R&S®SMM-K47/-K87
1xEV-DO Rev A, Rev B
User Manual

1179200202
Version 05

ROHDE&SCHWARZ
Make ideas real

This document describes the following software options:

- R&S®SMM-K47 1xEV-DO Rev. A (1441.1982.xx)
- R&S®SMM-K87 1xEV-DO Rev. B (1441.1853.xx)

This manual describes firmware version FW 5.30.047.xx and later of the R&S®SMM100A.

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1179.2002.02 | Version 05 | R&S®SMM-K47/-K87

The following abbreviations are used throughout this manual: R&S®SMM100A is abbreviated as R&S SMM, R&S®WinIQSIM2™ is abbreviated as R&S WinIQSIM2; the license types 02/03/07/11/13/16/12 are abbreviated as xx.

Contents

1 Welcome to the 1xEV-DO digital standard

The R&S SMM100A-K47/-K87 is a firmware application that adds functionality to generate signals in accordance to the CDMA2000® 1xEV-DO (Evolution-Data Optimized), Rev. A and Rev. B.

CDMA2000® 1xEV-DO is the North American standard for the third mobile radio generation (3G). CDMA2000® 1xEV-DO is a high-speed packet-switched transmission technique with forward peak data rates of 4.9152 Mbps per carrier, designed and optimized for a data-centric broadband network.

The R&S SMM100A simulates 1xEV-DO signal at the physical layer. In forward link (downlink) mode, the signal is generated in real time. Parameter changes during active signal output take effect immediately without signal interruption. In reverse link (uplink) mode, the signal is precalculated and played from the ARB memory. Parameter changes result in a recalculation of the signal.

The following list gives an overview of the main feature provided by the R&S SMM100A for generating an 1xEV-DO signal in accordance with 3GGP2 C.S0024-B.v3.0.

- Generation of 1xEV-DO signals with a chip rate of 1.2288 Mcps
- Independent configuration of up to four traffic channels or four access terminals
- Support of physical layer subtypes 0, 1, 2 and 3
- Support of multi-carrier operation with up to 16 simultaneous carriers
- Operating modes "Traffic" and "Access" on the uplink
- Simulation of up to 360 additional MAC users
- Generation of standard compliant forward/downlink and reverse/uplink channel types
- Supports configuration of public data as defined in the standard, such as Long Code Masks for I and Q channel, Preamble Length, DRCLength.
- Filling the data files for data channels from the following standard sources: pattern (all1, all0, user-defined up to 64 bits), PN data or data lists
- Clipping for reducing the crest factor

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 SMM100A user manual. The latest version is available at:

www.rohde-schwarz.com/manual/SMM100A

Installation

You can find detailed installation instructions in the delivery of the option or in the R&S SMM100A service manual.

1.1 Accessing the 1xEV-DO dialog

To open the dialog with 1xEV-DO settings

► In the block diagram of the R&S SMM100A, select "Baseband > 1xEV-DO".

A dialog box opens that display 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®SMM100A.

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

- Time-based triggering, see "Time Based Trigger" on page 18 and "Trigger Time" on page 18.
- Editorial changes

1.3 Documentation overview

This section provides an overview of the R&S SMM100A user documentation. Unless specified otherwise, you find the documents at:

www.rohde-schwarz.com/manual/smm100a

1.3.1 Getting started manual

Introduces the R&S SMM100A 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 SMM100A is not included.

The contents of the user manuals are available as help in the R&S SMM100A. 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 SMM100A 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 SMM100A. 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/smm100a

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/smm100a

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/smm100a

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 SMM100A 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 1xEV-DO options

This section provides an overview of required options and background information on the CDMA2000® 1xEV-DO standard.

2.1 Required options

The basic equipment layout for generating 1xEV-DO signals includes the:

- Baseband Generator(R&S SMM-B9)
- Frequency option (e.g. R&S SMM-B1006)
- Baseband realtime extension (R&S SMM-K520)
- Digital standard 1xEV-DO Rev. A (R&S SMM-K47)
- Digital standard 1xEV-DO Rev. B (R&S SMM-K87)

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

For more information, see data sheet.

2.2 Modulation system

The following table gives an overview of parameters of the modulation system 1xEV-DO.

Table 2-1: Parameters of the modulation system 1xEV-DO

Parameter	Value
Chip rate	1.2288 Mcps
Channel types	Forward link: • Pilot channel • Forward Traffic Channel (Rev. A) • Reverse Activity • DRCLock • Reverse Power Control • ARQ (Rev. A) • Control Channel Reverse link, access mode: • Pilot Channel • Data Channel Reverse link, traffic mode: • Pilot Channel • Auxiliary Pilot Channel (Rev. A) • Reverse Rate Indicator • Data Rate Control • Data Source Control (Rev. A) • ACK Channel • Data Channel
Generation mode	Forward link: • Realtime mode Reverse link: • Arbitrary waveform mode • Multicarrier operation Up to 16 concurrent carriers supported Requires option R&S SMM-K87
Data rates	Forward link: • 38.4 .. 2457.6 kbps (Rev. 0) • 4.8 .. 3072 kbps (Rev. A) • 4.8 .. 4915 kbps (Rev. B) Requires option R&S SMM-K87 Reverse link: • 9.6 .. 153.6 kbps (Rev. 0) • 4.8 .. 1843.2 kbps (Rev. A)
Frame length	26.67 ms (1 frame = 16 slots)
Slot duration	1.67 ms (1 slot = 2048 PN chips)
PN offset	0 .. 511
Channel coding	All channel coding modes defined in the standard (channel encoding, block interleaving, repetition, modulation, orthogonal spreading by Walsh function)
Modulation	BPSK, QPSK, 8PSK, 16QAM, 64QAM Requires option R&S SMM-K87
Multi-code modulation	B4, Q2, Q4, Q4Q2, E4E2
Long Code Mask	Separate Long Code Masks for I and Q channel. The Long Code Generator is reloaded at every PN rollover with 0x24B91BFD3A8.
Walsh covers	Different Walsh functions for the different channels

2.3 Traffic scheduling process

In the 1xEV-DO system, the Forward Link is governed by a time division multiple access technique. Access to Forward Link bandwidth by a user channel is governed by a scheduling process. The schedule process determines who gets access to Forward Link slots to carry user data.

The traffic scheduling process in this instrument follows a number of rules to schedule which user's data is sent for each slot.

The rules are listed in order of priority, with the highest priority rules being listed first. In the event that two rules contradict each other, the circumstances invoking the lower priority rule must be altered to resolve the contradiction.

- A channel with "State = Off" is never transmitted.
- The first slot of the control channel packet is always transmitted at its specified offset at the start of the control channel cycle.
- Once the first slot of a multiple slot packet is sent, the remaining slots are always transmitted with the proper interlace (three slots skipped after one slot sent).
- Packets for a user can be transmitted on 1 to 4 interlaces (there are a total of 4 interlaces in the 1xEV-DO system). Packets on the different interlaces are duplicates of the packets sent on the other interlaces for a given user. The interleave factor user interface parameter is used to control the number of interlaces used for each user.
- Immediately after the transmission of the last slot of a multiple slot packet, a lockout period of three slots is created. No additional packets from the same source can be scheduled before the three slot period expires.
- A control channel packet has priority over all other traffic channels. This excludes transmission of user channels in advance of the control channel packet, if the other channel would require a slot that the control channel packet would require.
- User1 traffic has priority over User2, User3, and User4 traffic.
- User2 traffic has priority over User3 and User4 traffic.
- User3 traffic has priority over User4 traffic.
- If no traffic is scheduled for a slot, an idle slot is transmitted.

3 1xEV-DO configuration and settings

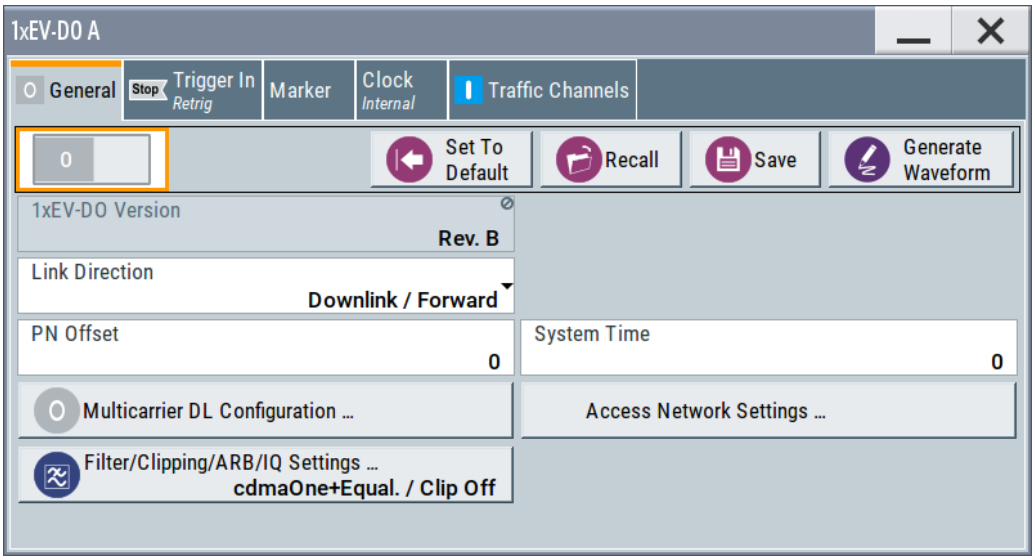
Access:

► Select "Baseband" > "1xEV-DO".

The remote commands required to define these settings are described in Chapter 4, "Remote-control commands", on page 65.

3.1 General settings

The tab provides access to the default and the "Save/Recall" settings. The selected link direction determines the available parameters.



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

Remote command:
[:SOURce<hw>]:BB:EVDO:STATe on page 71

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
PN Offset	0
System Time	0
Predefined Settings	User Defined
Multicarrier State	off
Filter	CdmaOne + Equalizer
Clipping	Off
Trigger	Auto

Remote command:
[:SOURce<hw>]:BB:EVDO:PRESet on page 69

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 SMM100A user manual.

Remote command:
[:SOURce<hw>]:BB:EVDO:SETTing:CATalog? on page 69
[:SOURce<hw>]:BB:EVDO:SETTing:LOAD on page 70
[:SOURce<hw>]:BB:EVDO:SETTing:STORe on page 70
[:SOURce<hw>]:BB:EVDO:SETTing:DELete on page 70

Generate Waveform
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:EVDO:WAVeform:CREate on page 72

1xEV-DO Version
Displays the version of the standard that the firmware supports.

Remote command:
[:SOURce<hw>]:BB:EVDO:VERSion? on page 71

Link Direction
Selects the link direction.

The settings of the traffic channels per user and the access terminals are provided in the following menu section in accordance with the selection.

"Downlink/Forward"
The link direction selected is base station to access terminal. The signal corresponds to that of a base station.

"Uplink/Reverse"
The link direction selected is access terminal to base station. The signal corresponds to that of an access terminal.

Remote command:
[:SOURce<hw>]:BB:EVDO:LINK on page 69

PN Offset
Sets the PN Offset of the 1xEV-DO signal.

Remote command:
[:SOURce<hw>]:BB:EVDO:PNOFfset on page 69

System Time
Sets the system time value of the 1xEV-DO signal and the base station. The system time is expressed in units of 1.67 ms intervals (80 ms/ 48).

Note: In uplink, the value selected for system time must be multiple of 16.

Remote command:
[:SOURce<hw>]:BB:EVDO:STIMe on page 71

Multicarrier Configuration
Provides access to the "Multicarrier Configuration" dialog, see Chapter 3.7, "Multi-carrier configuration settings", on page 36.

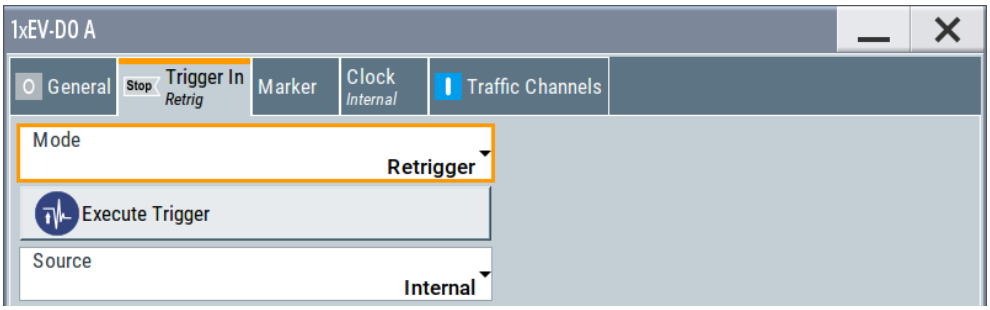
Access Network Settings
In downlink direction, provides access to the "Access Network Settings" dialog, see Chapter 3.8, "Access network settings", on page 38.

Filter / Clipping / ARB Settings
Provides access to the settings dialogs for configuring baseband filtering, clipping and the sequence length of the arbitrary waveform component, see Chapter 3.10, "Filter / clipping / ARB settings", on page 59.

3.2 Trigger settings

Access:

► Select "Baseband" > "1xEV-DO" > "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, "Local and global connectors settings", on page 23.
   You can map trigger signals to one or more User x or T/M connectors.

   Local and 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 SMM100A 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 SMM100A user manual.

Settings:

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:EVDO[:TRIGger]:SEQuence` on page 77

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:EVDO:TRIGger:SLUNit` on page 78

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:EVDO:TRIGger:SLENgth on page 78

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:EVDO:TRIGger:RMODe? on page 79

Time Based Trigger
Requires trigger "Mode" > "Armed Auto"/"Single".

Activates time-based triggering with a fixed time reference.

The R&S SMM100A 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 SMM100A user manual.

Remote command:
[:SOURce<hw>]:BB:EVDO:TRIGger:TIME[:STATe] on page 80

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 SMM100A. 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 SMM100A user manual.

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

Remote command:
[:SOURce<hw>]:BB:EVDO:TRIGger:TIME:DATE on page 79

"Time" Sets the time of the time-based trigger in format hh:mm:ss.

Remote command:
[:SOURce<hw>]:BB:EVDO:TRIGger:TIME:TIME on page 79

Arm
Stops the signal generation until subsequent trigger event occurs.

Remote command:
[:SOURce<hw>]:BB:EVDO:TRIGger:ARM:EXECute on page 80

Execute Trigger
For internal trigger source, executes trigger manually.

Remote command:
[:SOURce<hw>]:BB:EVDO:TRIGger:EXECute on page 81

Source
The following sources of the trigger signal are available:

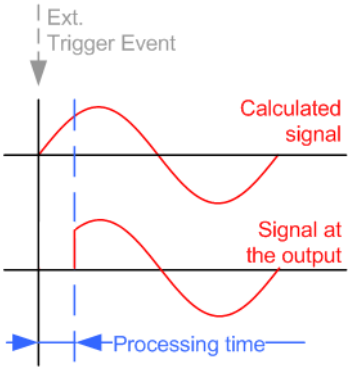
- "Internal"
  The trigger event is executed manually by the "Execute Trigger".
- "External Global Trigger"
  The trigger event is the active edge of an external trigger signal provided and configured at the User x connectors.
- "Baseband Sync In"
  In primary-secondary instrument mode, secondary instruments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

How to: "Routing and activating a trigger signal" on page 16

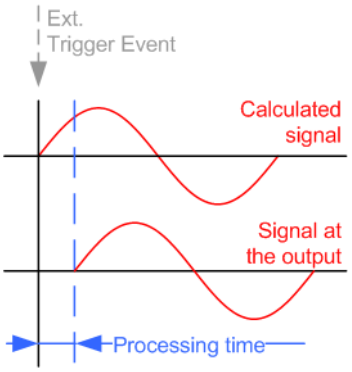
Remote command:
[:SOURce<hw>]:BB:EVDO:TRIGger:SOURce on page 78

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.



Remote command:
[:SOURce<hw>]:BB:EVDO:TRIGger:EXTernal:SYNChronize:OUTPut on page 80

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 SMM100A user manual.

Remote command:
[:SOURce<hw>]:BB:EVDO:TRIGger[:EXTernal]:INHibit on page 81

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

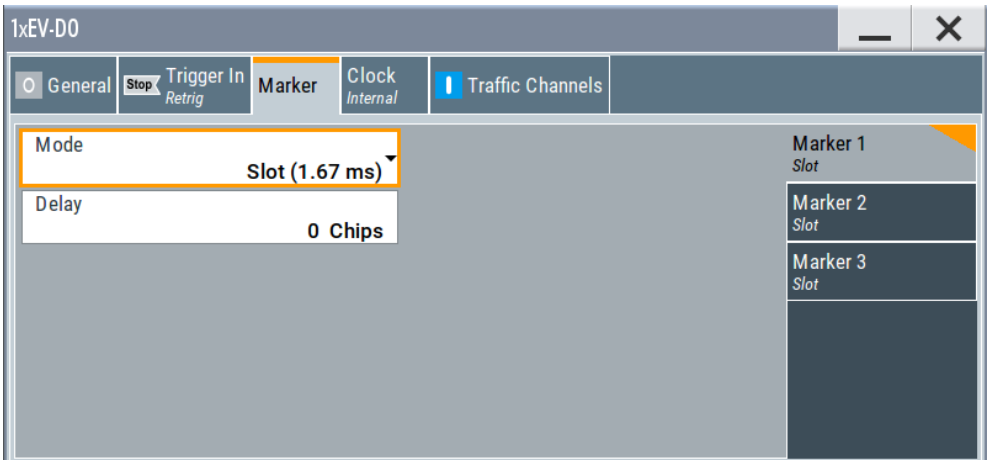
For more information, see chapter "Basics on ..." in the R&S SMM100A user manual.

Remote command:
[:SOURce<hw>]:BB:EVDO:TRIGger[:EXTernal]:DELay on page 81

3.3 Marker settings

Access:

► Select "Baseband" > "1xEV-DO" > "Marker".



The dialog provides settings to select and configure the marker output signal including marker mode and marker delay.

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 SMM100A user manual.

Routing and enabling a marker

The provided marker signals are not dedicated to a particular connector. They can be mapped to one or more User x or T/M connectors.

To route and enable a marker signal, perform the following *general steps*:

- Define the shape of the generated marker, i.e. select the "Marker > Mode".
- Define the connector where the selected signal is provided.
  Use the Local and global connectors settings.

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.

"Slot (1.67 ms)"

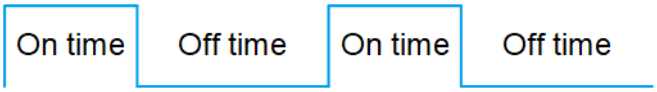
A marker signal is generated at the start of each slot (every 1.67 ms).

"PN Sequence Period (26,67 ms)"
A marker signal is generated every 26.67 ms (PN Sequence Period).

"Even Second Mark (2 s)"
A marker signal is generated every 2 seconds.

"Chip Sequence Period (ARB)"
(For reverse link mode)
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.

"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:EVDO:TRIGger:OUTPut<ch>:ONTime` on page 82
`[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:OFFTime` on page 82

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

Remote command:
`[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:PERiod` on page 82

Remote command:
`[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:MODE` on page 82

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.

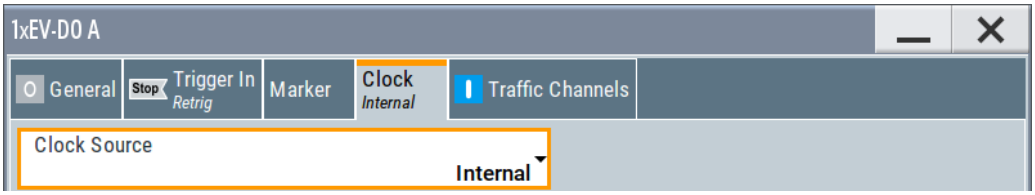
Remote command:
`[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:DELay` on page 83

3.4 Clock settings

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

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 SMM100A user manual.



Defining the clock

The provided clock signals are not dedicated to a particular connector. They can be mapped to one or more User x and T/M/C connectors.

Use the Local and global connectors settings to configure the signal mapping, the polarity, the trigger threshold, and the input impedance of the input connectors.

To route and enable a trigger signal, perform the following *general steps*:

- Define the signal source, that is select the "Clock > Source".
- Define the connector where the selected signal is provided.
  Use the Local and global connectors settings.

Clock Source

Selects the clock source.

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

Remote command:

`[:SOURce<hw>]:BB:EVDO:CLOCk:SOURce` on page 83

Clock Mode

Sets the type of externally supplied clock.

Remote command:

`[:SOURce<hw>]:BB:EVDO:CLOCk:MODE` on page 83

3.5 Local and global connectors settings

Accesses a dialog to configure local connectors or global connectors.

The button is available in the following dialogs or tabs:

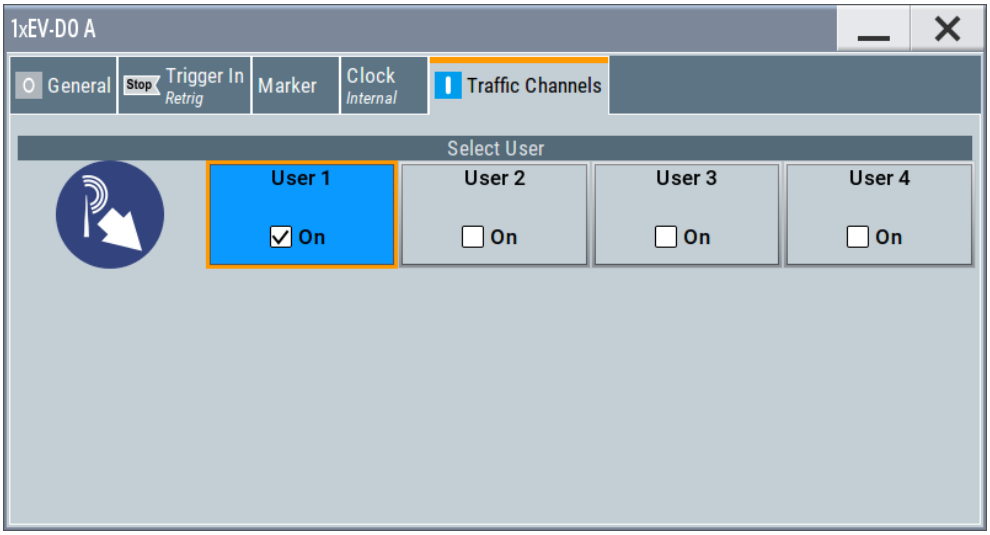
- "Trigger / Marker / Clock" dialog that is accessible via the "TMC" block in the block diagram.
- "Trigger In", "Marker" and "Clock" tabs that are accessible via the "Baseband" block in the block diagram.

See also chapter "Local and global connectors settings" in the user manual.

3.6 Traffic channel settings

Access:

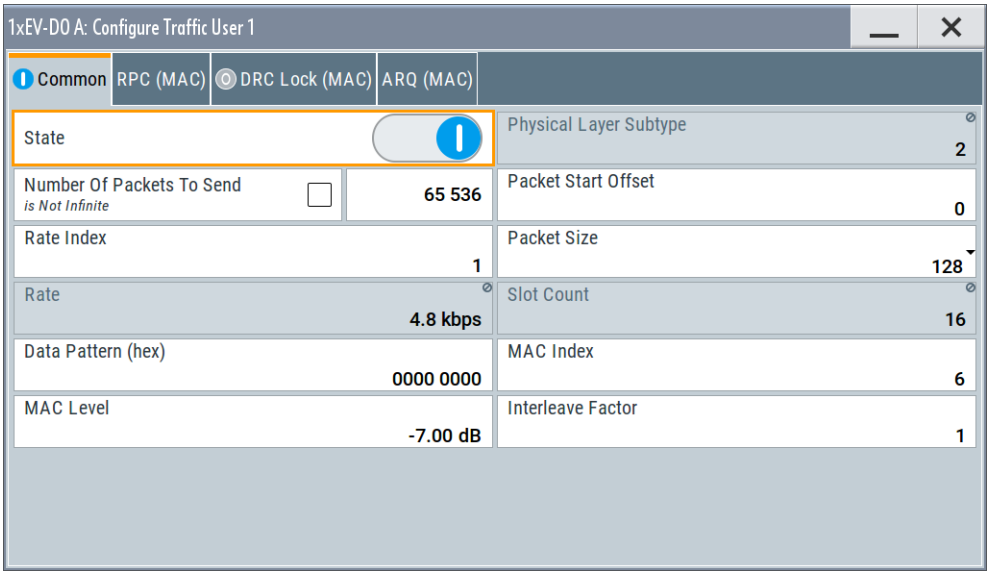
1. Select "Baseband > 1xEV-DO > Link Direction > Downlink"
2. Select "Traffic Channels".



Four "User (1 to 4)" are available.

3. To activate a user, set e.g. "User 1 > On".
4. To access the settings of a user, select the corresponding field, e.g. "User 1".

   The corresponding "Configure Traffic User 1 .. 4" dialog opens. The user number is indicated in the panel headline.



The dialog comprises the settings of the traffic channel and of the forward MAC channel settings, such as Reverse Power Control (RPC) and DRCLock.

Common
Comprises the common traffic channel settings:

State (User) ← Common
Enables or disables the selected user.

If the user is enabled, the proper "MAC Index" is placed within the MAC channel and packets can be sent to the user. If disabled, the "MAC Index" is not present within the MAC channel and packets cannot be sent to the user.

Note: Disabling the state of a user during a transfer aborts all transfers to the user.

Remote command:
`[:SOURce<hw>]:BB:EVDO:USER<st>:STATe` on page 100

Physical Layer Subtype (User) ← Common
Displays the physical layer subtype selected in the menu "Access Network Settings".

Remote command:
`[:SOURce<hw>]:BB:EVDO:ANETwork:SUBType` on page 88

Number of Packets to Send - Infinite ← Common
Enables or disables sending an unlimited number of packets to the selected user.

If "Infinite" is enabled, there is no limit to the number of packets sent to the user.

If "Infinite" is disabled, the number of packets to be sent to the selected "User" can be specified.

Remote command:
`[:SOURce<hw>]:BB:EVDO:USER<st>:PACKet:INFinite` on page 95

Number of Packets to Send - Value ← Common
Sets the number of packets to send to the selected user.

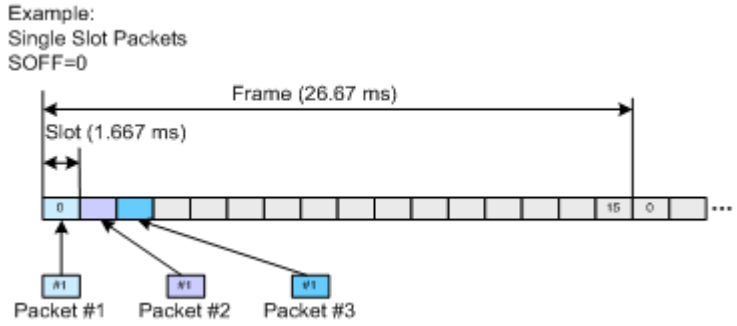
The number of packets to be sent depends on whether the parameter "Infinite" is enabled or disabled. If "Infinite" is enabled, there is no limit to the number of packets sent to the user.

If "Infinite" is disabled and a value is specified while packets are being sent, the new count value is used at the end of transmission of the current packet. If a value of zero is specified, the transmission to the user is stopped at the end of the current packet.

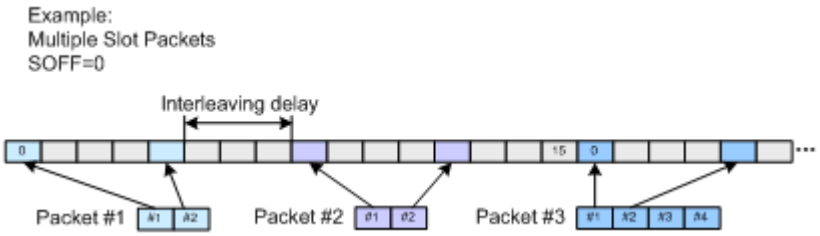
Remote command:
`[:SOURce<hw>]:BB:EVDO:USER<st>:PACKet:INFinite` on page 95
`[:SOURce<hw>]:BB:EVDO:USER<st>:PACKet:COUNt` on page 95

Packet Start Offset ← Common
Sets the minimum number of slots between the end of one packet and the beginning of the next.

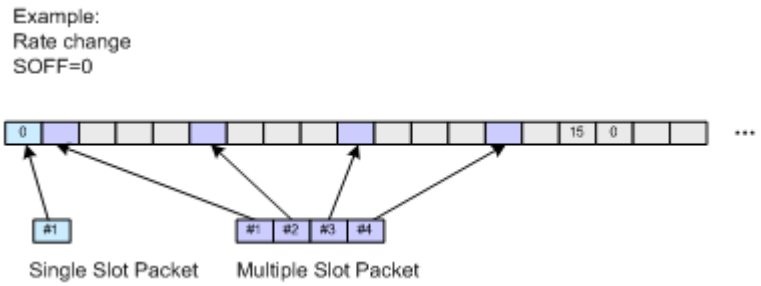
For single slot packets, a value of zero will cause the next packet to be sent in the immediate next slot (subject to scheduling).



For multiple slot packets, a value of zero will cause the next packet transmission to start three slots after the end of the previous packet. The three slot delay is identical to the interleaving delay between slots for multiple slot packets. The offset value is attached to the end of the preceding packet.



Note: An offset value of zero with a rate change from a single slot packet to multiple slot packets causes the first slot of the multiple slot packets to be transmitted in the slot immediately following the single slot packet.



See Chapter 2.3, "Traffic scheduling process", on page 12 for an explanation on how the control and traffic channels are transmitted over time.

Remote command:
[:SOURce<hw>]:BB:EVDO:USER<st>:PACKet:SOFFset on page 96

Rate Index ← Common
Sets an index into the table of rates and slot counts.

Note: Selected rate becomes effective at the beginning of the next packet transmitted to the selected user.

For physical layer 0&1, the parameter "Rate Index" alone automatically set the packet size, data rate and the slot count for the packets sent to the selected user. Parameters "Packet Size", "Data Rate" and "Slot Count" are read-only.

Table 3-1: Rate index for Physical Layer subtype 0&1

Rate index	Packet size index	Packet size, bits	Data Rate, kbps	Slot count
1	0	1024	38.4	16
2	0	1024	76.8	8
3	0	1024	153.6	4
4	0	1024	307.2	2
5	0	2048	307.2	4
6	0	1024	614.4	1
7	0	2048	614.4	2
8	0	3072	921.6	2
9	0	2048	1228.8	1
10	0	4096	1228.8	2
11	0	3072	1843.2	1
12	0	4096	2457.6	1

For physical layer subtype 2, a combination of the parameters "Rate Index" and "Packet Size" sets the data rate and the slot count for the packets sent to the selected user.

Table 3-2: Rate index for Physical Layer subtype 2

Rate index	Packet size index	Packet size, bits	Data Rate, kbps	Slot count
1	3	128	4.8	16
1	2	256	9.6	16
1	1	512	19.2	16
1	0	1024	38.4	16
2	3	128	9.6	8
2	2	256	19.2	8
2	1	512	38.4	8
2	0	1024	76.8	8
3	3	128	19.2	4
3	2	256	38.4	4
3	1	512	76.8	4
3	0	1024	153.6	4
4	3	128	38.4	2
4	2	256	76.8	2
4	1	512	153.6	2
4	0	1024	307.2	2

Rate index	Packet size index	Packet size, bits	Data Rate, kbps	Slot count
5	2	512	76.8	4
5	1	1024	153.6	4
5	0	2048	307.2	4
6	3	128	76.8	1
6	2	256	153.6	1
6	1	512	307.2	1
6	0	1024	614.4	1
7	2	512	153.6	2
7	1	1024	307.2	2
7	0	2048	614.4	2
8	1	1024	307.2	2
8	0	3072	921.6	2
9	2	512	307.2	1
9	1	1024	614.4	1
9	0	2048	1228.8	1
10	0	4096	1228.8	2
11	1	1024	614.4	1
11	0	3072	1843.2	1
12	0	4096	2457.6	1
13	0	5120	1536	2
14	0	5120	3072	1

Table 3-3: Rate index for Physical Layer subtype 3 (requires the appropriate Rev. B option)

Rate index	Packet size index	Packet size, bits	Data Rate, kbps	Slot count
1	3	128	4.8	16
1	2	256	9.6	16
1	1	512	19.2	16
1	0	1024	38.4	16
2	3	128	9.6	8
2	2	256	19.2	8
2	1	512	38.4	8
2	0	1024	76.8	8
3	3	128	19.2	4
3	2	256	38.4	4

Rate index	Packet size index	Packet size, bits	Data Rate, kbps	Slot count
3	1	512	76.8	4
3	0	1024	153.6	4
4	3	128	38.4	2
4	2	256	76.8	2
4	1	512	153.6	2
4	0	1024	307.2	2
5	2	512	76.8	4
5	1	1024	153.6	4
5	0	2048	307.2	4
6	3	128	76.8	1
6	2	256	153.6	1
6	1	512	307.2	1
6	0	1024	614.4	1
7	2	512	153.6	2
7	1	1024	307.2	2
7	0	2048	614.4	2
8	1	1024	307.2	2
8	0	3072	921.6	2
9	2	512	307.2	1
9	1	1024	614.4	1
9	0	2048	1228.8	1
10	0	4096	1228.8	2
11	1	1024	614.4	1
11	0	3072	1843.2	1
12	0	4096	2457.6	1
13	0	5120	1536	2
14	0	5120	3072	1
15	0	1024	153.6	4
16	0	2048	307.2	4
17	0	3072	460.8	4
18	0	4096	614.4	4
19	0	5120	768	4
20	0	6144	921.6	4

Rate index	Packet size index	Packet size, bits	Data Rate, kbps	Slot count
21	0	6144	1843.2	2
22	0	6144	3686.4	1
23	0	7168	1075.2	4
24	0	7168	2150.4	2
25	0	7168	4300.8	1
26	0	8192	1228.8	4
27	0	8192	2457.6	2
28	0	8192	4915.2	1

Remote command:
`[:SOURce<hw>]:BB:EVDO:USER<st>:RATE:INDex` on page 97

Packet Size ← Common
Sets the packet size for the packets sent to the selected user.

For physical layer 0&1, the parameter "Packet Size" is read-only. The value is automatically set depending on the selection for the parameter "Rate Index". (see Table 3-1)

For physical layer subtypes 2 and 3, a combination of the parameter "Packet Size" and the parameter "Rate Index" sets the data rate and the slot count for the packets sent to the selected user, see Table 3-2.

Note: Selected rate becomes effective at the beginning of the next packet transmitted to the selected user.

Remote command:
`[:SOURce<hw>]:BB:EVDO:USER<st>:PSIZe` on page 96

Data Rate ← Common
Displays the data rate of the packets sent to the selected user. This parameter is read-only. The value is set automatically, depending on the selected "Rate Index " and "Packet Size", see Table 3-1 and Table 3-2.

Note: Selected rate becomes effective at the beginning of the next packet transmitted to the selected user.

Remote command:
`[:SOURce<hw>]:BB:EVDO:USER<st>:RATE?` on page 97

Slot Count ← Common
Displays the slot count of the packets sent to the selected user.

This parameter is read-only. The value is set automatically, depending on the selected "Rate Index" and "Packet Size", see Table 3-1 and Table 3-2.

Note: Selected rate becomes effective at the beginning of the next packet transmitted to the selected user.

Remote command:
`[:SOURce<hw>]:BB:EVDO:USER<st>:SCOunt?` on page 100

Data Pattern (hex) ← Common
Sets the data pattern for the data portion of the packets sent to the user.

The most significant bit (MSB) of this value is the MSB of the packet and the word is repeated to fill all space within the packet. This parameter is in a hexadecimal format.

Remote command:
`[:SOURce<hw>]:BB:EVDO:USER<st>:DATA:PATTern` on page 91

MAC Index ← Common
Sets the MAC index used for the selected user.

MAC indexes have to be different for the different users. However, in case that two users are using the same value for MAC index, the lower priority user is disabled, or be unable to enable.

The values for the MAC indexes for the other users (see parameter Other Users Count) are assigned from a pool of valid MAC indexes, that exclude the MAC indexes specified for each of the four configurable users.

Remote command:
`[:SOURce<hw>]:BB:EVDO:USER<st>:MAC:INDex` on page 94

MAC Level ← Common
Sets the power within the MAC channel that is dedicated to the selected user.

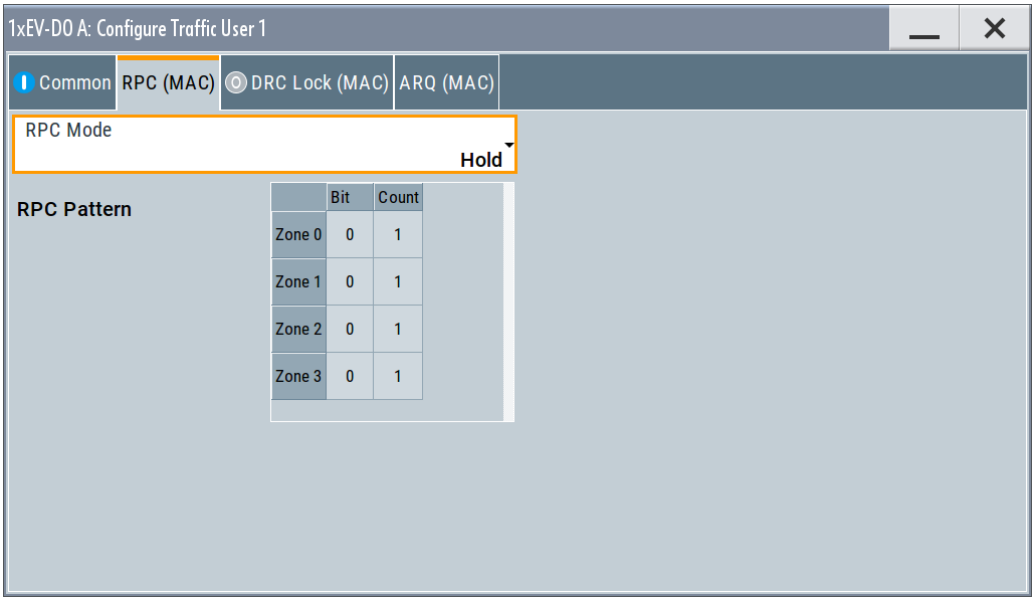
Remote command:
`[:SOURce<hw>]:BB:EVDO:USER<st>:MAC:LEVel` on page 95

Interleave Factor ← Common
Controls the number of interleave slots used for the selected user on the forward link.

Four interleave slots are defined in the 1xEV-DO system. By default, only 1 interleave slot ("Interleave Factor" = 1) for an access terminal is configured and transmission to that access terminal every fourth slot is selected. For an interleave factor > 1, packets on multiple interleave slots are sent, increasing the data throughput to the access terminal.

Remote command:
`[:SOURce<hw>]:BB:EVDO:USER<st>:IFACtor` on page 94

RPC (MAC)
Access: "Baseband > 1xEV-DO > Traffic Channels > User > RPC (MAC)".



RPC Mode ← RPC (MAC)
Sets the operation mode for the Reverse Power Control (RPC) Channel within the MAC channel for the selected user.

"Hold" An alternating series of up and down power control bits are transmitted. The intent is to hold the access terminal at a constant power level. This mode always starts with an up bit, and ends with the following down bit. This mode is 2 bits long.

"All up" A continuous stream of up (0) power control bits are transmitted. The intent is to force the access terminal to the highest transmit power level.
This mode is a single bit long.

"All down" A continuous stream of down (1) power control bits are transmitted. The intent is to force the access terminal to the lowest transmit power level.
This mode is a single bit long.

"Range" A sequence of up power control bits is sent followed by an equal number of down power control bits. The intent is to force the access terminal to ramp its power from one extreme to another. The number of power control bits in each direction is specified by the "RPC Range Count" parameter. (see RPC Range Count). Each time that the range mode is specified, the sequence is restarted.
The range mode starts with the first up bit and ends with the last down bit.
The length of the mode is two times the RPC range Count.

"Pattern" A user-defined sequence of RPC bits is sent. The mode starts with the bit defined in the first (0) zone, and ends with the last bit of the last (3) zone. The length of the pattern is the sum of the Count values for each RPC zone.

Remote command:
[:SOURce<hw>]:BB:EVDO:USER<st>:RPC:MODE on page 98

RPC Range Count ← RPC (MAC)
Sets the number of Reverse Power Control (RPC) bits sent in each direction when the "RPC Mode" is set to "Range". The specified value is used immediately.

Note: This parameter is displayed in RPC mode "Range" only.

Remote command:
[:SOURce<hw>]:BB:EVDO:USER<st>:RPC:RANGe on page 99

RPC Pattern ← RPC (MAC)
Defines the Reverse Power Control (RPC) pattern in form of table with four zones (zone 0 .. 3).

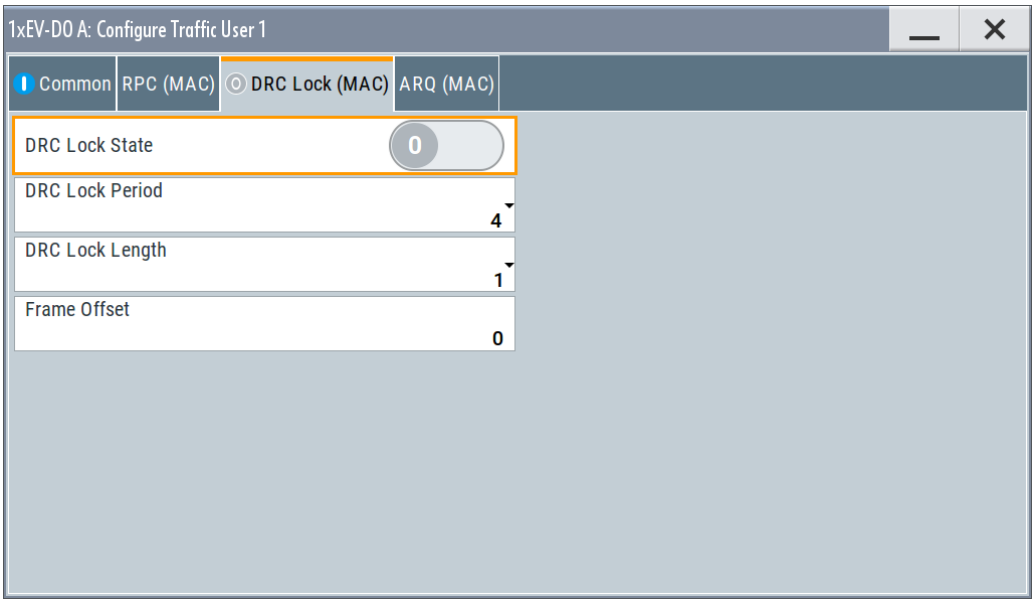
For each zone, a bit and a count can be defined.

"Bit" Defines the RPC bits sent within the specific zone of the RPC pattern.

"Count" Defines the number of RPC bits sent within the specific zone of the RPC pattern.

Remote command:
[:SOURce<hw>]:BB:EVDO:USER<st>:RPC:ZONE<ch0>:BIT on page 99
[:SOURce<hw>]:BB:EVDO:USER<st>:RPC:ZONE<ch0>:COUNt on page 100

DRC Lock (MAC)
Access: "Baseband > 1xEV-DO > Traffic Channels > User > DRC Lock (MAC)".

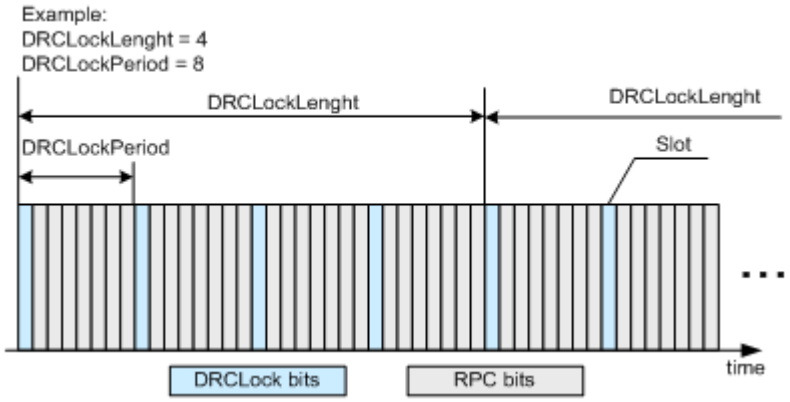


DRC Lock State ← DRC Lock (MAC)
Sets the state of the DRC (Data Rate Control) lock bit for the selected user.

Note: Changes in the DRC lock state are only considered at the interval defined by the parameter DRC lock length.

Remote command:
[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:STATe on page 93

DRC Lock Period ← DRC Lock (MAC)
Sets the period (measured in slots) of time between successive transmissions of the DRC (Data Rate Control) lock bit for the selected user.



Note: A value of zero disables the DRC lock subchannel and the MAC RPC channel of the selected user is not punctured with the DRC lock subchannel.

Remote command:
[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:PERiod on page 92

DRC Lock Length ← DRC Lock (MAC)
Sets the number of DRC (Data Rate Control) lock Periods that the state of the DRC lock for the selected user is held constant.

Note: Changes in the DRC lock state are only considered at the interval defined by the parameter "DRC Lock Length".

A value of one allows updating of the DRC lock bit at anytime.

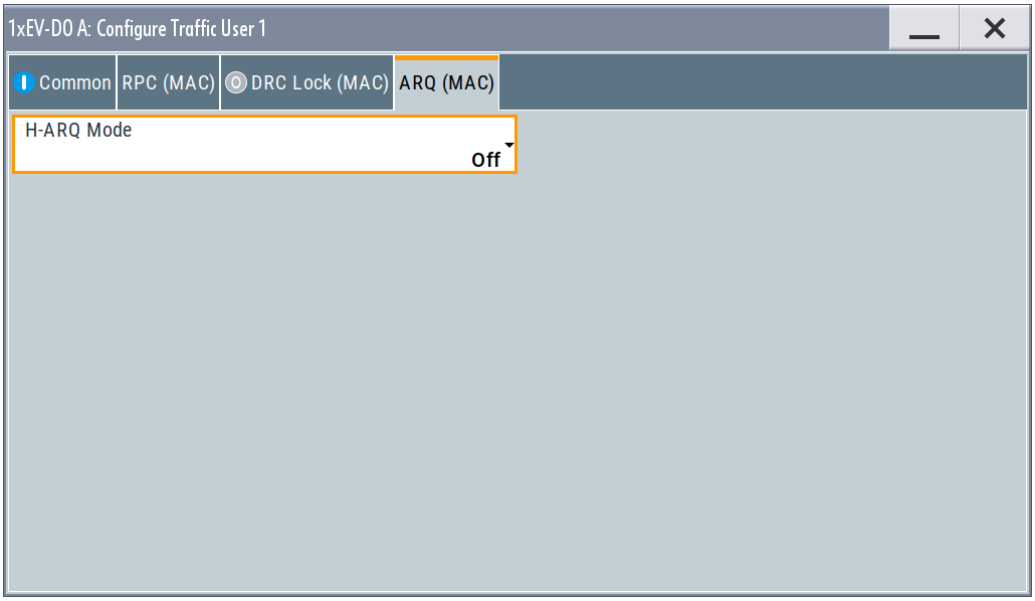
Remote command:
[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:LENGth on page 92

Frame Offset ← DRC Lock (MAC)
Sets the reverse link frame offset for the reverse link.

The frame offset is used to position the DRC lock bit within the MAC channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:OFFSet on page 92

ARQ (MAC)
Access: "Baseband > 1xEV-DO > Traffic Channels > User > ARQ (MAC)".



H-ARQ Mode ← ARQ (MAC)
Enables or disables the H-ARQ Channel.

The H-ARQ channel is used by the access network to transmit positive acknowledgement (ACK) or a negative acknowledgement (NAK) in response to a physical layer packet.

Note: This parameter is enabled for Physical Layer "Subtype 2 "only.

"Off" Disables transmission of the H-ARQ channel.

"ACK" The channel is transmitted with all bits set to ACK.

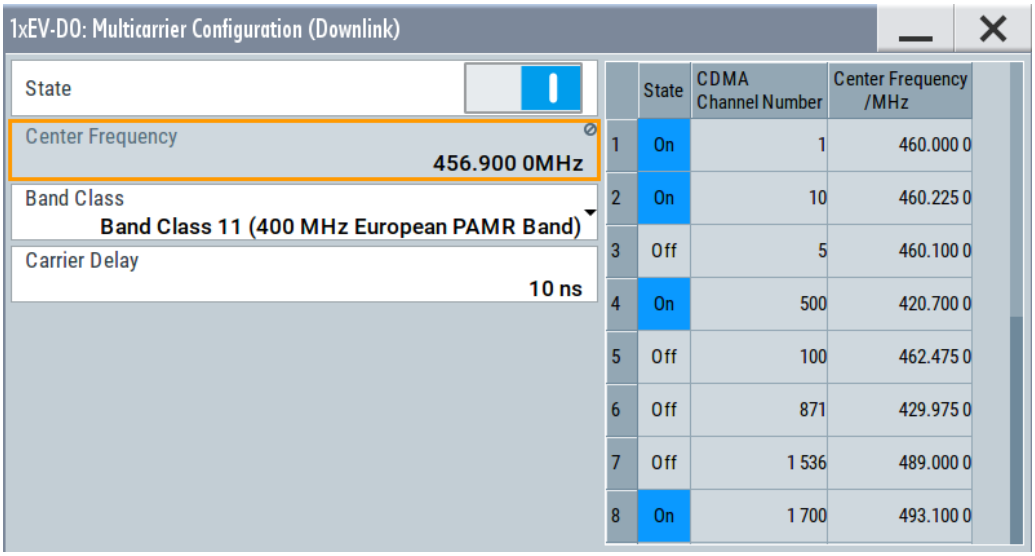
"NAK" The channel is transmitted with all bits set to NAK.

Remote command:
`[:SOURce<hw>]:BB:EVDO:USER<st>:HARQ:MODE` on page 93

3.7 Multi-carrier configuration settings

Multi-Carrier Configuration requires option R&S SMM-K87

In multi-carrier mode, up to 16 modulated carriers can be generated with one baseband. Each carrier's center frequency is input via it's "CDMA Channel Number" or by directly entering the RF "Center Frequency / MHz". The carriers can be activated or deactivated separately.



State
Enables or disables multi-carrier operation.

Remote command:
`[:SOURce<hw>]:BB:EVDO:UP:MC:CARRier<ch>:STATe` on page 90
`[:SOURce<hw>]:BB:EVDO:DOWN:MC:CARRier<ch>:STATe` on page 90

Center Frequency (band)
Shows the center frequency of the band resulting from the set active carriers.

Remote command:
`[:SOURce<hw>]:BB:EVDO:DOWN:MC:CFRequency?` on page 89
`[:SOURce<hw>]:BB:EVDO:UP:MC:CFRequency?` on page 89

Band Class
Selects the band class for operation, as defined in 3GPP2 C.S0057-E.

Remote command:
`[:SOURce<hw>]:BB:EVDO:UP:MC:BCLass` on page 89
`[:SOURce<hw>]:BB:EVDO:DOWN:MC:BCLass` on page 89

Carrier Delay
Applies a delay to each carrier in order to reduce the crest factor of the sum signal.

The delay increases by the given value on each active carrier. Inactive carriers are not accounted.

Example:

"Carrier Delay = 1000 ns"

The first active carrier is delayed by 0 ns, the second by 1000 ns, the third by 2000 ns, etc.

Remote command:
[:SOURce<hw>]:BB:EVDO:UP:MC:CDELay on page 89
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CDELay on page 89

State
Switches the selected carrier on or off.

Remote command:
[:SOURce<hw>]:BB:EVDO:UP:MC:CARRier<ch>:STATe on page 90
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CARRier<ch>:STATe on page 90

CDMA Channel Number
Selects the carrier's channel number.

The selected channel numbers are directly translated into center frequencies, according to the used band class. In some cases, not all channel numbers in the range that is indicated by the tool tip are allowed. In case a non-existing channel is selected, the software selects the next available channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:UP:MC:CARRier<ch>:CHANnel on page 90
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CARRier<ch>:CHANnel on page 90

Center Frequency
Sets the center frequency of the carrier.

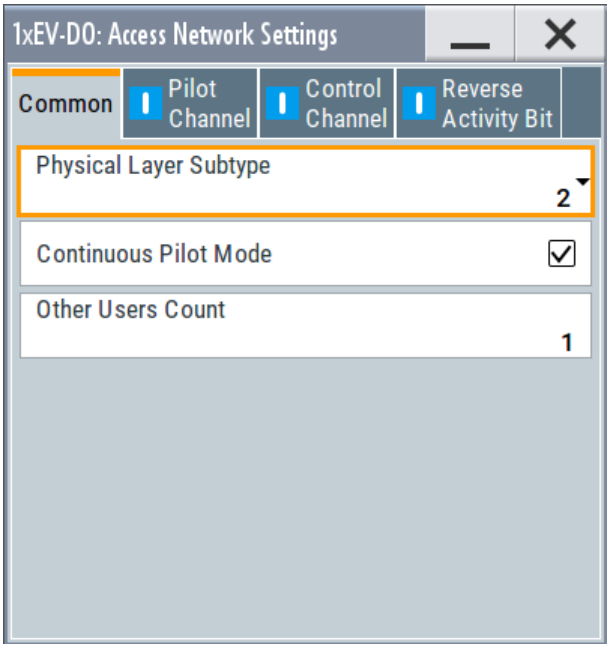
In some cases, not all center frequencies in the range that is indicated by the tool tip are defined by the selected band class. In case a non-existing frequency is selected, the software selects the next available frequency.

Remote command:
[:SOURce<hw>]:BB:EVDO:UP:MC:CARRier<ch>:FREQuency on page 90
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CARRier<ch>:FREQuency on page 90

3.8 Access network settings

The "Access Network Settings" dialog is available at Downlink only and allows configuration of physical layer subtype, the pilot and control channels and reverse activity bit.

"Access Network Settings" consists of three main sections, "Pilot Channel", "Control Channel" and "Reverse Activity Bit (MAC)".



Physical Layer Subtype (Access Network Settings)
Defines the physical layer subtype for the forward link direction.

Physical layer subtype 0 is the original (release "0").

Physical layer subtype 1 and 2 are the revision "A" physical layers.

Physical layer subtype 3 is the revision "B" physical layer.

Remote command:
`[:SOURce<hw>]:BB:EVDO:ANETwork:SUBType` on page 88

Continuous Pilot Mode
Enables or disables a special mode within the 1xEV-DO generator. When the state is off, normal operation is selected. When the state is on, a special mode is selected.

In this special mode, the 1xEV-DO generator generates a pilot signal only.

Note: During the special mode, all other parameters do not affect the signal output.

Remote command:
[:SOURce<hw>]:BB:EVDO:ANETwork:CPMode on page 85

Other Users Count
Sets the number of additional users (beyond the four defined users) that appear in the MAC Channel.

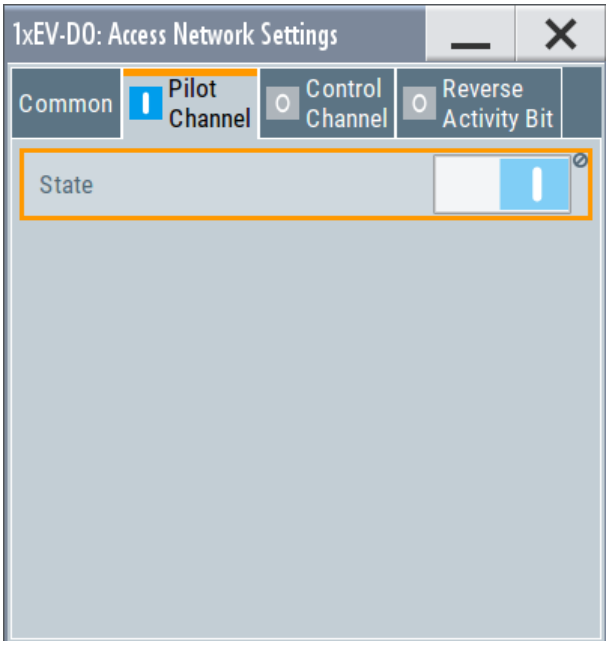
These additional users never have a packet addressed to them, but are used to fill in the MAC channel code domain.

These Other Users are used to distribute the excess power (beyond what is required by the "User 1..4" and RAB channels).

Remote command:
[:SOURce<hw>]:BB:EVDO:ANETwork:OUCount on page 86

Pilot Channel
Access:

"Baseband > 1xEV-DO > General > Access Network Settings > Pilot Channel"

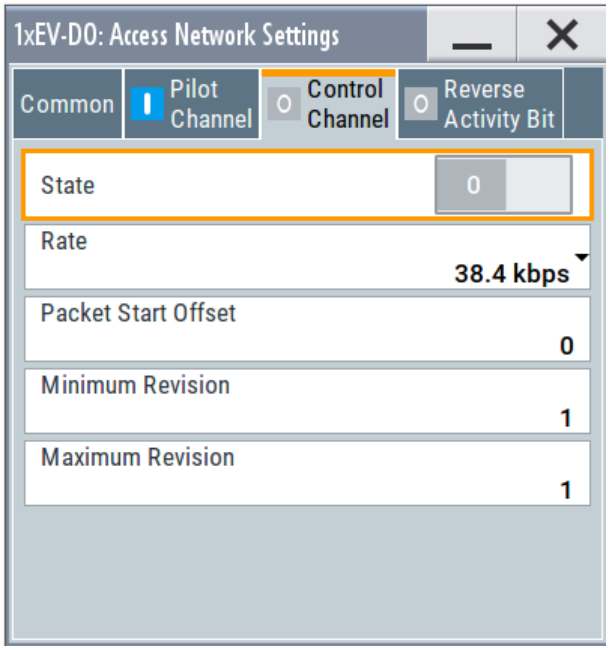


State ← Pilot Channel
Displays the state of the pilot channel. Pilot channel is transmitted by sector on each active forward channel. It is present always and transmitted at the full sector power.

Remote command:
[:SOURce<hw>]:BB:EVDO:ANETwork:PCHannel:STATe? on page 86

Control Channel
Access:

"Baseband > 1xEV-DO > General > Access Network Settings > Control Channel"



State ← Control Channel
Enables or disables the control channel messages.

The only control channel message that is ever sent is the Sync Message. When this is enabled, the control channel messages have the highest priority for placement within the slots. The Sync Message is updated constantly, even when the control channel is not enabled.

Remote command:
`[:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:STATe` on page 85

Rate ← Control Channel
Sets the rate that the control channel messages are transmitted at.

Remote command:
`[:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:RATE` on page 84

Packet Start Offset ← Control Channel
Sets the offset (in slots) from the start of control channel cycle to the start of the synchronous message capsule that contains the Sync Message.

See Chapter 2.3, "Traffic scheduling process", on page 12 for an explanation on how the control and traffic channels are transmitted over time.

Remote command:
`[:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:PSOFfset` on page 84

Minimum Revision ← Control Channel
Sets the value of the minimum revision field within the control channel message.

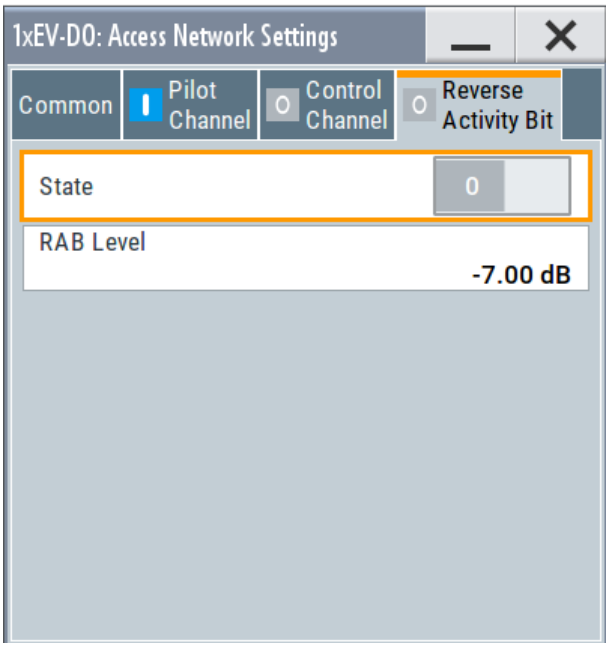
Remote command:
`[:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:REVision:MINimum` on page 85

Maximum Revision ← Control Channel
Sets the value of the maximum revision field within the control channel message.

Remote command:
[:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:REVision:MAXimum
on page 85

Reverse Activity Bit
Access:

"Baseband > 1xEV-DO > General > Access Network Settings > Reverse Activity Bit"



State ← Reverse Activity Bit
Activates or deactivates the reverse activity bit (RAB).

Remote command:
[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:STATe on page 88

RAB Level ← Reverse Activity Bit
Sets the power within the MAC block for the Reverse Activity Channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:LEVel on page 87

RAB Length ← Reverse Activity Bit
For physical layer subtype 0&1 only

Sets the duration (in slots) of a Reverse Activity bit.

Remote command:
[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:LENGth on page 86

RAB Offset ← Reverse Activity Bit
For physical layer subtype 0&1 only

Sets the starting time offset of the Reverse Activity (RA) bit in slots. The command is specified in Reverse Activity Length/8 units.

The RA bit starts when the following equation is satisfied:

- System Time mod RAB length = RAB Offset,
  where System Time is expressed in slots.

Remote command:
`[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:OFFSet` on page 87

RAB MAC Index ← Reverse Activity Bit
For physical layer subtype 3 only sets the RAB MAC Index.

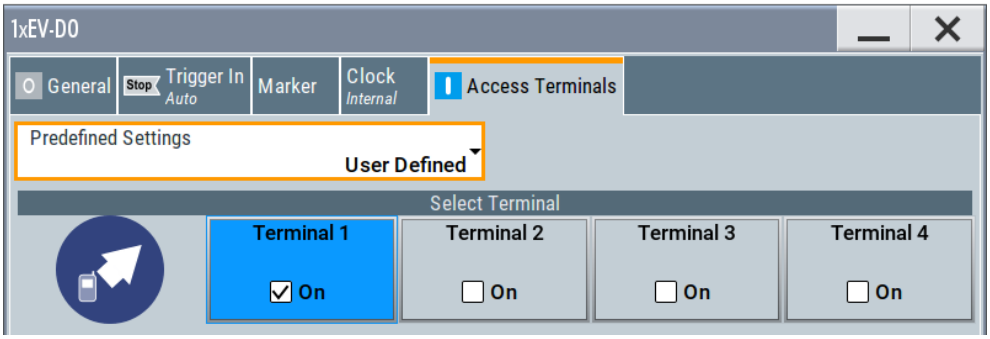
Remote command:
`[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:MAC:INDex` on page 87

3.9 Access terminal settings

Access:

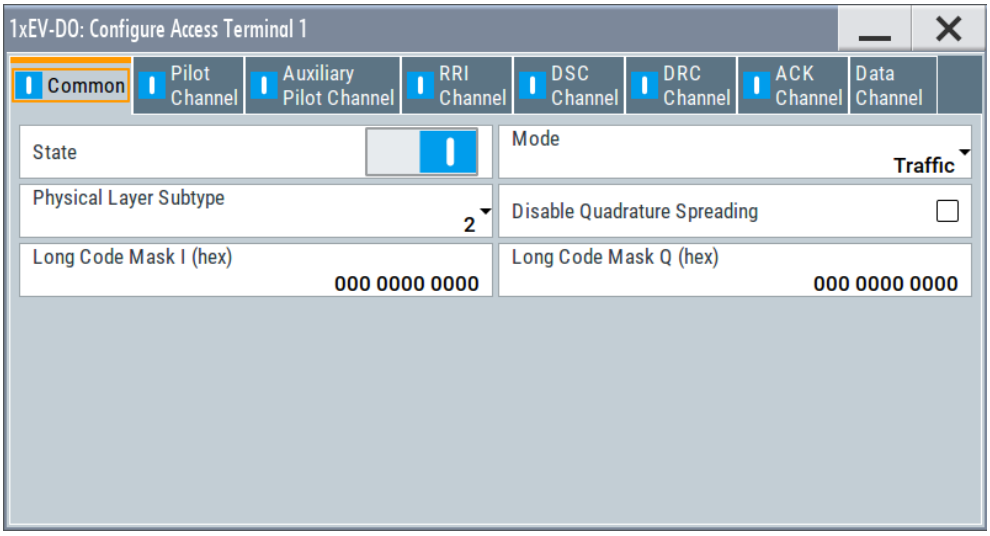
1. Select "Baseband > 1xEV-DO > Link Direction > Uplink"
2. Select "Access Terminals".

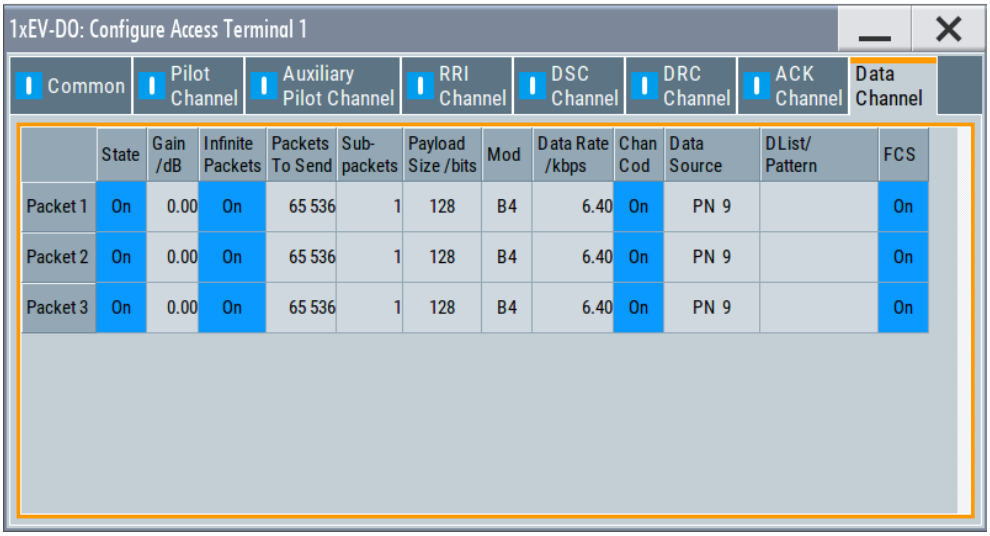
   Four terminals are available.



3. To enable a subset of predefined settings for faster configuration, select "Predefined Settings".
4. To activate a terminal, set its state to "On", e.g. "Terminal 1 > On".
5. To access the settings of a terminal, select the corresponding field, e.g. "Terminal 1".

   The corresponding "Configure Access Terminal 1 .. 4" dialog opens. The access terminal number is indicated in the panel headline.





The dialog comprises the settings of the access terminal mode, of the data channel and configuration of the different channels.

The available channels depend on the selected "Physical Layer Subtype" and the selected "Access Terminal Mode", see Table 3-4.

Table 3-4: Overview on available channels, depending on physical layer subtype and access terminal mode

Physical layer subtype	Access terminal mode	Pilot channel	Auxiliary pilot channel	RRI channel	DSC channel	DRC channel	ACK channel	Data channel
0&1	Traffic	X	-	X	-	X	X	Packet 1
	Access	X	-	-	-	-	-	Packet 1

Physical layer subtype	Access terminal mode	Pilot channel	Auxiliary pilot channel	RRI channel	DSC channel	DRC channel	ACK channel	Data channel
2	Traffic	X	X	X	X	X	X	Packet 1..3
	Access	X	-	-	-	-	-	Packet 1

Predefined Settings
Uplink only

Enables selection of UL predefined settings for Terminal 1 for faster configuration.

The predefined settings are made according to 3GPP2 C.S0032-A to allow easy receiver testing.

Remote command:
`[:SOURce<hw>]:BB:EVDO:PREDefined` on page 102

State
Enables or disables the selected access terminal.

Remote command:
`[:SOURce<hw>]:BB:EVDO:TERMinal<st>:STATe` on page 122

Mode
Sets the mode ("Traffic" or "Access") of the selected access terminal.

Remote command:
`[:SOURce<hw>]:BB:EVDO:TERMinal<st>:MODE` on page 120

Physical Layer Subtype
Selects the physical layer subtype for the selected access terminal.

Remote command:
`[:SOURce<hw>]:BB:EVDO:TERMinal<st>:SUBType` on page 122

Disable Quadrature Spreading
Disables the quadrature spreading (complex multiply) with PN sequences and long code.

Remote command:
`[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DQSPreading` on page 116

Long Code Mask I (hex)
Sets the long code mask of the I channel.

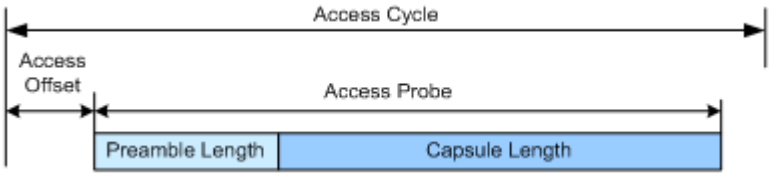
Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:IMASk on page 120

Long Code Mask Q (hex)
Sets the long code mask of the Q channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:QMASk on page 121

Preamble Length
(enabled for access terminal working in access mode only)

Specifies the length of the preamble in frames (16 slots each) of the access probe (see figure below).



Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:PLENgth on page 121

Access Cycle Duration
(enabled for access terminal working in access mode only)

Sets the access cycle duration in slots. Access probes are repeated with a period of access cycle duration slots.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACYCle:DURation on page 105

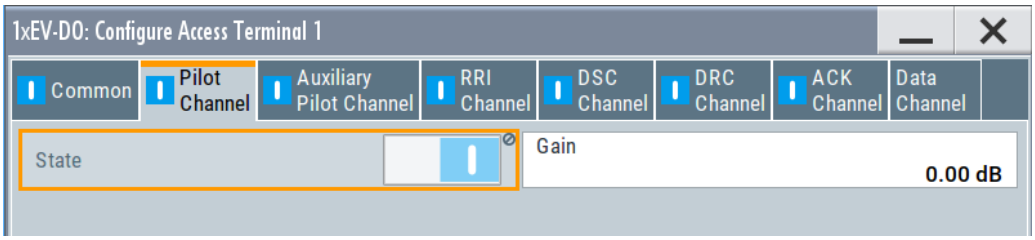
Access Cycle Offset
(enabled for access terminal working in access mode only)

The access channel transmission starts with this number of slots relative to the beginning of each access cycle duration.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACYCle:OFFSet on page 105

Pilot Channel
Access:

Select "Baseband > 1xEV-DO > Access Terminals > Terminal > Pilot Channel".



State ← Pilot Channel
Displays the state of the pilot channel.

Note: The pilot channel is always switched on.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:PCHannel:STATe? on page 121

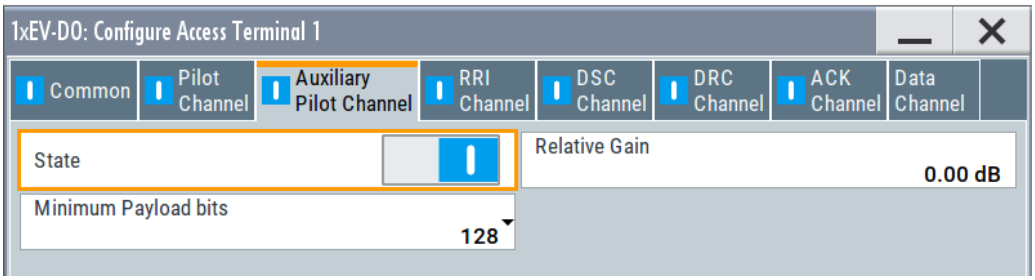
Gain ← Pilot Channel
Sets the gain of the pilot channel.

Gains of other channels are relative to the pilot channel power. This setting is used to distinguish the power between access terminals, when more than one access terminal is active.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:PCHannel:GAIN on page 120

Auxiliary Pilot Channel
Access:

Select "Baseband > 1xEV-DO > Access Terminals > Terminal > Auxiliary Pilot Channel".



State ← Auxiliary Pilot Channel
(enabled for Physical Layer subtype 2 and an access terminal working in traffic mode only)

Enables or disables the state of the auxiliary pilot channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:APCHannel:STATe on page 106

Relative Gain ← Auxiliary Pilot Channel
Sets the gain of the auxiliary pilot channel relative to the data channel power.

Note: All other channel gains are specified relative to the pilot channel power, but the auxiliary pilot gain is specified relative to the data channel power. This parameter is only enabled for Physical Layer subtype 2 and for an access terminal working in traffic mode.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:APCHannel:GAIN on page 106

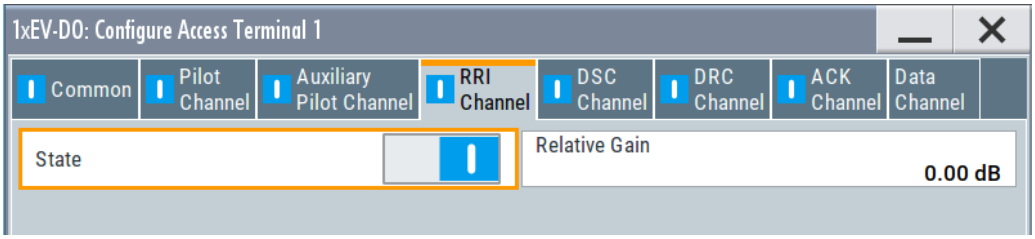
Minimum Payload ← Auxiliary Pilot Channel
(enabled for Physical Layer subtype 2 and an access terminal working in traffic mode only)

Sets the minimum payload size in bits of the data channel that activates the transmission of the auxiliary pilot channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:APCHannel:PAYLoad:MINimum
on page 106

RRI Channel
Access:

Select "Baseband > 1xEV-DO > Access Terminals > Terminal > RRI Channel".



State ← RRI Channel
(enabled for access terminal working in traffic mode only)

Enables or disables the state of the reverse rate indicator (RRI) channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:RRIChannel:STATe on page 122

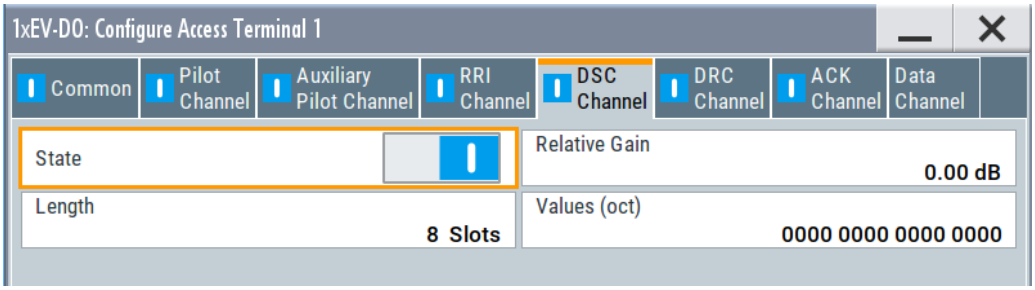
Relative Gain ← RRI Channel
(enabled for access terminal working in traffic mode only)

Sets the gain of the reverse rate indicator (RRI) channel relative to the pilot channel power.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:RRIChannel:GAIN on page 121

DSC Channel
Access:

Select "Baseband > 1xEV-DO > Access Terminals > Terminal > DSC Channel".



State ← DSC Channel
(enabled for Physical Layer subtype 2 and an access terminal working in traffic mode only)

Enables or disables the state of the data source control (DSC) channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DSCChannel:STATe on page 119

Relative Gain ← DSC Channel
(enabled for Physical Layer subtype 2 and an access terminal working in traffic mode only)

Sets the gain of the data source control (DSC) channel relative to the pilot channel power.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DSCChannel:GAIN on page 118

Length ← DSC Channel
(enabled for Physical Layer subtype 2 and an access terminal working in traffic mode only)

Specifies the transmission duration of the data source control (DSC) channel in slots.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DSCChannel:LENGth on page 119

Values (OCT) ← DSC Channel
(enabled for Physical Layer subtype 2 and an access terminal working in traffic mode only)

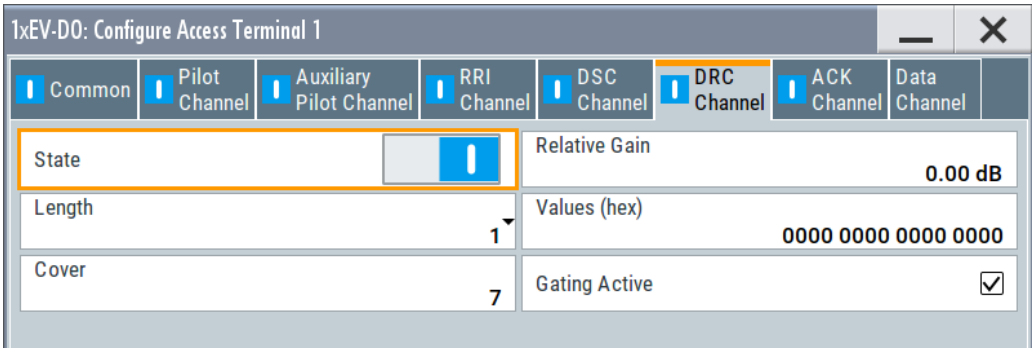
Specifies the pattern transmitted on the data source control (DSC) Channel.

The sequence starts at frame 0 and slot 0 and is repeated with the length of the pattern. Each specified value is transmitted for DSC length slots.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DSCChannel:VALues on page 119

DRC Channel
Access:

Select "Baseband > 1xEV-DO > Access Terminals > Terminal > DRC Channel".



State ← DRC Channel
(enabled for access terminal working in traffic mode only)

Enables or disables the state of the data rate control (DRC) channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:STATe on page 118

Relative Gain ← DRC Channel
(enabled for access terminal working in traffic mode only)

Sets the gain of the data rate control (DRC) channel relative to the pilot channel power.

Remote command:
`[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:GAIN` on page 117

Length ← DRC Channel
(enabled for access terminal working in traffic mode only)

Specifies the transmission duration of the data rate control (DRC) channel in slots.

Remote command:
`[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:LENGth` on page 117

Values (hex) ← DRC Channel
(enabled for access terminal working in traffic mode only)

Specifies the pattern transmitted on the data rate control (DRC) channel.

The sequence starts at frame 0 and slot 0 and is repeated with the length of the pattern. Each specified value is used for DRC length slots.

Remote command:
`[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:VALues` on page 118

Cover ← DRC Channel
(enabled for access terminal working in traffic mode only)

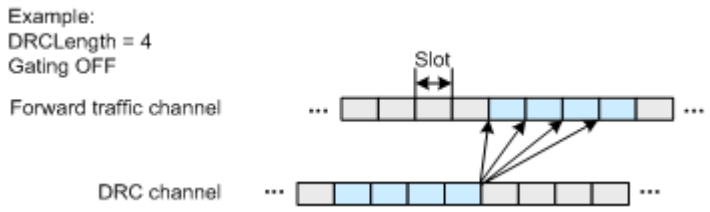
Selects the data rate control (DRC) channel Walsh cover.

Remote command:
`[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:COVer` on page 116

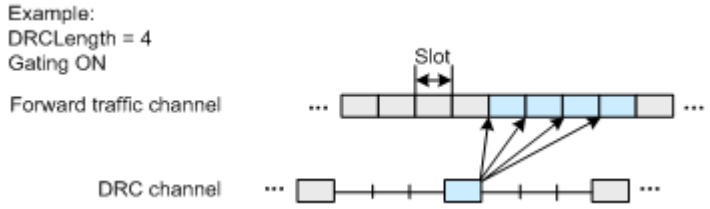
Gating Active ← DRC Channel
(enabled for access terminal working in traffic mode only)

Activates or deactivates the data rate control (DRC) Channel gating.

With deactivated gating, each DRC value is repeated for DRC length slots.



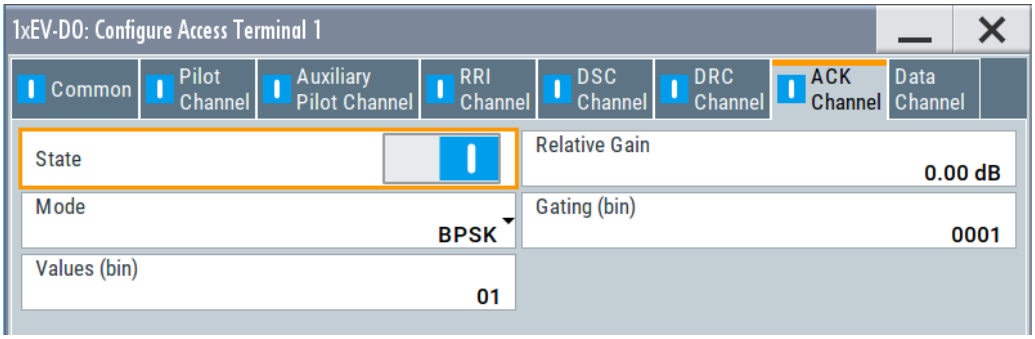
If gating is active, each value of the DRC channel is transmitted for one slot followed by DRCLenght-1 empty slots.



Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:GATing[:STATe]
on page 117

ACK Channel
Access:

Select "Baseband > 1xEV-DO > Access Terminals > Terminal > ACK Channel".



State ← ACK Channel
(enabled for access terminal working in traffic mode only)

Enables or disables the ACK channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACKChannel:STATe on page 104

Relative Gain ← ACK Channel
(enabled for access terminal working in traffic mode only)

Sets the gain of the ACK channel relative to the pilot channel power.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACKChannel:GAIN on page 103

Mode ← ACK Channel
(enabled for access terminal working in traffic mode only)

Specifies the modulation mode of the ACK channel.

"BPSK" Sets the modulation to BPSK (Binary Phase Shift Keying). With BPSK modulation, a 0 (ACK) is mapped to +1 and a 1 (NAK) to -1 respectively.

"OOK" Sets the modulation to OOK (On/Off keying). With OOK modulation, a 0 (ACK) is mapped to ON and a 1 (NAK) to OFF.

Note: OKK modulation is only enabled for physical layer subtype 2.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACKChannel:MODE on page 104

Gating (bin) ← ACK Channel
(enabled for access terminal working in traffic mode only)

Sets the active and inactive slots of the ACK channel.

The sequence starts at frame 0 and slot 0 and is repeated with the length of the pattern.

A 0 gates the ACK channel off for the corresponding slot, a 1 activates the channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACKChannel:GATing on page 103

Values ← ACK Channel
(enabled for access terminal working in traffic mode only)

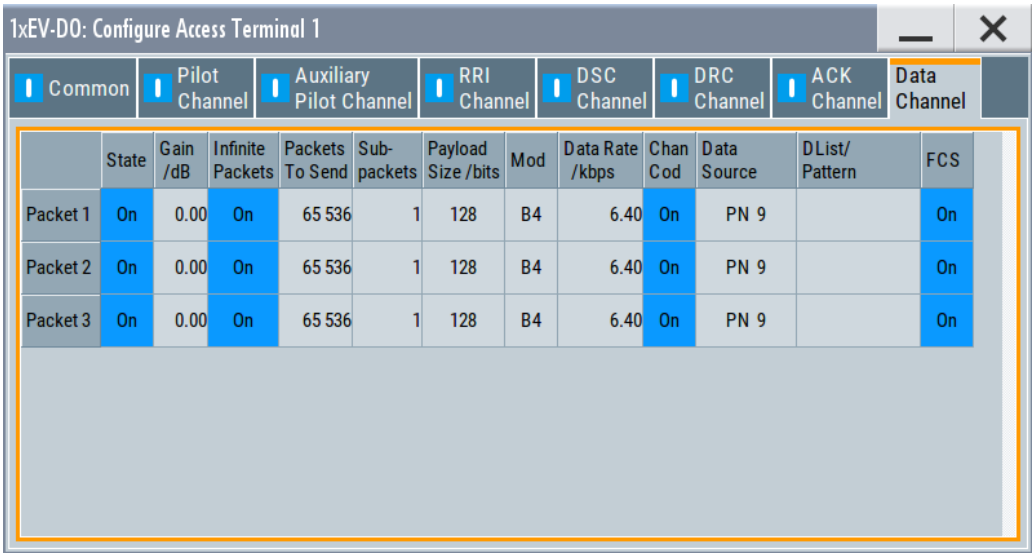
Specifies the data pattern transmitted on the ACK Channel.

The sequence starts at frame 0 and slot 0 and is repeated with the length of the pattern. A 0 specifies an ACK, a 1 specifies a NAK. This pattern is only read for slots that are gated on.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACKChannel:VALues on page 105

Data Channel
Access:

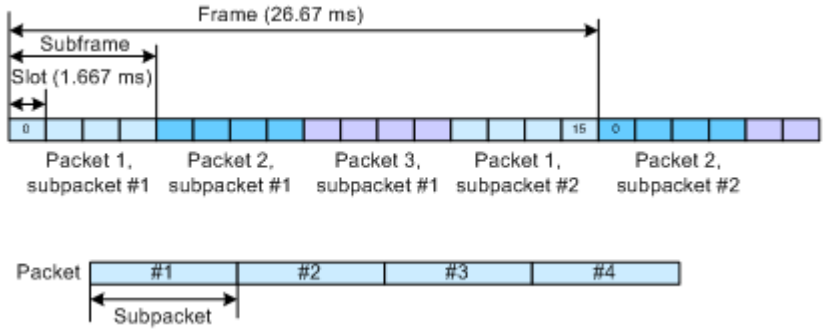
Select "Baseband > 1xEV-DO > Access Terminals > Terminal > Data Channel".



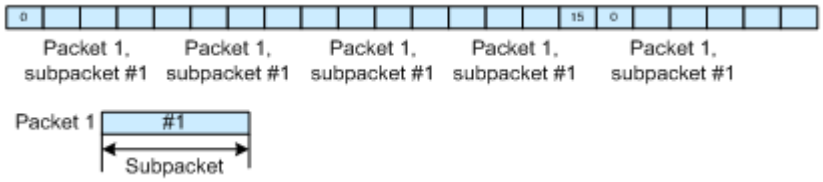
State ← Data Channel
(enabled for access terminal working in traffic mode only)

Enables or disables the state of the packets.

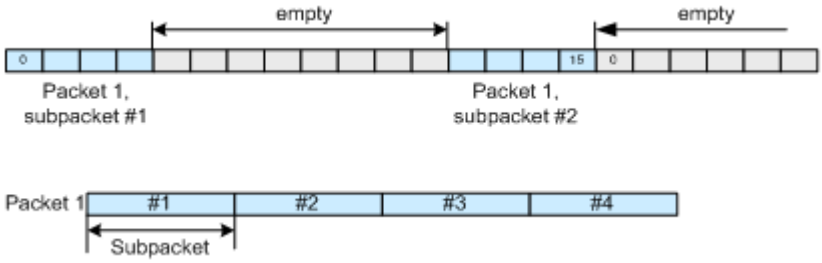
There are three configurable packets ("Packet 1… 3") for physical layer subtype 2. When more than one packet is active, packet 1 is sent on the first subframe (first four slots). Packets 2 and 3 are sent respectively on the second and the third subframe (see figure below).



When only one packet is active and "Number of Subpackets" is set to 1, no interleaving is performed between the packets. In this case, the data channel is active continuously (see figure below).



When only one packet is active but the number of subpackets is larger than one, interleave subframe. In this case, two subframes are left empty in-between every two subpackets (see figure below).



Only one configurable packet is available for physical layer subtype 0&1, the data channel is continuously active for the number of packets to send.

Remote command:
`[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:STATe`
on page 115

Gain/db ← Data Channel
(enabled for access terminal working in traffic mode only)

Sets the gain in dB of the selected packet relative to the pilot channel power.

Note: Configuration of "Packet 2" and "Packet 3" transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:GAIN
on page 113

Infinite Packets ← Data Channel
(enabled for access terminal working in traffic mode only)

Enables or disables sending an unlimited number of packets.

If "Infinite Packets" is disabled, the number of packets to send can be specified with the parameter "Number of Packets to Send".

Note: Configuration of "Packet 2" and "Packet 3" transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:INFinite
on page 113

Packets To Send ← Data Channel
(enabled for access terminal working in traffic mode only)

Sets the number of packets to be sent.

The number of packets to send depends on whether the parameter "Infinite Packets" is enabled or disabled. If "Infinite Packets" is enabled, there is no limit to the number of packets sent.

If "Infinite Packets" is disabled, the number of packets can be specified. The data channel will be switched off after the specified "Number of Packets" have been sent.

Note: Configuration of "Packet 2" and "Packet 3" transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:COUNt
on page 110

Subpackets ← Data Channel
(enabled for physical layer subtype 2 and an access terminal working in traffic mode only)

Sets the number of subpackets to be sent.

Example:

If number of subpackets is 4, then subpacket 0, 1, 2 and 3 of a packet is sent in a subframe each (with two subframes interleaving between). Afterward the next packet is started. It simulates a situation where three times NAK has been received from the base station with an ACK after the fourth subpacket.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:
SUBPackets[:COUNt] on page 115

Payload Size/bits ← Data Channel
(enabled for access terminal working in traffic mode only)

Sets the payload size in bits for the selected packet.

Note: Configuration of "Packet 2" and "Packet 3" transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:PSIZe
on page 114

Modulation ← Data Channel
(enabled for physical layer subtype 2 and an access terminal working in traffic mode only)

Displays the modulation type per packet.

The modulation type is set automatically according to the selected payload size. The value is read-only.

Remote-control command: SOUR:BB:EVDO:TERM2:DCH:PACK3:MOD?

"B4" The modulation type is set to BPSK modulation with 4-ary Walsh cover.

"Q4" The modulation type is set to QPSK modulation with 4-ary Walsh cover.

"Q2" The modulation type is set to QPSK modulation with 2-ary Walsh cover.

"Q4Q2" Sum of Q4 and Q2 modulated symbols.

"E4E2" Sum of E4 (8-PSK modulated with 4-ary Walsh cover) and E2 (8-PSK modulated with 2-ary Walsh cover) modulated symbols.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:MODulation?
on page 114

Data Rate/kbps ← Data Channel
(enabled for access terminal working in traffic mode only)

Displays the resulting data rate for the selected packet.

The data rate is the effective data rate achieved for the specific packet. Sum up the data rates of all three packets to obtain the total effective data rate for the uplink data channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:DRATe?
on page 112

Channel Coding ← Data Channel
(enabled for access terminal working in traffic mode only)

Activates or deactivates channel coding, including scrambling, turbo encoding and channel interleaving.

Note: Configuration of "Packet 2" and "Packet 3" transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:CCODing
on page 110

Data Source ← Data Channel
(enabled for access terminal working in traffic mode only)

Selects the data source.

The number of bits read from the data source for each packet depends on the payload size, channel coding state and FCS state. The following table gives an overview on the number of bits read.

	FCS ON	**FCS OFF**
Channel Coding ON	PayloadSize - FCSSize - 6	PayloadSize - 6
Channel Coding OFF	(PayloadSize/CodeRate) - FCSSize	(PayloadSize/CodeRate)

FCSSize and code rate depend on the physical layer subtype (see that table bellow).

	Physical layer subtype 0&1	**Physical layer subtype 2**
FCSSize	16	24
Code rate	1/4 or 1/2	1/5 or 1/3

Note: Configuration of "Packet 2" and "Packet 3" transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

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 SMM100A user manual.
- Section "File and Data Management" in the R&S SMM100A user manual.
- Section "Data List Editor" in the R&S SMM100A user manual

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:DATA on page 111
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:DATA:DSELection on page 111
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:DATA:PATTern on page 111

FCS ← Data Channel
(enabled for access terminal working in traffic mode only)

Enables or disables appending a standard frame check sequence (FCS) to the MAC layer packet.

Note: Configuration of "Packet 2" and "Packet 3" transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:FCS[:STATe] on page 112

State ← Data Channel
(enabled for access terminal working in access mode only)

Enables or disables the state of the data channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:STATe on page 116

Relative Gain ← Data Channel
(enabled for access terminal working in access mode only)

Sets the gain in dB of the data channel relative to the pilot channel power.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:GAIN on page 109

Capsule Length ← Data Channel
(enabled for access terminal working in access mode only)

Sets the number of frames (16 slots each) to be transmitted after the preamble. Each frame contains one data packet.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:CLENgth on page 107

Data Rate ← Data Channel
(enabled for access terminal working in access mode only)

Selects the data rate for the data channel.

Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:DRATe on page 108

Data Source ← Data Channel
(enabled for access terminal working in access mode only)

Selects the 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 SMM100A user manual.
- Section "File and Data Management" in the R&S SMM100A user manual.
- Section "Data List Editor" in the R&S SMM100A user manual

Remote command:

`[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:DATA` on page 107

`[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:DATA:PATTern` on page 108

Append FCS ← Data Channel
(enabled for access terminal working in access mode only)

Enables or disables appending a standard frame check sequence (FCS) to the MAC layer packet.

Remote command:

`[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:FCS[:STATe]` on page 109

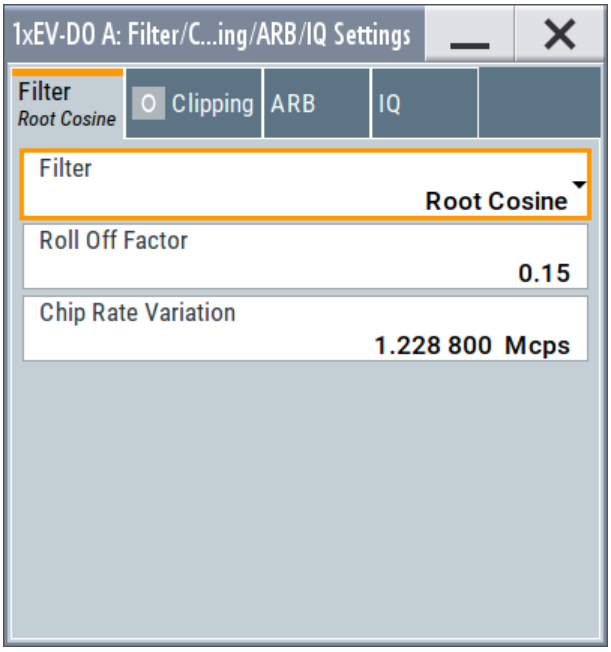
3.10 Filter / clipping / ARB settings

Access:

► Select "General > Filter/Clipping/ARB/IQ Settings".

The dialog comprises the settings, necessary to configure the baseband filter, sample rate variation and clipping.

3.10.1 Filter settings



Settings:

Filter
Selects the baseband filter.

Remote command:
`[:SOURce<hw>]:BB:EVDO:FILTer:TYPE` on page 76

Roll Off 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:EVDO:FILTer:PARameter:APCO25` on page 74
`[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:COSine` on page 74
`[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:GAUSs` on page 74
`[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:PGAuss` on page 75
`[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:RCOSine` on page 76
`[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:SPHase` on page 76

Cut Off 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:EVDO:FILTer:PARameter:LPASs on page 75
[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:LPASSEVM on page 75

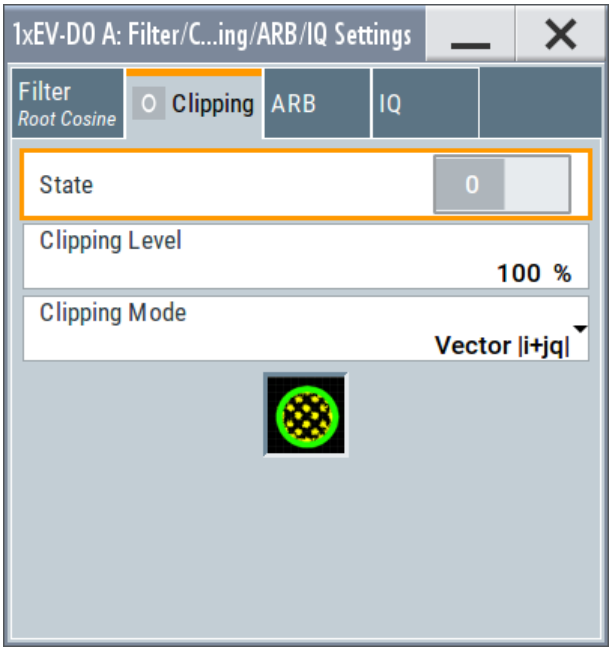
Chip Rate Variation
Enters the chip rate.

The chip rate entry changes the output clock and the modulation bandwidth.

Remote command:
[:SOURce<hw>]:BB:EVDO:CRATe:VARiation on page 73

3.10.2 Clipping settings

► Access:
Select "Baseband > 1xEV-DO > General > Filter/Clipping/ARB/IQ Settings > Clipping"



Provided are the following settings for configuring the clipping settings:

Clipping State
(For reverse link mode only)

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 to filtering, the procedure does not influence the spectrum. The EVM however increases.

1xEV-DO signals can have high crest factors particularly with many channels and long sequences.

Remote command:
`[:SOURce<hw>]:BB:EVDO:CLIPping:STATe` on page 73

Clipping Level
(For reverse link mode only)

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:EVDO:CLIPping:LEVel` on page 72

Clipping Mode
(For reverse link mode only)

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

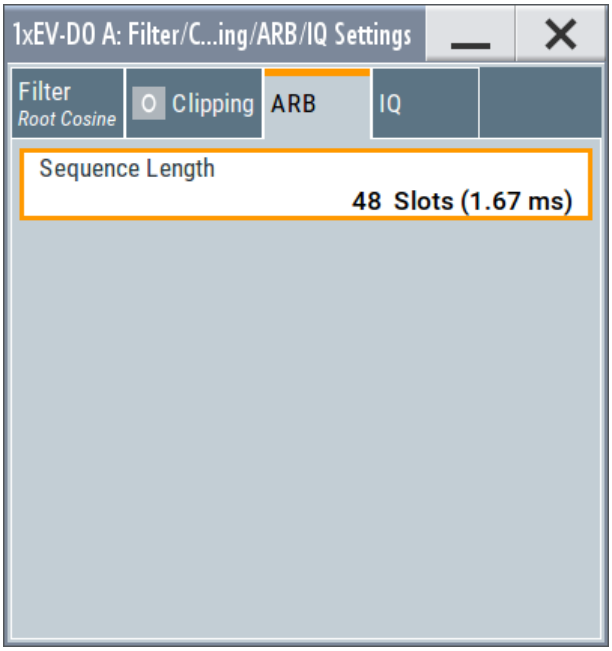
- "Vector | i + jq |"
  The limit is related to the amplitude | i + q |. The I and Q components are mapped together, the angle is retained.
- "Scalar | i | , | q |"
  The limit is related to the absolute maximum of all the I and Q values | i | + | q |. The I and Q components are mapped separately, the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

Remote command:
`[:SOURce<hw>]:BB:EVDO:CLIPping:MODE` on page 73

3.10.3 ARB settings

► Access:

Select "Baseband > 1xEV-DO > General > Filter/Clipping/ARB/IQ Settings > ARB"



Provided are the following settings for configuring the ARB settings:

Sequence Length ARB
(For reverse link mode only)

Changes the sequence length of the arbitrary waveform component of the 1xEV-DO signal. This component is calculated in advance and output in the arbitrary waveform generator. It is added to the realtime signal components.

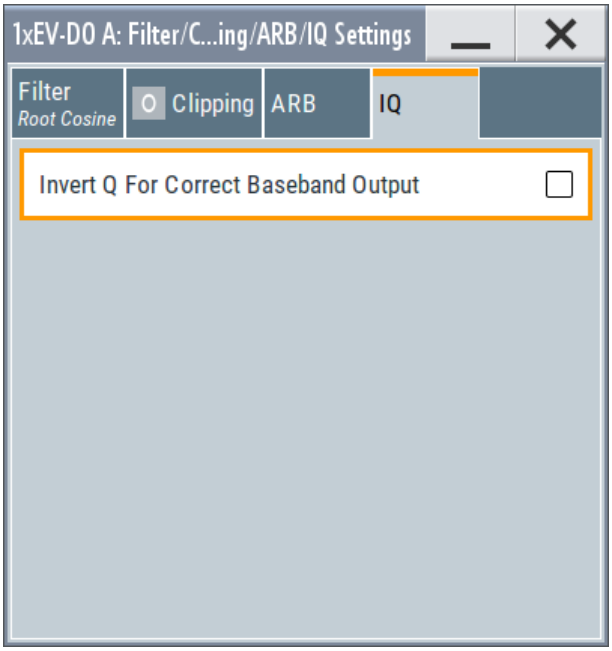
The number of chips is determined from this sequence length. One slot of 1.67ms duration equals 2048 chips.

Remote command:
`[:SOURce<hw>]:BB:EVDO:SLENgth` on page 70

3.10.4 I/Q setting

► Access:

Select "Baseband > 1xEV-DO > General > Filter/Clipping/ARB/IQ Settings > IQ"



Provided are the following settings for configuring the IQ settings:

Invert Q for Correct Baseband Output
With its default 1xEV-DO settings, the R&S SMM100A generates a standard compliant *RF* signal.

If a standard compliant *baseband* signal is required, enable this parameter to invert the Q-part of the baseband signal.

If both, the RF signal and baseband signal have to be compliant with the 1xEV-DO standard:

- Set "Invert Q for Correct Baseband Output > On"
- Set "I/Q Mod > I/Q Settings > I/Q Swap > On"

See also R&S SMM100A user manual, section "Applying I/Q Vector Modulation".

Remote command:
`[:SOURce<hw>]:BB:EVDO:IQSWap:STATe` on page 76

4 Remote-control commands

The following commands are required to generate signals with the 1xEV-DO options in a remote environment. We assume that the R&S SMM100A has already been set up for remote operation in a network as described in the R&S SMM100A 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 SMM100A 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<ch>`	1	available baseband signals
`OUTPut<ch>`	1 to 3	available markers
`CARRier<Ch>`	0 to 21	band class
`USER<ST>`	1 to 4	user
`TERMinal<ST>`	1 to 4	terminal

The following commands specific to the 1xEV-DO are described here:

4.1 Programming examples

Example: Performing general tasks

This example shows how to enable the option with predefined settings as basis for further customization (e.g. defining the transmission direction, etc.). Results and configuration are stored with the save/recall function.

```
// ********************************************************************
// Reset instrument first
// ********************************************************************
*RST; *CLS

:SOURce1:BB:EVDO:PRESet
:SOURce1:BB:EVDO:STATe ON
:SOURce1:BB:EVDO:SETTing:STORe "/var/user/1xEVDO_def"

// ********************************************************************
// Recall settings
// ********************************************************************
MMEM:CDIR "/var/user/"
:SOURce1:BB:EVDO:SETTing:CATalog?
// 1xEVDO_def,1xEVDO_dl,1xEVDO_test
:SOURce1:BB:EVDO:SETTing:DELete "1xEVDO_test"
:SOURce1:BB:EVDO:SETTing:LOAD "1xEVDO_dl"

// ********************************************************************
// Change the data transmission direction
// queries PN offset, sets the system time
// queries version and ARB sequence length
// generates and stores an waveform file in the current directory
// ********************************************************************
:SOURce1:BB:EVDO:LINK?
// DOWN
:SOURce1:BB:EVDO:LINK UP
:SOURce1:BB:EVDO:PNOFfset?
// 0
:SOURce1:BB:EVDO:STIMe 32
:SOURce1:BB:EVDO:SLENgth?
// 48
:SOURce1:BB:EVDO:VERSion?
// Release B
:SOURce1:BB:EVDO:WAVeform:CREate "wv1xEVDO_ul"
```

Example: Adjusting clock and trigger settings

The following example lists the provided commands:

```
// ********************************************************************
// Clock settings
// ********************************************************************
```

```
:SOURce1:BB:EVDO:CLOCk:SOURce INTernal

// *****************************************************************
// Configure and enable signal generation
// *****************************************************************
:SOURce1:BB:EVDO:TRIGger:SOURce INTernal
:SOURce1:BB:EVDO:TRIGger:SEQuence ARETrigger
:SOURce1:BB:EVDO:STAT ON
:SOURce1:BB:EVDO:TRIGger:EXECute
:SOURce1:BB:EVDO:TRIGger:ARM:EXECute
// :SOURce1:BB:EVDO:TRIGger:SEQuence SING
// :SOURce1:BB:EVDO:TRIGger:SLUNit CHIP
// :SOURce1:BB:EVDO:TRIGger:SLENgth 2
:SOURce1:BB:EVDO:TRIGger:RMODe?
// Stopped
:SOURce1:BB:EVDO:TRIGger:EXECute
:SOURce1:BB:EVDO:TRIGger:RMODe?
// Run

// :SOURce1:BB:EVDO:TRIGger:SOURce EGT1
// :SOURce1:BB:EVDO:TRIGger:EXTernal:SYNChronize:OUTPut ON
// :SOURce1:BB:EVDO:TRIGger:EXTernal:INHibit 200
// :SOURce1:BB:EVDO:TRIGger:EXTernal:DELay 100
```

Example: Configure and enable standard marker signals

```
:SOURce1:BB:EVDO:TRIGger:OUTPut1:MODE RATio
:SOURce1:BB:EVDO:TRIGger:OUTPut1:ONTime 40
:SOURce1:BB:EVDO:TRIGger:OUTPut1:OFFTime 20
:SOURce1:BB:EVDO:TRIGger:OUTPut3:MODE USER
:SOURce1:BB:EVDO:TRIGger:OUTPut3:PERiod 100
```

Example: Generating a downlink multicarrier signal

This example shows how to enable the multi-carrier configuration and generate a signal composed of four carriers within a selected band class.

```
// *****************************************************************
// Reset instrument first
// *****************************************************************
*RST; *CLS

:SOURce1:BB:EVDO:LINK?
// DOWN

:SOURce1:BB:EVDO:DOWN:MC:BCLass BC11
:SOURce1:BB:EVDO:DOWN:MC:CARRier1:STATe 1
:SOURce1:BB:EVDO:DOWN:MC:CARRier2:CHANnel 10
:SOURce1:BB:EVDO:DOWN:MC:CARRier2:STATe 1
:SOURce1:BB:EVDO:DOWN:MC:CARRier3:CHANnel 5
:SOURce1:BB:EVDO:DOWN:MC:CARRier4:CHANnel 500
:SOURce1:BB:EVDO:DOWN:MC:CARRier4:STATe 1
```

```
:SOURce1:BB:EVDO:DOWN:MC:CARRier5:CHANnel 100
:SOURce1:BB:EVDO:DOWN:MC:CARRier6:CHANnel 1200
:SOURce1:BB:EVDO:DOWN:MC:CARRier6:CHANnel?
// Response: 871
// channel 1200 is not valid, the firmware selects the next available channel.
:SOURce1:BB:EVDO:DOWN:MC:CARRier7:CHANnel 1536
:SOURce1:BB:EVDO:DOWN:MC:CARRier8:CHANnel 1700
:SOURce1:BB:EVDO:DOWN:MC:CARRier8:STATe 1
:SOURce1:BB:EVDO:DOWN:MC:CARRier9:CHANnel 240
:SOURce1:BB:EVDO:DOWN:MC:STATe 1

:SOURce1:BB:EVDO:STATe 1

:SOURce1:BB:EVDO:DOWN:MC:CFRequency?
// 456900000
:SOURce1:BB:EVDO:DOWN:MC:CARRier1:FREQuency?
// 460000000
:SOURce1:BB:EVDO:DOWN:MC:CARRier2:FREQuency?
// 460225000
:SOURce1:BB:EVDO:DOWN:MC:CARRier4:FREQuency?
// 420700000
:SOURce1:BB:EVDO:DOWN:MC:CARRier8:FREQuency?
// 493100000

// apply a carrier delay to reduce the crest factor
:SOURce1:BB:EVDO:DOWN:MC:CDELay 0.000001
// Carrier#1 is delayed by 0 ns, carrier#2 by 1000 ns,
// carrier#4 by 2000 ns, carrie#8 by 3000 ns
```

4.2 General commands

This section contains commands for the primary and general settings of the 1xEV-DO standard. These settings concern activation of the standard, setting the transmission direction, defining the chip rate and the sequence length, as well as the preset and power adjust setting.

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

Defines the transmission direction.

Parameters:

<Link> FORWard/DOWN | REVerse/UP
*RST: DOWN

Example: see Example"Performing general tasks" on page 66

Manual operation: See "Link Direction" on page 15

[:SOURce<hw>]:BB:EVDO:PNOFfset <PnOffset>

Sets the PN Offset of the 1xEV-DO signal.

Parameters:

<PnOffset> integer
Range: 0 to 511
*RST: 0

Example: see Example"Performing general tasks" on page 66

Manual operation: See "PN Offset" on page 15

[:SOURce<hw>]:BB:EVDO: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:EVDO:STATe`.

Example: see Example"Performing general tasks" on page 66

Usage: Event

Manual operation: See "Set To Default" on page 14

[:SOURce<hw>]:BB:EVDO:SETTing:CATalog?

Queries the files with 1xEV-DO settings (file extension `*.1xevdo`) in the default or the specified directory.

Return values:

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

Example: See Example"Performing general tasks" on page 66

Usage: Query only

Manual operation: See "Save/Recall" on page 14

[:SOURce<hw>]:BB:EVDO:SETTing:DELete <Filename>

Deletes the selected file from the default or specified directory. Deleted are files with the file extension `*.1xevdo`.

Setting parameters:
<Filename> string

Example: See Example"Performing general tasks" on page 66

Usage: Setting only

Manual operation: See "Save/Recall" on page 14

[:SOURce<hw>]:BB:EVDO:SETTing:LOAD <Filename>

Loads the selected file from the default or the specified directory. Loads are files with extension `*.1xevdo`.

Setting parameters:
<Filename> string

Example: See Example"Performing general tasks" on page 66

Usage: Setting only

Manual operation: See "Save/Recall" on page 14

[:SOURce<hw>]:BB:EVDO:SETTing:STORe <Filename>

Stores the current settings into the selected file; the file extension `*.1xevdo` is assigned automatically.

Setting parameters:
<Filename> string

Example: See Example"Performing general tasks" on page 66

Usage: Setting only

Manual operation: See "Save/Recall" on page 14

[:SOURce<hw>]:BB:EVDO:SLENgth <SLength>

(For reverse link mode only)

Sets the sequence length of the arbitrary waveform component of the 1XEV-DO signal in number of frames. This component is calculated in advance and output in the arbitrary waveform generator. It is added to the real time signal components. The number of chips is determined from this sequence length. One slot of 1.67ms duration equals 2048 chips.

Parameters:

<SLength> integer

Range: 4 to dynamic
Increment: 4
*RST: 48

Example: See Example"Performing general tasks" on page 66

Manual operation: See "Sequence Length ARB" on page 63

[:SOURce<hw>]:BB:EVDO: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: see Example"Performing general tasks" on page 66

Manual operation: See "State" on page 13

[:SOURce<hw>]:BB:EVDO:STIMe <STime>

Sets the System Time value of the 1xEV-DO signal and the base station. The System Time value is expressed in units of 1.67 ms intervals (80 ms/ 48).

Note: In uplink, the value selected for system time must be multiple of 16.

Parameters:

<STime> integer

Range: 0 to 2199023255551
*RST: 0

Example: see Example"Performing general tasks" on page 66

Manual operation: See "System Time" on page 15

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

Queries the version of the 1xEV-DO standard underlying the definitions

Return values:

<Version> string

Example: see Example"Performing general tasks" on page 66

Usage: Query only

Manual operation: See "1xEV-DO Version" on page 15

[:SOURce<hw>]:BB:EVDO:WAVeform:CREate <Filename>

Creates a waveform using the current settings. The file is stored with the predefined file extension `*.wv`. The filename and the directory it is stored in are user-definable.

Setting parameters:
<Filename> string

Example: See Example"Performing general tasks" on page 66

Usage: Setting only

Manual operation: See "Generate Waveform" on page 14

4.3 Filter / clipping / ARB commands

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

(For reverse link mode only)

The command sets the limit for level clipping (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.

Level clipping is activated with the command `SOUR:BB:EVDO:CLIP:STAT ON`

Parameters:
<Level> integer

Range: 0 PCT to 100 PCT
Increment: 1 PCT
*RST: 100 PCT

Example: `BB:EVDO:CLIP:LEV 80PCT`
sets the limit for level clipping to 80% of the maximum level.
`BB:EVDO:CLIP:STAT ON`
activates level clipping.

Manual operation: See "Clipping Level" on page 62

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

(For reverse link mode only)

Sets the method for level clipping.

Parameters:

<Mode> VECTor | SCALar

VECTor
The reference level is the amplitude `| i+jq |`

SCALar
The reference level is the absolute maximum of the I and Q values.

*RST: VECTor

Example:
```
BB:EVDO:CLIP:MODE SCAL
BB:EVDO:CLIP:LEV 80PCT
```
Sets the limit for level clipping to 80% of this maximum level.
```
BB:EVDO:CLIP:STAT ON
```

Manual operation: See "Clipping Mode" on page 62

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

(For reverse link mode only)

The command activates level clipping (Clipping). The value is defined with the command `BB:EVDO:CLIPping:LEVel`, the mode of calculation with the command `BB:EVDO:CLIPping:MODE`.

Parameters:

<State> 1 | ON | 0 | OFF

*RST: OFF

Example:
```
BB:EVDO:CLIP:STAT ON
```
activates level clipping.

Manual operation: See "Clipping State" on page 61

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

Enters 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: 1 Mcps to 5 Mcps
Increment: 1E-6 Mcps (1cps)
*RST: 1.2288 Mcps

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

Manual operation: See "Chip Rate Variation" on page 61

[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:APCO25 <Apco25>

Sets the rolloff factor for filter type APCO25.

Parameters:

<Apco25> float

Range: 0.05 to 0.99
Increment: 0.01
*RST: 0.2

Example: `BB:EVDO:FILT:PAR:APCO25 0.2`
Sets the rolloff factor to 0.2 for filter type APCO25.

Manual operation: See "Roll Off Factor or BxT" on page 60

[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:COSine <Cosine>

Sets the rolloff factor for the Cosine filter type.

Parameters:

<Cosine> float

Range: 0.05 to 1
Increment: 0.01
*RST: 0.1

Example: `BB:EVDO:FILT:PAR:COS 0.35`
Sets the rolloff factor to 0.35 for filter type Cosine.

Manual operation: See "Roll Off Factor or BxT" on page 60

[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:GAUSs <Gauss>

Sets the rolloff factor for the Gauss filter type.

Parameters:

<Gauss> float

Range: 0.15 to 2.5
Increment: 0.01
*RST: 0.5

Example: `BB:EVDO:FILT:PAR:GAUS 0.5`
Sets BxT to 0.5 for the Gauss filter type.

Manual operation: See "Roll Off Factor or BxT" on page 60

[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:LPASs <LPass>

Sets the cutoff frequency factor for the lowpass filter (ACP Opt.) type.

Parameters:
<LPass> float

Range: 0.05 to 2
Increment: 0.01
*RST: 0.5

Example: `BB:EVDO:FILT:PAR:LPAS 0.5`
The cut of frequency factor is set to 0.5.

Manual operation: See "Cut Off Frequency Factor" on page 60

[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:LPASSEVM <LPassEvm>

Sets the cutoff frequency factor for the lowpass filter (EVM Opt.) type.

Parameters:
<LPassEvm> float

Range: 0.05 to 2
Increment: 0.01
*RST: 0.5

Example: `BB:EVDO:FILT:PAR:LPASSEVM 0.5`
The cut of frequency factor is set to 0.5.

Manual operation: See "Cut Off Frequency Factor" on page 60

[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:PGAuss <PGauss>

Sets the rolloff factor for the Pure Gauss filter type.

Parameters:
<PGauss> float

Range: 0.15 to 2.5
Increment: 0.01
*RST: 0.5

Example: `BB:EVDO:FILT:PAR:GAUS 0.5`
Sets BxT to 0.5 for the Pure Gauss filter type.

Manual operation: See "Roll Off Factor or BxT" on page 60

[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:RCOSine <RCosine>

Sets the rolloff factor for the Root Cosine filter type.

Parameters:

<RCosine> float

Range: 0.05 to 1
Increment: 0.01
*RST: 0.15

Example: `BB:EVDO:FILT:PAR:RCOS 0.22`
Sets the rolloff factor to 0. 22 for filter type Root Cosine.

Manual operation: See "Roll Off Factor or BxT" on page 60

[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:SPHase <SPhase>

Sets BxT for the Split Phase filter type.

Parameters:

<SPhase> float

Range: 0.15 to 2.5
Increment: 0.01
*RST: 2

Example: `BB:EVDO:FILT:PAR:SPH 0.5`
Sets BxT to 0.5 for the Split Phase filter type.

Manual operation: See "Roll Off Factor or BxT" on page 60

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

The command 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: Downlink: COEQ; Uplink: CONE

Example: `BB:EVDO:FILT:TYPE CONE`
Sets the filter type CdmaOne. This filter type is defined by the standard for the uplink.

Manual operation: See "Filter" on page 60

[:SOURce<hw>]:BB:EVDO:IQSWap:STATe <State>

Inverts the Q-part of the baseband signal

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

Example: `SOURce1:BB:EVDO:IQSWap:STATe ON`
inverts the Q-part of the baseband signal
`SOURce:IQ:SWAP:STATe ON`
swaps the I and Q signals

Manual operation: See "Invert Q for Correct Baseband Output" on page 64

4.4 Trigger commands

[:SOURce<hw>]:BB:EVDO[: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"Adjusting clock and trigger settings" on page 66.

Manual operation: See "Mode" on page 17

[:SOURce<hw>]:BB:EVDO: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 local or global connectors
  - `EGT1|EGT2`: External global trigger
  - `EGC1|EGC2`: External global clock
- In primary-secondary instrument mode, the external baseband synchronization signal (`BBSY`)
- `OBASeband|BEXTernal|EXTernal`: Setting only
  Provided only for backward compatibility with other Rohde & Schwarz signal generators.
  The R&S SMM100A accepts these values and maps them automatically as follows:
  `EXTernal = EGT1`, `BEXTernal = EGT2`, `OBASeband = INTA`

Parameters:

<Source> INTernal|EGT1|EGT2|EGC1|EGC2|EXTernal|BBSY

*RST: INTernal

Example: See Example"Adjusting clock and trigger settings" on page 66

Manual operation: See "Source" on page 19

[:SOURce<hw>]:BB:EVDO:TRIGger:SLENgth <SLength>

Defines the length of the signal sequence that is output in the `SINGle` trigger mode.

Parameters:

<SLength> integer

Range: 1 to 4294967295
*RST: 1

Example: See Example"Adjusting clock and trigger settings" on page 66

Manual operation: See "Signal Duration" on page 17

[:SOURce<hw>]:BB:EVDO:TRIGger:SLUNit <SLunit>

Defines the unit for the entry of the length of the signal sequence.

Parameters:

<SLunit> SLOT | CHIP | SEQuence

*RST: SEQuence

Example: See Example"Adjusting clock and trigger settings" on page 66

Manual operation: See "Signal Duration Unit" on page 17

[:SOURce<hw>]:BB:EVDO:TRIGger:RMODe?

Queries the signal generation status.

Return values:
<RMode> STOP | RUN

Example: see Example"Adjusting clock and trigger settings" on page 66

Usage: Query only

Manual operation: See "Running/Stopped" on page 18

[:SOURce<hw>]:BB:EVDO: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 subchapter "Trigger Commands" of the chapter "SOURce:BB:ARB subsystem" in the R&S SMM100A user manual.

Manual operation: See "Trigger Time" on page 18

[:SOURce<hw>]:BB:EVDO: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 subchapter "Trigger Commands" of the chapter "SOURce:BB:ARB subsystem" in the R&S SMM100A user manual.

Manual operation: See "Trigger Time" on page 18

[:SOURce<hw>]:BB:EVDO:TRIGger:TIME[:STATe] <State>

Activates time-based triggering with a fixed time reference. If activated, the R&S SMM100A 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 subchapter "Trigger Commands" of the chapter "SOURce:BB:ARB subsystem" in the R&S SMM100A user manual.

Manual operation: See "Time Based Trigger" on page 18

[:SOURce<hw>]:BB:EVDO:TRIGger:EXTernal:SYNChronize:OUTPut <Output>

Enables signal output synchronous to the trigger event.

Parameters:
<Output> 1 | ON | 0 | OFF
*RST: 1

Example: See Example"Adjusting clock and trigger settings" on page 66

Manual operation: See "Sync. Output to External Trigger/Sync. Output to Trigger" on page 19

[:SOURce<hw>]:BB:EVDO:TRIGger:ARM:EXECute

Stops signal generation; a subsequent internal or external trigger event restart signal generation.

Example: see Example"Adjusting clock and trigger settings" on page 66

Usage: Event

Manual operation: See "Arm" on page 18

[:SOURce<hw>]:BB:EVDO:TRIGger:EXECute

Executes a trigger.

Example: see Example"Adjusting clock and trigger settings" on page 66

Usage: Event

Manual operation: See "Execute Trigger" on page 18

[:SOURce<hw>]:BB:EVDO: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"Adjusting clock and trigger settings" on page 66.

Manual operation: See "External Delay/Trigger Delay" on page 20

[:SOURce<hw>]:BB:EVDO: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"Adjusting clock and trigger settings" on page 66.

Manual operation: See "External Inhibit/Trigger Inhibit" on page 20

4.5 Marker commands

[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:MODE <Mode>

Defines the signal for the selected marker output.

Parameters:

<Mode> SLOT | PNSPeriod | ESM | CSPeriod | USER | RATio

SLOT
Each slot (every 1.67 ms)

PNSPeriod
Every 26.67 ms (PN Sequence Period)

ESM
Every 2 s (even second mark).

CSPeriod
Each arbitrary waveform sequence

RATio
Regular marker signal

USER
Every user-defined period.

*RST: SLOT

Example: `SOURce:BB:EVDO:TRIGger:OUTPut2:MODE ESM`
selects the even second mark clock (every 2 seconds) on the output for marker signal 2

Manual operation: See "Mode" on page 21

[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:ONTime <OnTime>
[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:OFFTime <OffTime>

Sets the duration during which the marker output is on or off.

Parameters:

<OffTime> integer

Range: 1 to 16777215
*RST: 1

Example: See Example"Configure and enable standard marker signals" on page 67.

Manual operation: See "Mode" on page 21

[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:PERiod <Period>

Sets the repetition rate for the signal at the marker outputs.

Parameters:

<Period> integer

Range: 1 to 16777215
*RST: 2

Example: See Example"Configure and enable standard marker signals" on page 67.

Manual operation: See "Mode" on page 21

[:SOURce<hw>]:BB:EVDO: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"Configure and enable standard marker signals" on page 67

Manual operation: See "Delay" on page 22

4.6 Clock commands

[:SOURce<hw>]:BB:EVDO:CLOCk:MODE <Mode>

Sets the type of externally supplied clock.

Parameters:

<Mode> CHIP

*RST: CHIP

Example: See Example"Adjusting clock and trigger settings" on page 66

Manual operation: See "Clock Mode" on page 23

[:SOURce<hw>]:BB:EVDO:CLOCk:SOURce <Source>

Selects the clock source:

- `INTernal`: Internal clock reference
- `ELCLock`: External local clock
- `EXTernal = ELCLock`: Setting only
  Provided for backward compatibility with other Rohde & Schwarz signal generators

Parameters:

<Source> INTernal

*RST: INTernal

Example: See Example"Adjusting clock and trigger settings" on page 66.

Manual operation: See "Clock Source" on page 23

4.7 Access network commands

[:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:PSOFfset <PSoffset>

Sets the offset (in slots) from the start of control channel cycle to the start of the synchronous message capsule that contains the Sync Message.

Parameters:

<PSoffset> integer

Range: 0 to 3
*RST: 0

Example: `BB:EVDO:ANET:CCH:PSOF 2`
sets the packet start offset for the control channel to 2.

Manual operation: See "Packet Start Offset" on page 41

[:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:RATE <Rate>

Sets the rate that the control channel messages are transmitted at.

Parameters:

<Rate> DR4K8 | DR9K6 | DR19K2 | DR38K4 | DR76K8 | DR153K6 | DR307K2 | DR614K4 | DR921K6 | DR1228K8 | DR1536K | DR1843K2 | DR2457K6 | DR3072K | DR460K8 | DR768K | DR1075K2 | DR2150K4 | DR3686K4 | DR4300K8 | DR4915K2

*RST: 38.4 kbps

Example: `BB:EVDO:ANET:CCH:RATE DR76K8`
sets the control channel rate to 76.8 kbps.

Manual operation: See "Rate" on page 41

[:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:REVision:MAXimum <Maximum>

Sets the value of the maximum revision field within the control channel message.

Parameters:

<Maximum> integer

Range: 0 to 255
*RST: 1

Example: `BB:EVDO:ANET:CCH:REV:MAX 10`
sets the value of the maximum revision field to 10.

Manual operation: See "Maximum Revision" on page 42

[:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:REVision:MINimum <Minimum>

Sets the value of the minimum revision field within the control channel message.

Parameters:

<Minimum> integer

Range: 0 to 255
*RST: 1

Example: `BB:EVDO:ANET:CCH:REV:MIN 1`
sets the value of the minimum revision field to 1.

Manual operation: See "Minimum Revision" on page 41

[:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:STATe <State>

Enables or disables the control channel messages.

Parameters:

<State> 1 | ON | 0 | OFF

*RST: 0

Example: `BB:EVDO:ANET:CCH:STAT ON`
enables the control channel message.

Manual operation: See "State" on page 41

[:SOURce<hw>]:BB:EVDO:ANETwork:CPMode <CpMode>

Enables or disables a special mode within the 1xEV-DO generator.

Note: During the special mode, all other parameters do not affect the signal output.

Parameters:
<CpMode> 1 | ON | 0 | OFF
*RST: 0

Example: `BB:EVDO:ANET:CPM ON`
enables the special mode.

Manual operation: See "Continuous Pilot Mode" on page 39

[:SOURce<hw>]:BB:EVDO:ANETwork:OUCount <OuCount>

Sets the number of additional users (beyond the four defined users) that appear in the MAC Channel.

Parameters:
<OuCount> integer
Range: 0 to 55 for physical layer subtype 0&1) , 0 to 110 for physical layer subtype 2, 0 to 360 for physical layer subtype 3
*RST: 1

Example: `BB:EVDO:ANET:OUC 5`
sets the number of additional users to 5.

Manual operation: See "Other Users Count" on page 40

[:SOURce<hw>]:BB:EVDO:ANETwork:PCHannel:STATe?

Displays the state of the pilot channel. Pilot channel is transmitted by sector on each active forward channel. It is present always and transmitted at the full sector power.

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

Example: `BB:EVDO:ANET:PCH:STAT?`
displays the state of the pilot channel.

Usage: Query only

Manual operation: See "State" on page 40

[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:LENGth <Length>

Sets the duration (in slots) of a Reverse Activity bit.

Note: This parameter is available for physical layer subtype 0&1 only.

Parameters:
<Length> RL8 | RL16 | RL32 | RL64
*RST: 8

Example: `BB:EVDO:ANET:RAB:LENG RL16`
sets the duration of the Reverse Activity Bit (RAB) to 16 slots.

Manual operation: See "RAB Length" on page 42

[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:LEVel <Level>

Sets the power within the MAC block for the Reverse Activity channel.

Parameters:
<Level> float

Range: -25 to -7
Increment: 0.01
*RST: -7

Example: `BB:EVDO:ANET:RAB:LEV -7.0`
sets the power of the MAC block for the Reverse Activity Channel to -7.0 dB.

Manual operation: See "RAB Level" on page 42

[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:MAC:INDex <Index>

For physical layer, subtype 3 only sets the RAB MAC Index.

Parameters:
<Index> integer

Range: 4 to 127
*RST: 4

Manual operation: See "RAB MAC Index" on page 43

[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:OFFSet <Offset>

Sets the starting time offset of the Reverse Activity bit in slots. The command is specified in Reverse Activity Length/8 units. The RA bit starts when the following equation is satisfied:

System Time mod RAB length = RAB Offset, where System Time is expressed in slots.

Note: This parameter is available for physical layer subtype 0&1 only.

Parameters:
<Offset> integer

Range: 0 to 7
*RST: 0

Example: `BB:EVDO:ANET:RAB:OFFS 1`
Sets the starting time offset of the Reverse Activity bit to 1.

Manual operation: See "RAB Offset" on page 42

[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:STATe <State>

Activates or deactivates the reverse activity bit (RAB).

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

Example: `BB:EVDO:ANET:RAB:STAT ON`
activates the Reverse Activity Bit.

Manual operation: See "State" on page 42

[:SOURce<hw>]:BB:EVDO:ANETwork:SUBType <Subtype>

Selects the physical layer subtype.

Note: The physical layer subtype settings can be queried per user.

Parameters:
<Subtype> S1 | S2 | S3
*RST: S2

Example: `BB:EVDO:ANET:SUBT S2`
sets the physical layer subtype to 2.

Options: S3 requires option R&S SMM-K87

Manual operation: See "Physical Layer Subtype (User)" on page 26
See "Physical Layer Subtype (Access Network Settings)" on page 39

4.8 Multi-carrier configuration commands

Multi-Carrier Configuration requires option R&S SMM-K87

[:SOURce<hw>]:BB:EVDO:UP:MC:BCLass <BandClass>
[:SOURce<hw>]:BB:EVDO:DOWN:MC:BCLass <BandClass>

Selects the band class for operation, as defined in 3GPP2 C.S0057-E.

`BC17` is supported in downlink only.

Parameters:

<BandClass> BC0 | BC1 | BC2 | BC3 | BC4 | BC5 | BC6 | BC7 | BC8 | BC9 | BC10 | BC11 | BC12 | BC13 | BC14 | BC15 | BC16 | BC17 | BC18 | BC19 | BC20 | BC21

*RST: BC0

Example: see Example"Generating a downlink multicarrier signal" on page 67

Options: R&S SMM-K87

Manual operation: See "Band Class" on page 37

[:SOURce<hw>]:BB:EVDO:UP:MC:CFRequency?
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CFRequency?

Queries the center frequency of the band resulting from the set active carriers.

Return values:

<CenterFrequency> integer

Example: see Example"Generating a downlink multicarrier signal" on page 67

Usage: Query only

Options: R&S SMM-K87

Manual operation: See "Center Frequency (band)" on page 37

[:SOURce<hw>]:BB:EVDO:UP:MC:CDELay <CarrierDelay>
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CDELay <CarrierDelay>

Sets a delay to each active carrier.

Parameters:

<CarrierDelay> float

Range: 0 to 10E-6
Increment: 1E-9
*RST: 0

Example: see Example"Generating a downlink multicarrier signal" on page 67

Options: R&S SMM-K87

Manual operation: See "Carrier Delay" on page 37

[:SOURce<hw>]:BB:EVDO:UP:MC:CARRier<ch>:STATe <State>
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CARRier<ch>:STATe <State>

Switches the selected carrier on or off.

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

Example: see Example"Generating a downlink multicarrier signal" on page 67

Options: R&S SMM-K87

Manual operation: See "State" on page 37
See "State" on page 38

[:SOURce<hw>]:BB:EVDO:UP:MC:CARRier<ch>:CHANnel <Channel>
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CARRier<ch>:CHANnel <Channel>

Sets carrier's CDMA channel number.

The available `Channel` values depend on the selected `Band Class`.

In some cases, not all channel numbers can be used. In case a non-existing channel is input, the next available channel is used.

Parameters:
<Channel> integer
Range: 0 to 3000
*RST: 1

Example: See Example"Generating a downlink multicarrier signal" on page 67

Options: R&S SMM-K87

Manual operation: See "CDMA Channel Number" on page 38

[:SOURce<hw>]:BB:EVDO:UP:MC:CARRier<ch>:FREQuency <Frequency>
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CARRier<ch>:FREQuency <Frequency>

Sets the center frequency of the carrier in MHz. In some cases, not all center frequencies are defined by the selected band class. In case a non-existing frequency is input, the next available frequency is used.

Parameters:
<Frequency> float
Range: 100 to 3000
Increment: 1E-4
*RST: 870.03

Example: See Example"Generating a downlink multicarrier signal" on page 67

Options: R&S SMM-K87

Manual operation: See "Center Frequency" on page 38

[:SOURce<hw>]:BB:EVDO:UP:MC:STATe <State>
[:SOURce<hw>]:BB:EVDO:DOWN:MC:STATe <State>

Enables or disables multi-carrier operation.

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

Example: See Example"Generating a downlink multicarrier signal" on page 67

Options: R&S SMM-K87

4.9 Configure traffic user commands

[:SOURce<hw>]:BB:EVDO:USER<st>:DATA:PATTern <Pattern>, <BitCount>

Sets the data pattern for the data portion of the packets sent to the user. The most significant bit (MSB) of this value is the MSB of the packet and the word is repeated to fill all space within the packet.

Parameters:

<Pattern> numeric
*RST: #H00000000,

<BitCount> integer
Range: 32 to 32
*RST: 32

Example: `BB:EVDO:USER2:DTA:PATT #H55aa55aa`
Sets the data pattern for user 2.

Manual operation: See "Data Pattern (hex)" on page 32

[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:LENGth <Length>

Sets the number of DRC (Data Rate Control) Lock periods that the state of the DRC Lock for the selected user is held constant.

Note: Changes in the DRC Lock state are only considered at the interval defined by the parameter DRC Lock Length.

A value of one allows updating of the DRC Lock bit at anytime.

Parameters:

<Length> DL1 | DL4 | DL8 | DL16 | DL32 | DL64
*RST: 1

Example: `BB:EVDO:USER2:DRCL:LENG DL8`
Sets eight DRCLock periods for holding the state of user 2 constant.

Manual operation: See "DRC Lock Length" on page 35

[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:OFFSet <Offset>

Sets the reverse link frame offset for the reverse link. The frame offset is used to position the DRC Lock bit within the MAC channel.

Parameters:

<Offset> integer
Range: 0 to 15
*RST: 0

Example: `BB:EVDO:USER2:DRCL:OFFS 5`
Sets the reverse link frame offset to 5.

Manual operation: See "Frame Offset" on page 35

[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:PERiod <Period>

Sets the period (measured in slots) of time between successive transmissions of the DRC (Data Rate Control) Lock bit for the selected user.

Note: A value of zero disables the DRC Lock subchannel and the MAC RPC channel of the selected user is not punctured with the DRC Lock subchannel.

Parameters:

<Period> DP0 | DP4 | DP8 | DP16

*RST: DP4

Example: `BB:EVDO:USER2:DRCL:PER DP8`
Sets the DRC Lock period for user 2 to 8 slots.

Manual operation: See "DRC Lock Period" on page 35

[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:STATe <State>

Sets the state of the DRC (Data Rate Control) Lock bit for the selected user.

Note: Changes in the DRC Lock state are only considered at the interval defined by the parameter DRC Lock Length.

Parameters:

<State> 1 | ON | 0 | OFF

*RST: OFF

Example: `BB:EVDO:USER2:DRCL:STAT ON`
activates the DRC Lock bit for user 2.

Manual operation: See "DRC Lock State" on page 34

[:SOURce<hw>]:BB:EVDO:USER<st>:HARQ:MODE <Mode>

Enables or disables the H-ARQ Channel. The H-ARQ channel is used by the access network to transmit positive acknowledgement (ACK) or a negative acknowledgement (NAK) in response to a physical layer packet.

Note: This parameter is enabled for Physical Layer Subtype 2 only.

Parameters:

<Mode> OFF | ACK | NAK

OFF
Disables transmission of the H-ARQ channel.

ACK
Enables transmission of H-ARQ. The channel is transmitted with all bits set to ACK.

NAK
Enables transmission of H-ARQ. The channel is transmitted with all bits set to NAK

*RST: OFF

Example: `BB:EVDO:USER2:SUBT S2`
Sets the physical layer subtype for user 2 to 2.
`BB:EVDO:USER2:HARQ:MODE ACK`
Enables ARQ channel. The channel is transmitted with all bits set to ACK.

Manual operation: See "H-ARQ Mode" on page 36

[:SOURce<hw>]:BB:EVDO:USER<st>:IFACtor <IFactor>

Controls the number of interleave slots used for the selected user on the forward link.

Four interleave slots are defined in the 1xEV-DO system.

By default, only 1 Interleave slot (Interleave Factor = 1) for an access terminal is configured and transmission to that access terminal every fourth slot is selected.

For an interleave factor > 1, packets on multiple interleave slots are sent, increasing the data throughput to the access terminal.

Parameters:
<IFactor> integer
Range: 1 to 4
*RST: 1

Example: `BB:EVDO:USER2:IFAC 2`
Sets two interleaved slots for user 2 on the forward link.

Manual operation: See "Interleave Factor" on page 32

[:SOURce<hw>]:BB:EVDO:USER<st>:MAC:INDex <Index>

Sets the MAC Index used for the selected user.

MAC Index has to be different for the different users. However, in case that two users are using the same value for MAC Index, the lower priority user is disabled, or be unable to enable.

The values for the MAC Indexes for the other users (see `[:SOURce<hw>]:BB:EVDO:ANETwork:OUCount`) are assigned from a pool of valid MAC Indexes.

Parameters:
<Index> integer
Range: 5 to 63 for physical layer subtype 0&1, 6 to 127 for physical layer subtype 2, 4 to 383 for physical layer subtype 3
*RST: Physical layer subtype 0&1: 5 for user 1; 6 for user 2; 7 for user 3; 8 for user 4; / physical layer subtype 2: 6 for user 1; 7 for user 2; 8 for user 3; 9 for user 4

Example: `BB:EVDO:USER2:MAC:IND 6`
Sets the MAC index for user 2 to 16.

Manual operation: See "MAC Index" on page 32

[:SOURce<hw>]:BB:EVDO:USER<st>:MAC:LEVel <Level>

Sets the power within the MAC channel that is dedicated to the selected user.

Parameters:

<Level> float

Range: -25 to -7
Increment: 0.01
*RST: -7

Example: `BB:EVDO:USER2:MAC:LEV -7.0`
sets the power within the MAC channel to -7.0 dB.

Manual operation: See "MAC Level" on page 32

[:SOURce<hw>]:BB:EVDO:USER<st>:PACKet:COUNt <Count>

Sets the number of packets to send to the selected user.

The number of packets to be send depends on whether the parameter "Infinite" is enabled or disabled.

If "Infinite" is enabled, there is no limit to the number of packets sent to the user.

If "Infinite" is disabled and a value is specified while packets are being sent, the new count value is used at the end of transmission of the current packet. If a value of zero is specified, the transmission to the user is stopped at the end of the current packet.

Parameters:

<Count> integer

Range: 0 to 65536
*RST: 65536

Example: `BB:EVDO:USER2:PACK:INF OFF`
Disables sending of unlimited number of packets.
`BB:EVDO:USER2:PACK:COUNT 10`
Sets the number of packets to be sent to 10.

Manual operation: See "Number of Packets to Send - Value" on page 26

[:SOURce<hw>]:BB:EVDO:USER<st>:PACKet:INFinite <Infinite>

Enables or disables sending an unlimited number of packets to the selected user.

Parameters:

<Infinite> 1 | ON | 0 | OFF

ON
Enables sending of an unlimited number of packets to the user.

OFF
Disables sending of an unlimited number of packets to the user. The number of packets to be sent can be specified.

*RST: 1

Example: `BB:EVDO:USER2:PACK:INF OFF`
Disables sending of unlimited number of packets for user 2.
`BB:EVDO:USER2:PACK:COUNT 10`
Sets the number of packets to be sent to user 2 to10.

Manual operation: See "Number of Packets to Send - Infinite" on page 26
See "Number of Packets to Send - Value" on page 26

[:SOURce<hw>]:BB:EVDO:USER<st>:PACKet:SOFFset <SOffset>

Sets the minimum number of slots between the end of one packet and the beginning of the next.

For single slot packets, a value of zero will cause the next packet to be sent in the immediate next slot (subject to scheduling).

For multiple slot packets, a value of zero will cause the next packet transmission to start three slots after the end of the previous packet. The three slot delay is identical to the interleaving delay between slots for multiple slot packets. The offset value is attached to the end of the preceding packet.

Parameters:
<SOffset> integer

Range: 0 to 255
*RST: 0

Example: `BB:EVDO:USER2:PACK:SOFF 10`
Sets the packet start offset for user 2 to10.

Manual operation: See "Packet Start Offset" on page 26

[:SOURce<hw>]:BB:EVDO:USER<st>:PSIZe <PSize>

Sets the packet size for the packets sent to the selected user.

Note: Selected rate becomes effective at the beginning of the next packet transmitted to the selected user.

Parameters:
<PSize> PS128 | PS256 | PS512 | PS768 | PS1024 | PS1536 | PS2048 | PS3072 | PS4096 | PS5120 | PS6144 | PS8192 | PS12288 | PS7168

*RST: PS128

Example:
```
BB:EVDO:ANET:SUBT S2
```
sets the physical layer subtype to 2.
```
BB:EVDO:USER2:RATE:IND 4
```
sets the rate index of user 2 to 4.
```
BB:EVDO:USER2:PSIZ PS256
```
sets the packet size for user 2 to 256.
```
SOUR:BB:EVDO:USER2:RATE?
```
queries the data rare for user 2.
```
Response: 76.8 kbps
```

Manual operation: See "Packet Size" on page 31

[:SOURce<hw>]:BB:EVDO:USER<st>:RATE?

Queries the data rate of the packets sent to the selected user.

Note: Selected rate becomes effective at the beginning of the next packet transmitted to the selected user.

Return values:

<Rate> DR4K8 | DR9K6 | DR19K2 | DR38K4 | DR76K8 | DR153K6 | DR307K2 | DR614K4 | DR921K6 | DR1228K8 | DR1536K | DR1843K2 | DR2457K6 | DR3072K | DR460K8 | DR768K | DR1075K2 | DR2150K4 | DR3686K4 | DR4300K8 | DR4915K2

*RST: DR4K8

Example:
```
BB:EVDO:ANET:SUBT S2
```
sets the physical layer subtype.
```
BB:EVDO:USER2:RATE:IND 4
```
sets the rate index of user 2.
```
BB:EVDO:USER2:PSIZ PS256
```
sets the packet size for user 2.
```
SOUR:BB:EVDO:USER2:RATE?
```
queries the data rate for user 2.
```
Response: 76.8 kbps
```

Usage: Query only

Manual operation: See "Data Rate" on page 31

[:SOURce<hw>]:BB:EVDO:USER<st>:RATE:INDex <Index>

Determines the rate index.

Note: Selected rate becomes effective at the beginning of the next packet transmitted to the selected user.

Parameters:

<Index> integer

Range: 1 to 12 (physical layer subtype 0&1), 1 to 14 (physical layer subtype 2), 1 to 28 (physical layer subtype 3)

*RST: 1

Example:

```
BB:EVDO:ANET:SUBT S2
```
sets the physical layer subtype.
```
BB:EVDO:USER2:RATE:IND 4
```
sets the rate index of user 2.
```
BB:EVDO:USER2:PSIZ PS256
```
sets the packet size for user 2.
```
SOUR:BB:EVDO:USER2:RATE?
```
queries the data rate for user 2.
```
Response: 76.8 kbps
```

Manual operation: See "Rate Index" on page 27

[:SOURce<hw>]:BB:EVDO:USER<st>:RPC:INJect

Enables sending of user defined Reverse Power Control (RPC) pattern at the end of the current RPC mode.

The former RPC mode is restart at the end of the pattern transmission.

Example:

```
BB:EVDO:USER2:RPC:MODE PATT
```
Sets the mode of the Reverse Power Control (RPC) Channel within the MAC channel for user 2 to pattern, i.e. a user-defined sequence is transmitted.
```
BB:EVDO:USER2:RPC:ZONE0:BIT 1
```
Sets the bit for zone 0 to 1
```
BB:EVDO:USER2:RPC:ZONE0:COUNT 10
```
Sets the number of RPC bits for zone 0 to 10.
```
BB:EVDO:USER2:RPC:ZONE1:BIT 0
BB:EVDO:USER2:RPC:ZONE1:COUNT 100
BB:EVDO:USER2:RPC:ZONE2:BIT 1
BB:EVDO:USER2:RPC:ZONE2:COUNT 50
BB:EVDO:USER2:RPC:ZONE3:BIT 0
BB:EVDO:USER2:RPC:ZONE3:COUNT 10
BB:EVDO:USER2:RPC:INJ
```
The user defined RPC pattern is inserted at the end of the current RPC mode.

Usage: Event

[:SOURce<hw>]:BB:EVDO:USER<st>:RPC:MODE <Mode>

Sets the operation mode for the Reverse Power Control (RPC) Channel within the MAC channel for the selected user.

Parameters:

<Mode> HOLD | UP | DOWN | RANGe | PATTern

*RST: HOLD

Example: `BB:EVDO:USER2:RPC:MODE UP`
a continuous stream of Up (0) are transmitted on the Reverse Power Control (RPC) Channel within the MAC channel for user 2.

Manual operation: See "RPC Mode" on page 33

[:SOURce<hw>]:BB:EVDO:USER<st>:RPC:RANGe <Range>

Sets the number of Reverse Power Control (RPC) bits sent in each direction when the "RPC Mode = Range". The specified value is used immediately.

Parameters:

<Range> integer

Range: 1 to 256
*RST: 1

Example: `BB:EVDO:USER2:RPC:MODE RANG`
Sets the mode of the Reverse Power Control (RPC) Channel within the MAC channel for user 2 to range.
`BB:EVDO:USER2:RPC:RANG:COUN 200`
Sets the number of RPC bits to 200.

Manual operation: See "RPC Range Count" on page 34

[:SOURce<hw>]:BB:EVDO:USER<st>:RPC:ZONE<ch0>:BIT <Bit>

The Reverse Power Control (RPC) pattern is defined in form of table with four zones (zone 0 .. 3). For each zone, a bit and a count can be defined.

This parameter defines the RPC bits sent within the specific zone of the RPC Pattern.

Parameters:

<Bit> 0 | 1

Range: 0 to 1
*RST: 0

Example: `BB:EVDO:USER2:RPC:MODE PATT`
Sets the mode of the Reverse Power Control (RPC) Channel within the MAC channel for user 2 to pattern, i.e. a user-defined sequence is transmitted.
`BB:EVDO:USER2:RPC:ZONE1:BIT 1`
Sets the bit for zone 1 to 1.

Manual operation: See "RPC Pattern" on page 34

[:SOURce<hw>]:BB:EVDO:USER<st>:RPC:ZONE<ch0>:COUNt <Count>

The Reverse Power Control (RPC) pattern is defined in form of table with four zones (zone 0 .. 3). For each zone, a bit and a count can be defined.

This parameter defines the number of RPC bits sent within the specific zone of the RPC Pattern.

Parameters:

<Count> integer

Range: 1 to 128
*RST: 0

Example: `BB:EVDO:USER2:RPC:MODE PATT`
Sets the mode of the Reverse Power Control (RPC) Channel within the MAC channel for user 2 to pattern, i.e. a user-defined sequence is transmitted.
`BB:EVDO:USER2:RPC:ZONE1:COUNT 10`
Sets the number of RPC bits for zone 1 to 10.

Manual operation: See "RPC Pattern" on page 34

[:SOURce<hw>]:BB:EVDO:USER<st>:SCOunt?

Queries the slot count of the packets sent to the selected user.

Return values:

<SCount> integer

Example: `BB:EVDO:ANET:SUBT S2`
Sets the physical layer subtype to 2.
`BB:EVDO:USER2:RATE:IND 4`
Sets the rate index of user 2 to 4.
`BB:EVDO:USER2:PSIZ PS256`
Sets the packet size for user 2 to 256.
`SOUR:BB:EVDO:USER2:SCO?`
Queries the number of slots for user 2.
`Response: 2`

Usage: Query only

Manual operation: See "Slot Count" on page 31

[:SOURce<hw>]:BB:EVDO:USER<st>:STATe <State>

Enables or disables the selected user. If the user is enabled, the proper MAC Index is placed within the MAC channel and packets can be sent to the user. If disabled, the MAC Index is not present within the MAC channel and packets cannot be sent to the user.

Note: Disabling the state of a user during a transfer aborts all transfers to the user.

Parameters:

<State> 1 | ON | 0 | OFF

*RST: ON (user 1); OFF (user 2 .. 4)

Example: `BB:EVDO:USER2:STAT ON`
Activates user 2.

Manual operation: See "State (User)" on page 26

4.10 Configure access terminal commands

[:SOURce<hw>]:BB:EVDO:PREDefined <Predefined>

Sets the UL setting of Terminal 1 to one of the predefined configurations.

The predefined settings are made according to 3GPP2 C.S0032-A to allow easy receiver testing.

Parameter	Description
USER	There are no predefined settings
ULS1DR9K6	UL, Subtype 1, 9.6 kbps.
ULS1DR19K2	UL, Subtype 1, 19.2 kbps.
ULS1DR38K4	UL, Subtype 1, 38.4 kbps.
ULS1DR76K8	UL, Subtype 1, 76.8 kbps.
ULS1DR153K6	UL, Subtype 1, 153.6 kbps.
ULS2PS128LL	UL, Subtype 2, 128 bits payload, Low Latency.
ULS2PS256HC	UL, Subtype 2, 256 bits payload, High Capacity.
ULS2PS256LL	UL, Subtype 2, 256 bits payload, Low Latency.
ULS2PS512LL	UL, Subtype 2, 512 bits payload, Low Latency.
ULS2PS768LL	UL, Subtype 2, 768 bits payload, Low Latency.
ULS2PS1024LL	UL, Subtype 2, 1024 bits payload, Low Latency.
ULS2PS1536LL	UL, Subtype 2, 1536 bits payload, Low Latency.
ULS2PS2048LL	UL, Subtype 2, 2048 bits payload, Low Latency.
ULS2PS3072LL	UL, Subtype 2, 3072 bits payload, Low Latency.
ULS2PS4096LL	UL, Subtype 2, 4096 bits payload, Low Latency.
ULS2PS6144LL	UL, Subtype 2, 6144 bits payload, Low Latency.

Parameter	Description
ULS2PS8192LL	UL, Subtype 2, 8192 bits payload, Low Latency.
ULS2PS12288LL	UL, Subtype 2, 12288 bits payload, Low Latency.

Parameters:

<Predefined> USER | ULS1DR9K6 | ULS1DR19K2 | ULS1DR38K4 | ULS1DR76K8 | ULS1DR153K6 | ULS2PS128LL | ULS2PS256HC | ULS2PS256LL | ULS2PS512LL | ULS2PS768LL | ULS2PS1024LL | ULS2PS1536LL | ULS2PS2048LL | ULS2PS3072LL | ULS2PS4096LL | ULS2PS6144LL | ULS2PS8192LL | ULS2PS12288LL

*RST: USER

Example: `BB:EVDO:PRED ULS2PS256HC`
Sets the UL settings of Terminal 1 to UL of Subtype 2 with 256 bits payload and High Capacity.
`BB:EVDO:TERM1:SUBT?`
Response: S2.
`BB:EVDO:TERM1:DCH:PACK1:PSIZ?`
Response: 256

Manual operation: See "Predefined Settings" on page 46

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACKChannel:GAIN <Gain>

(enabled for access terminal working in traffic mode)

Sets the gain of the ACK channel relative to the pilot channel power.

Parameters:

<Gain> float

Range: -80 to 30
Increment: 0.01
*RST: 0

Example: `BB:EVDO:TERM2:ACKC:GAIN -10`
Sets the relative gain of ACK channel to -10 dB

Manual operation: See "Relative Gain" on page 52

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACKChannel:GATing <Gating>

(enabled for access terminal working in traffic mode)

Sets the active and inactive slots of the ACK channel. This parameter is in binary format and has a maximal length of 16 bits.

The sequence starts at frame 0 and slot 0 and is repeated with the length of the pattern. A 0 gates the ACK channel off for the corresponding slot, a 1 activates the channel.

Parameters:
<Gating> integer
*RST: 0001

Example: `BB:EVDO:TERM2:ACKC:GAT #B11001100,8`
Sets slots 3, 4, 7 and 8 of ACK channel as inactive.

Manual operation: See "Gating (bin)" on page 53

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACKChannel:MODE <Mode>

(enabled for access terminal working in traffic mode)

Specifies the modulation mode of the ACK channel.

With BPSK modulation, a 0 (ACK) is mapped to +1 and a 1 (NAK) to -1.With OOK modulation, a 0 (ACK) is mapped to ON and a 1 (NAK) to OFF.

Parameters:
<Mode> BPSK | OOK

BPSK
Sets the modulation to BPSK (Binary Phase Shift Keying).

OOK
Sets the modulation to OOK (On-Off Keying).
Note: This value is only enabled for physical layer subtype 2.

*RST: BPSK

Example: `BB:EVDO:TERM2:MODE TRAF`
sets the mode of terminal 2 to traffic.
`BB:EVDO:TERM2:SUBT S2`
sets the physical layer subtype of terminal 2 to 2.
`BB:EVDO:TERM2:ACKC:MODE OOK`
selects OOK modulation for ACK channel of terminal 2.

Manual operation: See "Mode" on page 52

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACKChannel:STATe <State>

(enabled for access terminal working in traffic mode)

Enables or disables the ACK channel.

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

Example: `BB:EVDO:TERM2:ACKC:STAT OFF`
Deactivates the ACK channel for terminal 2.

Manual operation: See "State" on page 52

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACKChannel:VALues <Values>

(enabled for access terminal working in traffic mode)

Specifies the data pattern transmitted on the ACK Channel.

The sequence starts at frame 0 and slot 0 and is repeated with the length of the pattern.A 0 specifies an ACK, a 1 specifies a NAK. The pattern is only read for slots that are gated on. This parameter is in binary format and has a maximal length of 16 bits.

Parameters:

<Values> integer

*RST: #H1

Example: `BB:EVDO:TERM2:ACKC:VAL #B011,3`
Sets the data pattern transmitted on the ACK channel for terminal 2.

Manual operation: See "Values" on page 53

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACYCle:DURation <Duration>

(enabled for access terminal working in access mode)

Sets the access cycle duration in slots. Access probes are repeated with a period of access cycle duration slots.

Parameters:

<Duration> integer

Range: 1 to 255
*RST: 16

Example: `BB:EVDO:TERM2:MODE ACC`
enables terminal 2 to work in access mode.
`BB:EVDO:TERM2:ACYC:DUR 20`
sets the duration of the access cycle for terminal 2 to 20 slots.

Manual operation: See "Access Cycle Duration" on page 47

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:ACYCle:OFFSet <Offset>

(enabled for access terminal working in access mode)

The Access Channel transmission starts with this number of slots relative to the beginning of each access cycle duration.

Parameters:

<Offset> integer

Range: 0 to 12
Increment: 4
*RST: 0

Example: `BB:EVDO:TERM2:MODE ACC`
Enables terminal 2 to work in access mode.
`BB:EVDO:TERM2:ACYC:OFFS 10`
Sets the offset of the Access Channel to 10.

Manual operation: See "Access Cycle Offset" on page 47

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:APCHannel:GAIN <Gain>

(enabled for Physical Layer subtype 2 and for an access terminal working in traffic mode)

Sets the gain of the auxiliary pilot channel relative to the data channel power.

Note: All other channel gains are specified relative to the pilot power, but the auxiliary pilot gain is specified relative to the data channel power.

Parameters:
<Gain> float

Range: -80 to 30
Increment: 0.01
*RST: 0

Example: `BB:EVDO:TERM2:APCH:GAIN -10`
sets the relative gain of auxiliary pilot channel to -10 dB

Manual operation: See "Relative Gain" on page 48

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:APCHannel:PAYLoad:MINimum <Minimum>

(enabled for Physical Layer subtype 2 and for an access terminal working in traffic mode)

Sets the minimum payload size in bits of the data channel that activates the transmission of the auxiliary pilot channel.

Parameters:
<Minimum> PS128 | PS256 | PS512 | PS768 | PS1024 | PS1536 | PS2048 | PS3072 | PS4096 | PS6144 | PS8192 | PS12288

*RST: PS128

Example: `BB:EVDO:TERM2:APCH:PAYL:MIN PS256`
Sets the minimum payload of the auxiliary pilot channel to 256 bits.

Manual operation: See "Minimum Payload" on page 48

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:APCHannel:STATe <State>

(enabled for Physical Layer subtype 2 and for an access terminal working in traffic mode)

Enables or disables the auxiliary pilot channel.

Parameters:

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

Example: `BB:EVDO:TERM2:APCH:STAT OFF`
Deactivates the auxiliary pilot channel for terminal 2.

Manual operation: See "State" on page 48

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:CLENgth <CLength>

(enabled for access terminal working in access mode)

Sets the number of frames (16 slots each) to be transmitted after the preamble. Each frame contains one data packet.

Parameters:

<CLength> integer
Range: 1 to 15
*RST: 1

Example: `BB:EVDO:TERM2:MODE ACC`
Enables terminal 2 to work in access mode.
`BB:EVDO:TERM2:DCH:CLEN 10`
For terminal two, ten frames will be transmitted after the preamble.

Manual operation: See "Capsule Length" on page 58

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:DATA <Data>

Selects the data source, e.g. a sequence of 0 or 1, a pseudo-random sequence with different length, a pattern or a data list (`DLISt`).

Parameters:

<Data> ZERO | ONE | PATTern | PN9 | PN11 | PN15 | PN16 | PN20 | PN21 | PN23 | DLISt
*RST: PN9

Example: `SOURce:BB:EVDO:TERMinal2:DCHannel:DATA PATTern`
Sets the data source of terminal 2 to pattern.
`SOURce:BB:EVDO:TERMinal2:DCHannel:DATA:PATTern #H3F,8`
Sets the pattern for the data source of terminal 2.

Example: `SOURce:BB:EVDO:TERMinal2:DCHannel:DATA DLISt`
Sets the data source of terminal 2 to data list.
`MMEM:CDIR "datalists"`
Selects the directory for the data lists.
`SOURce:BB:EVDO:TERMinal2:DCHannel:DATA:DSELection "datalist.dm_iqd"`
Selects `datalist.dm_iqd` file as data source. This file must be in the directory `/var/user/datalists` and have a file extension `*.dm_iqd`.

Manual operation: See "Data Source" on page 58

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:DATA:DSELection <Filename>

Selects the data list for the data source.

Parameters:
<Filename> string

Example: see `[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:DATA` on page 107

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:DATA:PATTern <Pattern>, <BitCount>

Selects the bit pattern for the data source.

Parameters:
<Pattern> numeric
*RST: #H0

<BitCount> integer
Range: 1 to 64
*RST: 1

Example: see `[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:DATA` on page 107

Manual operation: See "Data Source" on page 58

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:DRATe <DRate>

(enabled for an access terminal working in access mode)

Selects the data rate for the Data Channel.

Parameters:

<DRate> DR4K8 | DR9K6 | DR19K2 | DR38K4 | DR76K8 | DR153K6 | DR307K2 | DR614K4 | DR921K6 | DR1228K8 | DR1536K | DR1843K2 | DR2457K6 | DR3072K | DR460K8 | DR768K | DR1075K2 | DR2150K4 | DR3686K4 | DR4300K8 | DR4915K2

*RST: DR9K6

Example: `BB:EVDO:TERM2:MODE ACC`
Enables terminal 2 to work in access mode.
`BB:EVDO:TERM2:DCH:DRAT DR19K2`
Sets the data rate of the data channel for terminal 2 kbps to 19.2 kbps.

Manual operation: See "Data Rate" on page 58

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:FCS[:STATe] <State>

(enabled for an access terminal working in access mode)

Enables or disables appending a standard frame check sequence (FCS) to the MAC layer packet.

Parameters:

<State> 1 | ON | 0 | OFF

*RST: 1

Example: `BB:EVDO:TERM2:MODE ACC`
Enables terminal 2 to work in access mode.
`BB:EVDO:TERM2:DCH:FCS:STAT OFF`
Disables appending of FCS to the MAC layer for terminal 2.

Manual operation: See "Append FCS" on page 59

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:GAIN <Gain>

(enabled for an access terminal working in access mode)

Sets the gain in dB of the data channel relative to the pilot channel power.

Parameters:

<Gain> float

Range: -80 to 30
Increment: 0.01
*RST: 0

Example: `BB:EVDO:TERM2:MODE ACC`
Enables terminal 2 to work in access mode.
`BB:EVDO:TERM2:DCH:GAIN -10`
Sets the relative gain of data channel to -10 dB

Manual operation: See "Relative Gain" on page 58

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:CCODing
<CCoding>

(enabled for an access terminal working in traffic mode)

Activates or deactivates channel coding, including scrambling, turbo encoding and channel interleaving.

Parameters:

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

Example:
```
BB:EVDO:TERM2:MODE TRAF
```
Enables terminal 2 to work in traffic mode.
```
BB:EVDO:TERM2:SUBT S2
```
Sets physical layer subtype 2 for terminal 2.
```
BB:EVDO:TERM2:DCH:PACK3:CCOD OFF
```
Disables channel coding for packet 3.

Manual operation: See "Channel Coding" on page 56

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:COUNt
<Count>

(enabled for an access terminal working in traffic mode)

Sets the number of packets to be sent.

The number of packets to be send depends on whether the parameter "Infinite Packets" is enabled or disabled. If "Infinite Packets "is enabled, there is no limit to the number of packets sent.

If "Infinite Packets" is disabled, the number of packets can be specified. In this case, the data channel will be switched off after the specified number of packets have been sent.

Note: Configuration of Packet 2 and Packet 3 transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Parameters:

<Count> integer
Range: 0 to 65536
*RST: 65536

Example:
```
BB:EVDO:TERM2:MODE TRAF
```
Enables terminal 2 to work in traffic mode.
```
BB:EVDO:TERM2:SUBT S2
```
Sets physical layer subtype 2 for terminal 2.
```
BB:EVDO:TERM2:DCH:PACK3:INF OFF
```
Disables sending of unlimited umber of packets.
```
BB:EVDO:TERM2:DCH:PACK3:COUN 2000
```
Sets number of packets to be sent to 2000.

Manual operation: See "Packets To Send" on page 55

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:DATA <Data>

Selects the data source of an access terminal working in traffic mode

Parameters:

<Data> ZERO | ONE | PATTern | PN9 | PN11 | PN15 | PN16 | PN20 | PN21 | PN23 | DLISt

*RST: PN9

Example: `SOURce:BB:EVDO:TERMinal2:MODE TRAffic`
Enables terminal 2 to work in traffic mode.
`SOURce:BB:EVDO:TERMinal2:SUBType S2`
Sets physical layer subtype 2 for terminal 2.
`SOURce:BB:EVDO:TERMinal2:DCHannel:PACKet3:DATA PATTern`
Sets the data source of terminal 2 to pattern.
`SOURce:BB:EVDO:TERMinal2:DCHannel:PACKet3: PATTern #H3F,8`
Sets the pattern for the data source of terminal 2.

Example: `SOURce:BB:EVDO:TERMinal2:DCHannel:PACKet1:DATA DLISt`
Sets the data source of terminal 2, packet 1 to data list.
`MMEM:CDIR "/var/user/datalists"`
Selects the directory for the data lists.
`SOURce:BB:EVDO:TERMinal2:DCHannel:PACKet1:DATA: DSELection "datalist.dm_iqd"`
Selects `datalist.dm_iqd` file as data source. This file must be in the directory `/var/user/datalists` and have a file extension `*.dm_iqd`.

Manual operation: See "Data Source" on page 57

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:DATA: DSELection <Filename>

(enabled for an access terminal working in traffic mode)

Selects the data list for the data source.

Parameters:

<Filename> string

Example: See `[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel: PACKet<ch>:DATA` on page 111

Manual operation: See "Data Source" on page 57

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:DATA:PATTern <Pattern>, <BitCount>

(enabled for an access terminal working in traffic mode)

Selects the bit pattern for the data source.

Note: Configuration of Packet 2 and Packet 3 transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Parameters:

<Pattern> numeric
*RST: #H0

<BitCount> integer
Range: 1 to 64
*RST: 1

Example: see `[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:DATA` on page 111

Manual operation: See "Data Source" on page 57

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:DRATe?

(enabled for an access terminal working in traffic mode)

Displays the data rate in kbps of the selected packet.

Note: Configuration of Packet 2 and Packet 3 transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Return values:

<DRate> float
Range: 0 to ...

Example:
```
BB:EVDO:TERM2:MODE TRAF
```
enables terminal 2 to work in traffic mode.
```
BB:EVDO:TERM2:DCH:PACK2:DRAT?
```
queries the data rate of the packet number 2 for terminal 2.
```
Response: '6.4'
```
the data rate of packet 2 is 6.4 kbps.

Usage: Query only

Manual operation: See "Data Rate/kbps" on page 56

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:FCS[:STATe]
<State>

(enabled for an access terminal working in traffic mode)

Enables or disables appending a standard Frame Check Sequence (FCS) and tail to the MAC layer packet.

Note: Configuration of Packet 2 and Packet 3 transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Parameters:

<State> 1 | ON | 0 | OFF

*RST: ON

Example: `BB:EVDO:TERM2:MODE ACC`
enables terminal 2 to work in access mode.
`BB:EVDO:TERM2:DCH:PACK:FCS:STAT OFF`
disables appending of FCS to the MAC layer for terminal 2, packet 1.

Manual operation: See "FCS" on page 58

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:GAIN <Gain>

(enabled for an access terminal working in traffic mode)

Sets the gain in dB of the Data Channel relative to the pilot channel power.

Note: Configuration of Packet 2 and Packet 3 transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Parameters:

<Gain> float

Range: -80 to 30
Increment: 0.01
*RST: 0

Example: `BB:EVDO:TERM2:MODE TRAF`
Enables terminal 2 to work in traffic mode.
`BB:EVDO:TERM2:SUBT S2`
Sets the physical layer subtype of terminal 2 to 2.
`BB:EVDO:TERM2:DCH:PACK3:GAIN -10`
Sets the relative gain of packet 3 dB to -10 dB

Manual operation: See " Gain/db" on page 54

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:INFinite <Infinite>

(enabled for an access terminal working in traffic mode)

Enables or disables sending an unlimited number of packets.

The parameter "Number of Packets to be Send" depends on whether the parameter "Infinite Packets" is enabled or disabled. If "Infinite Packets" is enabled, there is no limit to the number of packets sent.

If "Infinite Packets" is disabled, the number of packets can be specified.

Note: Configuration of Packet 2 and Packet 3 transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Parameters:

<Infinite> 1 | ON | 0 | OFF

*RST: ON

Example: `BB:EVDO:TERM2:MODE TRAF`
Enables terminal 2 to work in traffic mode.
`BB:EVDO:TERM2:SUBT S2`
Sets physical layer subtype 2 for terminal 2.
`BB:EVDO:TERM2:DCH:PACK3:INF OFF`
Disables sending of unlimited umber of packets.
`BB:EVDO:TERM2:DCH:PACK3:COUN 2000`
Sets number of packets to be sent to 2000.

Manual operation: See "Infinite Packets" on page 55

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:MODulation?

(enabled for physical layer subtype 2 and for an access terminal working in traffic mode)

Displays the modulation type per packet.

Return values:

<Modulation> B4 | Q4 | Q2 | Q4Q2 | E4E2

B4
The modulation type is set to BPSK modulation with 4-ary Walsh cover.

Q4
The modulation type is set to QPSK modulation with 4-ary Walsh cover.

Q2
The modulation type is set to QPSK modulation with 2-ary Walsh cover.

Q4Q2
Sum of Q4 and Q2 modulated symbols.

E4E2
Sum of E4 (8-PSK modulated with 4-ary Walsh cover) and E2 (8-PSK modulated with 2-ary Walsh cover) modulated symbols.

*RST: B4

Example: `BB:EVDO:TERM2:DCH:PACK3:MOD?`
queries the modulation for packet 3 of terminal 2.

Usage: Query only

Manual operation: See "Modulation" on page 56

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:PSIZe <PSize>

(enabled for an access terminal working in traffic mode)

Sets the Payload Size in bits for the selected packet.

Note: Configuration of Packet 2 and Packet 3 transmitted on the second and the third subframe, is only enabled for physical layer subtype 2.

Parameters:

<PSize> PS128 | PS256 | PS512 | PS768 | PS1024 | PS1536 | PS2048 | PS3072 | PS4096 | PS6144 | PS8192 | PS12288

Example: `BB:EVDO:TERM2:MODE TRAF`
enables terminal 2 to work in traffic mode.
`BB:EVDO:TERM2:SUBT S2`
sets the physical layer subtype of terminal 2 to 2.
`BB:EVDO:TERM2:DCH:PACK3:PSIZ PS512`
sets the payload size fro packet 3 to 512.

Manual operation: See "Payload Size/bits" on page 55

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:STATe <State>

For an access terminal working in traffic mode, enables or disables the state of the packets.

Parameters:

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

Example: `BB:EVDO:TERM2:MODE TRAF`
Enables terminal 2 to work in traffic mode.
`BB:EVDO:TERM2:SUBT S2`
Sets the physical layer subtype of terminal 2 to 2.
`BB:EVDO:TERM2:DCH:PACK2:STAT OFF`
Deactivates packet 2 of terminal 2.

Manual operation: See "State" on page 53

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:SUBPackets[:COUNt] <Count>

(enabled for physical layer subtype 2 and for an access terminal working in traffic mode)

Sets the number of subpackets to be sent.

Parameters:

<Count> integer
Range: 1 to 4
*RST: 1

Example: `BB:EVDO:TERM2:MODE TRAF`
Enables terminal 2 to work in traffic mode.
`BB:EVDO:TERM2:SUBT S2`
Sets physical layer subtype 2 for terminal 2.
`BB:EVDO:TERM2:DCH:PACK3:SUBP:COUN 4`
Sets the number of subpackets to 4, i.e. subpacket 0, 1, 2 and 3 of a packet is sent in a subframe each (with two subframes interleaving between). Afterward the next packet is started.
This is to simulate a situation where three times NAK has been received from the base station with an ACK after the fourth subpacket

Manual operation: See " Subpackets" on page 55

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:STATe <State>

(enabled for an access terminal working in access mode)

Enables or disables the state of the Data Channel.

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

Example: `BB:EVDO:TERM2:MODE ACC`
enables terminal 2 to work in access mode.
`BB:EVDO:TERM2:DCH:STAT OFF`
disables data channel for terminal 2.

Manual operation: See "State" on page 58

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DQSPreading <DqSpreading>

Disables the quadrature spreading (complex multiply) with PN sequences and long code.

Parameters:
<DqSpreading> 1 | ON | 0 | OFF
*RST: OFF

Example: `BB:EVDO:TERM2:DQSP ON`
enables using quadrature spreading with PN sequence and long code.

Manual operation: See "Disable Quadrature Spreading" on page 46

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:COVer <Cover>

(enabled for an access terminal working in traffic mode)

Selects the Data Rate Control (DRC) Channel Walsh cover.

Parameters:

<Cover> integer

Range: 0 to 7
*RST: 7

Example: `BB:EVDO:TERM2:DRCC:COV 1`
Sets the DRC cover to 1.

Manual operation: See "Cover" on page 51

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:GAIN <Gain>

(enabled for an access terminal working in traffic mode)

Sets the gain of the Data Rate Control (DRC) channel relative to the pilot channel power.

Parameters:

<Gain> float

Range: -80 dB to 10 dB
Increment: -
*RST: 0 dB

Example: `BB:EVDO:TERM2:DRCC:GAIN 10`
sets the relative gain for DRC to 10 dB.

Manual operation: See "Relative Gain" on page 51

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:GATing[:STATe] <State>

(enabled for an access terminal working in traffic mode)

Activates or deactivates the Data Rate Control (DRC) Channel gating.

If gating is active, each value of the DRC channel is transmitted for one slot followed by DRCLenght-1 empty slots.

With deactivated gating, each DRC value is repeated for DRC length slots.

Parameters:

<State> 1 | ON | 0 | OFF

*RST: ON

Example: `BB:EVDO:TERM2:DRCC:GAT:STAT OFF`
deactivates DRC gating.

Manual operation: See "Gating Active" on page 51

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:LENGth <Length>

(enabled for an access terminal working in traffic mode)

Specifies the transmission duration of the Data Rate Control (DRC) channel in slots.

Parameters:

<Length> DL1 | DL2 | DL4 | DL8

*RST: DL1

Example: `BB:EVDO:TERM2:DRCC:LENG DL2`
Sets the transmission duration of DRC to two slots.

Manual operation: See "Length" on page 51

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:STATe <State>

(enabled for an access terminal working in traffic mode)

Enables or disables the state of the Data Rate Control (DRC) channel.

Parameters:

<State> 1 | ON | 0 | OFF

*RST: ON

Example: `BB:EVDO:TERM2:DRCC:STAT OFF`
deactivates DRC channel.

Manual operation: See "State" on page 50

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:VALues <Values>

(enabled for an access terminal working in traffic mode)

Specifies the pattern transmitted on the Data Rate Control (DRC) Channel. The sequence starts at frame 0 and slot 0 and is repeated with the length of the pattern. Each specified value is used for DRC length slots.

Parameters:

<Values> integer

*RST: #H0

Example: `BB:EVDO:TERM2:DRCC:VAL #H7,4`
sets transmitted pattern on DRC to #H7,4.

Manual operation: See "Values (hex)" on page 51

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DSCChannel:GAIN <Gain>

(enabled for Physical Layer subtype 2 and for an access terminal working in traffic mode)

Sets the gain of the Data Source Control (DSC) channel relative to the pilot channel power.

Parameters:

<Gain> float

Range: -80 dB to 10 dB
Increment: -
*RST: 0 dB

Example: `BB:EVDO:TERM2:DSCC:GAIN 10`
sets the relative gain for DSC to 10 dB.

Manual operation: See "Relative Gain" on page 50

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DSCChannel:LENGth <Length>

(enabled for Physical Layer subtype 2 and for an access terminal working in traffic mode)

Specifies the transmission duration of the Data Source Control (DSC) channel in slots.

Parameters:

<Length> integer

Range: 8 to 256
Increment: 8
*RST: 8

Example: `BB:EVDO:TERM2:DSCC:LENG 16`
sets the transmission duration of DSC to 16 slots.

Manual operation: See "Length" on page 50

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DSCChannel:STATe <State>

(enabled for Physical Layer subtype 2 and for an access terminal working in traffic mode)

Enables or disables the state of the Data Source Control (DSC) channel.

Parameters:

<State> 1 | ON | 0 | OFF

*RST: ON

Example: `BB:EVDO:TERM2:DSCC:STAT OFF`
deactivates DSC channel.

Manual operation: See "State" on page 49

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DSCChannel:VALues <Values>

(enabled for Physical Layer subtype 2 and for an access terminal working in traffic mode)

Specifies the pattern transmitted on the Data Source Control (DSC) Channel.

The sequence starts at frame 0 and slot 0 and is repeated with the length of the pattern. Each specified value is transmitted for DSC length slots.

Parameters:
<Values> integer
*RST: 0

Example: `BB:EVDO:TERM2:DSCC:VAL #H147,12`
sets transmitted pattern on DSC to #H147,12.

Manual operation: See "Values (OCT)" on page 50

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:IMASk <IMask>

Sets the long code mask of the I channel.

Parameters:
<IMask> 44 bits
*RST: #H00000000000

Example: `BB:EVDO:TERM2:IMAS #H2FFFFFFFFFFF,42`
sets the long code mask for I channel to #H2FFFFFFFFFFF,42.

Manual operation: See "Long Code Mask I (hex)" on page 46

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:MODE <Mode>

Sets the mode (Traffic or Access) of the selected access terminal.

Parameters:
<Mode> ACCess | TRAFfic
*RST: TRAFfic

Example: `BB:EVDO:TERM2:MODE ACC`
sets the mode of terminal 2 to access.

Manual operation: See "Mode" on page 46

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:PCHannel:GAIN <Gain>

Sets the gain of the pilot channel.

Gains of other channels are relative to the Pilot Channel power.

This setting is used to distinguish the power between access terminals, when more than one access terminal is active.

Parameters:
<Gain> float
Range: -80 to 10 dB
Increment: 0.01
*RST: 0 dB

Example: `BB:EVDO:TERM2:PCH:GAIN 10`
sets the gain of pilot channel to 10 dB.

Manual operation: See "Gain" on page 48

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:PCHannel:STATe?

Displays the state of the pilot channel.

Note: The pilot channel is always switched on.

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

Example: `BB:EVDO:TERM2:PCH:STAT?`
queries the state of the pilot channel.

Usage: Query only

Manual operation: See "State" on page 48

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:PLENgth <PLength>

(enabled for access terminal working in access mode)

Specifies the length of the preamble in frames (16 slots each) of the access probe.

Parameters:
<PLength> integer
Range: 1 to 7
*RST: 1

Example: `BB:EVDO:TERM2:PLEN 7`
Sets the preamble length to seven frames.

Manual operation: See "Preamble Length" on page 47

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:QMASk <QMask>

Sets the long code mask of the Q channel.

Parameters:
<QMask> 44 bits
*RST: #H00000000000

Example: `BB:EVDO:TERM2:IMAS #H3FFFFFFFFFFF,42`
sets the long code mask for I channel to #H3FFFFFFFFFFF,42.

Manual operation: See "Long Code Mask Q (hex)" on page 47

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:RRIChannel:GAIN <Gain>

(enabled for an access terminal working in traffic mode)

Sets the gain of the Reverse Rate Indicator (RRI) channel relative to the pilot channel power.

Parameters:

<Gain> float

Range: -80 to 10 dB
Increment: 0.01
*RST: 0 dB

Example: `BB:EVDO:TERM2:RRIC:GAIN 10`
sets the gain of pilot channel to 10 dB.

Manual operation: See "Relative Gain" on page 49

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:RRIChannel:STATe <State>

(enabled for an access terminal working in traffic mode)

Enables or disables the state of the Reverse Rate Indicator (RRI) channel.

Parameters:

<State> 1 | ON | 0 | OFF

*RST: ON

Example: `BB:EVDO:TERM2:RRIC:STAT OFF`
Disables the RRI channel.

Manual operation: See "State" on page 49

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:STATe <State>

(enabled for an access terminal working in traffic mode)

Enables or disables the state of the Reverse Rate Indicator (RRI) channel.

Parameters:

<State> 1 | ON | 0 | OFF

*RST: ON (access terminal 1)

Example: `BB:EVDO:TERM2:RRIC:STAT OFF`
Disables the RRI channel.

Manual operation: See "State" on page 46

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:SUBType <Subtype>

Selects the physical layer subtype for the selected access terminal.

Parameters:

<Subtype> S1 | S2

*RST: 2

Example: `BB:EVDO:TERM2:SUBT S2`
sets the physical layer subtype 2.

Manual operation: See "Physical Layer Subtype" on page 46

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