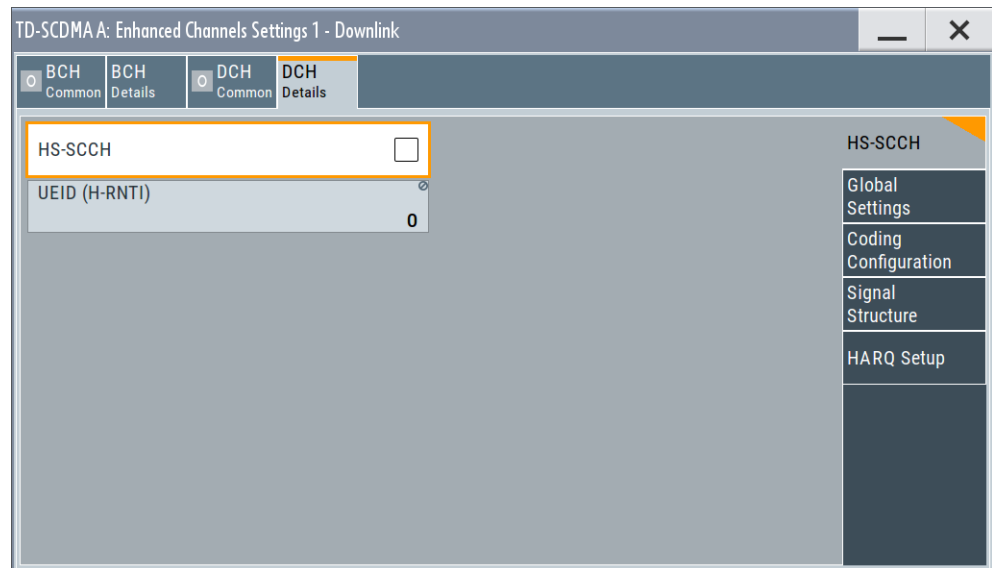
on page 126

3.9.4 Dedicated channels (DCH) details settings

Access:

1. Select "TD-SCDMA > General > Link Direction > Downlink / Forward".

2. In the "Cells" tab, select "Cell 1".
3. In the "Slots" tab, select "Enhanced Channels > DCH Details".



This dialog comprises the detailed settings required for DCH configuration.

Number of Timeslots (DCH)

Sets the number of timeslots to be used.

The initial value is preset according to the selected [Coding Type](#).

Remote command:

```
[ :SOURce<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:TSCount
on page 127
```

Number of Channels (DCH)

Sets the number of channels to be used.

The initial value is preset according to the selected [Coding Type](#).

Remote command:

```
[ :SOURce<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:CCOUNT
on page 121
```

Slot Format

Displays the slot format of the selected channel.

A slot format defines the complete structure of a slot made of data and control fields. The slot format depends on the coding type selected.

Remote command:

```
[ :SOURce<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:SFORmat?
on page 126
```

Data Bits Per Frame (10 ms)

Displays the data bits in the DPDCH component of the DPCH frame at physical level. The value depends on the slot format.

Remote command:

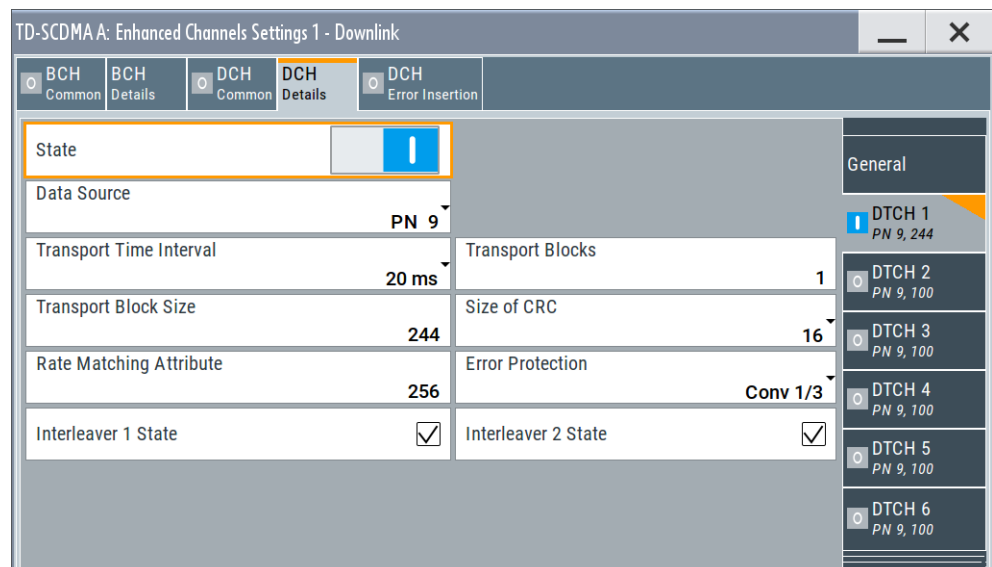
[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:BPFrame?

on page 121

3.9.5 Transport channel

Access:

1. Select "TD-SCDMA > General > Link Direction > Downlink / Forward"
2. In the "Cells" tab, select "Cell 1".
3. In the "Slots" tab, select:
 - a) "Enhanced Channels > BCH Details" or
 - b) "Enhanced Settings > DCH Details".
4. Select "DTCH".



This dialog comprises the detailed settings required for configuring the transport channels (TCHs).

The most important parameters of the TCH are displayed (transport block size and data source).

State

Displays the transport channel state.

Note: For BCH, only the DTCH component is active.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:STATE on page 124

Data Source

Selects the data source for the transport channel.

The following standard data sources are available:

- "All 0, All 1"
An internally generated sequence containing 0 data or 1 data.
- "PNxx"
An internally generated pseudo-random noise sequence.
- "Pattern"
An internally generated sequence according to a bit pattern.
Use the "Pattern" box to define the bit pattern.
- "Data List/Select DList"
A binary data from a data list, internally or externally generated.
Select "Select DList" to access the standard "Select List" dialog.
 - Select the "Select Data List > navigate to the list file *.dm_iqd > Select" to select an existing data list.
 - Use the "New" and "Edit" functions to create internally new data list or to edit an existing one.
 - Use the standard "File Manager" function to transfer external data lists to the instrument.

See also:

- Section "Modulation Data" in the R&S SMBV100B user manual.
- Section "File and Data Management" in the R&S SMBV100B user manual.
- Section "Data List Editor" in the R&S SMBV100B user manual

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:DATA`

on page 128

`[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:DATA` on page 122

`[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:DATA:DSElect` on page 128

`[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:DATA:DSElect` on page 122

`[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:DATA:PATtern` on page 129

`[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:DATA:PATtern` on page 123

Transport Time Interval

Displays the number of frames into which a TCH is divided. This setting also defines the interleaver depth.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:TTInterval?`

on page 130

`[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:TTInterval` on page 125

Transport Blocks

Displays the number of transport blocks for the TCH.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:TBCount?

on page 130

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:TBCount on page 124

Transport Block Size

Displays the size of the transport block at the channel coding input.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:TBSize?

on page 130

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:TBSize on page 125

Size Of CRC

Displays the type (length) of the CRC.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:CRCSize?

on page 127

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:CRCSize on page 121

Rate Matching Attribute

Displays the rate matching.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:RMATtribute?

on page 129

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:RMATtribute on page 124

Error Protection

Displays the error protection.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:EProtection?

on page 129

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:EProtection on page 123

Interleaver 1 State

Activates or deactivates the channel coding interleaver state 1 of the transport channel. Interleaver state 1 can be set independently in each TCH. Activation does not change the symbol rate.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:IONE

on page 123

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:IONE on page 124

Interleaver 2 State

Activates or deactivates the channel coding interleaver state 2 off all the transport channels. Interleaver state 2 can only be set for all the TCHs together. Activation does not change the symbol rate.

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:ITWO
```

on page 123

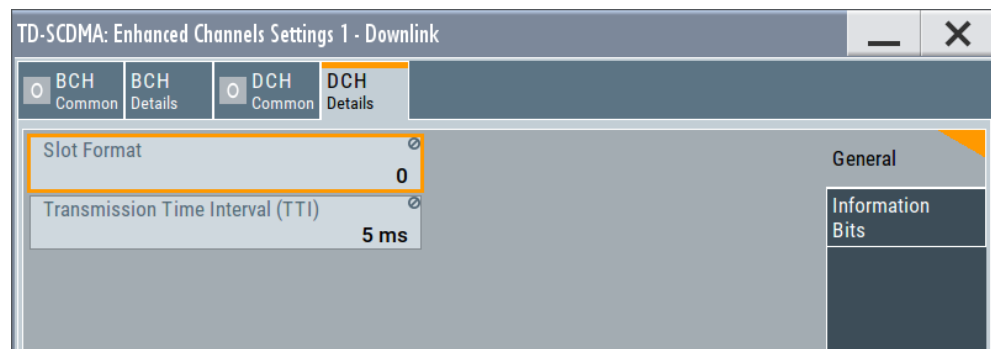
```
[ :SOURCE<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:ITWO
```

on page 124

3.9.6 RMC PLCCH channel settings

Access:

1. Select "TD-SCDMA > General > Link Direction > Downlink / Forward".
2. In the "Cells" tab, select "Cell 1".
3. In the "Slots" tab, select "Enhanced Channels > DCH Common".
4. Select "Coding Type > RMC PLCCH".
5. Select "DCH Details".



6. Select "Information Bits".

This dialog comprises the detailed settings required for DCH configuration of the RMC PLCCH channel.

Transmission Time Interval (TTI)

Displays the transmission time interval.

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:PLCCh:TTInterval?
```

on page 118

Number of Sync Shift&TPC Information Bits

Displays the number of information bits used for sync shift and TPC. The RMC PLCCH does not contain data bits.

Remote command:
n.a.

Sync Shift Pattern

Sets the sync shift pattern. The pattern length is 21 bits.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:PLCCh:SSPattern
on page 117

TPC Pattern

Sets the TPC pattern. The pattern length is 21 bits.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:PLCCh:TPCPattern
on page 118

Repetition Encoder

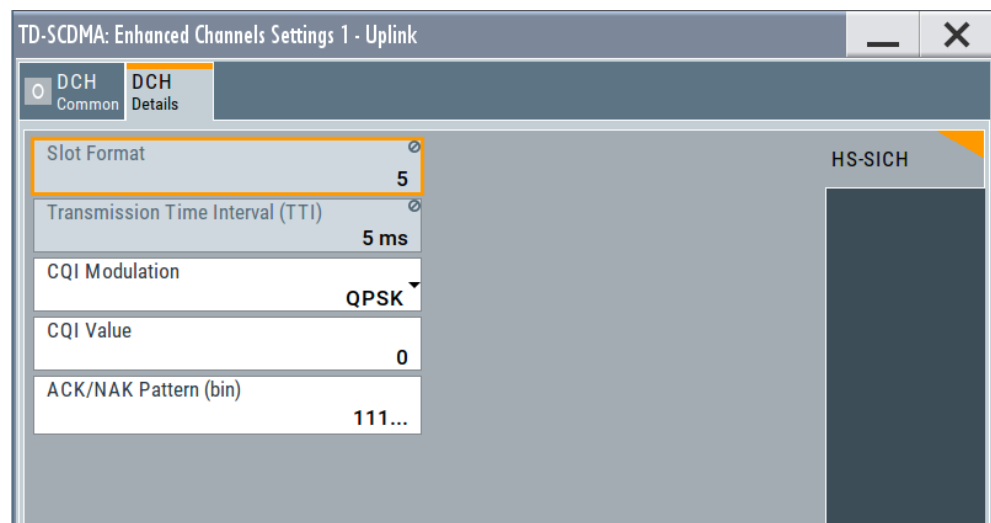
Displays the state of the repetition encoder.

Remote command:

n.a.

3.9.7 RMC HS-SICH channel settings

1. To access this dialog select "TD-SCDMA > General > Link Direction" > **"Uplink / Reverse"**
2. In the "Cells" tab, select "Cell 1".
3. In the "Slots" tab, select "Enhanced Channels > DCH Common".
4. Select "Coding Type > RMC HS-SICH".
5. Select "DCH Details"



This dialog comprises the detailed settings required for DCH configuration of the RMC HS-SICH channel.

Transmission Time Interval (TTI) – RMC HS-SICH

Displays the transmission time interval.

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSICH:TTInterval?  
on page 119
```

CQI Modulation

Sets the CQI modulation.

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSICH:CQI:  
MODulation on page 119
```

CQI Value

Sets the CQI value.

With the CQI (Channel quality indicator), the user equipment informs the base station about the received quality of downlink HS-PDSCH. Thus the base station can adapt the modulation and coding scheme to improve the signal quality.

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSICH:CQI:VALue  
on page 119
```

ACK/NAK Pattern

Sets the ACK/NAK pattern. The pattern has a maximal length of 36 bits; a "1" corresponds to ACK, a "0" to NAK.

Remote command:

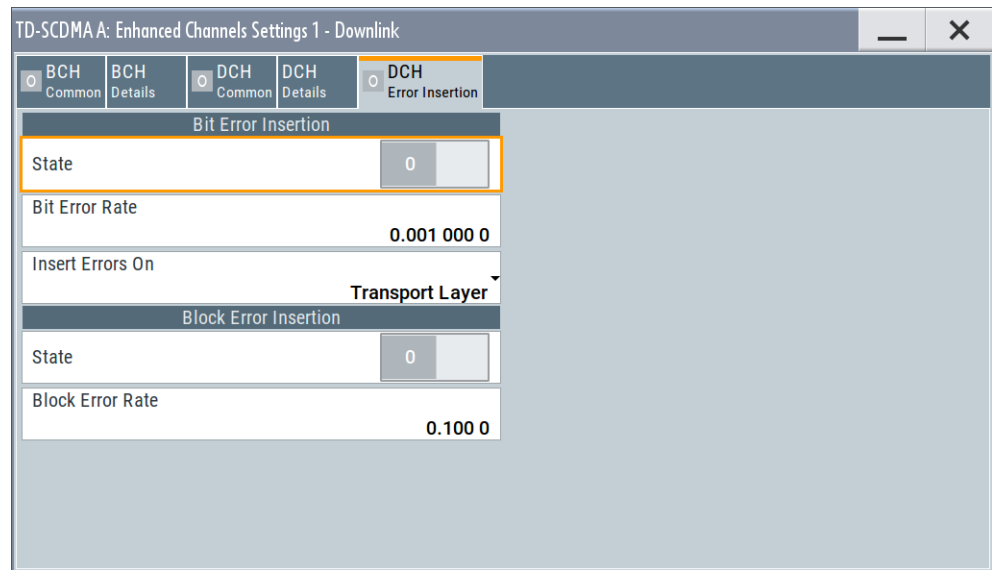
```
[ :SOURCE<hw> ] :BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSICH:ANPattern  
on page 118
```

3.9.8 Bit and block error insertion

Access:

1. Select "TD-SCDMA > Cells > Cell 1".

2. In the "Slots" tab, select "Enhanced Channels > DCH Error Insertion".



In this dialog, the bit error and the block error simulation are configured and activated.

State (Bit Error)

Activates or deactivates bit error generation.

Bit errors are inserted into the data fields of the enhanced channels. If channel coding is active, it is possible to select the layer in which the errors are inserted (physical or transport layer).

When the data source is read out, individual bits are inverted at random points in the data bitstream at the specified error rate to simulate an invalid signal.

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:BIT:STATE`
on page 120

Bit Error Rate

Enters the bit error rate.

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:BIT:RATE`
on page 120

Insert Errors On

Selects the layer in the coding process at which bit errors are inserted.

"Transport Layer"

Bit errors are inserted in the transport layer.
This selection is only available if channel coding is active.

"Physical Layer"

Bit errors are inserted in the physical layer.

Remote command:

```
[ :SOURce<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:BIT:LAYer  
on page 120
```

State (Block Error)

Activates or deactivates block error generation.

The CRC checksum is determined and then the last bit is inverted at the specified error probability to simulate an invalid signal.

Remote command:

```
[ :SOURce<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:BLOCK:STATe  
on page 121
```

Block Error Rate

Enters the block error rate.

Remote command:

```
[ :SOURce<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:BLOCK:RATE  
on page 120
```

3.10 HSDPA/HSUPA settings

The HSDPA settings are available in downlink transmission direction and "Coding Type > HSDPA".

The HSUPA settings are available in uplink transmission direction and "Coding Type > HSUPA".

3.10.1 HSDPA settings

Access:

1. Select "TD-SCDMA > General > Link Direction > Downlink / Forward"
2. In the "Cells" tab, select "Cell x".
3. In the "Slots" tab, select "Enhanced Channels > DCH Common".

4. Select "Coding Type > HSDPA"

TD-SCDMA A: Enhanced Channels Settings 1 - Downlink

BCH Common | BCH Details | **DCH Common** | DCH Details

State: 0 | Coding Type: HSDPA

RMC Configuration: H-RMC 0.5 Mbps (QPSK) | Resource Units on Physical Layer: 2 TS (10 * SF 16)

Mapping on Physical Channels: Select Slots To Use

Slot 0	Dw PTS	GP	Up PTS	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
<input type="checkbox"/> On				<input type="checkbox"/> On	<input type="checkbox"/> On	<input type="checkbox"/> On	<input checked="" type="checkbox"/> On	<input checked="" type="checkbox"/> On	<input type="checkbox"/> On

Spreading Code Selection for Enhanced Channels: Auto

The settings can be configured in the "DCH Details" dialog. The settings are divided into several sections, which are described below.

RMC Configuration

(HSDPA only)

Enables a predefined set of RMC channels or fully configurable user mode, see [Table 3-1](#).

Table 3-1: RMC configurations

RMC Config.	Modulation	Resources units allocated	Description	Transport channels
H-RMC 0.5 Mbps	QPSK	2TS (10*SF16) = 20RU/5ms	2 slots with 10 code channels using spreading factor 16	1H-DTCH
H-RMC 1.1 Mbps	QPSK	2TS (10*SF16) = 20RU/5ms	2 slots with 10 code channels using spreading factor 16	1H-DTCH
	16QAM	2TS (12*SF16) = 24RU/5ms	2 slots with 12 code channels using spreading factor 16	1H-DTCH
H-RMC 1.6 Mbps	QPSK	3TS (10*SF16) = 30RU/5ms	3 slots with 10 code channels using spreading factor 16	1H-DTCH
	16QAM	3TS (12*SF16) = 36RU/5ms	3 slots with 12 code channels using spreading factor 16	1H-DTCH
H-RMC 2.2 Mbps	QPSK	4TS (10*SF16) = 40RU/5ms	4 slots with 10 code channels using spreading factor 16	1H-DTCH

RMC Config.	Modulation	Resources units allocated	Description	Transport channels
	16QAM	4TS (12*SF16) = 48RU/5ms	4 slots with 12 code channels using spreading factor 16	1H-DTCH
H-RMC 2.8 Mbps	QPSK	5TS (10*SF16) = 50RU/5ms	5 slots with 10 code channels using spreading factor 16	1H-DTCH
	16QAM	5TS (12*SF16) = 50RU/5ms	5 slots with 12 code channels using spreading factor 16	1H-DTCH
H-RMC 64QAM	64QAM (Category 16UE)	3TS (14*SF16) = 42RU/5ms	3 slots with 14 code channels using spreading factor 16	1H-DTCH
	64QAM (Category 19UE)	5TS (14*SF16) = 70RU/5ms	5 slots with 14 code channels using spreading factor 16	1H-DTCH
	64QAM (Category 22UE)	5TS (14*SF16) = 70RU/5ms	5 slots with 14 code channels using spreading factor 16	1H-DTCH
User	-	-	-	-

Several parameters are automatically set, depending on the selected RMC.

However, it is also possible to change these parameters.

In this case, the value of the parameter "RMC Configuration" is automatically set to "User".

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:RMC
```

on page 150

3.10.2 HSUPA settings

Access:

1. Select "TD-SCDMA > General > Link Direction > Uplink / Reverse"
2. In the "Cells" tab, select "Cell x".
3. In the "Slots" tab, select "Enhanced Channels > DCH Common".

4. Select "Coding Type > HSUPA".

TD-SCDMA: Enhanced Channels Settings 1 - Uplink

DCH Common | DCH Details

State: 0 | Coding Type: HSUPA

E-DCH Fixed Reference Channel (FRC): 1 | Resource Units on Physical Layer: 2 TS (1 * SF 4)

Mapping on Physical Channels: Select Slots To Use

Slot 0	Dw PTS	GP	Up PTS	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
<input type="checkbox"/> On				<input checked="" type="checkbox"/> On	<input checked="" type="checkbox"/> On	<input type="checkbox"/> On	<input type="checkbox"/> On	<input type="checkbox"/> On	<input type="checkbox"/> On

Spreading Code Selection for Enhanced Channels: Auto

The settings can be configured in the "DCH Details" dialog. The settings are divided into several sections, which are described below.

E-DCH Fixed Reference Channel (FRC)

(HSUPA only)

Selects a predefined E-DCH fixed reference channel or fully configurable user mode, see [Table 3-2](#).

Table 3-2: FRC configurations

FRC	Modulation	Resources units allocated	Description	Transport channels
1	QPSK	2TS(1*SF4) =2RU/5ms	2 slots with 1 code channel using spreading factor 4	1DTCH
2	QPSK	2TS(1*SF2) =2RU/5ms	2 slots with 1 code channel using spreading factor 2	1DTCH
3	16QAM	3TS(1*SF2) =3RU/5ms	3 slots with 1 code channel using spreading factor 2	1DTCH
4	16QAM	4TS(1*SF1) =2RU/5ms	4 slots with 1 code channel using spreading factor 1	1DTCH
User	-	-	-	-

Several settings are preconfigured according to the selected FRC.

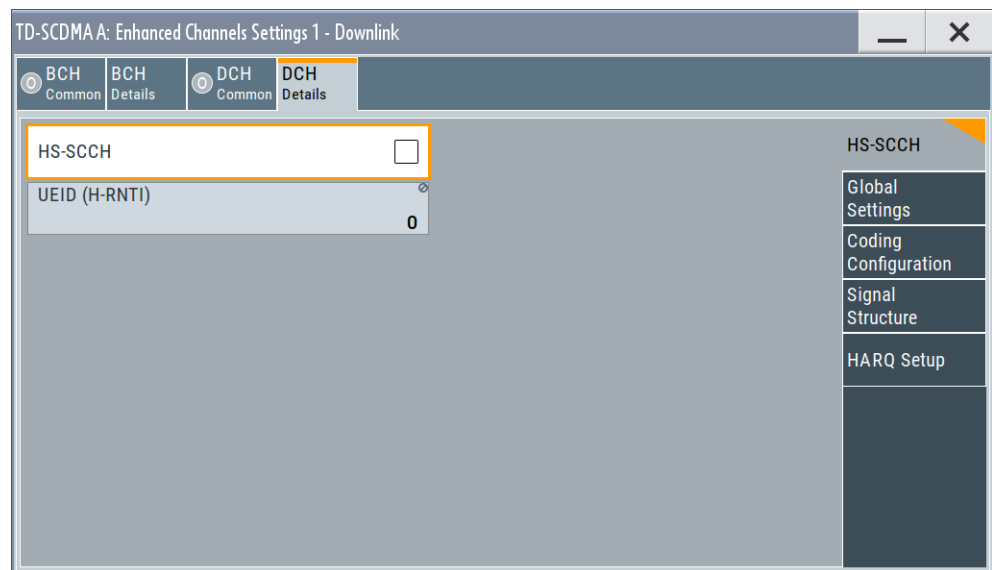
Remote command:

[:SOURCE<hw>] :BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:FRC on page 153

3.10.3 HS-SCCH settings (HSDPA)

Access:

1. Select "TD-SCDMA > General > Link Direction > Downlink / Forward"
2. In the "Cells" tab, select "Cell x".
3. In the "Slots" tab, select "Enhanced Channels > DCH Common".
4. Select "Coding Type > HSDPA".
5. Select "DCH Details".



HS-SCCH State

(HSDPA only)

Enables/disables the HS-SCCH.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:SCCH`
on page 151

UEID (H-RNTI)

(HSDPA only)

Sets the UE identity which is the HS-DSCH Radio network identifier(H-RNTI) defined in 3GPP TS25.331, "Radio resource control (RRC); Protocol Specification".

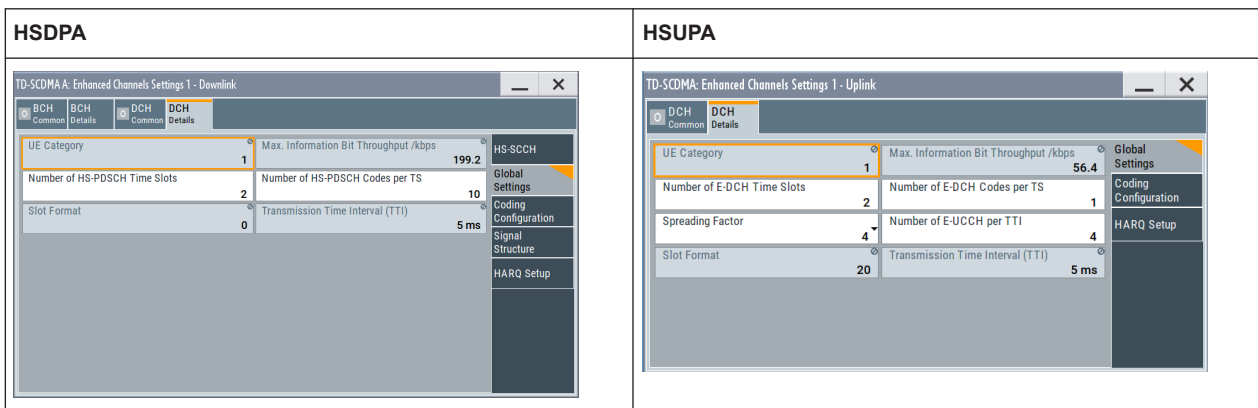
Remote command:

`[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:UEID`
on page 152

3.10.4 Global settings

Access:

1. Select "TD-SCDMA > General > Link Direction > Downlink / Forward"
2. In the "Cells" tab, select "Cell x".
3. In the "Slots" tab, select "Enhanced Channels > DCH Common".
4. Select "Coding Type > HSDPA".
5. Select "DCH Details > Global Settings".



UE Category

Displays the UE category that is minimum required to receive the selected RMC or FRC.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN | UP:CELL<st>:ENH:DCH:HSDPA | HSUPA:UECategory? on page 160

Maximum Information Bit Throughput /kbps

Displays maximum information bits sent in each TTI before coding.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN | UP:CELL<st>:ENH:DCH:HSDPA | HSUPA:MI BT? on page 157

Number of HS-PDSCH/E-DCH Timeslots

Sets the number of timeslots.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN | UP:CELL<st>:ENH:DCH:HSDPA | HSUPA:TSCo unt on page 160

Number of HS-PDSCH/E-DCH Codes per TS

Sets the number of physical channels per timeslot.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:CTSCount on page 155

Spreading Factor (FRC)

(HSUPA only)

Selects the spreading factor for the FRC.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:SFACTOR on page 154

Number of E-UCCH per TTI

(HSUPA only)

Sets the number of E-UCCH channels per TTI.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:EUCTTI on page 152

Slot Format

Displays the slot format of the selected channel.

A slot format defines the complete structure of a slot made of data and control fields. The slot format depends on the coding type selected.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:SFORMAT? on page 159

Transmission Time Interval (TTI)

Displays the transmission time interval (TTI).

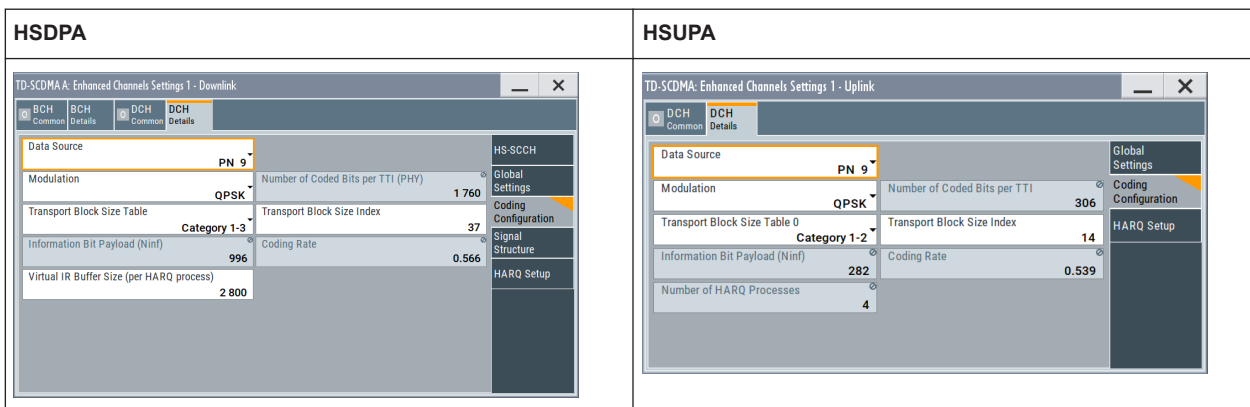
Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:TTIINTERVAL? on page 160

3.10.5 Coding configuration

Access:

1. Select "TD-SCDMA > General > Link Direction > Downlink / Forward"
2. In the "Cells" tab, select "Cell x".
3. In the "Slots" tab, select "Enhanced Channels > DCH Common".
4. Select "Coding Type > HSDPA".
5. Select "DCH Details > Coding Configuration".



Data Source

Selects the data source for the HSDPA/HSUPA channels.

The following standard data sources are available:

- "All 0, All 1"
An internally generated sequence containing 0 data or 1 data.
- "PNxx"
An internally generated pseudo-random noise sequence.
- "Pattern"
An internally generated sequence according to a bit pattern.
Use the "Pattern" box to define the bit pattern.
- "Data List/Select DList"
A binary data from a data list, internally or externally generated.
Select "Select DList" to access the standard "Select List" dialog.
 - Select the "Select Data List > navigate to the list file *.dm_iqd > Select" to select an existing data list.
 - Use the "New" and "Edit" functions to create internally new data list or to edit an existing one.
 - Use the standard "File Manager" function to transfer external data lists to the instrument.

See also:

- Section "Modulation Data" in the R&S SMBV100B user manual.
- Section "File and Data Management" in the R&S SMBV100B user manual.
- Section "Data List Editor" in the R&S SMBV100B user manual

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:DOWN | UP:CELL<st>:ENH:DCH:HSDPA | HSUPA:DATA` on page 155

`[:SOURce<hw>] :BB:TDSCdma:DOWN | UP:CELL<st>:ENH:DCH:HSDPA | HSUPA:DATA:PATtern` on page 156

`[:SOURce<hw>] :BB:TDSCdma:DOWN | UP:CELL<st>:ENH:DCH:HSDPA | HSUPA:DATA:DSElect` on page 156

Modulation

Sets the modulation scheme for each HSDPA RMC or HSUPA FRC.

64QAM is not available for the HSUPA FRCs.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:MODulation on page 157

Number of Coded Bits Per TTI

Displays the number of bits after coding.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:NCBTti? on page 158

Transport Block Size Table

(HSDPA only)

Sets the transport block size table, according to the specification 3GPP TS 25.321.

The values available depend on the selected modulation.

Modulation	TBS Table	
	Downlink	Uplink
QPSK	category [1, 3] category [4, 6] category [7, 9] category [10,12] category [13, 15] category [16, 18] category [19, 21] category [22, 24]	category [1, 2] category [3, 6]
16QAM	category [4, 6] category [7, 9] category [10,12] category [13, 15] category [16, 18] category [19, 21] category [22, 24]	category [1, 2] category [3, 6]
64QAM	category [16, 18] category [19, 21] category [22, 24]	-

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:TBS:TABLE on page 151

Transport Block Size Table 0

(HSUPA only)

Sets the transport block size table, according to the specification 3GPP TS 25.321, annex BC.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:TBS:TABLE
on page 154

Transport Block Size Index

Selects the index for the corresponding table, as described in 3GPP TS 25.321.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
TBS:INDEX on page 159

Information Bit Payload (Ninf)

Displays the payload of the information bit. i.e. transport block size. This value determines the number of transport layer bits sent in each TTI before coding.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
BPAYload? on page 154

Coding Rate

Displays the resulting coding rate.

The coding rate is calculated as a relation between the Information Bit Payload and "Number of Coded Bits per TTI".

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
CRATE? on page 155

Virtual IR Buffer Size (Per HARQ process)

(HSDPA only)

Sets the size of the virtual IR buffer.

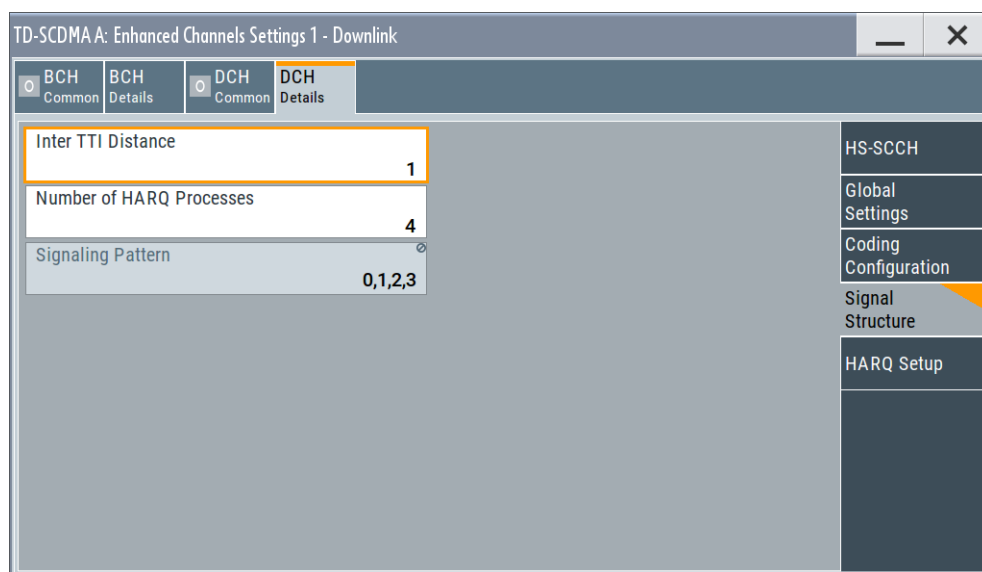
Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:VIBSize
on page 152

3.10.6 Signal structure

Access:

1. Select "TD-SCDMA > General > Link Direction > Downlink / Forward"
2. In the "Cells" tab, select "Cell x".
3. In the "Slots" tab, select "Enhanced Channels > DCH Common".
4. Select "Coding Type > HSDPA".
5. Select "DCH Details > Signal Structure".



Inter TTI Distance

(HSDPA only)

Sets the inter-TTI distance. This is the distance between two packets in HSDPA packet mode and determines whether data is sent each TTI or there is a DTX transmission in some of the TTIs.

An "Inter TTI Distance" of 1 means continuous generation.

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:TTIDistance`
on page 152

Number of HARQ Processes

Sets the number of HARQ processes. This value determines the distribution of the payload in the subframes and depends on the "Inter TTI Distance".

A minimum of three HARQ Processes are required to achieve continuous data transmission.

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
HARQ:LENGTH` on page 156

Signaling Pattern

Displays the distribution of packets over time.

The "Signaling Pattern" displays a HARQ-Process cycle and is a sequence of HARQ-IDs and "-". An HARQ-ID indicates a packet, a "-" indicates no packet. The signaling pattern is cyclically repeated.

Long signaling patterns with regular repeating groups of HARQ-ID and "-" are not displayed completely. The displayed signaling pattern is shortened but the scheduling is performed according to the selected "Inter TTI Distance". Long signaling patterns with irregularity in the HARQ-ID and "-" groups are displayed completely.

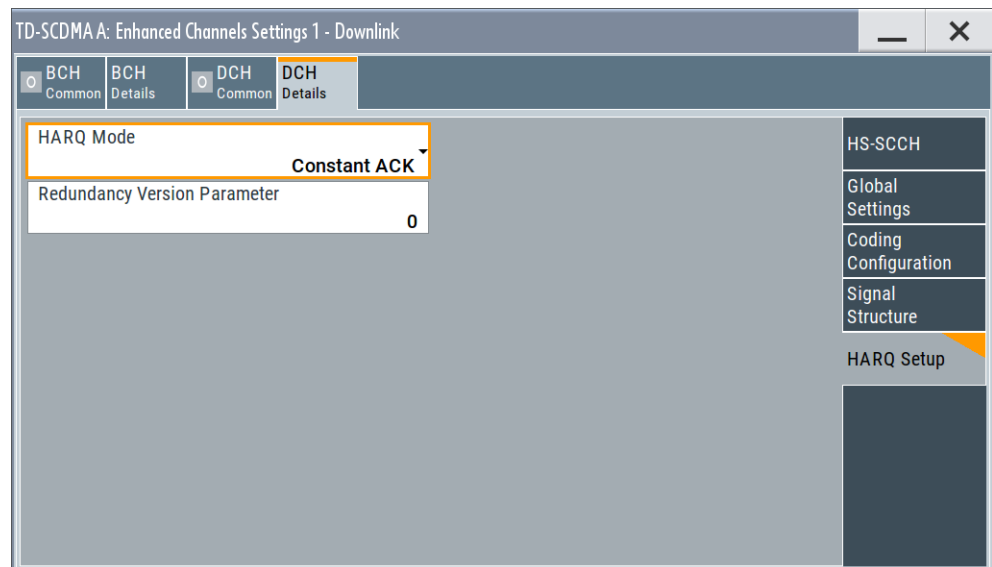
Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:SPATtern?
on page 151

3.10.7 HARQ setup

Access:

1. Select "TD-SCDMA > General > Link Direction > Downlink / Forward"
2. In the "Cells" tab, select "Cell x".
3. In the "Slots" tab, select "Enhanced Channels > DCH Common".
4. Select "Coding Type > HSDPA".
5. Select "DCH Details > HARQ Setup".



HARQ Mode

Sets the HARQ simulation mode.

"Constant ACK"	New data is used for each new TTI. This mode is used to simulate maximum throughput transmission.
"Constant NACK"	Enables NACK simulation, i.e. depending on the sequence selected with parameter "Redundancy Version Sequence" packets are retransmitted. This mode is used for testing with varying redundancy version.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
HARQ:MODE on page 157

Redundancy Version Parameter

(for "HARQ Mode > Constant ACK")

Enters the redundancy version parameter.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:RVParameter on page 158

Redundancy Version Sequence

(for "HARQ Mode > Constant NACK")

Sets the retransmission sequence.

The sequence has a length of maximum 30 values, separated by commas. The sequence length determines the maximum number of retransmissions. New data is retrieved from the data source after reaching the end of the sequence.

For HSUPA, this parameter is read-only.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:RVSequence on page 158

Retransmission Sequence Number

(for HSUPA and "HARQ Mode > Constant ACK")

Sets the retransmission sequence number.

The value is fixed to 0.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:RSNumber? on page 153

Retransmission Sequence

(for HSUPA and "HARQ Mode > Constant NACK")

Sets the retransmission sequence.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:RSEquence on page 153

3.11 Slot configuration

This "TD-SCDMA Cell/Slot..." dialog contains the parameters required for configuring the cell of the selected slot, providing the channel table with graphical display of the respective channel.

3.11.1 Common settings

1. To access this dialog, select "TD-SCDMA > Cells".

2. Select "Cell 1...Cell 4".
3. In the "Slots" tab, select "Slot 0...Slot 6".
4. Select "Common".

Data 44		Midamble 144						Data 44		Guard 16	
Channel Type	Enhanced	Crt.User/Mid.Shift	Slot Fmt	Spred Fact	Spred Code	Power /dB	Data	DList / Pattern	DPCCH Settings	State	Dom Conf
0	P-CCPCH 1	Off	1/120	0	16	1	0.00	PN 9		On	
1	P-CCPCH 2	Off	1/120	0	16	2	0.00	PN 9		On	
2	S-CCPCH 1		1/120	0	16	1	0.00	PN 9	Config...	Off	
3	S-CCPCH 2		1/120	0	16	1	0.00	PN 9	Config...	Off	
4	FPACH		1/120	0	16	1	0.00	PN 9		Off	
5	PDSCH		1/120	0	16	1	0.00	PN 9	Config...	Off	

This dialog comprises the common settings required for configuring and activating a slot. The selected link direction determines the provided parameters.

State

Activates or deactivates the selected slot. The index of the selected slot is displayed in the dialog header.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:STATE on page 142

Slot Mode

(This feature is available in the uplink only.)

Selects the slot mode.

"Dedicated" Selects the Dedicated mode. In this mode, the instrument generates a signal with a dedicated physical control channel (DPCCH) and up to six dedicated physical data channels (DPDCH). The signal is used for voice and data transmission.

"PRACH" In this mode, the instrument generates a single physical random access channel (PRACH). This channel is needed to set up the connection between the mobile and the base station. To set the PRACH parameters, see [Chapter 3.13, "Slot mode PRACH settings"](#), on page 80.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:MODE on page 142

3.11.2 Channel table

1. To access this channel table, select "TD-SCDMA > Cells".
2. Select "Cell 1...Cell 4".
3. In the "Slots" tab, select "Slot 0...Slot 6".
4. Select "Common".

Channel Type	Enhanced	Crt.User/Mid.Shift	Slot Fmt	Spred Fact	Spred Code	Power /dB	Data	DList / Pattern	DPCCH Settings	State	Dom Conf
0 P-CCPCH 1	Off	1/120	0	16	1	0.00	PN 9			On	
1 P-CCPCH 2	Off	1/120	0	16	2	0.00	PN 9			On	
2 S-CCPCH 1		1/120	0	16	1	0.00	PN 9		Config...	Off	
3 S-CCPCH 2		1/120	0	16	1	0.00	PN 9		Config...	Off	
4 FPACH		1/120	0	16	1	0.00	PN 9			Off	
5 PDSCH		1/120	0	16	1	0.00	PN 9		Config...	Off	

The channel table comprises the individual channel parameters, and displays the currently selected channel structure graphically.

The number of channels and the available channel types depend on the link direction. In downlink, Channels 0 to 5 are assigned to the special channels, with the allocation of the channels being fixed. In uplink, Channel 0 is assigned to a special channel, with the allocation of the channel being fixed. It is possible to simulate the signal of a base station that supports high-speed channels.

See [Table 3-3](#) and [Table 3-4](#) for overview of the supported channel types and their sequence in the TD-SCDMA channel table.

Table 3-3: Supported channel types (Downlink)

Index	Short form	Name	Function
0	P-CCPCH 1	Primary Common Control Phys. Channel 1	Transfers the system frame number (SFN) Timing reference for additional downlink channels Contains the BCH transport channel
1	P-CCPCH 2	Primary Common Control Phys. Channel 2	Transfers the system frame number (SFN) Timing reference for additional downlink channels Contains the BCH transport channel
2	S-CCPCH 1	Secondary Common Control Phys. Channel	

Index	Short form	Name	Function
3	S-CCPCH 2	Secondary Common Control Phys. Channel	
4	FPACH	Fast Physical Access Channel	
5	PDSCH	Phys. Downlink Shared Channel	
6-21	DPCH QPSK	Dedicated Phys. Channel Modulation QPSK	Transfers the user data and the control information
	DPCH 8PSK	Dedicated Phys. Channel Modulation 8PSK	
	HS-SCCH 1	High-Speed Shared Control Channel 1	
	HS-SCCH 2	High-Speed Shared Control Channel 2	
	HS-PDSCH (QPSK)	High-Speed Phys. Downlink Shared Channel QPSK	
	HS-PDSCH (16QAM)	High-Speed Phys. Downlink Shared Channel 16 QAM	
	HS-PDSCH (64QAM)	High-Speed Phys. Downlink Shared Channel 64QAM	
	PLCCH	Physical layer common control channel	
	E-AGCH	E-DCH Absolute Grant Channel	
	E-HICH	E-DCH Hybrid ARQ Indicator Channel	

Table 3-4: Supported channel types (Uplink)

Index	Short form	Name	Function
0	PUSCH	Phys. Uplink Shared Channel	
1-16	DPCH QPSK	Dedicated Phys. Channel Modulation QPSK	
	DPCH 8PSK	Dedicated Phys. Channel Modulation 8PSK	
	HS-SICH	High-Speed Shared Information Channel	
	E-PUCH (QPSK)	E-DCH Uplink Physical Channel (QPSK)	
	E-PUCH (16QAM)	E-DCH Uplink Physical Channel (16QAM)	
	E-RUCCH	E-DCH Random Access Uplink Control Channel	

Channel Number

Displays the consecutive channel numbers. The range depends on the selected transmission direction.

All available channels are displayed, even inactive channels. Each channel is activated/deactivated by the "State" button.

Remote command:
n.a.

Channel Type

Selects the channel type.

In the uplink, the channel type is fixed for channel number 0.

In the downlink, the channel type is fixed for channel numbers 0 to 5.

For the remaining numbers, the choice lies between the relevant standard channels and the high-speed channels (see [Table 3-3](#) and [Table 3-4](#)).

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:TYPE on page 141

Enhanced

Displays the enhanced state. If the enhanced state is set to on, the channel coding cannot be changed.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:ENHanced? on page 139

Crt.User/Mid.Shift

Enters the value for the user and displays the midamble shift.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:USER on page 141

Slot Format

Enters the slot format for the selected channel.

The range of the values depends on the channel selected. For DPCH 8PSK channels, for example, the value range for the slot formats is 0 to 24.

A slot format defines the complete structure of a slot made of data and control fields and includes the symbol rate.

Parameters set via the slot format can then be changed individually.

The structure of the channel currently selected is displayed in a graphic above the channel table.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:SFORMat on page 140

Sprd. Fact.

Enters the spreading factor for the selected channel. The selection depends on the channel type and interacts with the slot format.

Remote command:

```
[ :SOURce<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:SFACTOR on page 140
```

Sprd. Code

Enters the spreading code for the selected channel. The code channel is spread with the set spreading code. The range of values for the spreading code depends on the channel type and the spreading factor. Depending on the channel type, the range of values can be limited.

Remote command:

```
[ :SOURce<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:SCODE on page 140
```

Power/dB

Sets the channel power in dB.

The power entered is relative to the powers outputs of the other channels. If "Adjust Total Power to 0 dB" is executed (top level of the TD-SCDMA dialog), all the power data is relative to 0 dB.

The value range is -80 dB to 0 dB.

Note: The maximum channel power of 0 dB applies to non-blanked channels (duty cycle 100%). With blanked channels, the maximum value can be increased to values greater than 0 dB.

Use the parameter "Adjust Total Power" to increase the power to a maximum value of $10 \cdot \log_{10}(1/\text{duty_cycle})$

Remote command:

```
[ :SOURce<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:POWER on page 139
```

Data

Selects data source.

The following standard data sources are available:

- "All 0, All 1"
An internally generated sequence containing 0 data or 1 data.
- "PNxx"
An internally generated pseudo-random noise sequence.
- "Pattern"
An internally generated sequence according to a bit pattern.
Use the "Pattern" box to define the bit pattern.
- "Data List/Select DList"
A binary data from a data list, internally or externally generated.
Select "Select DList" to access the standard "Select List" dialog.
 - Select the "Select Data List > navigate to the list file *.dm_iqd > Select" to select an existing data list.

- Use the "New" and "Edit" functions to create internally new data list or to edit an existing one.
- Use the standard "File Manager" function to transfer external data lists to the instrument.

See also:

- Section "Modulation Data" in the R&S SMBV100B user manual.
- Section "File and Data Management" in the R&S SMBV100B user manual.
- Section "Data List Editor" in the R&S SMBV100B user manual

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:DATA on page 135

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:DATA:DSElect on page 135

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:DATA:PATTern on page 135

DPCCH Settings

Accesses the dialog for configuring the control fields of the selected channel.

The selected slot format predetermines the setting of the control fields.

So a change is also made to the control fields by changing the slot format and vice versa.

The dialog is described in [Chapter 3.12, "DPCCH settings"](#), on page 73

Remote command:

n.a.

State

Activates or deactivates the channel.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:STATe on page 141

Dom. Conf.

Displays whether the channel has a code domain conflict with one of the overlying channels (with lower channel number).

If there is a conflict, a warning icon appears. You can find the current code domain assignment graphically displayed in the "Code Domain" tab (see [Chapter 3.11.3, "Code domain"](#), on page 70).

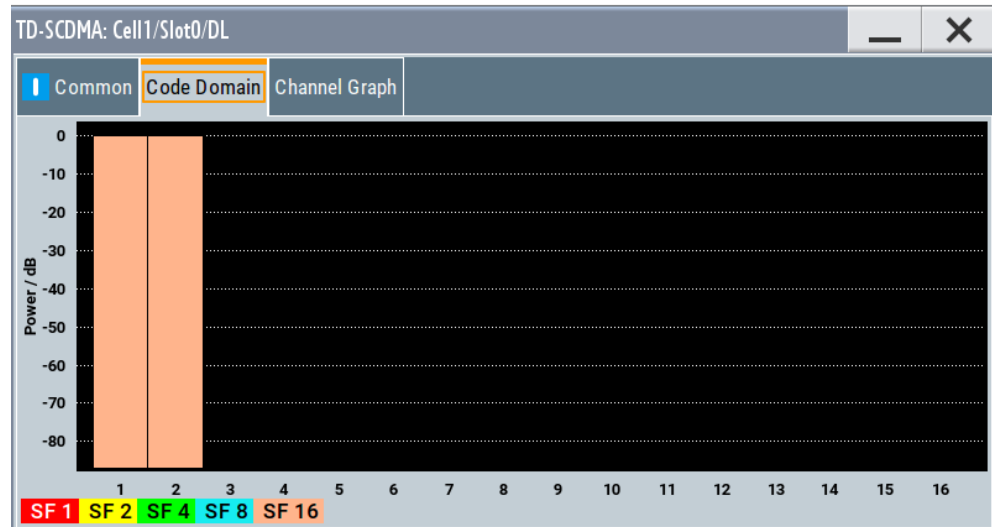
Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:DCONflict? on page 142

3.11.3 Code domain

The channelization codes are taken from a code tree of hierarchical structure (see [Figure 3-1](#)). The higher the spreading factor, the smaller the symbol rate and vice versa.

4. Select "Code Domain".

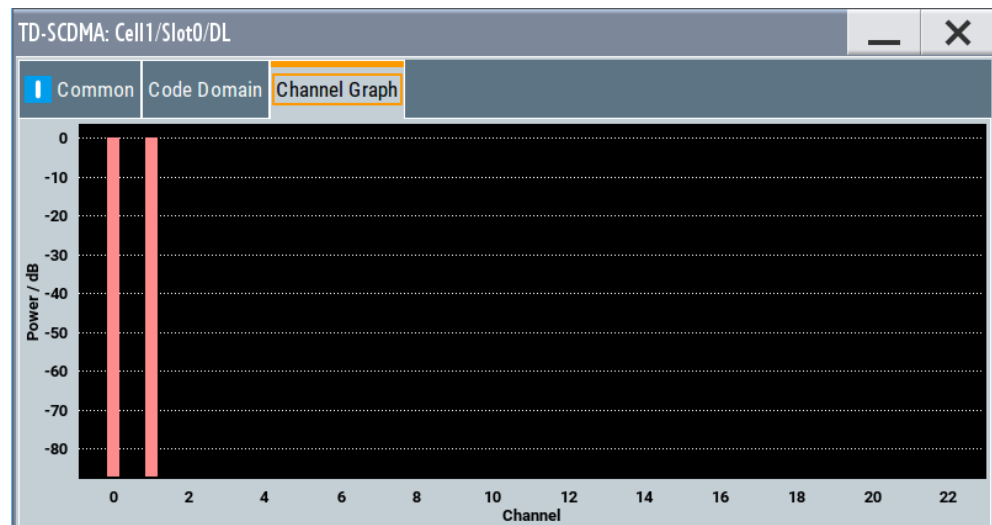


The graph indicates the code domain assignment of all active code channels.

The channelization code is plotted at the X axis, the colored bars indicate coherent code channels. The colors are assigned to the spreading factor, the allocation is shown below the graph. The relative power can be taken from the height of the bar.

3.11.4 Channel graph

1. To access channel graph, select "TD-SCDMA > Cells".
2. Select "Cell 1...Cell 4".
3. In the "Slots" tab, select "Slot 0...Slot 6".
4. Select "Channel Graph".



The channel graph dialog shows the active code channels.

The channel number is plotted on the X axis. The red bars represent the special channel (P-CCPCH1 to PDSCH in the downlink, P-CCPCH1 to PUSCH in the uplink), the green bars the data channels (DPCH). The height of the bars shows the relative power of the channel. The graph is calculated from the settings that have been made.

3.12 DPCCH settings

The "Config DPCCH" dialog contains the parameters required for configuring the fields of the dedicated physical controller.

1. To access the DCCPH settings, select "TD-SCDMA > Cells".
2. Select "Cell 1...Cell 4".
3. In the "Slots" tab, select "Slot 0...Slot 6".
4. Select "Common".
5. In the channel table, select "DPCCH Settings > Config..." for the respective channel.
6. Select "DPCCH Settings > Config..."

Data	Midamble	Data	Guard
44	144	44	16

Slot Format: 0 Midamble Shift: 120

TFCI	Sync Shift	TPC
Number of TFCI Bits		
TFCI Value		

The selected slot format predetermines the setting of the parameter provided in this dialog. Whenever the "TFCI State" and "Pilot Length" settings are changed, the slot format is adjusted accordingly. These parameters apply to the S-CCPCH channel.

3.12.1 Slot structure and slot format

1. To access the DCCPH settings, select "TD-SCDMA > Cells".
2. Select "Cell 1...Cell 4".
3. In the "Slots" tab, select "Slot 0...Slot 6".
4. Select "Common".
5. In the channel table, select "DPCCH Settings > Config..." for the respective channel.
6. Select "DPCCH Settings > Config..."

Data	Midamble	Data	Guard
44	144	44	16

Slot Format: 0 Midamble Shift: 120

TFCI Sync Shift TPC

Number of TFCI Bits: 0

TFCI Value: 0

The selected slot format predetermines the setting of the parameter provided in this dialog. Whenever the "TFCI State" and "Pilot Length" settings are changed, the slot format is adjusted accordingly. These parameters apply to the S-CCPCH channel.

Slot Structure

Displays the slot structure.

The structure in the graph represents the currently selected slot format.

Remote command:

n.a.

Slot Format

Displays the slot format.

The slot format display changes when the "Number of TFCI Bits" and the "Number of Sync Shift & TPC Bits" are modified.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:SFORmat on page 140

Midamble Shift

Displays the midamble shift.

The midamble can be shifted in the range of 0 to 120 chips in increments of 8 chips. Channels belonging to the same user equipment are characterized by the same midamble shift.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:MSHift? on page 139

3.12.2 TFCI settings

1. To access the TFCI settings, select "TD-SCDMA > Cells".
2. Select "Cell 1...Cell 4".
3. In the "Slots" tab, select "Slot 0...Slot 6".
4. Select "Common".
5. In the channel table, select "DPCCH Settings > Config..." for the respective channel.
6. Select "DPCCH Settings > Config... > TFCI"

This tab contains the parameters required for setting the TFCI length and value.

Number of TFCI Bits

Selects the length of the TFCI field expressed in bits.

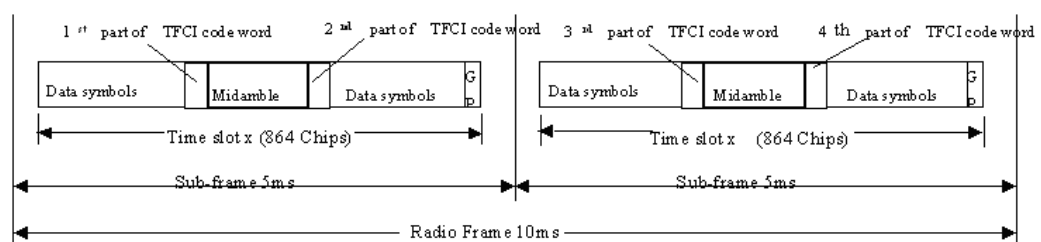
Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:DPCCh:TFCI:LENGth on page 137

TFCI Value

Enters the value of the TFCI field. The value range is 0 to 1023.

The coded TFCI word is divided into four parts:



Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:DPCCh:TFCI:VALue on page 137

3.12.3 Sync shift settings

1. To access these settings, select "TD-SCDMA > Cells".
2. Select "Cell 1...Cell 4".
3. In the "Slots" tab, select "Slot 0...Slot 6".
4. Select "Common".
5. In the channel table, select "DPCCH Settings > Config..." for the respective channel.
6. Select "DPCCH Settings > Config... > Sync Shift"

Data	Midamble	Data	Guard
44	144	44	16

Slot Format: 0 Midamble Shift: 120

TFCI	Sync Shift	TPC
	Number of Sync Shift & TPC Bits: 0 & 0	
	Sync Shift Pattern: 1...	
	Sync Shift Repetition M: 1	

This tab contains the parameters required for setting the synchronization shift.

Number of Sync Shift & TPC Bits

Selects the length of the sync shift and the length of the TPC field expressed in bits. The available values depend on the slot format.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:DPCCh:SYNC:LENGth on page 136

Sync Shift Pattern

Enters the bit pattern for the sync shift. The maximum pattern length is 64 bits.

The following values are allowed:

- 0: decreases the sync shift

- 1: increases the sync shift
- -: the sync shift stays unchanged

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:DPCCh:SYNC:PATtern on page 136
```

Sync Shift Repetition M

Enters the value for the sync shift repetition. This value defines the spacing for the sync shift which is used to transmit a new timing adjustment. M specifies the spacing in subframes of 5 ms each.

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:DPCCh:SYNC:REPetition on page 136
```

3.12.4 E-UCCH settings

1. To access the E-UCCH settings, select "TD-SCDMA > General > Link Direction > Uplink / Reverse".
2. In the "Cells" tab, select "Cell 1...Cell 4".
3. In the "Slots" tab, select "Slot 0...Slot 6".
4. Select "Common".
5. In the channel table, select "Channel Type > E-PUCH 16 QAM " for the respective channel.
6. Select "DPCCH Settings > Config... > E-UCCH".

TD-SCDMA: Cell1/Slot1/DPCCH1/UL			
Data 88	Midamble 144	Data 88	Guard 16
Slot Format	1	Midamble Shift	120
E-UCCH		TPC	
Number Of E-UCCH Channels	0	Number Of Phy. Chan. Bits Per E-UCCH	32
(Bits 0..15 Mapped To E-UCCH Part 1 And Bits 16..31 Mapped To E-UCCH Part 2)			
E-TFCI Value	0	Retransmission Sequence Number	0
HARQ Process ID	0		

This tab contains the parameters for configuring this specific channel type in uplink transmission direction.

These settings are preconfigured and disabled, if an HSUPA coding type is enabled for the corresponding channel.

Number of E-UCCH Channels

Sets the number of the E-DCH Uplink Control Channels (E-UCCH).

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:  
DPCCh:EUCC:CCOUNT on page 133
```

Number of Phy. Chan. Bits per E-UCCH

Displays the number of physical channel bits per one E-UCCH.

The value is fixed to 32.

Remote command:

n.a.

E-TFCI Value

Enters the value of the TFCI field.

If an HSUPA is enabled for the corresponding channel, the E-TFCI value is set to the value configured for the parameter [Transport Block Size Index](#).

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:  
DPCCh:EUCC:TFCI on page 134
```

Retransmission Sequence Number (E-UCCH)

Sets the retransmission sequence number.

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:  
DPCCh:EUCC:RSNUMBER on page 134
```

HARQ Process ID

Sets the HARQ process ID.

Remote command:

```
[ :SOURCE<hw> ] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:  
DPCCh:EUCC:HPID on page 134
```

3.12.5 TPC settings

The "TPC" tab contains the parameters required for configuring the TPC field.

1. To access the TPC settings, select "TD-SCDMA > Cells".
2. Select "Cell 1...Cell 4".
3. In the "Slots" tab, select "Slot 0...Slot 6".
4. Select "Common".

5. In the channel table, select "DPCCH Settings > Config... > TPC".

Data	Midamble	Data	Guard
44	144	44	16

Slot Format: 0 Midamble Shift: 120

TFCI Sync Shift TPC

Number of Sync Shift & TPC Bits: 0 & 0

TPC Source: Pattern

TPC Pattern: 01...

Read Out Mode: Continuous

This tab contains the parameters for configuring the TPC field parameters. The selected "Link direction" determines the available parameters.

Number of Sync Shift & TPC Bits

Selects the length of the sync shift and the length of the TPC field expressed in bits. The available values depend on the slot format.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:DPCCh:SYNC:LENGth on page 136

Number of TPC Bits Per E-UCCH

Displays the number of the TPC field bits of the E-UCCH channel type, i.e. in uplink transmission direction.

Remote command:

n.a.

TPC Source

Selects the data source for the TPC field of the DPCCH.

The following standard data sources are available:

- "Pattern"
 - An internally generated sequence according to a bit pattern.
 - Use the "Pattern" box to define the bit pattern.
- "Data List/Select DList"
 - A binary data from a data list, internally or externally generated.
 - Select "Select DList" to access the standard "Select List" dialog.
 - Select the "Select Data List > navigate to the list file *.dm_iqd > Select" to select an existing data list.
 - Use the standard "File Manager" function to transfer external data lists to the instrument.

- Use the "New" and "Edit" functions to create internally new data list or to edit an existing one.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:DPCCh:TPC:DATA on page 137

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:DPCCh:TPC:DATA:PATtern on page 138

[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:DPCCh:TPC:DATA:DSElect on page 138

Read Out Mode

Defines TPC data usage.

The TPC bits are used to signal the increase or reduction in transmit power to the called station. For all read out modes, 1 bit is taken from the data stream for the TPC field for each slot. The bit is entered into the bitstream several times, depending on the symbol rate. The difference between the modes lies in the usage of the TPC bits.

The different modes can be used to set a specific output power and then let the power oscillate around this value. For example, if the power is the pattern 11111, the power can be varied with "Single + alt. 01" and "Single + alt. 10". Thus, power measurements can be carried out at quasi-constant power.

- "Continuous:"
The TPC bits are used cyclically.
- "Single + All 0"
The TPC bits are used once, and then the TPC sequence is continued with 0 bits.
- "Single + All 1"
The TPC bits are used once, and then the TPC sequence is continued with 1 bit.
- "Single + alt. 01"
The TPC bits are used once and then the TPC sequence is continued with 0 bits and 1 bit alternately. Bits as appended in multiples, depending on the symbol rate, for example, 00001111.
- "Single + alt. 10"
The TPC bits are used once and then the TPC sequence is continued with 1 bit and 0 bits alternately. Bits as appended in multiples, depending on by the symbol rate, for example, 11110000.

Remote command:

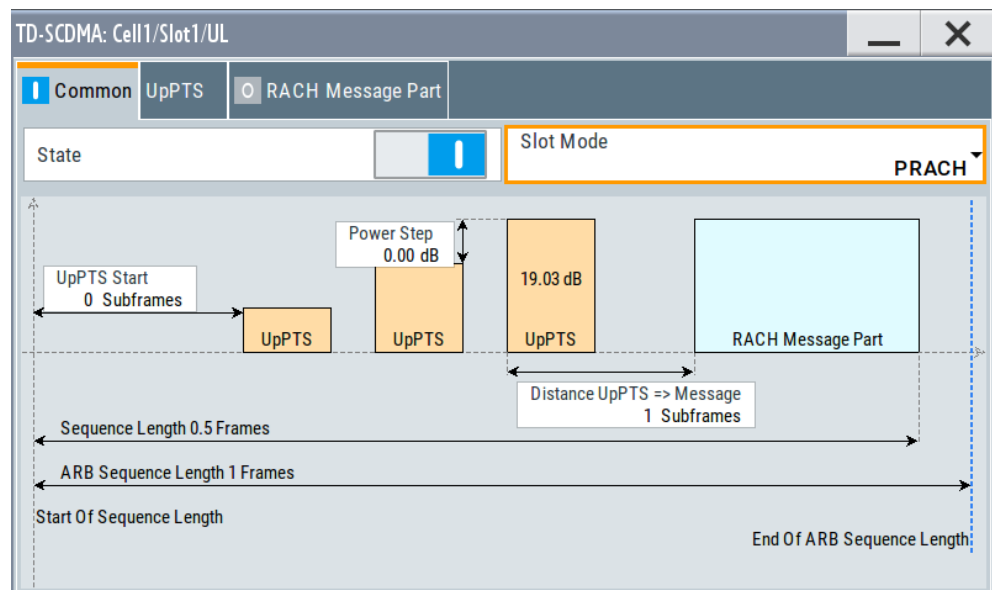
[:SOURCE<hw>] :BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:
CHANnel<us0>:DPCCh:TPC:READ on page 138

3.13 Slot mode PRACH settings

For uplink transmission direction, the "TD-SCDMA-Cell/Slot../UL" dialog contains the parameters required for configuring the (physical random access channel) PRACH and the UpTS (uplink pilot timeslot).

3.13.1 Common settings

1. To access the PRACH settings, select "TD-SCDMA > General > Link Direction > Uplink / Reverse"
2. In the "Cells" tab, select "Cell 1...Cell 4".
3. In the "Slots" tab, select "Slot 0...Slot 6".
4. In the "Common" tab, select "Slot Mode > PRACH"



This dialog comprises the common PRACH settings.

Power Step

Enters the power by which the UpPTS is increased from repetition to repetition. The power set under Power is the "target power", used during the last repetition of the preamble.

Example:

UpPTS Power = 0 dB

UpPTS repetition = 3

Power step = 3

Generated power sequence:

Preamble 1 -6 dB	→ + 3 dB	Preamble 2 -3 dB	→ + 3 dB	Preamble 3 0 dB
---------------------	----------	---------------------	----------	--------------------

Remote command:

[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:PTS:PSTep
on page 148

UpPTS Start

Enters the number of the subframe in which the first UpPTS has to be transmitted. The value range is 0 to 10.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:PTS:START`
on page 148

Distance UpPTS

Enters the value to vary the timing between UpPTS and RACH.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:PTS:DISTance`
on page 147

Sequence Length

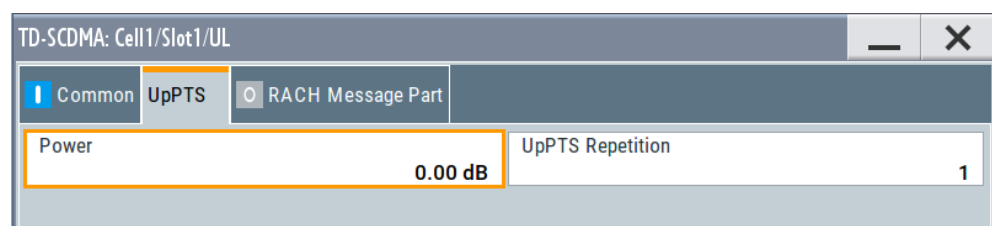
Displays the value of the sequence length.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:SEnGth?`
on page 149

3.13.2 Uppts settings

1. To access these settings, select "TD-SCDMA > General > Link Direction > Uplink / Reverse"
2. In the "Cells" tab, select "Cell 1...Cell 4".
3. In the "Slots" tab, select "Slot 0...Slot 6".
4. In the "Common" tab, select "Slot Mode > PRACH".
5. Select "UpPTS".



This dialog comprises the UpPTS settings.

Power

Enters the power of the UpPTS.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:PTS:POWer`
on page 147

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:PTS:PCORrection?`
on page 147

UpPTS Repetition

Enters the number of UpPTS repetitions before a PRACH burst happens.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:PTS:

REPetition on page 148

3.13.3 RACH message part settings

1. To access these settings, select "TD-SCDMA > General > Link Direction > Uplink / Reverse"
2. In the "Cells" tab, select "Cell 1...Cell 4".
3. In the "Slots" tab, select "Slot 0...Slot 6".
4. In the "Common" tab, select "Slot Mode > PRACH".
5. Select "RACH Message Part".

The screenshot shows a configuration window titled "TD-SCDMA: Cell1/Slot1/UL". It has three tabs: "Common" (selected), "UpPTS", and "RACH Message Part". The "RACH Message Part" tab is active, showing the following settings:

State	0	Message Length	1 Subframe (5 ms)
Slot Format	0	Power	0.00 dB
Spreading Factor	16	Spreading Code	1
Data Source	PN 9		
Current User	1	Midamble Shift	120

This dialog comprises the RACH (random access channel) message part settings.

State (RACH Message Part)

Activates or deactivates the RACH (random access channel) message part.

Remote command:

[:SOURCE<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:STATE

on page 146

Message Length

Selects the message length of the random access channel expressed in subframes.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:LENGth
on page 144

Slot Format (PRACH)

Displays the slot format of the PRACH. The slot format depends on the selected spreading factor.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:SFORmat?
on page 146

Power (RACH Message Part)

Enters the power of the PRACH message part.

The value range is -80 dB to 0 dB.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:POWer
on page 145
[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:
PCORrection on page 144

Spreading Factor (PRACH)

Selects the spreading factor for the PRACH.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:SFACtor
on page 145

Spreading Code (PRACH)

Enters the spreading code for the PRACH. The code channel is spread with the set spreading code. The range of values of the spreading code depends on the channel type and the spreading factor.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:SCODE
on page 145

Data Source (PRACH)

Selects data source for the PRACH.

The following standard data sources are available:

- "All 0, All 1"
An internally generated sequence containing 0 data or 1 data.
- "PNxx"
An internally generated pseudo-random noise sequence.
- "Pattern"
An internally generated sequence according to a bit pattern.
Use the "Pattern" box to define the bit pattern.
- "Data List/Select DList"
A binary data from a data list, internally or externally generated.
Select "Select DList" to access the standard "Select List" dialog.

- Select the "Select Data List > navigate to the list file *.dm_iqd > Select" to select an existing data list.
- Use the "New" and "Edit" functions to create internally new data list or to edit an existing one.
- Use the standard "File Manager" function to transfer external data lists to the instrument.

See also:

- Section "Modulation Data" in the R&S SMBV100B user manual.
- Section "File and Data Management" in the R&S SMBV100B user manual.
- Section "Data List Editor" in the R&S SMBV100B user manual

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:DATA`
on page 143

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:DATA:`
`DSElect` on page 143

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:DATA:`
`PATtern` on page 144

Current User (PRACH)

Enters the number of current users.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:USER`
on page 146

Midamble Shift (PRACH)

Displays the value for the midamble shift.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:MSHift?`
on page 144

3.14 Filter / clipping / ARB settings

Access:

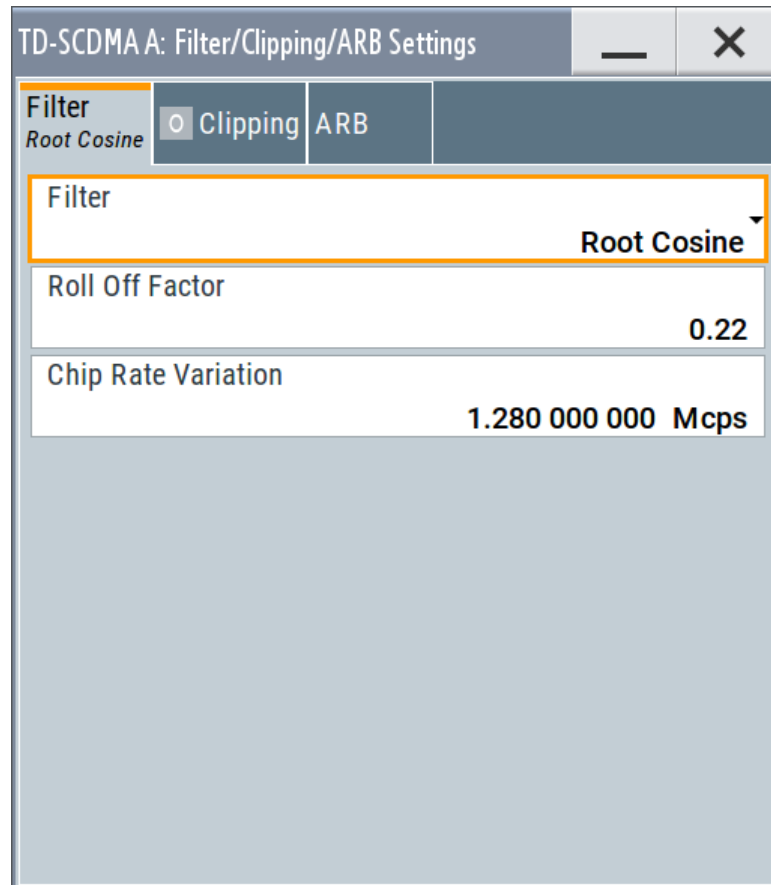
- ▶ Select "TD-SCDMA > General > Filter/Clipping/ARB Settings".

The dialog comprises the settings, necessary to configure the baseband filter, to enable clipping and adjust the sequence length of the arbitrary waveform component.

3.14.1 Filter settings

Access:

- ▶ Select "Filter".



This dialog comprises the settings required for configuring the baseband filter.

Filter

Selects the baseband filter.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:FILTer:TYPE` on page 101

Rolloff Factor or BxT

Sets the filter parameter.

The filter parameter ("Roll off Factor" or "BxT") depends on the currently selected filter type. This parameter is preset to the default for each of the predefined filters.

Remote command:

`[:SOURce<hw>] :BB:TDSCdma:FILTer:PARAMeter:APCO25` on page 101

`[:SOURce<hw>] :BB:TDSCdma:FILTer:PARAMeter:COSine` on page 101

`[:SOURce<hw>] :BB:TDSCdma:FILTer:PARAMeter:GAUSS` on page 101

`[:SOURce<hw>] :BB:TDSCdma:FILTer:PARAMeter:PGAuss` on page 102

[:SOURce<hw>] :BB:TDSCdma:FILTer:PARAmeter:RCOSine on page 103

[:SOURce<hw>] :BB:TDSCdma:FILTer:PARAmeter:SPHase on page 103

Cutoff Frequency Factor

Sets the value for the cutoff frequency factor. The cutoff frequency of the filter can be adjusted to reach spectrum mask requirements.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:FILTer:PARAmeter:LPASs on page 102

[:SOURce<hw>] :BB:TDSCdma:FILTer:PARAmeter:LPASSEVM on page 102

Chip Rate Variation

Enters the chip rate.

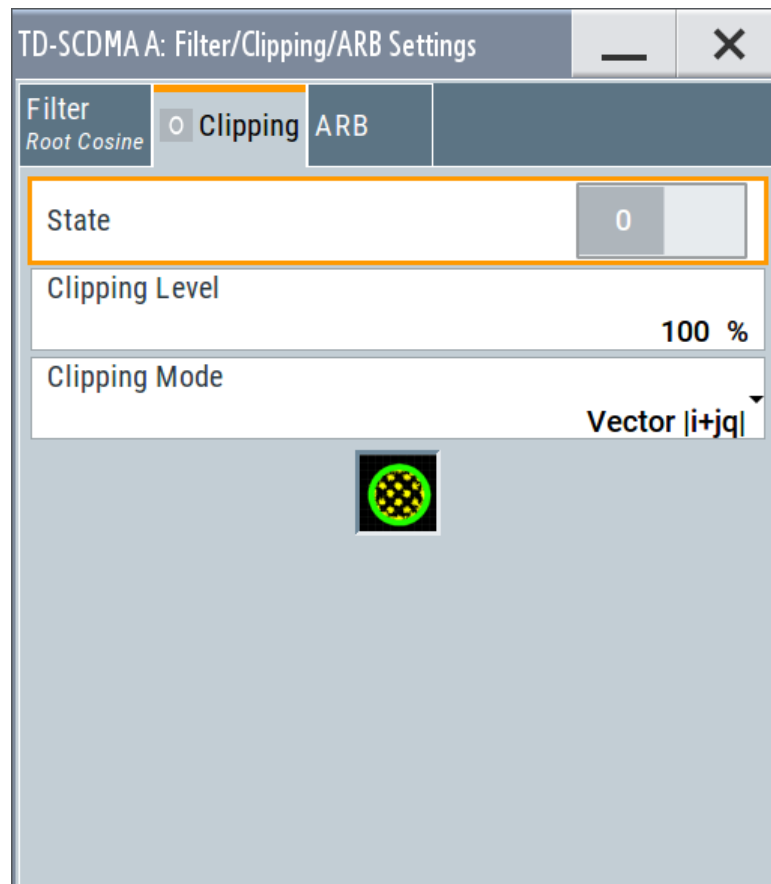
Remote command:

[:SOURce<hw>] :BB:TDSCdma:CRATe:VARiation on page 94

3.14.2 Clipping settings

Access:

- Select "Clipping".



This dialog comprises the settings required for configuring the clipping.

Clipping State

Switches baseband clipping on and off.

Baseband clipping is a simple and effective way of reducing the crest factor of the signal. Since clipping is done before filtering, the procedure does not influence the spectrum. The EVM however increases.

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:CLIPping:STATE` on page 100

Clipping Level

Sets the limit for clipping.

This value indicates at what point the signal is clipped. It is specified as a percentage, relative to the highest level. 100% indicates that clipping does not take place.

Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:CLIPping:LEVel` on page 100

Clipping Mode

Selects the clipping method. The dialog displays a graphical illustration on how this two methods work.

- "Vector $| i + jq |$ "
The limit is related to the amplitude $| i + q |$. The I and Q components are mapped together, the angle is retained.
- "Scalar $| i | , | q |$ "
The limit is related to the absolute maximum of all the I and Q values $| i | + | q |$.
The I and Q components are mapped separately, the angle changes.

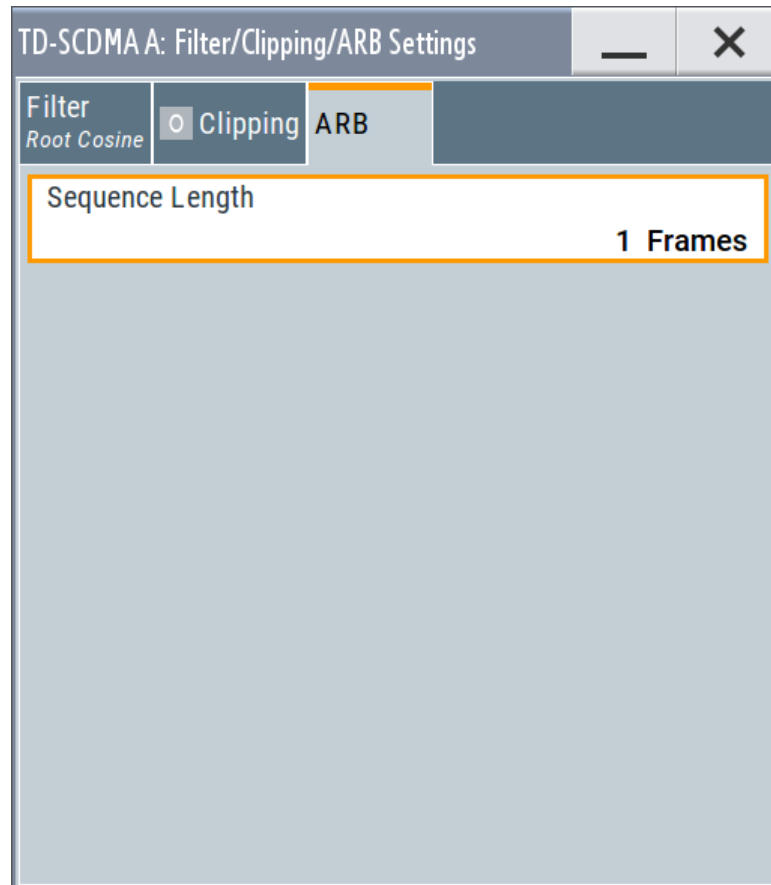
Remote command:

`[:SOURCE<hw>] :BB:TDSCdma:CLIPping:MODE` on page 100

3.14.3 ARB settings

Access:

- ▶ Select "ARB".



This dialog comprises the settings required for configuring the ARB.

Sequence Length ARB

Changes the sequence length of the arbitrary waveform component of the signal. This component is calculated in advance and output in the arbitrary waveform generator. It is added to the realtime signal components.

The maximum sequence length depends on the installed ARB memory size and the current chip rate.

In pure amplifier tests with several channels and no real time channels, it is possible to improve the statistical properties of the signal by increasing the sequence length.

Remote command:

[:SOURce<hw>] :BB:TDSCdma :SLENgth on page 103

3.15 Power ramping

The "Power Ramping Settings" dialog contains the shape and time parameters required for configuring the baseband power ramp.

- ▶ To access these settings, select "TD-SCDMA > General > Power Ramping".

Power Ramp Control	
Ramp Function	Cosine
Ramp Time	2 Chips
Rise Delay	-2 Chips
Fall Delay	2 Chips
In Baseband Only	<input type="checkbox"/>

This dialog comprises the settings required for power ramping.

Ramp Function

Selects the form of the transmitted power, i.e. the shape of the rising and falling edges during power ramp control.

- "Linear" The transmitted power rises and falls linear fashion.
- "Cosine" The transmitted power rises and falls with a cosine-shaped edge, which causes a more favorable spectrum than the Linear setting.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:PRAMP:SHAPE on page 96

Ramp Time

Sets the power ramping rise time and fall time for a burst.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:PRAMp:TIME on page 96

Rise Delay

Sets the offset in the rising edge of the envelope at the start of a burst. A positive value causes a delay and a negative value causes an advance.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:PRAMp:RDELay on page 96

Fall Delay

Sets the offset in the falling edge of the envelope at the end of a burst. A positive value causes a delay and a negative value causes an advance.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:PRAMp:FDELay on page 96

In Baseband Only

Activates or deactivates power ramping for the baseband signals.

Remote command:

[:SOURce<hw>] :BB:TDSCdma:PRAMp:BBONLY on page 95

4 Remote-control commands

The following commands are required to perform signal generation with the TD-SCDMA options in a remote environment. We assume that the R&S SMBV100B has already been set up for remote operation in a network as described in the R&S SMBV100B documentation. A knowledge about the remote control operation and the SCPI command syntax are assumed.



Conventions used in SCPI command descriptions

For a description of the conventions used in the remote command descriptions, see section "Remote Control Commands" in the R&S SMBV100B user manual.

Common suffixes

The following common suffixes are used in remote commands:

Suffix	Value range	Description
ENTity<ch>	1	Optional keyword, provided for compatibility with R&S®SMW200A ENTity1:SOURce1 = SOURce1
SOURce<hw>	1	available baseband signals
OUTPut<ch>	1 to 3	available markers
CELL<st>	[1] 2 3 4	Cell
DTCH<ch>	1 to 7	
SLOT<ch0>	[0] to 6	Slot number
CHANnel<us0>	[0] to 21	Channel number

The following commands specific to the TD-SCDMA are described here:

- [General commands](#).....93
- [Filter / clipping / ARB settings](#)..... 99
- [Trigger settings](#)..... 104
- [Marker settings](#).....109
- [Clock settings](#)..... 110
- [Predefined settings](#)..... 111
- [Cell settings](#)..... 112
- [Enhanced channels of cell 1](#)..... 116
- [Channel settings](#)..... 132
- [HSDPA/HSUPA settings](#)..... 149

4.1 General commands

[:SOURce<hw>]:BB:TDSCdma:COPY:SOURce	93
[:SOURce<hw>]:BB:TDSCdma:COPY:DESTination	93
[:SOURce<hw>]:BB:TDSCdma:COPY:EXECute	94
[:SOURce<hw>]:BB:TDSCdma:CRATe?	94
[:SOURce<hw>]:BB:TDSCdma:CRATe:VARiation	94
[:SOURce<hw>]:BB:TDSCdma:LINK	95
[:SOURce<hw>]:BB:TDSCdma:POWer:ADJust	95
[:SOURce<hw>]:BB:TDSCdma:POWer[:TOTal]?	95
[:SOURce<hw>]:BB:TDSCdma:PRAMp:BBONLY	95
[:SOURce<hw>]:BB:TDSCdma:PRAMp:FDELaY	96
[:SOURce<hw>]:BB:TDSCdma:PRAMp:RDELaY	96
[:SOURce<hw>]:BB:TDSCdma:PRAMp:SHAPE	96
[:SOURce<hw>]:BB:TDSCdma:PRAMp:TIME	96
[:SOURce<hw>]:BB:TDSCdma:PRESet	97
[:SOURce<hw>]:BB:TDSCdma:RESet	97
[:SOURce<hw>]:BB:TDSCdma:SETTing:CATalog?	97
[:SOURce<hw>]:BB:TDSCdma:SETTing:LOAD	97
[:SOURce<hw>]:BB:TDSCdma:SETTing:STORE	98
[:SOURce<hw>]:BB:TDSCdma:SETTing:TMODeL	98
[:SOURce<hw>]:BB:TDSCdma:SETTing:TMODeL:CATalog?	98
[:SOURce<hw>]:BB:TDSCdma:STATe	99
[:SOURce<hw>]:BB:TDSCdma:VERSion?	99
[:SOURce<hw>]:BB:TDSCdma:WAVEform:CREate	99

[:SOURce<hw>]:BB:TDSCdma:COPY:SOURce <Source>

Selects the cell whose settings are to be copied.

Parameters:

<Source> 1 | 2 | 3 | 4
 Range: 1 to 4
 *RST: 1 (Cell1)

Example: See [\[:SOURce<hw>\]:BB:TDSCdma:COPY:DESTination](#)
 on page 93

Manual operation: See "Copy Cell..." on page 30

[:SOURce<hw>]:BB:TDSCdma:COPY:DESTination <Destination>

Selects the cell whose settings are to be overwritten.

Parameters:

<Destination> 1 | 2 | 3 | 4
 Range: 1 to 4
 *RST: 2 (Cell2)

Example:

```
BB:TDSC:LINK DOWN
BB:TDSC:COPY:SOUR 1
BB:TDSC:COPY:DEST 4
BB:TDSC:COPY:EXEC
```

Manual operation: See ["Copy Cell..."](#) on page 30

[:SOURce<hw>]:BB:TDSCdma:COPY:EXECute

Starts the copy process. The dataset of the selected source cell is copied to the destination cell.

Example: See [\[:SOURce<hw>\]:BB:TDSCdma:COPY:DESTination](#) on page 93

Usage: Event

Manual operation: See ["Copy Cell..."](#) on page 30

[:SOURce<hw>]:BB:TDSCdma:CRATe?

Queries the system chip rate.

The output chip rate which determines the rate of the spread symbols as is used for signal output can be set with the command `SOUR:BB:TDSC:CRAT:VAR.`

Return values:

```
<CRate>          R1M28
                  *RST:    R1M28
```

Example:

```
BB:TDSC:CRAT?
Response: R1M2
The system chip rate is 1.2288 Mcps.
```

Usage: Query only

Manual operation: See ["Chip Rate"](#) on page 20

[:SOURce<hw>]:BB:TDSCdma:CRATe:VARiation <Variation>

Sets the output chip rate.

The output chip rate changes the output clock and the modulation bandwidth, as well as the synchronization signals that are output. It does not affect the calculated chip sequence.

Parameters:

```
<Variation>      float
                  Range:    400 to 5E6
                  Increment: 0.001
                  *RST:    1280000
                  Default unit: Hz (c/s)
```

Example: BB:TDSC:CRAT:VAR 4086001
sets the chip rate to 4.08 Mcps.

Manual operation: See "[Chip Rate Variation](#)" on page 87

[[:SOURce<hw>]:BB:TDSCdma:LINK <Link>

Defines the transmission direction.

Parameters:

<Link> FORWARD | DOWN | REVerse | UP
*RST: DOWN

Example: BB:TDSC:LINK DOWN

Manual operation: See "[Link Direction](#)" on page 20

[[:SOURce<hw>]:BB:TDSCdma:POWer:ADJust

The command sets the power of the active channels in such a way that the total power of the active channels is 0 dB. This will not change the power ratio among the individual channels.

Example: BB:TDSC:POW:ADJ
the total power of the active channels is set to 0 dB, the power ratio among the individual channels is unchanged.

Usage: Event

Manual operation: See "[Adjust Total Power to 0dB](#)" on page 31

[[:SOURce<hw>]:BB:TDSCdma:POWer[:TOTal]?

Queries the total power of the active channels. After "Power Adjust", this power corresponds to 0 dB.

Return values:

<Total> float
Increment: 0.01

Example: BB:TDSC:POW:TOT?
queries the total power of the active channels.
Response: -22.5
the total power is -22.5 dB.

Usage: Query only

Manual operation: See "[Total Power](#)" on page 31

[[:SOURce<hw>]:BB:TDSCdma:PRAMP:BBONly <BbOnly>

Activates or deactivates power ramping for the baseband signals.

Parameters:

<BbOnly> 1 | ON | 0 | OFF
 *RST: 0

Example:

BB:TDSC:PRAM:BBON ON

Manual operation: See ["In Baseband Only"](#) on page 91

[:SOURce<hw>]:BB:TDSCdma:PRAMP:FDElay <FDelay>
[:SOURce<hw>]:BB:TDSCdma:PRAMP:RDElay <RDelay>

Sets the offset in the falling edge of the envelope at the end of a burst. A positive value delays the ramp and a negative value causes an advance.

Parameters:

<RDelay> integer
 Range: -4 to 4
 *RST: 2 (FDElay) / -2 (RDElay)

Example:

BB:TDSC:PRAM:RDEL 8.0

Sets the offset in the rising edge of the envelope to 8.0 chips.

Manual operation: See ["Rise Delay"](#) on page 91

[:SOURce<hw>]:BB:TDSCdma:PRAMP:SHAPE <Shape>

Selects the form of the transmitted power, i.e. the shape of the rising and falling edges during power ramp control.

Parameters:

<Shape> LINear | COSine
 *RST: COSine

Example:

BB:TDSC:PRAM:SHAP LIN

Sets a linear shape.

Manual operation: See ["Ramp Function"](#) on page 90

[:SOURce<hw>]:BB:TDSCdma:PRAMP:TIME <Time>

Sets the power ramping rise time and fall time for a burst.

Parameters:

<Time> integer
 Range: 0 to 4
 *RST: 2

Example:

BB:TDSC:PRAM:TIME 2.0

Manual operation: See ["Ramp Time"](#) on page 90

[:SOURce<hw>]:BB:TDSCdma:PRESet

Sets the parameters of the digital standard to their default values (*RST values specified for the commands).

Not affected is the state set with the command `SOURce<hw>:BB:TDSCdma:STATe`.

Example: `SOURce1:BB:TDSCdma:PRESet`

Usage: Event

Manual operation: See ["Set to Default"](#) on page 19

[:SOURce<hw>]:BB:TDSCdma:RESet

Resets all cells to the predefined settings. The reset applies to the selected link direction.

Example: `BB:TDSC:RES`
resets all the cells to the predefined settings.

Usage: Event

Manual operation: See ["Reset All Cells"](#) on page 29

[:SOURce<hw>]:BB:TDSCdma:SETTING:CATalog?

Queries the files with settings in the default directory. Listed are files with the file extension `*.tdscdma`.

For general information on file handling in the default and in a specific directory, see section "MMEMory Subsystem" in the R&S SMBVBuser manual.

Return values:

<Catalog> <filename1>,<filename2>,...
Returns a string of filenames separated by commas.

Example: `MME:CDIR '/var/user/tdscdma'`
`SOURce1:BB:TDSCdma:SETTING:CATalog?`
`// Response: "up", "down"`
`SOURce1:BB:TDSCdma:SETTING:LOAD "up"`
`SOURce1:BB:TDSCdma:SETTING:STOR 'tdscdma_1'`

Usage: Query only

Manual operation: See ["Save/Recall"](#) on page 20

[:SOURce<hw>]:BB:TDSCdma:SETTING:LOAD <Filename>

Loads the selected file from the default or the specified directory. Loaded are files with extension `*.tdscdma`.

Setting parameters:

<Filename> "<filename>"
 Filename or complete file path; file extension can be omitted

Example: See [\[:SOURCE<hw>\]:BB:TDSCdma:SETTING:CATalog?](#)
 on page 97

Usage: Setting only

Manual operation: See ["Save/Recall"](#) on page 20

[:SOURCE<hw>]:BB:TDSCdma:SETTING:STORE <Filename>

Stores the current settings into the selected file; the file extension (*.tdscdma) is assigned automatically.

Setting parameters:

<Filename> string
 Filename or complete file path

Example: See [\[:SOURCE<hw>\]:BB:TDSCdma:SETTING:CATalog?](#)
 on page 97

Usage: Setting only

Manual operation: See ["Save/Recall"](#) on page 20

[:SOURCE<hw>]:BB:TDSCdma:SETTING:TModel <TModel>

Selects the file with the test models defined in the TD-SCDMA standard or a self-defined test setup.

Parameters:

<TModel> string

Example: BB:TDSC:SETT:TMOD 'Test_Mode_ACLR'
 calls the specified test model.

Manual operation: See ["Test Setups/Models"](#) on page 31

[:SOURCE<hw>]:BB:TDSCdma:SETTING:TModel:CATalog?

Queries the file with the test models defined in the TD-SCDMA standard or a self-defined test setup.

Return values:

<Catalog> <filename1>,<filename2>,...
 Returns a string of filenames separated by commas.

Example: MMEM:CDIR '/var/user/tdscdma'
 SOURCE1:BB:TDSCdma:SETTING:TModel:CATalog?
 // Response: "tdscma_tm1", "tdscma_tm2"

Usage: Query only

[:SOURce<hw>]:BB:TDSCdma:STATe <State>

Activates the standard and deactivates all the other digital standards and digital modulation modes in the same path.

Parameters:

<State> 1 | ON | 0 | OFF
*RST: 0

Example: SOURce1:BB:TDSCdma:STATe ON

Manual operation: See "[State](#)" on page 19

[:SOURce<hw>]:BB:TDSCdma:VERSion?

Queries the version of the TD-SCDMA standard underlying the definitions.

Return values:

<Version> string

Example: BB:TDSC:VERS?
Response: Release C

Usage: Query only

Manual operation: See "[TD-SCDMA Version](#)" on page 20

[:SOURce<hw>]:BB:TDSCdma:WAVEform:CREate <Filename>

Stores the current settings as an ARB signal in a waveform file (* .wv).

For general information on file handling in the default and in a specific directory, see section "MMEMory Subsystem" in the R&S SMBVB operating manual.

Setting parameters:

<Filename> string
Filename or complete file path; file extension is assigned automatically

Example: MMEM:CDIR '/var/user/wavefrom'
SOURce1:BB:TDSCdma:WAVEform:CREate "tdscdma"

Usage: Setting only

Manual operation: See "[Generate Waveform File](#)" on page 20

4.2 Filter / clipping / ARB settings

[:SOURce<hw>]:BB:TDSCdma:CLIPping:LEVel	100
[:SOURce<hw>]:BB:TDSCdma:CLIPping:MODE	100
[:SOURce<hw>]:BB:TDSCdma:CLIPping:STATe	100
[:SOURce<hw>]:BB:TDSCdma:FILTer:TYPE	101

[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:APCO25.....	101
[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:COsine.....	101
[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:GAUSS.....	101
[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:LPASs.....	102
[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:LPASSEVM.....	102
[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:PGAuss.....	102
[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:RCOSine.....	103
[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:SPHase.....	103
[:SOURce<hw>]:BB:TDSCdma:SLenGth.....	103

[:SOURce<hw>]:BB:TDSCdma:CLIPping:LEVel <Level>

Sets the limit for clipping.

This value indicates at what point the signal is clipped. It is specified as a percentage, relative to the highest level. 100% indicates that clipping does not take place.

Parameters:

<Level> integer
 Range: 1 to 100
 *RST: 100
 Default unit: PCT

Example: BB:TDSC:CLIP:LEV 80
 BB:TDSC:CLIP:STAT ON

Manual operation: See "[Clipping Level](#)" on page 88

[:SOURce<hw>]:BB:TDSCdma:CLIPping:MODE <Mode>

Sets the method for level clipping.

Parameters:

<Mode> VECTor | SCALar
VECTor
 The reference level is the amplitude.
SCALar
 The reference level is the absolute maximum of the I and Q values.
 *RST: VECTor

Example: BB:TDSC:CLIP:MODE VECT

Manual operation: See "[Clipping Mode](#)" on page 88

[:SOURce<hw>]:BB:TDSCdma:CLIPping:STATe <State>

Activates level clipping

Parameters:

<State> 1 | ON | 0 | OFF
 *RST: 0

Example: BB:TDSC:CLIP:STAT ON

Manual operation: See ["Clipping State"](#) on page 88

[[:SOURce<hw>]:BB:TDSCdma:FILTer:TYPE <Type>

Selects the filter type.

Parameters:

<Type> RCOSine | COSine | GAUSs | LGAuss | CONE | COF705 |
COEQUALizer | COFEQUALizer | C2K3x | APCO25 | SPHase |
RECTangle | PGAuss | LPASs | DIRac | ENPShape |
EWPSHape | LPASSEVM
*RST: RCOSine

Example: BB:TDSC:FILT:TYPE RCOS

Manual operation: See ["Filter"](#) on page 86

[[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:APCO25 <Apc25>

Sets the rolloff factor for filter type APCO25.

Parameters:

<Apc25> float
Range: 0.05 to 0.99
Increment: 0.01
*RST: 0.2

Example: BB:TDSC:FILT:PAR:APCO25 0.2

Manual operation: See ["Rolloff Factor or BxT"](#) on page 86

[[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:COSine <Cosine>

Sets the rolloff factor for the cosine filter type.

Parameters:

<Cosine> float
Range: 0 to 1
Increment: 0.01
*RST: 0.35

Example: BB:TDSC:FILT:PAR:COS 0.35

Manual operation: See ["Rolloff Factor or BxT"](#) on page 86

[[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:GAUSs <Gauss>

Sets the BxT for the gauss filter type.

Parameters:

<Gauss> float
 Range: 0.15 to 2.5
 Increment: 0.01
 *RST: 0.5

Example: BB:TDSC:FILT:PAR:GAUS 0.5

Manual operation: See ["Rolloff Factor or BxT"](#) on page 86

[:SOURce<hw>]:BB:TDSCdma:FILT:PAR:LPASs <LPass>

Sets the cutoff frequency factor for the Lowpass (ACP opt) filter type.

Parameters:

<LPass> float
 Range: 0.05 to 2
 Increment: 0.01
 *RST: 0.5

Example: BB:TDSC:FILT:PAR:LPAS 0.5

Manual operation: See ["Cutoff Frequency Factor"](#) on page 87

[:SOURce<hw>]:BB:TDSCdma:FILT:PAR:LPASSEVM <LPassEvm>

Sets the cutoff frequency factor for the Lowpass (EVM opt) filter type.

Parameters:

<LPassEvm> float
 Range: 0.05 to 2
 Increment: 0.01
 *RST: 0.5

Example: BB:TDSC:FILT:PAR:LPASSEVM 0.5

Manual operation: See ["Cutoff Frequency Factor"](#) on page 87

[:SOURce<hw>]:BB:TDSCdma:FILT:PAR:PGAuss <PGauss>

Sets the BxT for the pure gauss filter type.

Parameters:

<PGauss> float
 Range: 0.15 to 2.5
 Increment: 0.01
 *RST: 0.5

Example: BB:TDSC:FILT:PAR:GAUS 0.5

Manual operation: See ["Rolloff Factor or BxT"](#) on page 86

[[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:RCOSine <RCosine>

Sets the rolloff factor for the root cosine filter type.

Parameters:

<RCosine> float
 Range: 0 to 1
 Increment: 0.01
 *RST: 0.22

Example: BB:TDSC:FILT:PAR:RCOS 0.22

Manual operation: See "[Rolloff Factor or BxT](#)" on page 86

[[:SOURce<hw>]:BB:TDSCdma:FILTer:PARAmeter:SPHase <SPHase>

Sets the BxT for the split phase filter type.

Parameters:

<SPHase> float
 Range: 0.15 to 2.5
 Increment: 0.01
 *RST: 2

Example: BB:TDSC:FILT:PAR:SPH 0.5

Manual operation: See "[Rolloff Factor or BxT](#)" on page 86

[[:SOURce<hw>]:BB:TDSCdma:SLENgth <SLength>

Sets the sequence length of the arbitrary waveform component of the TD-SCDMA signal in the number of frames. This component is calculated in advance and output in the arbitrary waveform generator. It is added to the realtime signal components.

Parameters:

<SLength> integer
 Range: 1 to 5000
 *RST: 1

Example: BB:TDSC:SLEN 10

Manual operation: See "[Sequence Length ARB](#)" on page 89

4.3 Trigger settings

Example: Trigger configuration

```

SOURcel:BB:TDSCdma:TRIGger:SOURce INTernal
SOURcel:BB:TDSCdma:TRIGger:SEQuence ARETrigger
SOURcel:BB:TDSCdma:STAT ON
SOURcel:BB:TDSCdma:TRIGger:EXECute
SOURcel:BB:TDSCdma:TRIGger:ARM:EXECute
SOURcel:BB:TDSCdma:TRIGger:RMODe?
// stopped
SOURcel:BB:TDSCdma:TRIGger:EXECute
SOURcel:BB:TDSCdma:TRIGger:RMODe?
// run

// SOURcel:BB:TDSCdma:TRIGger:SEQuence SING
// SOURcel:BB:TDSCdma:TRIGger:SLUNit SEQuence
// SOURcel:BB:TDSCdma:TRIGger:SLENgth 2

// SOURcel:BB:TDSCdma:TRIGger:SEQuence ARET
// SOURcel:BB:TDSCdma:TRIGger:SOURce EGT1
// SOURcel:BB:TDSCdma:TRIGger:EXTErnal:SYNChronize:OUTPut 1
// SOURcel:BB:TDSCdma:TRIGger:EXTErnal:INHibit 100
// SOURcel:BB:TDSCdma:TRIGger:EXTErnal:DELay 10

```

[:SOURce<hw>]:BB:TDSCdma:TRIGger:ARM:EXECute.....	104
[:SOURce<hw>]:BB:TDSCdma:TRIGger:EXECute.....	105
[:SOURce<hw>]:BB:TDSCdma:TRIGger:EXTErnal:SYNChronize:OUTPut.....	105
[:SOURce<hw>]:BB:TDSCdma:TRIGger:RMODe?.....	105
[:SOURce<hw>]:BB:TDSCdma:TRIGger:SLENgth.....	105
[:SOURce<hw>]:BB:TDSCdma:TRIGger:SLUNit.....	105
[:SOURce<hw>]:BB:TDSCdma:TRIGger:SOURce.....	106
[:SOURce<hw>]:BB:TDSCdma:TRIGger[:EXTErnal]:DELay.....	106
[:SOURce<hw>]:BB:TDSCdma:TRIGger[:EXTErnal]:INHibit.....	106
[:SOURce<hw>]:BB:TDSCdma[:TRIGger]:SEQuence.....	107
[:SOURce<hw>]:BB:TDSCdma:TRIGger:TIME:DATE.....	107
[:SOURce<hw>]:BB:TDSCdma:TRIGger:TIME:TIME.....	108
[:SOURce<hw>]:BB:TDSCdma:TRIGger:TIME[:STATE].....	108

[:SOURce<hw>]:BB:TDSCdma:TRIGger:ARM:EXECute

Stops signal generation; a subsequent trigger event restarts signal generation.

Example: See [Example "Trigger configuration"](#) on page 104

Usage: Event

Manual operation: See ["Arm"](#) on page 24

[:SOURce<hw>]:BB:TDSCdma:TRIGger:EXECute

Executes a trigger.

Example: See [Example "Trigger configuration"](#) on page 104

Usage: Event

Manual operation: See ["Execute Trigger"](#) on page 24

[:SOURce<hw>]:BB:TDSCdma:TRIGger:EXTernal:SYNChronize:OUTPut <Output>

Enables signal output synchronous to the trigger event.

Parameters:

<Output> 1 | ON | 0 | OFF
*RST: 1

Example: See [Example "Trigger configuration"](#) on page 104

Manual operation: See ["Sync. Output to External Trigger/Sync. Output to Trigger"](#) on page 24

[:SOURce<hw>]:BB:TDSCdma:TRIGger:RMODE?

Queries the signal generation status.

Return values:

<RMode> STOP | RUN

Example: See [Example "Trigger configuration"](#) on page 104

Usage: Query only

Manual operation: See ["Running/Stopped"](#) on page 23

[:SOURce<hw>]:BB:TDSCdma:TRIGger:SLENgth <SLength>

Defines the length of the signal sequence that is output in the `SINGLE` trigger mode.

Parameters:

<SLength> integer
Range: 1 to max
*RST: 12800

Example: See [Example "Trigger configuration"](#) on page 104

Manual operation: See ["Signal Duration"](#) on page 23

[:SOURce<hw>]:BB:TDSCdma:TRIGger:SLUNit <SIUnit>

Defines the unit for the entry of the signal sequence length.

Parameters:

<SIUnit> FRAME | CHIP | SEQuence
 *RST: SEQuence

Example: See [Example"Trigger configuration"](#) on page 104

Manual operation: See ["Signal Duration Unit"](#) on page 22

[[:SOURce<hw>]:BB:TDSCdma:TRIGger:SOURce <Source>

Selects the trigger signal source and determines the way the triggering is executed. Provided are:

- Internal triggering by a command (INTernal)
- External trigger signal via one of the User x connectors
EGT1: External global trigger
- In primary-secondary instrument mode, the external baseband synchronization signal (BBSY)
- EXTernal: Setting only
Provided only for backward compatibility with other Rohde & Schwarz signal generators.
The R&S SMBV100B accepts this value and maps it automatically as follows:
EXTernal = EGT1

Parameters:

<Source> INTernal|EGT1|EXTernal|BBSY
 *RST: INTernal

Example: See [Example"Trigger configuration"](#) on page 104

Manual operation: See ["Source"](#) on page 24

[[:SOURce<hw>]:BB:TDSCdma:TRIGger[:EXTernal]:DELay <Delay>

Sets the trigger delay.

Parameters:

<Delay> float
 Range: 0 to 2147483647
 Increment: 0.01
 *RST: 0
 Default unit: samples

Example: See [Example"Trigger configuration"](#) on page 104

Manual operation: See ["External Delay/Trigger Delay"](#) on page 25

[[:SOURce<hw>]:BB:TDSCdma:TRIGger[:EXTernal]:INHibit <Inhibit>

Specifies the duration by which a restart is inhibited.

Parameters:

<Inhibit> integer
 Range: 0 to 21.47*chipRate
 *RST: 0

Example: See [Example"Trigger configuration"](#) on page 104

Manual operation: See ["External Inhibit/Trigger Inhibit"](#) on page 25

[:SOURce<hw>]:BB:TDSCdma[:TRIGger]:SEQUence <Sequence>

Selects the trigger mode:

- AUTO = auto
- RETRigger = retrigger
- AAUTo = armed auto
- ARETrigger = armed retrigger
- SINGLe = single

Parameters:

<Sequence> AUTO | RETRigger | AAUTo | ARETrigger | SINGLe
 *RST: AUTO

Example: See [Example"Trigger configuration"](#) on page 104

Manual operation: See ["Mode"](#) on page 22

[:SOURce<hw>]:BB:TDSCdma:TRIGger:TIME:DATE <Year>, <Month>, <Day>

Sets the date for a time-based trigger signal. For trigger modes single or armed auto, you can activate triggering at this date via the following command:

SOURce<hw>:BB:<DigStd>:TRIGger:TIME:STATe

<DigStd> is the mnemonic for the digital standard, for example, ARB. Time-based triggering behaves analogously for all digital standards that support this feature.

Parameters:

<Year> integer
 Range: 1980 to 9999

<Month> integer
 Range: 1 to 12

<Day> integer
 Range: 1 to 31

Example: See example "Configure a time-based trigger signal" in the sub-chapter "Trigger Commands" of the chapter "SOURce:BB:ARB subsystem" in the R&S SMBV100B user manual.

Manual operation: See ["Trigger Time"](#) on page 23

```
[ :SOURce<hw>]:BB:TDSCdma:TRIGger:TIME:TIME <Hour>, <Minute>, <Second>
```

Sets the time for a time-based trigger signal. For trigger modes single or armed auto, you can activate triggering at this time via the following command:

```
SOURce<hw>:BB:<DigStd>:TRIGger:TIME:STATE
```

<DigStd> is the mnemonic for the digital standard, for example, ARB. Time-based triggering behaves analogously for all digital standards that support this feature.

Parameters:

<Hour>	integer	
	Range:	0 to 23
<Minute>	integer	
	Range:	0 to 59
<Second>	integer	
	Range:	0 to 59

Example: See example "Configure a time-based trigger signal" in the sub-chapter "Trigger Commands" of the chapter "SOURce:BB:ARB subsystem" in the R&S SMBV100B user manual.

Manual operation: See ["Trigger Time"](#) on page 23

```
[ :SOURce<hw>]:BB:TDSCdma:TRIGger:TIME[:STATe] <State>
```

Activates time-based triggering with a fixed time reference. If activated, the R&S SMBV100B triggers signal generation when its operating system time matches a specified time.

Specify the trigger date and trigger time with the following commands:

```
SOURce<hw>:BB:<DigStd>:TRIGger:TIME:DATE
```

```
SOURce<hw>:BB:<DigStd>:TRIGger:TIME:TIME
```

<DigStd> is the mnemonic for the digital standard, for example, ARB. Time-based triggering behaves analogously for all digital standards that support this feature.

Parameters:

<State>	1 ON 0 OFF
	*RST: 0

Example: See example "Configure a time-based trigger signal" in the sub-chapter "Trigger Commands" of the chapter "SOURce:BB:ARB subsystem" in the R&S SMBV100B user manual.

Manual operation: See ["Time Based Trigger"](#) on page 23

4.4 Marker settings

Example: Marker configuration

```
SOURcel:BB:TDSCdma:TRIGger:OUTPut1:MODE USER
SOURcel:BB:TDSCdma:TRIGger:OUTPut1:PERiod 12800
```

```
SOURcel:BB:TDSCdma:TRIGger:OUTPut1:MODE RAT
SOURcel:BB:TDSCdma:TRIGger:OUTPut1:ONTime 1
SOURcel:BB:TDSCdma:TRIGger:OUTPut1:OFFTime 1
// defines the on/off ratio
```

```
// Marker delay configuration
SOURcel:BB:TDSCdma:TRIGger:OUTPut1:DELay 1600
// delays the marker signal output
```

```
[:SOURce<hw>]:BB:TDSCdma:TRIGger:OUTPut<ch>:MODE..... 109
[:SOURce<hw>]:BB:TDSCdma:TRIGger:OUTPut<ch>:ONTime..... 109
[:SOURce<hw>]:BB:TDSCdma:TRIGger:OUTPut<ch>:OFFTime..... 109
[:SOURce<hw>]:BB:TDSCdma:TRIGger:OUTPut<ch>:PERiod..... 110
[:SOURce<hw>]:BB:TDSCdma:TRIGger:OUTPut<ch>:DELay..... 110
```

[:SOURce<hw>]:BB:TDSCdma:TRIGger:OUTPut<ch>:MODE <Mode>

Defines the signal for the selected marker output.

Parameters:

<Mode> RFRame | SFNR | CSPeriod | RATio | USER | FACTive
 RFRame = Radio Frame
 SFNR = System Frame Number (SFN) Restart
 CSPeriod = Chip Sequence Period (ARB)
 RATio = On/Off Ratio
 USER = User Period
 *RST: RFRame

Example: See [Example "Marker configuration"](#) on page 109

Manual operation: See ["Mode"](#) on page 27

[:SOURce<hw>]:BB:TDSCdma:TRIGger:OUTPut<ch>:ONTime <OnTime>
[:SOURce<hw>]:BB:TDSCdma:TRIGger:OUTPut<ch>:OFFTime <OffTime>

Sets the number of chips during which the marker output is on or off.

Parameters:

<OffTime> integer
 Range: 1 to 16777215
 *RST: 1

Example: See [Example "Marker configuration"](#) on page 109

Manual operation: See ["Mode"](#) on page 27

[[:SOURce<hw>]:BB:TDSCdma:TRIGger:OUTPut<ch>:PERiod <Period>

Sets the repetition rate for the signal at the marker outputs.

Parameters:

<Period> integer
 Range: 1 to (2³²-1) chips
 *RST: 12800

Example: See [Example"Marker configuration"](#) on page 109

Manual operation: See ["Mode"](#) on page 27

[[:SOURce<hw>]:BB:TDSCdma:TRIGger:OUTPut<ch>:DELay <Delay>

Defines the delay between the signal on the marker outputs and the start of the signals.

Parameters:

<Delay> float
 Range: 0 to 16777215
 Increment: 1
 *RST: 0

Example: See [Example"Marker configuration"](#) on page 109

Manual operation: See ["Delay"](#) on page 27

4.5 Clock settings

[\[:SOURce<hw>\]:BB:TDSCdma:CLOCK:SOURce.....](#) 110

[[:SOURce<hw>]:BB:TDSCdma:CLOCK:SOURce <Source>

Selects the clock source:

- `INTernal`: Internal clock reference

Parameters:

<Source> INTernal
 *RST: INTernal

Example: `BB:TDSC:CLOC:SOUR INT`
 Selects an internal clock reference.

Manual operation: See ["Clock Source"](#) on page 28

4.6 Predefined settings

<code>[:SOURce<hw>]:BB:TDSCdma:DOWN UP:PPARameter:DPCH:COUNT</code>	111
<code>[:SOURce<hw>]:BB:TDSCdma:DOWN UP:PPARameter:DPCH:CRESt</code>	111
<code>[:SOURce<hw>]:BB:TDSCdma:DOWN UP:PPARameter:DPCH:SFACTOR</code>	112
<code>[:SOURce<hw>]:BB:TDSCdma:DOWN UP:PPARameter:EXECute</code>	112
<code>[:SOURce<hw>]:BB:TDSCdma:DOWN:PPARameter:PCCPch:STATe</code>	112

`[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:PPARameter:DPCH:COUNT <Count>`

Sets the number of activated DPCHs.

The maximum number depends on the spreading factor:

Max. No. DPCH = 3 x "Spreading Factor"

Parameters:

<Count> integer
 Range: 1 to 48
 *RST: 12

Example: BB:TDSC:DOWN:PPAR:DPCH:COUN 48

Manual operation: See ["Number of Dedicated Channels"](#) on page 33

`[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:PPARameter:DPCH:CRESt <Crest>`

Selects the desired range for the crest factor of the test scenario.

Parameters:

<Crest> MINimum | AVERage | WORSt

MINimum

The crest factor is minimized.

The channelization codes are distributed uniformly over the code domain. The timing offsets are increased by 3 per channel.

AVERage

An average crest factor is set.

The channelization codes are distributed uniformly over the code domain. The timing offsets are all set to 0.

WORSt

The crest factor is set to an unfavorable value (i.e. maximum).

The channelization codes are assigned in ascending order. The timing offsets are all set to 0.

*RST: MINimum

Example: BB:TDSC:DOWN:PPAR:DPCH:CRESt WORSt

Manual operation: See ["Crest Factor"](#) on page 33

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:PPARameter:DPCH:SFACtor <SFactor>

Sets the spreading factor for the DPCHs.

Parameters:

<SFactor> 1 | 2 | 4 | 8 | 16
 *RST: 16

Example: BB:TDSC:DOWN | UP:PPAR:DPCH:SFAC 16

Manual operation: See "[Spreading Factor Dedicated Channels](#)" on page 33

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:PPARameter:EXECute

Presets the channel table of cell 1 with the parameters defined by the PPARameter commands. Scrambling Code 0 is automatically selected.

Example: BB:TDSC:DOWN:PPAR:EXEC

Usage: Event

Manual operation: See "[Accept](#)" on page 33

[:SOURce<hw>]:BB:TDSCdma:DOWN:PPARameter:PCCPch:STATe <State>

Defines, if P-CCPCH is used in the scenario or not.

If P-CCPCH is used, both P-CCPCHs are activated in slot 0 with spreading code 0+1.

Parameters:

<State> 1 | ON | 0 | OFF
 *RST: 1

Example: BB:TDSC:DOWN:PPAR:PCCP:STAT ON

Manual operation: See "[Use PCCPCH \(Downlink Slot 0, code 0+1\)](#)" on page 32

4.7 Cell settings

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:UPPTs:MODE	113
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[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:UPPTs:POWer	113
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[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:UPPTs:STATe?	113
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:DWPTs:STATe?	113
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<code>[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:STATe</code>	115
<code>[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:SUCode</code>	115
<code>[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:TDElay</code>	116
<code>[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:USERS</code>	116

`[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:UPPTs:MODE`
`[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:DWPTs:MODE <Mode>`

Selects whether to use the pilot time slot and its power or not.

Parameters:

<Mode> AUTO | ON | OFF
 *RST: AUTO

Example: BB:TDSC:DOWN:CELL1:DWPT:MODE ON

Manual operation: See "[DwPTS Mode/ UpPTS Mode](#)" on page 35

`[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:UPPTs:POWER`
`[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:DWPTs:POWER <Power>`

Sets the power of the downlink/uplink pilot time slot.

Parameters:

<Power> float
 Range: -80 to 10
 Increment: 0.01
 *RST: 0

Example: BB:TDSC:DOWN:CELL1:DWPT:POW -12.5
 sets the power of the downlink pilot slot.

Manual operation: See "[DwPTS Power/ UpPTS Power](#)" on page 35

`[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:UPPTs:STATe?`
`[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:DWPTs:STATe?`

Queries the state of the downlink/uplink pilot timeslot.

Return values:

<State> 1 | ON | 0 | OFF
 *RST: 1

Example: BB:TDSC:DOWN:CELL1:DWPT:STAT?

Usage: Query only

Manual operation: See "[DwPTS Mode/ UpPTS Mode](#)" on page 35

`[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:MCODe?`

Queries the basic midamble code id. The value is set automatically by the change of the scrambling code parameter (it is equal to scrambling code).

Return values:

<MCode> integer
 Range: 0 to 127
 *RST: 0

Example: BB:TDSC:DOWN:CELL1:SCOD 15

Usage: Query only

Manual operation: See "[Basic Midamble Code ID](#)" on page 34

[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>]:PROTation <PRotation>

Selects the phase rotation for the downlink pilots.

Parameters:

<PRotation> AUTO | S1 | S2

AUTO

Default phase rotation sequence according to the presence of the P-CCPCH.

S1

There is a P-CCPCH in the next four subframes.

S2

There is no P-CCPCH in the next four subframes.

*RST: AUTO

Example: BB:TDSC:DOWN:CELL1:PROT AUTO

Manual operation: See "[Phase Rotation](#)" on page 35

[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>]:SCODe <SCode>

Sets the scrambling code. The scrambling code is used for transmitter-dependent scrambling of the chip sequence.

Parameters:

<SCode> integer
 Range: 0 to 127
 *RST: 0

Example: BB:TDSC:DOWN:CELL1:SCOD 15
 sets the scrambling code for cell 1.

Manual operation: See "[Scrambling Code](#)" on page 34

[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>]:SCODe:STATe <State>

Activates or deactivates the scrambling code.

Parameters:

<State> 1 | ON | 0 | OFF
 *RST: 1

Example: BB:TDSC:DOWN:CELL1:SCOD:STAT ON

Manual operation: See ["Use \(Scrambling Code\)"](#) on page 34

[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SDCode?

Queries the SYNC-DL code.

Return values:

<SdCode> integer
 Range: 0 to 31
 *RST: 0

Example: BB:TDSC:DOWN:CELL1:SDC?

Usage: Query only

Manual operation: See ["SYNC-DL Code"](#) on page 35

[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SPOint <SPoint>

Sets the switching point between the uplink slots and the downlink slots in the frame.

Parameters:

<SPoint> integer
 Range: 1 to 6
 *RST: 3

Example: BB:TDSC:DOWN:CELL1:SPO 4

Manual operation: See ["Switching Point"](#) on page 37

[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:STATE <State>

Activates and deactivates the specified cell.

Parameters:

<State> 1 | ON | 0 | OFF
 *RST: 0

Example: BB:TDSC:DOWN:CELL1:STAT ON

Manual operation: See ["Cell On / Cell Off"](#) on page 32
 See ["State"](#) on page 34

[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SUCode <SuCode>

Sets the SYNC-UL code.

Parameters:

<SuCode> integer
 Range: 0 to 255
 *RST: 0

Example: BB:TDSC:DOWN:CELL1:SUC 120

Manual operation: See "SYNC-UL Code" on page 35

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:TDElay <TDelay>

Sets the time shift of the selected cell compared to cell 1; the time delay of cell 1 is 0.

Parameters:

<TDelay> integer
 Range: 0 to 19200
 *RST: 0
 Default unit: chip

Example: BB:TDSC:DOWN:CELL2:TDEL 100
 'shifts cell 2 by 100 chips compared to cell 1.

Manual operation: See "Time Delay" on page 36

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:USERS <Users>

Sets the total number of users of the cell.

Parameters:

<Users> 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16
 *RST: 16

Example: BB:TDSC:DOWN:CELL1:USER 4

Manual operation: See "Number of Users" on page 36

4.8 Enhanced channels of cell 1

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[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:BIT:STATe.....	120
[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:BLOCK:RATE.....	120
[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:BLOCK:STATe.....	121
[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:BPFRame?.....	121
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[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:ITWO.....	123
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[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:DTCH<ch> DCCH:ITWO...	124
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[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:SCSMo.....	126
[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:SFORmat?.....	126
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[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:TSCo.....	127
[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:TYPE.....	127
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:BPFRame?.....	127
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:CRCSiz.....	127
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:DATA.....	128
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:DATA:DSElect.....	128
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:DATA:PATtern.....	129
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:EPRotectio.....	129
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:RMAtribut.....	129
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:STATe.....	130
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:TBCo.....	130
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:TBSiz.....	130
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:TTInterv.....	130
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:SCSMo.....	130
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:SFORmat?.....	131
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:SLOTstate<ch0>?.....	131
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:STATe.....	131
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:TYPE?.....	132

[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:PLCCh:SSPatt
<SsPattern>, <BitCount>

Sets the sync shift pattern and the pattern length.

Parameters:

<SsPattern> numeric
 *RST: #H0

<BitCount> integer
 Range: 1 to 21
 *RST: 3

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:PLCC:SSP #HA5,8
 sets the sync shift pattern.

Manual operation: See "[Sync Shift Pattern](#)" on page 49

**[[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:PLCC:TPCPattern
 <TpcPattern>, <BitCount>**

Sets the TPC pattern and the pattern length.

Parameters:

<TpcPattern> numeric
 *RST: #H0

<BitCount> integer
 Range: 1 to 21
 *RST: 3

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:PLCC:TCP #HA5,8
 sets the TPC pattern

Manual operation: See "[TPC Pattern](#)" on page 49

[[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:PLCC:TTInterval?

Queries the transmission time interval.

Return values:

<TtInterval> 5MS | 10MS | 20MS | 40MS | 80MS

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:PLCC:TTIN?
 queries the TTI value
 Respose: 5ms

Usage: Query only

Manual operation: See "[Transmission Time Interval \(TTI\)](#)" on page 48

**[[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSIC:ANPattern
 <AnPattern>, <BitCount>**

Sets the ACK/NACK Pattern and the maximum pattern length. A "1" corresponds to ACK, a "0" to NAK.

Parameters:

<AnPattern> numeric
 *RST: #H7

<BitCount> integer
 Range: 1 to 36
 *RST: 3

Example: BB:TDSC:UP:CELL1:ENH:DCH:HSIC:ANP #HAA,8
 sets the ACK/NACK pattern

Manual operation: See "[ACK/NAK Pattern](#)" on page 50

[:SOURCE<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSICH:CQI:MODulation
 <Modulation>

Sets the CQI modulation.

Parameters:

<Modulation> QPSK | QAM16 | QAM64
 *RST: QPSK

Example: BB:TDSC:UP:CELL1:ENH:DCH:HSIC:CQI:MOD QAM16
 sets the CQI modulation

Manual operation: See "[CQI Modulation](#)" on page 50

[:SOURCE<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSICH:CQI:VALue
 <Value>

Sets the CQI value.

Parameters:

<Value> integer
 Range: 0 to 63
 *RST: 0

Example: BB:TDSC:UP:CELL1:ENH:DCH:HSIC:CQI:VAL 10
 sets the CQI value

Manual operation: See "[CQI Value](#)" on page 50

[:SOURCE<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSICH:TTINterval?

Queries the transmission time interval.

Return values:

<TtInterval> 5MS | 10MS | 20MS | 40MS | 80MS

Example: BB:TDSC:UP:CELL1:ENH:DCH:HSIC:TTIN?
 Response: 5ms

Usage: Query only

Manual operation: See "[Transmission Time Interval \(TTI\) – RMC HS-SICH](#)" on page 50

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:BIT:LAYer <Layer>

Sets the layer in the coding process at which bit errors are inserted.

Parameters:

<Layer> TRANsport | PHYSical
*RST: TRANsport

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:BIT:LAY TRAN

Manual operation: See ["Insert Errors On"](#) on page 51

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:BIT:RATE <Rate>

Sets the bit error rate.

Parameters:

<Rate> float
Range: 1E-7 to 0.5
Increment: 1E-7
*RST: 0.001

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:BIT:RATE 5E-1
sets the bit error rate.

Manual operation: See ["Bit Error Rate"](#) on page 51

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:BIT:STATe <State>

Activates or deactivates bit error generation.

Parameters:

<State> 1 | ON | 0 | OFF
*RST: 0

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:BIT:STAT ON

Manual operation: See ["State \(Bit Error\)"](#) on page 51

**[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:BLOCK:RATE
<Rate>**

Sets the block error rate.

Parameters:

<Rate> float
Range: 1E-4 to 0.5
Increment: 1E-4
*RST: 0.1

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:BLOC:RATE 10E-1
sets the block error rate.

Manual operation: See ["Block Error Rate"](#) on page 52

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:BLOCK:STATE
 <State>

Activates or deactivates block error generation.

Parameters:

<State> 1 | ON | 0 | OFF
 *RST: 0

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:BLOC:STAT ON

Manual operation: See ["State \(Block Error\)"](#) on page 52

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:BPFRame?

Queries the data bits in the DPDCH component of the DPCH frame at physical level.
 The value depends on the slot format.

Return values:

<BpFrame> string

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:BPFR?

Usage: Query only

Manual operation: See ["Data Bits Per Frame \(10 ms\)"](#) on page 44

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:CCOUNT <CCOUNT>

Sets the number of channels to be used.

The number of timeslots is set with the command
 BB:TDSC:DOWN|UP:CELL1:ENH:DCH:TSCOUNT.

Parameters:

<CCOUNT> integer
 Range: 1 to 16
 *RST: 1(uplink), 2(downlink)

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:CCO 2

Manual operation: See ["Number of Channels \(DCH\)"](#) on page 44

**[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:
 CRCSize <CrcSize>**

Sets the type (length) of the CRC.

Parameters:

<CrcSize> NONE | 8 | 12 | 16 | 24
 *RST: 16(DTCH), 12(DCCH)

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:DTCH:CRCS?
queries the type (length) of the CRC.

Manual operation: See "Size Of CRC" on page 47

**[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:
DATA <Data>**

The command selects the data source for the specified channel.

For the traffic channels, this value is specific for the selected radio configuration.

Parameters:

<Data> PN9 | PN11 | PN15 | PN16 | PN20 | PN21 | PN23 | DLISt |
ZERO | ONE | PATTErn

PNxx

PRBS data as per CCITT with period lengths between 29-1 and 223-1 is generated internally.

DLISt

Internal data from a programmable data list is used. The data list can be generated by the Data Editor or generated externally. Data lists are selected in the "Select Data List" field. The data list is selected with the command

BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:DATA:DSEL <data list name>.

ZERO | ONE

Internal 0 and 1 data is used.

PATTErn

A user-definable bit pattern with a maximum length of 64 bits is generated internally. The bit pattern is defined in the "Pattern entry field". The bit pattern is selected with the command

BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:DATA:PATT <bit pattern>.

*RST: PN9

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:DTCH:DATA PN9
selects PN9 as the data source of the transport channel.

Manual operation: See "Data Source" on page 46

**[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:
DATA:DSElect <DSelect>**

Selects an existing data list file from the default directory or from the specific directory.

For general information on file handling in the default and in a specific directory, see section "MMEMory Subsystem" in the R&S SMBVBuser manual.

For the traffic channels, this value is specific for the selected radio configuration.

Parameters:

<DSelect> string
 Filename incl. file extension or complete file path

Example:

```
BB:TDSC:DOWN:CELL1:ENH:DCH:DTCH:DATA DLIS
MMEM:CDIR "/var/user/Lists"
```

```
BB:TDSC:DOWN:CELL1:ENH:DCH:DTCH:DATA:DSEL
"tdscdma_1"
```

selects file `tdscdma_1` as the data source. This file must be in specified directory and it must have the file extension `*.dm_iqd`.

Manual operation: See ["Data Source"](#) on page 46

[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>]DCCH:DATA:PATtern <Pattern>, <BitCount>

Sets the bit pattern

For the traffic channels, this value is specific for the selected radio configuration.

Parameters:

<Pattern> numeric
 *RST: #H0

<BitCount> integer
 Range: 1 to 64
 *RST: 1

Example:

```
BB:TDSC:DOWN:CELL1:ENH:DCH:DTCH:DATA:PATT
#H800FE038,30
```

Manual operation: See ["Data Source"](#) on page 46

[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>]DCCH:EPRotectioN <EProtection>

Sets the error protection.

Parameters:

<EProtection> NONE | TURBo3 | CON2 | CON3
 *RST: CON3

Example:

```
BB:TDSC:DOWN:CELL1:ENH:DCH:DTCH:EPR CON2
sets the error protection.
```

Manual operation: See ["Error Protection"](#) on page 47

[[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:IONE <IOne>[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:ITWO <ITwo>

[:SOURce<hw>]:BB:TDS Cdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH: IONE <IOne>

[:SOURce<hw>]:BB:TDS Cdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH: ITWO <ITwo>

Activates or deactivates the channel coding interleaver state 1 and 2 off all the transport channels. Interleaver state 1 and 2 can only be set for all the TCHs together. Activation does not change the symbol rate.

Parameters:

<ITwo> 1 | ON | 0 | OFF
*RST: 1

Example: BB:TDS C:DOWN:CELL1:ENH:DCH:DTCH:ITWO ON

Manual operation: See ["Interleaver 2 State"](#) on page 48

[:SOURce<hw>]:BB:TDS Cdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH: RMAtribute <RmAttribute>

Sets the rate matching.

Parameters:

<RmAttribute> integer
Range: 16 to 1024
*RST: 256

Example: BB:TDS C:DOWN:CELL1:ENH:DCH:DTCH:RMA 32

Manual operation: See ["Rate Matching Attribute"](#) on page 47

[:SOURce<hw>]:BB:TDS Cdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH: STATE <State>

Sets the state of the transport channel.

Parameters:

<State> 1 | ON | 0 | OFF
*RST: depends on channel

Example: BB:TDS C:DOWN:CELL1:ENH:DCH:DTCH:STAT ON
enables the transport channel.

Manual operation: See ["State"](#) on page 45

[:SOURce<hw>]:BB:TDS Cdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH: TBCount <TbCount>

Sets the number of transport blocks for the TCH.

Parameters:

<TbCount> integer
 Range: 1 to 24
 *RST: 1

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:DTCH:TBC 2

Manual operation: See ["Transport Blocks"](#) on page 46

**[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:
 TBSIZE <TbSize>**

Sets the size of the transport block at the channel coding input.

Parameters:

<TbSize> integer
 Range: 0 to 4096
 *RST: 244(DTCH), 100(DCCH)

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:DTCH:TBS 4096
 sets the size of transport block of the channel coding input.

Manual operation: See ["Transport Block Size"](#) on page 47

**[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:DTCH<ch>|DCCH:
 TTINTERVAL <TtInterval>**

Sets the number of frames into which a TCH is divided. This setting also defines the interleaver depth.

Parameters:

<TtInterval> 5MS | 10MS | 20MS | 40MS
 *RST: 20MS(DTCH), 40MS(DCCH)

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:DTCH:TTIN 40MS
 sets the number of frames into which a TCH is divided.

Manual operation: See ["Transport Time Interval"](#) on page 46

[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:RUPLayer?

The command queries the resource units on the physical layer needed to generate the selected channel.

Return values:

<RupLayer> string

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:RUPL?
 queries the resource units on the physical layer needed to generate the selected channel.

Usage: Query only

Manual operation: See ["Resource Units On Physical Layer"](#) on page 42

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:SCSMoDe
<ScsMode>
```

Sets the spreading code selection mode for the used transport channels.

Parameters:

```
<ScsMode>          AUTO | USER
*RST:              AUTO
```

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:SCSM AUTO

Manual operation: See "[Spreading Code Selection for Enhanced Channels](#)" on page 43

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:SFORmat?
```

Queries the slot format of the selected channel.

Return values:

```
<SFormat>          string
```

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:SFOR?

Usage: Query only

Manual operation: See "[Slot Format](#)" on page 44

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:SLOTstate<ch>
<SlotState>
```

Queries the state of the slots off cell 1 used to transmit the transport channel.

Parameters:

```
<SlotState>        1 | ON | 0 | OFF
*RST:              depends on slot
```

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:SLOT 3?
queries the state of slot 3.

Manual operation: See "[Mapping On Physical Channels: Select Slots To Use](#)" on page 43

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:STATe <State>
```

Activates or deactivates the enhanced state for the DCH channel coding.

Parameters:

```
<State>            1 | ON | 0 | OFF
*RST:              0
```

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:STAT ON
deactivates the enhanced state for the DCH channel.

Manual operation: See "[State \(DCH\)](#)" on page 41

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:TSCount
<TsCount>
```

Sets the number of timeslots to be used.

Parameters:

```
<TsCount>          integer
                    Range:    1 to 5
                    *RST:     1
```

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:TSC 2

Manual operation: See ["Number of Timeslots \(DCH\)"](#) on page 44

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:TYPE <Type>
```

The command sets the channel coding type.

Parameters:

```
<Type>             RMC12K2 | RMC64K | RMC144K | RMC384K | RMC2048K |
                    HRMC526K | HRMC730K | UP_RMC12K2 | UP_RMC64K |
                    UP_RMC144K | UP_RMC384K | HSDPA | HSUPA | HS_SICH |
                    PLCCCH | USER | USER
                    *RST:     RMC12K2
```

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:TYPE RMC12K2
sets the channel coding type to RMC12K2.

Manual operation: See ["Coding Type"](#) on page 41

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:BPFRame?
```

Queries the data bits in the DPDCH component of the DPCH frame at physical level. The value depends on the slot format.

Return values:

```
<BpFrame>         string
```

Example: BB:TDSC:DOWN:CELL1:ENH:BCH:BPFR?

Usage: Query only

Manual operation: See ["Data Bits Per Frame \(10 ms\)"](#) on page 40

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:CRCSize?
```

The command queries the type (length) of the CRC.

Return values:

```
<CrcSize>         NONE | 8 | 12 | 16 | 24
```

Example: BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:CRCS?
queries the type (length) of the CRC.

Usage: Query only
Manual operation: See "Size Of CRC" on page 47

[[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:DATA <Data>

The command selects the data source for the specified channel.

For the traffic channels, this value is specific for the selected radio configuration.

Parameters:

<Data> PN9 | PN11 | PN15 | PN16 | PN20 | PN21 | PN23 | DLISt |
 ZERO | ONE | PATTErn

PNxx

PRBS data as per CCITT with period lengths between 2^9-1 and $2^{23}-1$ is generated internally.

DLISt

Internal data from a programmable data list is used. The data list can be generated by the Data Editor or generated externally. Data lists are selected in the "Select Data List" field. The data list is selected with the command

BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:DATA:DSEL <data list name>.

ZERO | ONE

Internal 0 and 1 data is used.

PATTErn

A user-definable bit pattern with a maximum length of 64 bits is generated internally. The bit pattern is defined in the "Pattern entry field". The bit pattern is selected with the command

BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:DATA:PATT <bit pattern>.

*RST: PN9

Example: BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:DATA PN9
 selects PN9 as the data source of the transport channel.

Manual operation: See "Data Source" on page 46

[[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:DATA:DSElect <DSelect>

Selects an existing data list file from the default directory or from the specific directory.

For general information on file handling in the default and in a specific directory, see section "MMEMory Subsystem" in the R&S SMBVBuser manual.

For the traffic channels, this value is specific for the selected radio configuration.

Parameters:

<DSelect> string

Example: BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:DATA DLIS
 MMEM:CDIR "/var/user/Lists"
 BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:DATA:DSEL
 "tdscdma_1"
 selects file `tdscdma_1` as the data source. This file must be in the specified directory and must have the file extension `*.dm_iqd`.

Manual operation: See ["Data Source"](#) on page 46

[[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:DATA:PATTERN<Pattern>, <BitCount>

Sets the bit pattern.

For the traffic channels, this value is specific for the selected radio configuration.

Parameters:

<Pattern>	numeric
	*RST: #H0
<BitCount>	integer
	Range: 1 to 64
	*RST: 1

Example: BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:DATA:PATT
 #H800FE038,30

Manual operation: See ["Data Source"](#) on page 46

[[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:EPRotectioN?

Queries the error protection.

Return values:

<EProtection> NONE | TURBo3 | CON2 | CON3

Example: BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:EPR?

Usage: Query only

Manual operation: See ["Error Protection"](#) on page 47

[[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:RMATtribute?

Queries the rate matching.

Return values:

<RmAttribute> integer

Example: BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:RMAT?

Usage: Query only

Manual operation: See ["Rate Matching Attribute"](#) on page 47

[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:STATE <State>

Queries the state of the transport channel.

Parameters:

<State> 1 | ON | 0 | OFF
 *RST: 1

Example: BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:STAT?

[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:TBCount?

Queries the number of transport blocks for the TCH.

Return values:

<TbCount> integer

Example: BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:TBC?

Usage: Query only

Manual operation: See "[Transport Blocks](#)" on page 46

[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:TBSize?

Queries the size of the transport block at the channel coding input.

Return values:

<TbSize> integer

Example: BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:TBS?

Usage: Query only

Manual operation: See "[Transport Block Size](#)" on page 47

[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:TTInterval?

Queries the number of frames into which a TCH is divided.

Return values:

<TtInterval> 5MS | 10MS | 20MS | 40MS | 80MS

Example: BB:TDSC:DOWN:CELL1:ENH:BCH:DTCH:TTIN?

Usage: Query only

Manual operation: See "[Transport Time Interval](#)" on page 46

[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:SCSMMode?

Queries the spreading code predetermined in the standard.

Return values:

<ScsMode> AUTO
*RST: AUTO

Example:

BB:TDSC:DOWN:CELL1:ENH:BCH:SCSM?

Usage:

Query only

Manual operation: See "[Spreading Code Selection \(BCH\)](#)" on page 39

[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:SFORMAT?

The command queries the slot format of the selected channel. A slot format defines the complete structure of a slot made of data and control fields and includes the symbol rate. The slot format (and thus the symbol rate, the pilot length, and the TFCI State) depends on the coding type selected.

Return values:

<SFormat> string

Example:

BB:TDSC:DOWN:CELL1:ENH:BCH:SFOR?
queries the channel coding type.

Usage:

Query only

Manual operation: See "[Slot Format](#)" on page 40

[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:SLOTstate<ch0>?

Queries the state of the slots off cell 1 used to transmit the broadcast channels.

Slot 0 is always on and all the other slots are always off.

Return values:

<SlotState> 1 | ON | 0 | OFF
*RST: 0

Example:

BB:TDSC:DOWN:CELL1:ENH:BCH:SLOT1?

Usage:

Query only

Manual operation: See "[Mapping On Physical Channels: BCH mapped to <Slot> 0, P-CCPCH1/2](#)" on page 39

[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:STATE <State>

Activates and deactivates the enhanced state for the P-CCPCH 1/2 channel.

Parameters:

<State> 1 | ON | 0 | OFF
*RST: 0

Example:

BB:TDSC:DOWN:CELL1:ENH:BCH:STAT ON

Manual operation: See "[State \(BCH\)](#)" on page 38

[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:TYPE?

The command queries the channel coding type.

Return values:

<Type> BCHSfn

Example:

BB:TDSC:DOWN:CELL1:ENH:BCH:TYPE?
queries the channel coding type.

Usage:

Query only

Manual operation: See "Coding Type (BCH)" on page 39

4.9 Channel settings

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**[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
 DPCCh:EUCC:CCOunt <CCount>**

Sets the number of the E-DCH Uplink Control Channels (E-UCCH).

Parameters:

<CCount> integer
 Range: 0 to 8
 *RST: 0

Example:

```
BB:TDSC:UP:CELL1:SLOT1:CHAN7:TYPE E_PUCH_QPSK
sets channel type E-PUCH QPSK
BB:TDSC:UP:CELL1:SLOT1:CHAN7:DPCC:EUCC:CCO 5
sets number of E-UCCH channels
```

Manual operation: See "Number of E-UCCH Channels" on page 78

```
[:SOURCE<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:CHANNEL<us0>:
  DPCCh:EUCC:HPID <Hpid>
```

Sets the HARQ process ID.

Parameters:

```
<Hpid>          integer
                Range:    0 to 3
                *RST:     0
```

Example: BB:TDSC:UP:CELL1:SLOT1:CHAN7:TYPE E_PUCH_QPSK
sets channel type E-PUCH QPSK
BB:TDSC:UP:CELL1:SLOT1:CHAN7:DPCC:EUCC:HPID 2
sets number HARQ process ID

Manual operation: See "[HARQ Process ID](#)" on page 78

```
[:SOURCE<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:CHANNEL<us0>:
  DPCCh:EUCC:RSNumber <RsNumber>
```

Sets the retransmission sequence number.

Parameters:

```
<RsNumber>      integer
                Range:    0 to 3
                *RST:     0
```

Example: BB:TDSC:UP:CELL1:SLOT1:CHAN7:TYPE E_PUCH_QPSK
sets channel type E-PUCH QPSK
BB:TDSC:UP:CELL1:SLOT1:CHAN7:DPCC:EUCC:RSN 2
sets retransmission sequence number

Manual operation: See "[Retransmission Sequence Number \(E-UCCH\)](#)" on page 78

```
[:SOURCE<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:CHANNEL<us0>:
  DPCCh:EUCC:TFCI <Tfci>
```

Enters the value of the TFCI field.

Parameters:

```
<Tfci>          integer
                Range:    0 to 63
                *RST:     0
```

Example: BB:TDSC:UP:CELL1:SLOT1:CHAN7:TYPE E_PUCH_QPSK
sets channel type E-PUCH QPSK
BB:TDSC:UP:CELL1:SLOT1:CHAN7:DPCC:EUCC:TFCI 10
sets the TFCI value

Manual operation: See "[E-TFCI Value](#)" on page 78

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
  DATA <Data>
```

The command determines the data source for the selected channel.

Parameters:

```
<Data>          PN9 | PN11 | PN15 | PN16 | PN20 | PN21 | PN23 | DLISt |
                ZERO | ONE | PATTern
```

PNxx
PRBS data as per CCITT with period lengths between 29-1 and 223-1 is generated internally.

DLISt
Internal data from a programmable data list is used.

ZERO | ONE
Internal 0 and 1 data is used.

PATTern
A user-definable bit pattern with a maximum length of 64 bits is generated internally.

```
*RST:          PN9
```

Example: `BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:DATA PN9`
sets the data source for the selected channel to PN9.

Manual operation: See "[Data](#)" on page 69

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
  DATA:DSElect <DSelect>
```

Selects an existing data list file from the default directory or from the specific directory.

Parameters:

```
<DSelect>      string
```

Example: `BB:TDSC:UP:CELL1:SLOT3:CHAN6:DATA DLIS`
`MMEM:CDIR "/var/user/Lists"`
`BB:TDSC:UP:CELL1:SLOT3:CHAN6:DATA:DSEL`
`"tdscdma_1"`
selects file `tdscdma_1` as the data source. This file must be in the directory and must have the file extension `*.dm_iqd`.

Manual operation: See "[Data](#)" on page 69

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
  DATA:PATTern <Pattern>, <BitCount>
```

Determines the bit pattern. The first parameter determines the bit pattern (choice of hexadecimal, octal, or binary notation), the second specifies the number of bits to use.

Parameters:

```
<Pattern>      numeric
                *RST:      #H0
```

<BitCount> integer
 Range: 1 to 64
 *RST: 1

Example: BB:TDSC:UP:CELL1:SLOT3:CHAN6:DATA:PATT #H3F, 8
 defines the bit pattern.

Manual operation: See ["Data"](#) on page 69

**[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
 DPCCh:SYNC:LENGth <Length>**

Sets the length of the sync shift and the length of the TPC field in bits. The available values depend on the slot format.

Parameters:

<Length> 0 | 2 | 3 | 4 | 8 | 16 | 32 | 48
 *RST: 0

Example: BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:DPCC:SYNC:LENG 2

Manual operation: See ["Number of Sync Shift & TPC Bits"](#) on page 76

**[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
 DPCCh:SYNC:PATTern <Pattern>**

Sets the bit pattern for the sync shift.

Parameters:

<Pattern> string
 The maximum pattern length is 64 bits.

Example: BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:DPCC:SYNC:PATT
 10-01

Manual operation: See ["Sync Shift Pattern"](#) on page 76

**[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
 DPCCh:SYNC:REPetition <Repetition>**

Sets the value for the sync shift repetition.

Parameters:

<Repetition> integer
 Range: 1 to 8
 *RST: 1

Example: BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:DPCC:SYNC:REP 1

Manual operation: See ["Sync Shift Repetition M"](#) on page 77

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
DPCCh:TFCI:LENGth <Length>
```

Sets the length of the TFCI field in bits.

Parameters:

```
<Length>          0 | 4 | 6 | 8 | 12 | 16 | 24 | 32 | 48
*RST:             0
```

Example:

```
BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:DPCC:TFCI:LENG
12
sets the length of the TFCI field to 12 bits.
```

Manual operation: See ["Number of TFCI Bits"](#) on page 75

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
DPCCh:TFCI:VALue <Value>
```

The command sets the value of the TFCI field.

Parameters:

```
<Value>          integer
Range:           0 to 1023
*RST:            0
```

Example:

```
BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:DPCC:TFCI:VAL 0
sets the value of the TFCI field to 0.
```

Manual operation: See ["TFCI Value"](#) on page 75

```
[ :SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
DPCCh:TPC:DATA <Data>
```

Sets the data source for the TPC field of the DPCCH.

Parameters:

```
<Data>          ZERO | ONE | PATtern | DLISt
DLISt
A data list is used.
ZERO | ONE
Internal 0 and 1 data is used.
PATtern
Internal data is used.
*RST:           PATtern
```

Example:

```
BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:DPCC:TPC:DATA
PATT
BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:DPCC:TPC:DATA:
PATT #H3F,8
```

Manual operation: See ["TPC Source"](#) on page 79

```
[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
DPCCh:TPC:DATA:DSElect <DSelect>
```

Selects an existing data list file from the default directory or from the specific directory.

For the traffic channels, this value is specific for the selected radio configuration.

Parameters:

<DSelect> string

Example:

```
BB:TDSC:DOWN:CELL1:SLOT3:CHAN5:DPCC:TPC:DATA
DLIS
```

```
MMEM:CDIR "/var/user/Lists"
```

```
BB:TDSC:DOWN:CELL1:SLOT3:CHAN5:DPCC:TPC:DATA:
DSEL "tdscdma_1"
```

selects file `tdscdma_1` as the data source. This file must be in the directory and must have the file extension `*.dm_iqd`.

Manual operation: See "[TPC Source](#)" on page 79

```
[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
DPCCh:TPC:DATA:PATtern <Pattern>, <BitCount>
```

Sets the bit pattern and the maximum bit pattern length.

Parameters:

<Pattern> numeric

```
*RST:        #H1
```

<BitCount> integer

```
Range:       1 to 64
```

```
*RST:        2
```

Example:

```
BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:DPCC:TPC:DATA:
PATT #H3F,8
```

defines the bit pattern.

Manual operation: See "[TPC Source](#)" on page 79

```
[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
DPCCh:TPC:READ <Read>
```

Sets the read out mode for the bit pattern of the TPC field.

Parameters:

<Read> CONTInuous | S0A | S1A | S01A | S10A

CONTInous

The TPC bits are used cyclically.

S0A

The TPC bits are used once and then the TPC sequence is continued with 0 bits.

S1A

The TPC bits are used once and then the TPC sequence is continued with 1 bit.

S01A

The TPC bits are used once and then the TPC sequence is continued with 0 and 1 bits alternately

S10A

The TPC bits are used once, and then the TPC sequence is continued with 1 and 0 bits alternately

*RST: CONTInuous

Example: BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:DPCC:TPC:READ
S01A

Manual operation: See ["Read Out Mode"](#) on page 80

**[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
ENHanced?**

Queries the enhanced state. If the enhanced state is set to ON, the channel coding cannot be changed.

Return values:

<Enhanced> 0 | 1 | 2 | OFF | ON | NOvalue

*RST: NOvalue

Example: BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:ENH?

Usage: Query only

Manual operation: See ["Enhanced"](#) on page 68

**[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
MSHift?**

Queries the midamble shift.

Return values:

<MShift> integer

Range: 0 to 128

*RST: 120

Example: BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:MSH?

Usage: Query only

Manual operation: See ["Midamble Shift"](#) on page 75

**[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:
POWer <Power>**

Sets the channel power in dB.

Parameters:

<Power> float
 Range: -80 to 0
 Increment: 0.01
 *RST: 0

Example: BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:POW -20

Manual operation: See "[Power/dB](#)" on page 69

[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:SCODE <SCode>

Sets the spreading code for the selected channel. The code channel is spread with the set spreading code. The range of values of the spreading code depends on the channel type and the spreading factor. Depending on the channel type, the range of values can be limited.

Parameters:

<SCode> integer
 Range: 1 to 16
 *RST: 1

Example: BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:SCOD 1
 set the spreading code for channel 6 to 1.

Manual operation: See "[Sprd. Code](#)" on page 69

[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:SFACTOR <SFactor>

Sets the spreading factor for the selected channel. The selection depends on the channel type and interacts with the slot format.

Parameters:

<SFactor> 1 | 2 | 4 | 8 | 16
 *RST: 16

Example: BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:SFAC 16

Manual operation: See "[Sprd. Fact.](#)" on page 69

[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANnel<us0>:SFORMAT <SFormat>

Sets the slot format for the selected channel. A slot format defines the complete structure of a slot made of data and control fields and includes the symbol rate. The slot format displays changes when a change is made to the "Number of TFCI Bits" and the "Number of Sync Shift & TPC Bits" field settings.

Parameters:

<SFormat> integer
 Range: 0 to 69
 *RST: -

Example:

BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:SFOR 0
 sets the slot format for channel 6 to 0.

Manual operation:

See "Slot Format" on page 68
 See "Slot Format" on page 74

**[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANNEL<us0>:
 STATE <State>**

Activates or deactivates the channel.

Parameters:

<State> 1 | ON | 0 | OFF
 *RST: 0

Example:

BB:TDSC:UP:CELL1:SLOT3:CHAN6:STAT ON

Manual operation:

See "State" on page 70

**[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANNEL<us0>:
 TYPE <Type>**

Sets the channel type.

In the uplink, the channel type is fixed for channel number 0. In the downlink, the channel type is fixed for channel numbers 0 to 5. For the remaining numbers, the choice lies between the relevant standard channels and the high speed channels.

Parameters:

<Type> P_CCPCH1 | P_CCPCH2 | S_CCPCH1 | S_CCPCH2 | FPACH |
 PDSCH | DPCH_QPSK | DPCH_8PSK | HS_SCCH1 |
 HS_SCCH2 | HS_PDS_QPSK | HS_PDS_16QAM | PUSCH |
 UP_DPCH_QPSK | UP_DPCH_8PSK | HS_SICH |
 HS_PDS_64QAM | E_PUCH_QPSK | E_PUCH_16QAM |
 E_RUCCH | PLCCH | EAGCH | EHICH
 *RST: depends on channel number

Example:

BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:TYPE DPC_QPSK
 sets the channel type DPC_QPSK for channel 6 of the channel
 table.

Manual operation:

See "Channel Type" on page 68

**[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:CHANNEL<us0>:
 USER <User>**

Sets the number of the user.

Parameters:

<User> integer
 Range: 1 to 16
 *RST: 1

Example: BB:TDSC:DOWN:CELL4:SLOT3:CHAN6:USER 3
 sets the number of the users to 3.

Manual operation: See "[Crt.User/Mid.Shift](#)" on page 68

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:DCONflict?

Queries the global domain conflict state per slot.

Return values:

<DConflict> 1 | ON | 0 | OFF
 *RST: 0

Example: BB:TDSC:UP:CELL1:SLOT3:DCON?

Usage: Query only

Manual operation: See "[Dom. Conf.](#)" on page 70

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:SLOT<ch0>:STATe <State>

Activates and deactivates the slot in the subframe.

Parameters:

<State> 1 | ON | 0 | OFF
 *RST: 0

Example: BB:TDSC:DOWN:CELL1:SLOT0:STAT ON

Manual operation: See "[Slot Icon](#)" on page 37
 See "[State](#)" on page 65

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:MODE <Mode>

Sets the mode in which the slot is to work.

Parameters:

<Mode> DEDicated | PRACH

DEDicated

The instrument generates a signal with a dedicated physical control channel (DPCCH) and up to six dedicated physical data channels (DPDCH). The signal is used for voice and data transmission.

PRACH

The instrument generates a single physical random access channel (PRACH). This channel is needed to set up the connection between the mobile station and the base station.

*RST: DEDicated

Example: BB:TDSC:UP:CELL4:SLOT3:MODE PRAC

Manual operation: See "[Slot Mode](#)" on page 65

**[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:DATA
<Data>**

The command determines the data source for the PRACH.

Parameters:

<Data> PN9 | PN11 | PN15 | PN16 | PN20 | PN21 | PN23 | DLIS |
ZERO | ONE | PATTern

PNxx

PRBS data as per CCITT with period lengths between 2^9-1 and $2^{23}-1$ is generated internally.

DLIS

Internal data from a programmable data list is used.

ZERO | ONE

Internal 0 and 1 data is used.

PATTern

A user-definable bit pattern with a maximum length of 64 bits is generated internally.

*RST: PN9

Example: BB:TDSC:UP:CELL4:SLOT3:PRAC:MSG:DATA PN9
selects PN9 as the data source for the PRACH.

Manual operation: See "[Data Source \(PRACH\)](#)" on page 84

**[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:DATA:
DSElect <DSelect>**

Selects an existing data list file from the default directory or from the specific directory.

Parameters:

<DSelect> string
Filename incl. file extension or complete file path

Example: BB:TDSC:UP:CELL1:SLOT3:PRAC:MSG:DATA DLIS
MMEM:CDIR "/var/user/Lists"

BB:TDSC:UP:CELL1:SLOT3:PRAC:MSG:DATA:DSEL
"tdscdma_1"

Selects file `tdscdma_1` as the data source. This file must be in the directory and it must have the file extension `*.dm_iqd`

Manual operation: See "[Data Source \(PRACH\)](#)" on page 84

**[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:DATA:
PATTern <Pattern>, <BitCount>**

Determines the bit pattern. The first parameter determines the bit pattern (choice of hexadecimal, octal or binary notation), the second specifies the number of bits to use.

Parameters:

<Pattern>	numeric
	*RST: #H0
<BitCount>	integer
	Range: 1 to 64
	*RST: 1

Example: BB:TDSC:UP:CELL1:SLOT3:PRAC:MSG:DATA:PATT #H3F,
8
defines the bit pattern.

Manual operation: See "[Data Source \(PRACH\)](#)" on page 84

**[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:LENGth
<Length>**

Sets the message length of the random access channel in subframes.

Parameters:

<Length>	1 2 4
	*RST: 1

Example: BB:TDSC:UP:CELL4:SLOT3:PRAC:MSG:LENG 1

Manual operation: See "[Message Length](#)" on page 83

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:MSHift?

Queries the value of the midamble shift.

Return values:

<MShift>	integer
	Range: 0 to 128
	*RST: 120

Example: BB:TDSC:UP:CELL1:SLOT3:PRAC:MSG:MSH?

Usage: Query only

Manual operation: See "[Midamble Shift \(PRACH\)](#)" on page 85

**[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:
PCORrection <PCorrection>**

Queries the value of the power correction.

Parameters:

<PCorrection> float
 Range: -1E10 to 1E10
 Increment: 0.01
 *RST: -

Example:

BB:TDSC:UP:CELL4:SLOT3:PRAC:MSG:POW -10
 sets the power of the PRACH message part
 BB:TDSC:UP:CELL4:SLOT3:PRAC:MSG:PCOR?
 queries the value of the power correction.
 Response: 2.99086185076844

Manual operation: See "[Power \(RACH Message Part\)](#)" on page 84

**[[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:POWER
 <Power>**

Sets the power of the PRACH message part.

Parameters:

<Power> float
 Range: -80 to 0
 Increment: 0.01
 *RST: 0

Example:

BB:TDSC:UP:CELL4:SLOT3:PRAC:MSG:POW 1

Manual operation: See "[Power \(RACH Message Part\)](#)" on page 84

**[[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:SCODE
 <SCode>**

Sets the spreading code for the PRACH. The code channel is spread with the set spreading code.

Parameters:

<SCode> integer
 Range: 1 to 16
 *RST: 1

Example:

BB:TDSC:UP:CELL4:SLOT3:PRAC:MSG:SCOD 16
 sets the power of the PRACH message part.

Manual operation: See "[Spreading Code \(PRACH\)](#)" on page 84

**[[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:SFACTOR
 <Sfactor>**

Sets the spreading factor for the PRACH.

Parameters:

<Sfactor> 4 | 8 | 16
 *RST: 16

Example:

BB:TDSC:UP:CELL4:SLOT3:PRAC:MSG:SFAC 16

Manual operation: See "[Spreading Factor \(PRACH\)](#)" on page 84

[:SOURCE<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:SFORmat?

Queries the slot format of the PRACH. The slot format depends on the selected spreading factor.

Return values:

<SFormat> integer
 Range: 0 to 25
 *RST: 0

Example:

BB:TDSC:UP:CELL4:SLOT3:PRAC:MSG:SFOR 1

Usage:

Query only

Manual operation: See "[Slot Format \(PRACH\)](#)" on page 84

[:SOURCE<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:STATE<State>

Activates or deactivates the RACH (random access channel) message part.

Parameters:

<State> 1 | ON | 0 | OFF
 *RST: 0

Example:

BB:TDSC:UP:CELL4:SLOT3:PRAC:MSG:STAT ON

Manual operation: See "[State \(RACH Message Part\)](#)" on page 83

[:SOURCE<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:MSG:USER<User>

Sets user number.

Parameters:

<User> integer
 Range: 1 to 16
 *RST: 1

Example:

BB:TDSC:UP:CELL1:SLOT3:PRAC:MSG:USER 1

Manual operation: See "[Current User \(PRACH\)](#)" on page 85

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:PTS:DISTance
 <Distance>

Sets the value to vary the timing between UpPTS and RACH.

Parameters:

<Distance> integer
 Range: 1 to 4
 *RST: 1

Example: BB:TDSC:UP:CELL4:SLOT3:PRAC:PTS:DIST 1

Manual operation: See "[Distance UpPTS](#)" on page 82

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:PTS:
PCORrection?

Queries the power correction of the UpPTS.

The value is computed based on:

- UpPTS power
 BB:TDSC:UP:CELL:SLOT:PRAC:PTS:POW
- Power step
 BB:TDSC:UP:CELL:SLOT:PRAC:PTS:PST
- Message power
 BB:TDSC:UP:CELL:SLOT:PRAC:MSG:POW
- UpPTS length, message length
 BB:TDSC:UP:CELL:SLOT:PRAC:MSG:LENG
- ARB sequence length
 BB:TDSC:SLLEN

Return values:

<PCorrection> float
 Range: -1E10 to 1E10
 Increment: 0.01
 *RST: 19.03

Example: BB:TDSC:UP:CELL4:SLOT3:PRAC:PTS:POW -12
 BB:TDSC:UP:CELL4:SLOT3:PRAC:PTS:PCOR?
 Response: 0.8890863332626

Usage: Query only

Manual operation: See "[Power](#)" on page 82

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:PTS:POWer
 <Power>

Sets the power of the UpPTS.

Parameters:

<Power> float
 Range: -80 to 0
 Increment: 0.01
 *RST: 0

Example: BB:TDSC:UP:CELL4:SLOT3:PRAC:PTS:POW -12

Manual operation: See "[Power](#)" on page 82

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:PTS:PSTep
 <PStep>

Sets the power by which the UpPTS is increased from repetition to repetition.

Parameters:

<PStep> float
 Range: 0 to 10
 Increment: 0.01
 *RST: 0

Example: BB:TDSC:UP:CELL4:SLOT3:PRAC:PTS:PST 3

Manual operation: See "[Power Step](#)" on page 81

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:PTS:REPetition
 <Repetition>

Sets the number of UpPTS repetitions before a PRACH burst happens.

Parameters:

<Repetition> integer
 Range: 1 to 10
 *RST: 1

Example: BB:TDSC:UP:CELL4:SLOT3:PRAC:PTS:REP 1

Manual operation: See "[UpPTS Repetition](#)" on page 83

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:PTS:STARt
 <Start>

Sets the number of the subframe in which the first UpPTS should be transmitted.

Parameters:

<Start> integer
 Range: 0 to 10
 *RST: 0

Example: BB:TDSC:UP:CELL4:SLOT3:PRAC:PTS:STAR 3

Manual operation: See "[UpPTS Start](#)" on page 82

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:SLOT<ch0>:PRAC:SLENgth?

Queries the sequence length of the PRACH slot.

The value is computed based on:

- Start Subframe
BB:TDSC:UP:CELL:SLOT:PRAC:PTS:STAR
- UpPTS repetition
BB:TDSC:UP:CELL:SLOT:PRAC:PTS:REP
- Distance UpPTS and RACH
BB:TDSC:UP:CELL:SLOT:PRAC:PTS:DIST
- Message length
BB:TDSC:UP:CELL:SLOT:PRAC:MSG:LENG

Return values:

<SLength> float
Range: 0.5 to 13.5
Increment: 0.5
*RST: 0.5

Example:

BB:TDSC:UP:CELL:SLOT:PRAC:PTS:STAR 3

Sets the number of the subframe in which the first UpPTS is transmitted.

BB:TDSC:UP:CELL4:SLOT3:PRAC:PTS:REP 2

Sets the number of UpPTS repetitions before a PRACH burst happens.

BB:TDSC:UP:CELL4:SLOT3:PRAC:PTS:DIST 2

Sets the number of the subframe in which the first UpPTS is transmitted.

BB:TDSC:UP:CELL4:SLOT3:PRAC:MSG:LENG 1

Sets the message length of the random access channel to one subframe.

BB:TDSC:UP:CELL4:SLOT3:PRAC:SLEN?

Queries the sequence length.

Response: 3.5

Usage: Query only

Manual operation: See "Sequence Length" on page 82

4.10 HSDPA/HSUPA settings

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[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:SCCH.....	151
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:SPATtern?.....	151
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:TBS:TABLE.....	151
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:TTIDistance.....	152
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:UEID.....	152
[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:VIBSize.....	152

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[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:RSequence.....	153
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[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:SFACTOR.....	154
[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:TBS:TABLE.....	154
[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:HSDPA HSUPA:BPAYload?.....	154
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[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:HSDPA HSUPA:DATA: PATTem.....	156
[:SOURce<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:HSDPA HSUPA: HARQ:LENGth.....	156
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[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:RMC <Rmc>

Enables a predefined set of RMC channels or fully configurable user mode.

Parameters:

<Rmc> HRMC_0M5_QPSK | HRMC_1M1_QPSK |
 HRMC_1M1_16QAM | HRMC_1M6_QPSK |
 HRMC_1M6_16QAM | HRMC_2M2_QPSK |
 HRMC_2M2_16QAM | HRMC_2M8_QPSK |
 HRMC_2M8_16QAM | HRMC_64QAM_16UE |
 HRMC_64QAM_19UE | HRMC_64QAM_22UE | USER
 *RST: HRMC_0M5_QPSK

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:RMC
 HRMC_2M8_QPSK
 sets the RMC mode

Manual operation: See "[RMC Configuration](#)" on page 53

[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:SCCH <Scch>

Enables/disables the HS-SCCH.

Parameters:

<Scch> 1 | ON | 0 | OFF
 *RST: 0

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:SCCH ON

Manual operation: See "[HS-SCCH State](#)" on page 56

[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:SPATtern?

Queries the distribution of packets over time.

The signaling pattern is cyclically repeated.

Return values:

<SPattern> string
 A sequence of HARQ-IDs and "-".
 A HARQ-ID indicates a packet, a "-" indicates no packet.

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:TTID 2
 BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:HARQ:LENG 4
 BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:SPAT?
 Response: '0,-,1,-2,-,3,-'

Usage: Query only

Manual operation: See "[Signaling Pattern](#)" on page 62

**[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:TBS:TABLE
 <Table>**

Sets the transport block size table, according to the specification 3GPP TS 25.321.

Parameters:

<Table> C1TO3 | C4TO6 | C10TO12 | C7TO9 | C13TO15 | C16TO18 |
 C19TO21 | C22TO24
 *RST: C1TO3

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:TSB:TABL
 C13TO15

Manual operation: See "[Transport Block Size Table](#)" on page 60

[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:TTIDistance <TtiDistance>

Sets the inter-TTI distance. The inter-TTI is the distance between two packets in HSDPA packet mode and determines whether data is sent each TTI or there is a DTX transmission in some of the TTIs.

An inter-TTI distance of 1 means continuous generation.

Parameters:

<TtiDistance> integer
 Range: 1 to 8
 *RST: 1

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:TTID 2

Manual operation: See "[Inter TTI Distance](#)" on page 62

[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:UEID <Ueid>

Sets the UE identity.

Parameters:

<Ueid> integer
 Range: 0 to 65535
 *RST: 0

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:UEID 2
 sets the UE ID

Manual operation: See "[UEID \(H-RNTI\)](#)" on page 56

[:SOURce<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:VIBSize <VibSize>

Sets the size of the virtual IR buffer.

Parameters:

<VibSize> integer
 Range: dynamic to 63360
 Increment: 704
 *RST: 2816

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:VIBS 2800
 sets the size of the virtual IR buffer

Manual operation: See "[Virtual IR Buffer Size \(Per HARQ process\)](#)" on page 61

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:EUCTti <Euctti>

Sets the number of E-UCCH channels per TTI.

Parameters:

<Euctti> integer
 Range: 1 to 8
 *RST: 4

Example:

BB:TDSC:UP:CELL1:ENH:DCH:HSUPA:EUCT 2
 sets the number of channels

Manual operation: See "[Number of E-UCCH per TTI](#)" on page 58

[:SOURCE<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:FRC <Frc>

Selects a predefined E-DCH fixed reference channel or fully configurable user mode.

Parameters:

<Frc> 1 | 2 | 3 | 4 | USER
 *RST: 1

Example:

BB:TDSC:UP:CELL1:ENH:DCH:HSUPA:EUCT 2

Manual operation: See "[E-DCH Fixed Reference Channel \(FRC\)](#)" on page 55

**[:SOURCE<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:RSEQUence
 <RSequence>**

(for "HSUPA" and "HARQ Mode" set to constant NACK)

Sets the retransmission sequence.

Parameters:

<RSequence> string
 *RST: 0

Example:

BB:TDSC:DOWN:CELL1:ENH:DCH:TYPE HSUPA
 BB:TDSC:UP:CELL1:ENH:DCH:HSUPA:HARQ:MODE CNAC
 BB:TDSC:UP:CELL1:ENH:DCH:HSUPA:RSEQ '0,2,3'

Manual operation: See "[Retransmission Sequence](#)" on page 64

[:SOURCE<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:RSNumber?

(for HARQ Mode set to constant ACK)

Queries the retransmission sequence number.

The value is fixed to 0.

Return values:

<RsNumber> integer
 Range: 0 to 0
 *RST: 0

Example: BB:TDSC:UP:CELL1:ENH:DCH:HSUPA:HARQ:MODE CACK
 BB:TDSC:UP:CELL1:ENH:DCH:HSUPA:RSN?
 Response: 0

Usage: Query only

Manual operation: See ["Retransmission Sequence Number"](#) on page 64

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:SFACtor
 <SFactor>

Selects the spreading factor for the FRC.

Parameters:
 <SFactor> 1 | 2 | 4 | 8 | 16
 *RST: 4

Example: BB:TDSC:UP:CELL1:ENH:DCH:HSUPA:SFAC 2
 sets the spreading factor

Manual operation: See ["Spreading Factor \(FRC\)"](#) on page 58

[:SOURce<hw>]:BB:TDSCdma:UP:CELL<st>:ENH:DCH:HSUPA:TBS:TABLE
 <Table>

Sets the transport block size table, according to the specification 3GPP TS 25.321, annex BC.

Parameters:
 <Table> C1TO2 | C3TO6
 *RST: C1TO2

Example: BB:TDSC:UP:CELL1:ENH:DCH:HSUPA:TBS:TABL C3TO6

Manual operation: See ["Transport Block Size Table 0"](#) on page 60

[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
 BPAYload?

Queries the payload of the information bit. i.e. transport block size. This value determines the number of transport layer bits sent in each TTI before coding.

Return values:
 <BPayload> integer

Example: BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:BPAY?

Usage: Query only

Manual operation: See ["Information Bit Payload \(Ninf\)"](#) on page 61

[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:CRATe?

Queries the coding rate.

Return values:

<CRate> float

Example: BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:CRAT?

Usage: Query only

Manual operation: See "[Coding Rate](#)" on page 61

[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:CTSCCount <CtsCount>

Sets the number of physical channels per timeslot.

Parameters:

<CtsCount> integer

Range: 1 to 14

*RST: 10(downlink), 1(uplink)

Example: BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:CTSC
2

Manual operation: See "[Number of HS-PDSCH/E-DCH Codes per TS](#)" on page 57

[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:DATA <Data>

The command determines the data source for the HSDPA/HSUPA channels.

Parameters:

<Data> PN9 | PN11 | PN15 | PN16 | PN20 | PN21 | PN23 | DLISt |
ZERO | ONE | PATtern

PNxx

PRBS data as per CCITT with period lengths between 2^9-1 and $2^{23}-1$ is generated internally.

DLISt

Internal data from a programmable data list is used.

ZERO | ONE

Internal 0 and 1 data is used.

PATtern

A user-definable bit pattern with a maximum length of 64 bits is generated internally.

*RST: PN9

Example: BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:DATA
PN11
selects the data source

Manual operation: See ["Data Source"](#) on page 59

**[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
DATA:DSElect <DSelect>**

Selects an existing data list file from the default directory or from the specific directory.

Parameters:

<DSelect> string
 Filename incl. file extension or complete file path

Example:

```
BB:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:DATA DLIS
MMEM:CDIR "/var/user/Lists"
BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:DATA:
DSEL "tdscdma_1"
Selects file tdscdma_1 as the data source. This file must be in
the directory and must have the file extension *.dm_iqd
```

Manual operation: See ["Data Source"](#) on page 59

**[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
DATA:PATtern <Pattern>, <BitCount>**

Determines the bit pattern. The first parameter determines the bit pattern (choice of hexadecimal, octal or binary notation), the second specifies the number of bits to use.

Parameters:

<Pattern> numeric
 *RST: #H0

<BitCount> integer
 Range: 1 to 64
 *RST: 1

Example:

```
BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:DATA:
PATT #H3F, 8
defines the bit pattern.
```

Manual operation: See ["Data Source"](#) on page 59

**[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
HARQ:LENGth <Length>**

Sets the number of HARQ processes. This value determines the distribution of the payload in the subframes and depends on the inter-TTI distance.

A minimum of three HARQ Processes are required to achieve continuous data transmission.

Parameters:

<Length> integer
 Range: 1 to 8
 *RST: 4

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:HARQ:LENG 5

Manual operation: See "[Number of HARQ Processes](#)" on page 62

**[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
 HARQ:MODE <Mode>**

Sets the HARQ simulation mode.

Parameters:

<Mode> CACK | CNACK

CACK

New data is used for each new TTI. This mode is used to simulate maximum throughput transmission.

CNACK

Enables NACK simulation, i.e. depending on the sequence selected with command

BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:RVS packets are retransmitted. This mode is used for testing with varying redundancy version.

*RST: CACK

Example: BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:HARQ:
 MODE CNACK
 sets the HARQ mode

Manual operation: See "[HARQ Mode](#)" on page 63

**[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
 MIBT?**

Queries maximum information bits sent in each TTI before coding.

Return values:

<Mibt> float
 Increment: 0.1

Example: BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:MBIT?

Usage: Query only

Manual operation: See "[Maximum Information Bit Throughput /kbps](#)" on page 57

**[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
 MODulation <Modulation>**

Sets the modulation scheme for each HSDPA RMC or HSUPA FRC.

The HSUPA FRCs do not support modulation scheme 64QAM.

Parameters:

<Modulation> QPSK | QAM16 | QAM64
*RST: QPSK

Example:

BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:MOD
QAM16

Manual operation: See "[Modulation](#)" on page 59

**[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
NCBTti?**

Queries the number of bits after coding.

Return values:

<NcbTti> integer

Example:

BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:NCBT?

Usage:

Query only

Manual operation: See "[Number of Coded Bits Per TTI](#)" on page 60

**[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
RVParameter <RvParameter>**

(for HARQ Mode set to constant ACK)

Sets the redundancy version parameter, i.e. indicates which redundancy version of the data is sent.

Parameters:

<RvParameter> integer
Range: 0 to 7
*RST: 0

Example:

BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:HARQ:
MODE CACK
BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:RVP 2

Manual operation: See "[Redundancy Version Parameter](#)" on page 64

**[[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
RVSequence <RvSequence>**

For HARQ mode set to constant NACK, sets the retransmission sequence.

For HSUPA, the command is a query only.

Parameters:

<RvSequence> string of 30 coma-separated values

The sequence length determines the maximum number of retransmissions. New data is retrieved from the data source after reaching the end of the sequence.

*RST: 0

Example:

```
BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:HARQ:
MODE CNAC
```

```
BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:RVS '0,2,1'
```

```
BB:TDSC:DOWN:CELL1:ENH:DCH:TYPE HSUPA
```

```
BB:TDSC:UP:CELL1:ENH:DCH:HSUPA:HARQ:MODE CNAC
```

```
BB:TDSC:UP:CELL1:ENH:DCH:HSUPA:RSEQ '0,2,3'
```

```
BB:TDSC:UP:CELL1:ENH:DCH:HSUPA:RVS?
```

```
Response: '0,2,1'
```

Manual operation: See "[Redundancy Version Sequence](#)" on page 64

**[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
SFormat?**

Queries the slot format of the selected channel.

A slot format defines the complete structure of a slot made of data and control fields. The slot format depends on the coding type selected.

Return values:

<SFormat> string

Example:

```
BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:SFOR?
```

Usage:

Query only

Manual operation: See "[Slot Format](#)" on page 58

**[:SOURCE<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
TBS:INDEX <Index>**

Sets the index for the corresponding table, as described in 3GPP TS 25.321.

Parameters:

<Index> integer

Range: 0 to 63

*RST: -

Example:

```
BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:TBS:
IND 20
```

Manual operation: See "[Transport Block Size Index](#)" on page 61

```
[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
  TSCount <TsCount>
```

Sets the number of timeslots.

Parameters:

```
<TsCount>          integer
                   Range:    2 to 5
                   *RST:     2
```

Example: BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:TSC 3

Manual operation: See "[Number of HS-PDSCH/E-DCH Timeslots](#)" on page 57

```
[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
  TTInterval?
```

Queries the transmission time interval (TTI).

Return values:

```
<TtInterval>      5MS
```

Example: BB:TDSC:DOWN|UP:CELL1:ENH:DCH:HSDPA|HSUPA:TTIN?
Response: 5MS

Usage: Query only

Manual operation: See "[Transmission Time Interval \(TTI\)](#)" on page 58

```
[:SOURce<hw>]:BB:TDSCdma:DOWN|UP:CELL<st>:ENH:DCH:HSDPA|HSUPA:
  UECategory?
```

Queries the UE category that is minimum required to receive the selected RMC or FRC.

Return values:

```
<UeCategory>      integer
```

Example: BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:RMC
HRMC_2M8_16QAM
BB:TDSC:DOWN:CELL1:ENH:DCH:HSDPA:UEC?
Response: 13

Usage: Query only

Manual operation: See "[UE Category](#)" on page 57

List of commands

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[:SOURCE<hw>]:BB:TDSCdma:CLIPping:STATe.....	100
[:SOURCE<hw>]:BB:TDSCdma:CLOCK:SOURce.....	110
[:SOURCE<hw>]:BB:TDSCdma:COPY:DESTination.....	93
[:SOURCE<hw>]:BB:TDSCdma:COPY:EXECute.....	94
[:SOURCE<hw>]:BB:TDSCdma:COPY:SOURce.....	93
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[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:TBCount?.....	130
[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:TBSIZE?.....	130
[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:DTCH:TTIntervAl?.....	130
[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:SCSMODE?.....	130
[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:SFORMAT?.....	131
[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:SLOTstate<ch0>?.....	131
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[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:BCH:TYPE?.....	132
[:SOURCE<hw>]:BB:TDSCdma:DOWN:CELL<st>:ENH:DCH:HSDPA:RMC.....	150
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[:SOURCE<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:BIT:STATe.....	120
[:SOURCE<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:BLOCK:RATE.....	120
[:SOURCE<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:BLOCK:STATe.....	121
[:SOURCE<hw>]:BB:TDSCdma:DOWN UP:CELL<st>:ENH:DCH:BPFRame?.....	121

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