This document describes the following software options:

- **R&S® SMBV-K47/-K87**
  1415.8090.xx, 1415.8719.02
- **R&S® SMU-K47/-K87**
  1408.7410.02, 1408.8675.02
- **R&S® AMU-K47/-K87**
  1402.6602.02, 1403.0999.02
- **R&S® SMATE-K47/-K87**
  1404.7900.02, 1404.8887.02
- **R&S® SMJ-K47/-K87**
  1409.2306.02, 1409.3548.02

This manual version corresponds to firmware version:
FW 3.50.082.xx and later of the R&S® SMBV100A
FW 3.20.286.xx and later of the R&S® SMU200A, R&S® SMATE200A, R&S® SMJ100A and R&S® AMU200A
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1 Preface

1.1 Documentation Overview

This section provides an overview of the R&S Signal Generator user documentation. You find it on the product page at:

http://www.rohde-schwarz.com/product/SMBV100A.html > "Downloads"

Quick start guide
Introduces the R&S Signal Generator 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.

Online help
Offers quick, context-sensitive access to the complete information for the base unit and the software options directly on the instrument.

Operating manual
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 quick start guide manual.

- Software option manual
  Contains the description of the specific functions of an option. Basic information on operating the R&S Signal Generator is not included.

The online version of the operating manual provides the complete contents for immediate display on the Internet.

Service manual
Describes the performance test for checking the rated specifications, module replacement and repair, firmware update, troubleshooting and fault elimination, and contains mechanical drawings and spare part lists.

The service manual is available for registered users on the global Rohde & Schwarz information system (GLORIS, https://gloris.rohde-schwarz.com).
Instrument security procedures manual
Deals with security issues when working with the R&S Signal Generator in secure areas.

Basic safety instructions
Contains safety instructions, operating conditions and further important information. The printed document is delivered with the instrument.

Data sheet and brochure
The data sheet contains the technical specifications of the software options, see "Digital Standards for Signal Generators - Data sheet" on the web site. It also lists the options and their order numbers.

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

Release notes and open source acknowledgment (OSA)
The release notes of the base units list new features, improvements and known issues of the current firmware version, and describe the firmware installation.

The open source acknowledgment document provides verbatim license texts of the used open source software. See the product page of the base unit, e.g. at:
http://www.rohde-schwarz.com/product/SMBV100A.html > "Downloads" > "Firmware"

Application Notes, Application Cards, White Papers, etc.
These documents deal with special applications or background information on particular topics, see http://www.rohde-schwarz.com/appnotes.

1.2 Conventions Used in the Documentation

1.2.1 Typographical Conventions
The following text markers are used throughout this documentation:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Graphical user interface elements&quot;</td>
<td>All names of graphical user interface elements on the screen, such as dialog boxes, menus, options, buttons, and softkeys are enclosed by quotation marks.</td>
</tr>
<tr>
<td>KEYS</td>
<td>Key names are written in capital letters.</td>
</tr>
<tr>
<td>File names, commands, program code</td>
<td>File names, commands, coding samples and screen output are distinguished by their font.</td>
</tr>
<tr>
<td>Input</td>
<td>Input to be entered by the user is displayed in italics.</td>
</tr>
</tbody>
</table>
1.2.2 Notes on Screenshots

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

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.

1.2.3 Naming of Software Options

In this operating manual, we explicitly refer to options required for specific functions of the digital standard.

The name of software options for signal generators vary in the name of the instrument, but the option name is identical. Therefore we use in this manual the placeholder R&S SMx/AMU.

Example:

Naming for an option of the vector signal generator R&S SMBV100A, e.g:

- R&S SMx/AMU-K99, stands for R&S SMBV-K99

The particular software options available for the corresponding instruments are listed on the back of the title page.
2 About the 1xEV-DO Options

The R&S Signal Generator (options R&S SMx/AMU-K47/-K87) provides you with the ability to generate signals in accordance with the standard CDMA2000 1xEV-DO (Evolution-Data Optimized), 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 Signal Generator 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.

To play back a signal from a waveform file created by the simulation software R&S WinIQSIM2, the corresponding R&S WinIQSIM2 digital standard option must be installed.

The following list gives an overview of the main options provided by the R&S Signal Generator for generating an 1xEV-DO signal in accordance with 3GPP2 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 all possible sources of the R&S Signal Generator: pattern (all1, all0, user-defined up to 64 bits), PN data or data lists
- Clipping for reducing the crest factor

The following table gives an overview of parameters of the modulation system 1xEV-DO.
Table 2-1: Parameters of the modulation system 1xEV-DO

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip rate</td>
<td>1.2288 Mcps</td>
</tr>
<tr>
<td>Channel types</td>
<td></td>
</tr>
<tr>
<td>Forward link:</td>
<td></td>
</tr>
<tr>
<td>● Pilot Channel</td>
<td></td>
</tr>
<tr>
<td>● Forward Traffic Channel (Rev. A)</td>
<td></td>
</tr>
<tr>
<td>● Reverse Activity</td>
<td></td>
</tr>
<tr>
<td>● DRCLock</td>
<td></td>
</tr>
<tr>
<td>● Reverse Power Control</td>
<td></td>
</tr>
<tr>
<td>● ARQ (Rev. A)</td>
<td></td>
</tr>
<tr>
<td>● Control Channel</td>
<td></td>
</tr>
<tr>
<td>Reverse link, access mode:</td>
<td></td>
</tr>
<tr>
<td>● Pilot Channel</td>
<td></td>
</tr>
<tr>
<td>● Data Channel</td>
<td></td>
</tr>
<tr>
<td>Reverse link, traffic mode:</td>
<td></td>
</tr>
<tr>
<td>● Pilot Channel</td>
<td></td>
</tr>
<tr>
<td>● Auxiliary Pilot Channel (Rev. A)</td>
<td></td>
</tr>
<tr>
<td>● Reverse Rate Indicator</td>
<td></td>
</tr>
<tr>
<td>● Data Rate Control</td>
<td></td>
</tr>
<tr>
<td>● Data Source Control (Rev. A)</td>
<td></td>
</tr>
<tr>
<td>● ACK Channel</td>
<td></td>
</tr>
<tr>
<td>● Data Channel</td>
<td></td>
</tr>
<tr>
<td>Generation mode</td>
<td></td>
</tr>
<tr>
<td>Forward link:</td>
<td></td>
</tr>
<tr>
<td>● Realtime mode</td>
<td></td>
</tr>
<tr>
<td>Reverse link:</td>
<td></td>
</tr>
<tr>
<td>● Arbitrary waveform mode</td>
<td></td>
</tr>
<tr>
<td>● Multicarrier operation</td>
<td></td>
</tr>
<tr>
<td>Up to 16 concurrent carriers supported</td>
<td></td>
</tr>
<tr>
<td>Requires option R&amp;S SMx/AMU-K87</td>
<td></td>
</tr>
<tr>
<td>Data rates</td>
<td></td>
</tr>
<tr>
<td>Forward link:</td>
<td></td>
</tr>
<tr>
<td>● 38.4 .. 2457.6 kbps (Rev. 0)</td>
<td></td>
</tr>
<tr>
<td>● 4.8 .. 3072 kbps (Rev. A)</td>
<td></td>
</tr>
<tr>
<td>● 4.8 .. 4915 kbps (Rev. B)</td>
<td></td>
</tr>
<tr>
<td>Requires option R&amp;S SMx/AMU-K87</td>
<td></td>
</tr>
<tr>
<td>Reverse link:</td>
<td></td>
</tr>
<tr>
<td>● 9.6 .. 153.6 kbps (Rev. 0)</td>
<td></td>
</tr>
<tr>
<td>● 4.8 .. 1843.2 kbps (Rev. A)</td>
<td></td>
</tr>
<tr>
<td>Frame length</td>
<td>26.67 ms (1 frame = 16 slots)</td>
</tr>
<tr>
<td>Slot duration</td>
<td>1.67 ms (1 slot = 2048 PN chips)</td>
</tr>
<tr>
<td>PN offset</td>
<td>0 .. 511</td>
</tr>
<tr>
<td>Channel coding</td>
<td>All channel coding modes defined in the standard (channel encoding, block interleaving, repetition, modulation, orthogonal spreading by Walsh function)</td>
</tr>
<tr>
<td>Modulation</td>
<td>BPSK, QPSK, 8PSK, 16QAM, 64QAM</td>
</tr>
<tr>
<td>Requires option R&amp;S SMx/AMU-K87</td>
<td></td>
</tr>
<tr>
<td>Multi-code modulation</td>
<td>B4, Q2, Q4, Q4Q2, E4E2</td>
</tr>
<tr>
<td>Long Code Mask</td>
<td>Separate Long Code Masks for I and Q channel. The Long Code Generator is reload at every PN rollover with 0x24B91BF3A8.</td>
</tr>
<tr>
<td>Walsh covers</td>
<td>Different Walsh functions for the different channels</td>
</tr>
</tbody>
</table>
2.1 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 lock-out 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 User Interface

To access the 1xEV-DO settings, select "Baseband block > 1xEV-DO".

The menu is split into three sections. The choice of link direction determines which displays and parameters are made available in the middle section.

In the upper menu section, the 1xEV-DO digital standard is enabled, the default settings are called and the link direction is selected. Also there the valid 1xEV-DO version is displayed.

Further buttons lead to submenus for loading and saving the 1xEV-DO configuration and for setting the filter, trigger, and clock parameters.

In the "Multicarrier Configuration" menu, you can define and activate / deactivate multiple carriers. See detailed description under Chapter 3.3, "Multi-Carrier Configuration Settings", on page 18.

In the lower menu section either the traffic channels per user or the access terminals are configured, depending on the link direction selected.
3.1 General Settings

With this dialog, the 1xEV-DO digital standard is enabled and reset, and all the settings valid for the signal in both link directions are made.

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 62

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Not affected by &quot;Set to default&quot;</td>
</tr>
<tr>
<td>Link Direction</td>
<td>Downlink/ Forward</td>
</tr>
<tr>
<td>PN Offset</td>
<td>0</td>
</tr>
<tr>
<td>System Time</td>
<td>0</td>
</tr>
<tr>
<td>Predefined Settings</td>
<td>User Defined</td>
</tr>
<tr>
<td>Multicarrier State</td>
<td>off</td>
</tr>
<tr>
<td>Filter</td>
<td>CdmaOne + Equalizer</td>
</tr>
<tr>
<td>Clipping</td>
<td>Off</td>
</tr>
<tr>
<td>Trigger</td>
<td>Auto</td>
</tr>
<tr>
<td>Clock</td>
<td>Internal</td>
</tr>
</tbody>
</table>

Remote command:
[:SOURce<hw>]:BB:EVDO:PRESet on page 60

Save/Recall ...
Calls the "Save/Recall" menu.

From the Save/Recall menu, the "Save/Recall Settings" windows for saving and recalling 1xEV-DO configurations and the "File Manager" can be called.

1xEV-DO configurations are stored as files with the predefined file extension *.*1xevdo. The filename and the directory they are stored in are user-definable.

The complete settings in the "1xEV-DO" menu are saved and recalled.

"Recall 1xEV-DO Setting" Opens the "Recall Settings" window for loading a saved 1xEV-DO configuration.
The configuration of the selected (highlighted) file is loaded by pressing the "Select" button.
"Save 1xEV-DO Setting" opens the "Save Settings" window for saving the current 1xEV-DO signal configuration. The name of the file is specified in the filename entry field, the directory selected in the save into field. The file is saved by pressing the "Save" button.

"File Manager" calls the "File Manager". The "File Manager" is used to copy, delete and rename files and to create directories.

Remote command:
[:SOURce<hw>:BB:EVDO:SETTING:LOAD on page 61
[:SOURce<hw>:BB:EVDO:SETTING:STORE on page 61
[:SOURce<hw>:BB:EVDO:SETTING:DELeete on page 61

Data List Management calls the "Data List Management" dialog. This menu is used to create and edit a data list. All data lists are stored as files with the predefined file extension *.dm_iqd. The filename and the directory they are stored in are user-definable. The data lists must be selected as a data source from the submenus under the individual function.

Note: All data lists are generated and edited by means of the SOURce:BB:DM subsystem commands. Files containing data lists usually end with *.dm_iqd. The data lists are selected as a data source for a specific function in the individual subsystems of the digital standard.

Remote command:
[:SOURce<hw>:BB:EVDO:TERMinal<st>:DCHannel:DATA:DSELection on page 100
[:SOURce<hw>:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:DATA: DSELection on page 103

Generate Waveform File
With enabled signal generation, triggers the instrument to store the current settings as an ARB signal in a waveform file. Waveform files can be further processed by the ARB and/or as a multi-carrier or a multi-segment signal. The filename and the directory it is stored in are user-definable; the predefined file extension for waveform files is *.wv.

Remote command:
[:SOURce<hw>:BB:EVDO:WAVeform:CREate on page 63

1xEV-DO Version
Displays the current version of the 1xEV-DO standard.
The default settings and parameters provided are oriented towards the specifications of the version displayed.

Remote command:
[:SOURce<hw>]:BB:EVDO:VERSion? on page 63

**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 60

**PN Offset**
Sets the PN Offset of the 1xEV-DO signal.
Remote command:
[:SOURce<hw>]:BB:EVDO:PNOFset on page 60

**System Time**
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.
Remote command:
[:SOURce<hw>]:BB:EVDO:STIMe on page 63

**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 94

**Multicarrier Configuration**
Access the "Multicarrier Configuration" dialog, see Chapter 3.3, "Multi-Carrier Configuration Settings", on page 18.

**Access Network Settings**
In Downlink direction, provides access to the "Access Network Settings" dialog (see Chapter 3.2, "Access Network Settings", on page 15).
Configure Traffic Channels
Appears at downlink only
Activates/deactivates the selected terminal and access the corresponding "Configure Traffic User 1 .. 4" dialog (see Chapter 3.4, "Traffic Channel Settings", on page 20).
Remote command:
[:SOURce<hw>]:BB:EVDO:USER<st>:STATe on page 92

Configure Access Terminals
Appears at uplink only
Activates/deactivates the selected terminal and access the corresponding "Configure Access Terminal 1 .. 4" dialog (see Chapter 3.5, "Access Terminal Settings", on page 31).
Remote command:
[:SOURce<hw>]:BB:EVDO:TERminal<st>:STATe on page 114

Filter / Clipping / ARB Settings
Access to the dialog for setting baseband filtering, clipping and the sequence length of the arbitrary waveform component (see Chapter 3.6, "Filter / Clipping / ARB Settings", on page 44).

Trigger/Marker
Calls the menu for selecting the trigger source, for configuring the marker signals and for setting the time delay of an external trigger signal (see Chapter 3.7, "Trigger/Marker/Clock Settings", on page 47).
The currently selected trigger source is displayed to the right of the button.

Execute Trigger
For internal trigger source, executes trigger manually.
Remote command:
[:SOURce<hw>]:BB:EVDO:TRIGger:EXECute on page 69

Clock
Calls the dialog for selecting the clock source and for setting a delay (see Chapter 3.7, "Trigger/Marker/Clock Settings", on page 47).

3.2 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 80

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 78

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:

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 78

**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 77

**Packet Start Offset**
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 2.1, "Traffic Scheduling Process", on page 10 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 77

**Minimum Revision**
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 78

**Maximum Revision**
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 77

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

Remote command:
[:SOURce<hw>:BB:EVDO:ANETwork:RAB:STATe](#) on page 80

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

Remote command:
[:SOURce<hw>:BB:EVDO:ANETwork:RAB:LEVel](#) on page 79

**RAB Length**
For physical layer subtype 0&1 only
Sets the duration (in slots) of a Reverse Activity bit.
RAB Offset
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:LENGth on page 79

RAB MAC Index
For physical layer subtype 3 only sets the RAB MAC Index.
Remote command:
[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:MAC:INDex on page 80

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 78

3.3 Multi-Carrier Configuration Settings

Multi-Carrier Configuration requires option R&S SMx/AMU-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.
Multi-Carrier Configuration Settings

State
Enables or disables multi-carrier operation.
Remote command:
[:SOURce<hw>]:BB:EVD0:UP:MC:CARrierm<ch>:STATe on page 82
[:SOURce<hw>]:BB:EVD0:DOWN:MC:CARrierm<ch>:STATe on page 82

Center Frequency (band)
Shows the center frequency of the band resulting from the set active carriers.
Remote command:
[:SOURce<hw>]:BB:EVD0:DOWN:MC:CFRequency? on page 81
[:SOURce<hw>]:BB:EVD0:UP:MC:CFRequency? on page 81

Band Class
Selects the band class for operation, as defined in 3GPP2 C.S0057-E.
Remote command:
[:SOURce<hw>]:BB:EVD0:UP:MC:BCLass on page 81
[:SOURce<hw>]:BB:EVD0:DOWN:MC:BCLass on page 81

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 82
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CDELay on page 82

State
Switches the selected carrier on or off.
Remote command:
[:SOURce<hw>]:BB:EVDO:UP:MC:CARRier<ch>:STATe on page 82
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CARRier<ch>:STATe on page 82

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 82
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CARRier<ch>:CHANnel on page 82

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 83
[:SOURce<hw>]:BB:EVDO:DOWN:MC:CARRier<ch>:FREQuency on page 83

3.4 Traffic Channel Settings

Access:
1. Select "Baseband > 1xEV-DO > Link Direction > Downlink"
2. Select "Traffic Channels".
Four "User (1..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.
State (User)
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 92

Physical Layer Subtype (User)
Displays the physical layer subtype selected in the menu "Access Network Settings".
Remote command:
[:SOURce<hw>]:BB:EVDO:ANETwork:SUBType on page 80

Number of Packets to Send - Infinite
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 88

Number of Packets to Send - Value
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 88
[:SOURce<hw>]:BB:EVDO:USER<st>:PACKet:COUNt on page 87

Packet Start Offset
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.

**Example:**
- **Single Slot Packets**
  - SOFF=0

**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.

**Example:**
- **Rate change**
  - SOFF=0

See Chapter 2.1, "Traffic Scheduling Process", on page 10 for an explanation on how the control and traffic channels are transmitted over time.

Remote command:

```
```

**Rate Index**

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

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

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

<table>
<thead>
<tr>
<th>Rate index</th>
<th>Packet size index</th>
<th>Packet size, bits</th>
<th>Data Rate, kbps</th>
<th>Slot count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>128</td>
<td>4.8</td>
<td>16</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>256</td>
<td>9.6</td>
<td>16</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>512</td>
<td>19.2</td>
<td>16</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1024</td>
<td>38.4</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>128</td>
<td>9.6</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>256</td>
<td>19.2</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>512</td>
<td>38.4</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>1024</td>
<td>76.8</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>128</td>
<td>19.2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>256</td>
<td>38.4</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>512</td>
<td>76.8</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>1024</td>
<td>153.6</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>128</td>
<td>38.4</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>256</td>
<td>76.8</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>512</td>
<td>153.6</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>1024</td>
<td>307.2</td>
<td>2</td>
</tr>
</tbody>
</table>
### Table 3-3: Rate index for Physical Layer subtype 3 (requires the appropriate Rev. B option)

<table>
<thead>
<tr>
<th>Rate index</th>
<th>Packet size index</th>
<th>Packet size, bits</th>
<th>Data Rate, kbps</th>
<th>Slot count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>128</td>
<td>4.8</td>
<td>16</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>256</td>
<td>9.6</td>
<td>16</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>512</td>
<td>19.2</td>
<td>16</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1024</td>
<td>38.4</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>128</td>
<td>9.6</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>256</td>
<td>19.2</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>512</td>
<td>38.4</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>1024</td>
<td>76.8</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>128</td>
<td>19.2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>256</td>
<td>38.4</td>
<td>4</td>
</tr>
<tr>
<td>Rate index</td>
<td>Packet size index</td>
<td>Packet size, bits</td>
<td>Data Rate, kbps</td>
<td>Slot count</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------</td>
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<td>-----------</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>512</td>
<td>76.8</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>1024</td>
<td>153.6</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>128</td>
<td>38.4</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>256</td>
<td>76.8</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>512</td>
<td>153.6</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>1024</td>
<td>307.2</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>512</td>
<td>76.8</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1024</td>
<td>153.6</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>2048</td>
<td>307.2</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>128</td>
<td>76.8</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>256</td>
<td>153.6</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>512</td>
<td>307.2</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>1024</td>
<td>614.4</td>
<td>1</td>
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<tr>
<td>7</td>
<td>2</td>
<td>512</td>
<td>153.6</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>1024</td>
<td>307.2</td>
<td>2</td>
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<tr>
<td>7</td>
<td>0</td>
<td>2048</td>
<td>614.4</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>1024</td>
<td>307.2</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>3072</td>
<td>921.6</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>512</td>
<td>307.2</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>1024</td>
<td>614.4</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td>2048</td>
<td>1228.8</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>4096</td>
<td>1228.8</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>1024</td>
<td>614.4</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>0</td>
<td>3072</td>
<td>1843.2</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
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<td>4096</td>
<td>2457.6</td>
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</tr>
<tr>
<td>13</td>
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<td>5120</td>
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</tr>
<tr>
<td>15</td>
<td>0</td>
<td>1024</td>
<td>153.6</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>0</td>
<td>2048</td>
<td>307.2</td>
<td>4</td>
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<tr>
<td>17</td>
<td>0</td>
<td>3072</td>
<td>460.8</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>0</td>
<td>4096</td>
<td>614.4</td>
<td>4</td>
</tr>
<tr>
<td>19</td>
<td>0</td>
<td>5120</td>
<td>768</td>
<td>4</td>
</tr>
<tr>
<td>20</td>
<td>0</td>
<td>6144</td>
<td>921.6</td>
<td>4</td>
</tr>
</tbody>
</table>
## Packet Size
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 89

## Data Rate
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 89

## Slot Count
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 92
Data Pattern (hex)
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 84

MAC Index
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 86

MAC Level
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 87

Interleave Factor
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 86

RPC Mode
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 91

RPC Range Count
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 91

RPC Pattern
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 91
[:SOURce<hw>]:BB:EVDO:USER<st>:RPC:ZONE<ch0>:COUNt on page 92

DRC Lock 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.
Remote command:
[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:STATe on page 85
**DRC Lock 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.

Remote command:
```
[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:PERiod
```
on page 85

**DRC Lock 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.

Remote command:
```
[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:LENGth
```
on page 84

**Frame 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.

Remote command:
```
[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:OFFSet
```
on page 85

**H-ARQ 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.

- "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 85

3.5 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

<table>
<thead>
<tr>
<th>Physical layer subtype</th>
<th>Access terminal mode</th>
<th>Pilot channel</th>
<th>Auxiliary pilot channel</th>
<th>RRI channel</th>
<th>DSC channel</th>
<th>DRC channel</th>
<th>ACK channel</th>
<th>Data channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>0&amp;1</td>
<td>Traffic</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Packet 1</td>
</tr>
<tr>
<td>Access</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Packet 1</td>
</tr>
</tbody>
</table>
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 94

State (Access Terminal)
Enables or disables the selected access terminal.
Remote command:
[:SOURce<hw>]:BB:EVDO:TERminal<st>:STATe on page 114

Mode (Access Terminal)
Sets the mode ("Traffic" or "Access") of the selected access terminal.
Remote command:
[:SOURce<hw>]:BB:EVDO:TERminal<st>:MODE on page 112

Physical Layer Subtype (Access Terminal)
Selects the physical layer subtype for the selected access terminal.
Remote command:
[:SOURce<hw>]:BB:EVDO:TERminal<st>:SUBType on page 114

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 108

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 111

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 113
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

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

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

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?

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

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 98

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 98

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 98

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>:RRICheannel:STATe on page 113

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>:RRICheannel:GAIN on page 113

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>:DSCheannel:STATe on page 111

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 110

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 110

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 111

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 109

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 108

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 109

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 110
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 108

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.
Example:
DRCLength = 4
Gating OFF
Forward traffic channel
... Slot ... Slot ... Slot ...
DRC channel
... 1 1 1 1 1 1 ...

If gating is active, each value of the DRC channel is transmitted for one slot followed
by DRCLength-1 empty slots.
Example:
DRCLength = 4
Gating ON
Forward traffic channel
... 1 Slot 1 1 1 1 ...
DRC channel
... 1 1 1 1 1 1 ...

Remote command:
[:SOURce<hw>]:BB:EVDO:TERminal<st>:DRCChannel:GATing[:STATe] on page 109

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 96

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 95

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 96

**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 95

**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 97

**State (Packet)**

(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 107

**Relative Gain (Packet)**

(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 105

**Infinite Packets (Packet)**

(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 105
**Number of Packets to Send (Packet)**
(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:
```plaintext
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:COUNT
```
on page 102

**Number of Subpackets (Packet)**
-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:
```plaintext
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DChannel:PACKet<ch>::SUBPackets[:COUNt] on page 107
```

**Payload Size (Packet)**
-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:
```plaintext
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DChannel:PACKet<ch>::PSIZE
```
on page 106

**Modulation (Packet)**
-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.

"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:

Data Rate (Packet)
(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 104

Channel Coding (Packet)
(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 101

Data Source (Packet)
(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.

<table>
<thead>
<tr>
<th></th>
<th>FCS ON</th>
<th>FCS OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel Coding ON</td>
<td>PayloadSize - FCSSize - 6</td>
<td>PayloadSize - 6</td>
</tr>
<tr>
<td>Channel Coding OFF</td>
<td>(PayloadSize/CodeRate) - FCSSize</td>
<td>(PayloadSize/CodeRate)</td>
</tr>
</tbody>
</table>
FCSSize and code rate depend on the physical layer subtype (see that table below).

<table>
<thead>
<tr>
<th></th>
<th>Physical layer subtype 0&amp;1</th>
<th>Physical layer subtype 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCSSize</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>Code rate</td>
<td>1/4 or 1/2</td>
<td>1/5 or 1/3</td>
</tr>
</tbody>
</table>

**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 "Main Dialog > Data List Management".

Remote command:

```
[:SOURce<hw>]:BB:EVDO:TERminal<st>:DCHannel:PACKet<ch>:DATA
```

on page 102

```
[:SOURce<hw>]:BB:EVDO:TERminal<st>:DCHannel:PACKet<ch>:DATA:DSELection
```

on page 103

```
```

on page 103

**FCS (Packet)**

(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 104

**State (Data Channel)**

(enabled for access terminal working in access mode only)

Enables or disables the state of the data channel.
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 101

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 99

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 100

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 "Main Dialog > Data List Management".
Remote command:
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:DATA on page 99
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:DATA:PATTern on page 100
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 101

3.6 Filter / Clipping / ARB Settings

► To access this dialog, select "Main dialog > Filter/Clipping/ARB/IQ Settings".

The dialog comprises the settings, necessary to configure the baseband filter, sample rate variation and clipping.
Generation of baseband signals according to 1xEV-DO standard by inverting the Q-part of the signal is enabled in the I/Q Settings section.

3.6.1 Filter Settings

Provided are the following settings for configuring the baseband filter:

Filter
Selects the baseband filter.
Remote command:
[:SOURce<hw>]:BB:EVDO:FILTER:TYPE on page 68
**Roll Off Factor or BxT**
Sets the filter parameter.

The filter parameter ("Folloff 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 65
- \[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:COSine on page 66
- \[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:GAUSs on page 66
- \[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:PGAuss on page 67
- \[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:RCOSine on page 67
- \[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:SPHase on page 67

**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 66
- \[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:LPASSEVM on page 66

**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 65

### 3.6.2 Clipping Settings

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 65

**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 64

Clipping Mode
(For reverse link mode only)
Selects the clipping method. A graphic illustration of the way in which this two methods work is given in the dialog.

- "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 64

3.6.3 ARB Settings

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 62

3.6.4 I/Q Setting

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 Signal Generator 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"

Remote command:
[:SOURce<hw>]:BB:EVDO:IQSWap:STATe on page 68
3.7 Trigger/Marker/Clock Settings

To access this dialog, select "Main Menu > Trigger/Marker".

- The "Trigger In" section allows setting of the trigger for the signal. Various parameters are provided for the settings, depending on which trigger source - internal or external - is selected. The status of signal generation ("Running" or "Stopped") is indicated for all trigger modes.

- The "Marker Mode" section is where the marker signals at the MARKER output connectors are configured.

- In the "Marker Delay" section, you can define the marker signal delay.

- In the "Clock Settings" section, you can select the clock source and - in case of an external source - the clock type.

- The buttons in the last section lead to submenu for general trigger, clock and mapping settings.
3.7.1 Trigger Settings

In the "Trigger in" dialog, the trigger for the signal is set. Various parameters are provided for the settings, depending on which trigger source - internal or external - is selected. The status of signal generation ("Running" or "Stopped") is indicated for all trigger modes.

**Trigger 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 with 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 with 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 69

**Signal Duration Unit**

Available in Single Trigger Mode. Defines the unit for describing the length of the signal sequence to be output.

Remote command:

\[:SOURce<hw>]:BB:EVDO:TRIGger:SLUNit on page 71

**Signal Duration**

Defines the length of the signal sequence to be output in the "Single" trigger mode. It is possible to output deliberately just part of the signal, an exact sequence of the signal, or a defined number of repetitions of the signal.

Remote command:

\[:SOURce<hw>]:BB:EVDO:TRIGger:SLENth on page 70

**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 70

**Arm**

Stops the signal generation until subsequent trigger event occurs.

Remote command:
[:SOURce<hw>]:BB:EVDO:TRIGger:ARM:EXECute on page 69

**Execute Trigger**

For internal trigger source, executes trigger manually.

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

**Trigger Source**

Selects trigger source. This setting is effective when a trigger mode other than "Auto" has been selected.

- "Internal"
  The trigger event is executed by "Execute Trigger".
- "Internal (Baseband A/B)"
  (two-path instruments)
  The trigger event is the trigger signal from the second path
- "External (Trigger 1/2)"
  The trigger event is the active edge of an external trigger signal, supplied at the TRIGGER 1/2 connector.
  Use the "Global Trigger/Clock Settings" dialog to define the polarity, the trigger threshold and the input impedance of the trigger signal.

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

**Sync. Output to External Trigger**

For an external trigger signal, enables/disables the output of a signal synchronous to the external trigger event.

- "On"
  Corresponds to the default state of this parameter.
  The signal calculation starts simultaneously with the external 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.
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 69

**Trigger Delay**

Delays the trigger event of the signal from:

- The external trigger source
- The other path

Use this setting to:

- Synchronize the instrument with the device under test (DUT) or other external devices

Remote command:

```
[:SOURce<hw>]:BB:EVDO:TRIGger[:EXTernal<ch>]:DELay
```
on page 71

```
[:SOURce<hw>]:BB:EVDO:TRIGger:OBASeband:DELay
```
on page 70

**Trigger Inhibit**

Available on external triggering or on internal triggering via the second path.

Sets the duration for inhibiting a new trigger event subsequent to triggering.

In the "Retrigger" mode, every trigger signal causes signal generation to restart. This restart is inhibited for the specified duration.
For two-path instruments, the trigger inhibit can be set separately for each of the two paths.

Remote command:

[:SOURce<hw>]:BB:EVDO:TRIGger[:EXTernal<ch>]:INHibit on page 72
[:SOURce<hw>]:BB:EVDO:TRIGger:OBASeband:INHibit on page 70

### 3.7.2 Marker Settings

The marker output signal for synchronizing external instruments is configured in the marker settings section "Marker Mode".

The R&S SMBV supports only two markers.

**Marker Mode**

Selects a marker signal for the associated MARKER output.

- **"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 only)
  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 Period"**
  A regular marker signal that is defined by an on/off ratio is generated. A period lasts one ON and OFF cycle. The "ON Time" and "OFF Time" are each expressed as a number of samples and are set in an input field which opens when on/off ratio is selected.

![ON time | OFF time | ON time | OFF time](image)

Remote command:

[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:ONTime on page 74
[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:OFFTime on page 74

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

Remote command:

[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:PERiod on page 74

Remote command:

[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:MODE on page 73
3.7.3 Marker Delay Settings

The delay of the signals on the marker outputs is set in the "Marker Delay" section. The R&S SMBV supports two markers.

**Marker x Delay**
Enters the delay between the marker signal at the marker outputs and the start of the signal.

If the setting "Fix marker delay to dynamic range" is enabled, the setting range is restricted to the dynamic range. In this range, the delay of the marker signals can be set without restarting the marker and signal.

Remote command:
```
[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:DELay
```
on page 72

**Current Range without Calculation**
Displays the dynamic range within which the delay of the marker signals can be set without restarting the marker and signal.

The delay can be defined by moving the setting mark.

Remote command:
```
[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:DELay:MINimum?
```
on page 73
```
[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:DELay:MAXimum?
```
on page 73

**Fix Marker to Current Range**
Restricts the marker delay setting range to the dynamic range. In this range, the delay can be set without restarting the marker and signal.

Remote command:
```
```
on page 72

3.7.4 Clock Settings

The clock settings are used to set the clock source.

**Sync. Mode**
(for R&S SMBV only)
Selects the synchronization mode.

This parameter is used to enable generation of precise synchronous signals of several connected R&S SMBVs.

**Note:** If several instruments are connected, the connecting cables from the master instrument to the slave one and between each two consecutive slave instruments must have the same length and type. Avoid unnecessary cable length and branching points.

- "None"
  The instrument is working in standalone mode.
- "Sync. Master"
The instrument provides all connected instruments with its synchronization and reference clock signal, also including the trigger signal.

- **"Sync. Slave"**
  The instrument receives the synchronization and reference clock signal from another instrument working in a master mode.

Remote command:
[[:SOURce<hw>:BB:EVDO:CLOCk:SYNChronization:MODE] on page 76](#)

### Set Synchronization Settings
(for R&S SMBV only)

Adjusts the instrument's settings required for the selected synchronization mode.

Remote command:
[[:SOURce<hw>:BB:EVDO:CLOCk:SYNChronization:EXECute] on page 75](#)

### Clock Source

Selects the clock source.

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

- **"External"**
  The instrument expects an external clock reference at the CLOCK connector. The symbol clock must be correctly set to the accuracy specified in the data sheet. To change the polarity of the clock input, use the "Global Trigger/Clock Settings". In the case of two-path instruments, this selection applies to path A.

Remote command:
[[:SOURce<hw>:BB:EVDO:CLOCk:SOURce] on page 75](#)

### Clock Mode

Enters the type of externally supplied clock.

- **"Chip"**
  A chip clock is supplied via the CLOCK connector.

- **"Multiple"**
  A multiple of the chip clock is supplied via the CLOCK connector; the symbol clock is derived internally from it.

Remote command:
[[:SOURce<hw>:BB:EVDO:CLOCk:MODE] on page 75](#)

### Chip Clock Multiplier

Enters the multiplication factor for clock type Multiple.

Remote command:
[[:SOURce<hw>:BB:EVDO:CLOCk:MULTiplier] on page 74](#)

### Measured External Clock

Provided for permanent monitoring of the enabled and externally supplied clock signal.

Remote command:
[CLOck:INPut:FREQuency?](#)
3.7.5 Global Settings

The buttons in this section lead to dialogs for general trigger, clock and mapping settings.

Global Trigger/Clock Settings
Calls the "Global Trigger/Clock/Input Settings" dialog.
This dialog is used among other things for setting the trigger threshold, the input impedance and the polarity of the clock and trigger inputs.
The parameters in this dialog affect all digital modulations and standards, and are described in chapter "Global Trigger/Clock/Input Settings" in the Operating Manual.

User Marker / AUX I/O Settings
Calls the "User Marker AUX I/O Settings" dialog, used to map the connector on the rear of the instruments.
See also "User Marker / AUX I/O Settings" in the Operating Manual.
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 Signal Generator has already been set up for remote operation in a network as described in the R&S Signal Generator 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 Signal Generator operating manual.

Common Suffixes

The following common suffixes are used in remote commands:

<table>
<thead>
<tr>
<th>Suffix</th>
<th>Value range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOURce&lt;ch&gt;</td>
<td>[1]</td>
<td>2</td>
</tr>
<tr>
<td>OUTPut&lt;ch&gt;</td>
<td>1 .. 4</td>
<td>available markers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R&amp;S SMBV supports two markers</td>
</tr>
<tr>
<td>EXTernal&lt;ch&gt;</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>CARRier&lt;Ch&gt;</td>
<td>0 .. 21</td>
<td>band class</td>
</tr>
<tr>
<td>USER&lt;ST&gt;</td>
<td>1 .. 4</td>
<td>user</td>
</tr>
<tr>
<td>TERMINal&lt;ST&gt;</td>
<td>1 .. 4</td>
<td>terminal</td>
</tr>
</tbody>
</table>

Placeholder <root>

For commands that read out or save files in the default directory, the default directory is set using command MMEM:CDIRECTory. The examples in this description use the placeholder <root> in the syntax of the command.

- D:\ - for selecting the internal hard disk of a Windows instrument
- E:\ - for selecting the memory stick which is inserted at the USB interface of a Windows instrument
- /var/user/ - for selecting the internal flash card of a Linux instrument
- /usb/ - for selecting the memory stick which is inserted at the USB interface of a Linux instrument.
Tasks (in manual or remote operation) that are also performed in the base unit in the same way are not described here.

In particular, this includes:

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

For a description of such tasks, see the R&S Signal Generator operating manual.

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

- Programming Examples.......................................................................................... 56
- General Commands............................................................................................... 60
- Filter/Clipping/ARB Commands............................................................................. 63
- Trigger Commands............................................................................................... 68
- Marker Commands............................................................................................... 72
- Clock Commands................................................................................................. 74
- Access Network Commands.................................................................................... 76
- Multi-Carrier Configuration Commands................................................................. 81
- Configure Traffic User Commands......................................................................... 83
- Configure Access Terminal Commands................................................................... 93

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.

```plaintext
// ***********************************************************
// Reset instrument first
// ***********************************************************
*RST; *CLS
SOURce1:BB:EVDO:PRESet
SOURce1:BB:EVDO:STATe ON
SOURce1:BB:EVDO:SETTING:STORE "<root>1xEVDO_def"

// ***********************************************************
// Recall settings
// ***********************************************************
MMEM:CDIR "<root>"
```
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 EXTernal
// SOURce1:BB:EVDO:TRIGger:EXTernal:SYNChronize:OUTPut ON
```
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
SOURce1:BB:EVDO:TRIGger:OUTPut3:DELAY 1000

SOURce1:BB:EVDO:TRIGger:OUTPut1:DELAY:FIXed 1
SOURce1:BB:EVDO:TRIGger:OUTPut1:DELAY:MINimum?
  // 0
SOURce1:BB:EVDO:TRIGger:OUTPut1:DELAY:MAXimum?
  // 2000
**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.

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

SOURce1:BB:EVDO:LINK?
// DOWN
:SOURce1:BB:EVDO:DOWN:MC:CARRier1:STATe 1
:SOURce1:BB:EVDO:DOWN:MC:CARRier2:STATe 1
:SOURce1:BB:EVDO:DOWN:MC:CARRier4:STATe 1
:SOURce1:BB:EVDO:DOWN:MC:CARRier5:CHANnel 100
// 871 (channel 1200 is not allowed; the software 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:STATe 1

:SOURce1:BB:EVDO:STATe 1

// 456900000
:SOURce1:BB:EVDO:DOWN:MC:CARRier1:FREQuency?
// 460000000
// 460225000
// 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, carrier#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:

<table>
<thead>
<tr>
<th>&lt;Link&gt;</th>
<th>FORward/DOWN</th>
<th>REverse/UP</th>
</tr>
</thead>
<tbody>
<tr>
<td>*RST:</td>
<td>DOWN</td>
<td></td>
</tr>
</tbody>
</table>

Example: see Example "Performing general tasks" on page 56

Manual operation: See "Link Direction" on page 14

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

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

Parameters:

<table>
<thead>
<tr>
<th>&lt;PnOffset&gt;</th>
<th>integer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range:</td>
<td>0 to 511</td>
</tr>
<tr>
<td>*RST:</td>
<td>0</td>
</tr>
</tbody>
</table>

Example: see Example "Performing general tasks" on page 56

Manual operation: See "PN Offset" on page 14

[: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 56
Usage: Event
Manual operation: See "Set to Default" on page 12

[: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 56
Usage: Query only
Manual operation: See "Save/Recall ..." on page 12

[: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 56
Usage: Setting only
Manual operation: See "Save/Recall ..." on page 12

[: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 56
Usage: Setting only
Manual operation: See "Save/Recall ..." on page 12

[: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 56

Usage: Setting only

Manual operation: See “Save/Recall …” on page 12

[:SOURce<hw>]:BB:EVDO:SETTing:STORe:FAST <Fast>

Determines whether the instrument performs an absolute or a differential storing of the settings.

Enable this function to accelerate the saving process by saving only the settings with values different to the default ones.

Note: This function is not affected by the "Preset" function.

Parameters:

<Fast> 0 | 1 | OFF | ON

*RST: 1

[: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 56

Manual operation: See “Sequence Length ARB” on page 46

[: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> 0 | 1 | OFF | ON

*RST: 0

Example: see Example “Performing general tasks” on page 56
Manual operation: See "State" on page 12

[: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 56

Manual operation: See "System Time" on page 14

[: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 56

Usage: see Example "Performing general tasks" on page 56

Manual operation: See "1xEV-DO Version" on page 13

[: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 56

Usage: Setting only

Manual operation: See "Generate Waveform File" on page 13

4.3 Filter/Clipping/ARB Commands

[:SOURce<hw>]:BB:EVDO:CLIPping:LEVEL
[:SOURce<hw>]:BB:EVDO:CLIPping:MODE
[:SOURce<hw>]:BB:EVDO:CLIPping:STATe
[:SOURce<hw>]:BB:EVDO:CRATe:VARiation
[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:APCO25
[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:COSine

[64]

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

[66]

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

[66]

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

[66]

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

[67]

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

[67]

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

[67]

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

[68]

[: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 45

[: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
Remote-Control Commands

Manual operation: See "Clipping Mode" on page 46

[: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> 0 | 1 | OFF | ON
*RST: OFF

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

Manual operation: See "Clipping State" on page 45

[: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 45

[: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 45
[:SOURce<hw>]:BB:EVDO:FILTer:PARameter:COSine <Cosine>

Sets the rolloff factor for the Cosine filter type.

Parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Range</th>
<th>Increment</th>
<th>RST</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Cosine&gt;</td>
<td>float</td>
<td>0.05 to 1</td>
<td>0.01</td>
<td>0.1</td>
</tr>
</tbody>
</table>

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 45

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

Sets the rolloff factor for the Gauss filter type.

Parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Range</th>
<th>Increment</th>
<th>RST</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Gauss&gt;</td>
<td>float</td>
<td>0.15 to 2.5</td>
<td>0.01</td>
<td>0.5</td>
</tr>
</tbody>
</table>

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 45

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

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

Parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Range</th>
<th>Increment</th>
<th>RST</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;LPass&gt;</td>
<td>float</td>
<td>0.05 to 2</td>
<td>0.01</td>
<td>0.5</td>
</tr>
</tbody>
</table>

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 45

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

Sets the cutoff frequency factor for the lowpass filter (EVM Opt.) type.
### Remote-Control Commands

**1xEV-DO Rev. A/Rev. B**

## Filter/Clipping/ARB Commands

### Parameters:

<table>
<thead>
<tr>
<th>&lt;LPassEvm&gt;</th>
<th>float</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range: 0.05 to 2</td>
<td></td>
</tr>
<tr>
<td>Increment: 0.01</td>
<td></td>
</tr>
<tr>
<td>*RST: 0.5</td>
<td></td>
</tr>
</tbody>
</table>

**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 45

---

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

Sets the rolloff factor for the Pure Gauss filter type.

**Parameters:**

<table>
<thead>
<tr>
<th>&lt;PGauss&gt;</th>
<th>float</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range: 0.15 to 2.5</td>
<td></td>
</tr>
<tr>
<td>Increment: 0.01</td>
<td></td>
</tr>
<tr>
<td>*RST: 0.5</td>
<td></td>
</tr>
</tbody>
</table>

**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 45

---

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

Sets the rolloff factor for the Root Cosine filter type.

**Parameters:**

<table>
<thead>
<tr>
<th>&lt;RCosine&gt;</th>
<th>float</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range: 0.05 to 1</td>
<td></td>
</tr>
<tr>
<td>Increment: 0.01</td>
<td></td>
</tr>
<tr>
<td>*RST: 0.15</td>
<td></td>
</tr>
</tbody>
</table>

**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 45

---

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

Sets BxT for the Split Phase filter type.

**Parameters:**

<table>
<thead>
<tr>
<th>&lt;SPhase&gt;</th>
<th>float</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range: 0.15 to 2.5</td>
<td></td>
</tr>
<tr>
<td>Increment: 0.01</td>
<td></td>
</tr>
<tr>
<td>*RST: 2</td>
<td></td>
</tr>
</tbody>
</table>

---

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Example: \texttt{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 45

\texttt{[:SOURce<hw>]:BB:EVDO:FILTer:TYPE <Type>}

The command selects the filter type.

Parameters:
\texttt{<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: \texttt{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 44

\texttt{[:SOURce<hw>]:BB:EVDO:IQSWap:STATe <State>}

Inverts the Q-part of the baseband signal

Parameters:
\texttt{<State>}
- 0
- 1
- OFF
- ON

*RST: 0

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

Manual operation: See "Invert Q for Correct Baseband Output" on page 46

4.4 Trigger Commands
[:SOURce<hw>]:BB:EVDO:TRIGger:SOURce.....................................................................71
[:SOURce<hw>]:BB:EVDO:TRIGger:[EXTernal<ch>]:DELay................................................ 71
[:SOURce<hw>]:BB:EVDO:TRIGger:[EXTernal<ch>]:INHibit................................................ 72

[: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 57

Manual operation: See "Trigger Mode" on page 48

[: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 57

Usage: Event

Manual operation: See "Arm" on page 49

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

Executes a trigger.

Example: see Example "Adjusting clock and trigger settings" on page 57

Usage: Event

Manual operation: See "Execute Trigger" on page 15

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

Enables/disables output of the signal synchronous to the external trigger event.

Parameters:

<Output> 0 | 1 | OFF | ON

*RST: 1

Example: See Example "Adjusting clock and trigger settings" on page 57
Manual operation: See "Sync. Output to External Trigger" on page 49

[:SOURce<hw>]:BB:EVDO:TRIGger:OBASeband:DELay <Delay>

When triggering via the other basebands, delays the trigger event compared to the one in the other baseband.

Parameters:
<Delay> float
  Range: 0 to 65535
  Increment: 0.01
  *RST: 0

Example: see [:SOURce<hw>]:BB:EVDO:TRIGger:OBASeband:INHibit on page 70

Manual operation: See "Trigger Delay" on page 50

[:SOURce<hw>]:BB:EVDO:TRIGger:OBASeband:INHibit <Inhibit>

For triggering via the other path, specifies the duration by which a restart is inhibited.

Parameters:
<Inhibit> integer
  Range: 0 to 67108863
  *RST: 0

Example:
  BB:EVDO:TRIG:SOUR OBAS
  sets triggering by the other path
  BB:EVDO:TRIG:INH 200
  sets a restart inhibit for 200 chips following a trigger event.
  BB:EVDO:TRIG:OBASeband:DEL 50
  sets a delay of 50 symbols for the trigger.

Manual operation: See "Trigger Inhibit" on page 50

[: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 57

Usage: Query only

Manual operation: See "Running/Stopped" on page 48

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

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

- **<SLength>**
  - Type: integer
  - Range: 1 to 4294967295
  - RST: 1

Example: See Example "Adjusting clock and trigger settings" on page 57

Manual operation: See "Signal Duration" on page 48

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

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

Parameters:

- **<SLunit>**
  - Options: SLOT | CHIP | SEQuence
  - RST: SEQuence

Example: See Example "Adjusting clock and trigger settings" on page 57

Manual operation: See "Signal Duration Unit" on page 48

### [:SOURce<hw>]:BB:EVDO:TRIGger:SOURce <Source>

Selects the trigger source:

- **INTernal**: manual trigger or *TRG.
- **EXTernal|BEXTernal**: trigger signal on the TRIGGER 1/2 connector.
- **OBASeband**: trigger signal from the other path

Parameters:

- **<Source>**
  - Options: INTernal|OBASeband|BEXTernal|EXTernal
  - RST: INTernal

Example: See Example "Adjusting clock and trigger settings" on page 57

Manual operation: See "Trigger Source" on page 49

### [:SOURce<hw>]:BB:EVDO:TRIGger[:EXTernal<ch>]:DElay <Delay>

Specifies the trigger delay (expressed as a number of chips) for external triggering.

Parameters:

- **<Delay>**
  - Type: float
  - Range: 0 to 65535
  - Increment: 0.01
  - RST: 0

Example: see [:SOURce<hw>]:BB:EVDO:TRIGger[:EXTernal<ch>]:INHibit on page 72

Manual operation: See "Trigger Delay" on page 50
[:SOURce<hw>:]BB:EVDO:TRIGger[:EXTERNAL<ch>:]INHibit <Inhibit>

Specifies the number of chips by which a restart is to be inhibited following a trigger event. This command applies only in the case of external triggering.

Parameters:

<internal integer>

Range: 0 to 67108863

*RST: 0

Example:

BB:EVDO:TRIG:SOUR EXT
selects an external trigger
BB:EVDO:TRIG:INH 200
sets a restart inhibit for 200 chips following a trigger event.
BB:EVDO:TRIG:DEL 50
sets a delay of 50 symbols for the trigger.

Manual operation: See "Trigger Inhibit" on page 50

4.5 Marker Commands

[:SOURce<hw>:]BB:EVDO:TRIGger:OUTPut:DELay:FIXed ................................................. 72
[:SOURce<hw>:]BB:EVDO:TRIGger:OUTPut<ch>:DELay ....................................................72
[:SOURCE<hw>:]BB:EVDO:TRIGger:OUTPut<ch>:MODE ....................................................73
[:SOURCE<hw>:]BB:EVDO:TRIGger:OUTPut<ch>:ONTime ................................................. 74
[:SOURCE<hw>:]BB:EVDO:TRIGger:OUTPut<ch>:OFFTime ................................................74
[:SOURCE<hw>:]BB:EVDO:TRIGger:OUTPut<ch>:PERiod ...................................................74


Restricts the marker delay setting range to the dynamic range.

Parameters:

<internal 0 | 1 | OFF | ON>

*RST: 0

Example: See Example "Configure and enable standard marker signals" on page 58

Manual operation: See "Fix Marker to Current Range" on page 52

[: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.
Remote-Control Commands

Marker Commands

Parameters:

<Delay> float
Range: 0 to max
Increment: 0.001
*RST: 0

Example: See Example "Configure and enable standard marker signals" on page 58

Manual operation: See "Marker x Delay" on page 52

[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:DELay:MINimum?
[:SOURce<hw>]:BB:EVDO:TRIGger:OUTPut<ch>:DELay:MAXimum?
Queries the min/max marker delay.

Return values:
<Maximum> float
Range: 0 to max

Example: See Example "Configure and enable standard marker signals" on page 58

Usage: Query only

Manual operation: See "Current Range without Calculation" on page 52

[: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 | TRIGger
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.

TRIGger
A received internal or external trigger signal is output at the marker connector.

*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 "Marker Mode" on page 51

[: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 58

Manual operation: See "Marker Mode" on page 51

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

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

Parameters:
<Period> integer
Range: 2 to 16777215
*RST: 2

Example: See Example "Configure and enable standard marker signals" on page 58

Manual operation: See "Marker Mode" on page 51

### 4.6 Clock Commands

[:SOURce<hw>]:BB:EVDO:CLOCK:MULTiplier................................................................. 74
[:SOURce<hw>]:BB:EVDO:CLOCK:SOURce.................................................................. 75
[:SOURce<hw>]:BB:EVDO:CLOCK:MODE................................................................... 75
[:SOURce<hw>]:BB:EVDO:CLOCK:SYNChronization:EXECute........................................... 75
[:SOURce<hw>]:BB:EVDO:CLOCK:SYNChronization:MODE............................................. 76

[:SOURce<hw>]:BB:EVDO:CLOCK:MULTiplier <Multiplier>

Sets the multiplier for clock type Multiplied.

For two-path instruments, the only numerical suffix allowed for SOURce is 1, since the external clock source is permanently allocated to path A.
Parameters:

<Multiplier>  integer
Range: 1 to 64
*RST: 4

Example: See Example "Adjusting clock and trigger settings" on page 57

Manual operation: See "Chip Clock Multiplier" on page 53

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

The command selects the clock source.

For two-path instruments, selecting EXTERNAL is only possible for path A, since the external clock source is permanently allocated to path A. Selection AINternal is only possible for path B.

Parameters:

<Source>  INTernal | EXTERNAL | AINternal
INTernal  The internal clock reference is used.
EXTERNAL  The external clock reference is supplied to the CLOCK connector. Commands :BB:EVDO:CLOCk:MODE and :MULTiplier are used to enter the type of the external clock.
AINternal  The clock source of path A is used for path B.
*RST:  INTernal

Example: See Example "Adjusting clock and trigger settings" on page 57

Manual operation: See "Clock Source" on page 53

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

Sets the type of externally supplied clock.

For two-path instruments, the only numerical suffix allowed for SOURce is 1, since the external clock source is permanently allocated to path A.

Parameters:

<Mode>  CHIP | MCHIP
*RST:  CHIP

Example: See Example "Adjusting clock and trigger settings" on page 57

Manual operation: See "Clock Mode" on page 53

[:SOURce<hw>]:BB:EVDO:CLOCk:SYNChronization:EXECute

Performs automatically adjustment of the instrument's settings required for the synchronization mode, set with the command :BB:EVDO:CLOCk:SYNC:MODE.
**Example:**

```plaintext
BB:EVD0:CLOC:SYNC:MODE MAST
```

The instrument is configured to work as a master one.

```plaintext
BB:EVD0:CLOC:SYNC:EXEC
```

All synchronizations settings are adjusted accordingly.

**Usage:**

Event

**Manual operation:** See "Set Synchronization Settings" on page 53

---

```plaintext
[:SOURce<hw>]:BB:EVD0:CLOCK:SYNChronization:MODE <Mode>
```

Selects the synchronization mode.

This parameter is used to enable generation of precise synchronous signal of several connected R&S SMBVs.

**Note:** If several instruments are connected, the connecting cables from the master instrument to the slave one and between each two consecutive slave instruments must have the same length and type. Avoid unnecessary cable length and branching points.

**Parameters:**

- `<Mode>`
  - NONE | MASTER | SLAVE
  - **NONE**
    - The instrument is working in stand-alone mode.
  - **MASTER**
    - The instrument provides all connected instrument with its synchronization (including the trigger signal) and reference clock signal.
  - **SLAVE**
    - The instrument receives the synchronization and reference clock signal from another instrument working in a master mode.

*RST:* NONE

**Example:**

```plaintext
BB:EVD0:CLOC:SYNC:MODE MAST
```

The instrument is configured to work as a master one.

**Manual operation:** See "Sync. Mode" on page 52

---

### 4.7 Access Network Commands

- [:SOURce<hw>]:BB:EVD0:ANETwork:CCChannel:PSOOfset................................................ 77
- [:SOURce<hw>]:BB:EVD0:ANETwork:CCChannel:RATE.................................................. 77
- [:SOURce<hw>]:BB:EVD0:ANETwork:CCChannel:REVision:MAXimum.................................. 77
- [:SOURce<hw>]:BB:EVD0:ANETwork:CCChannel:REVision:MINimum.................................. 78
- [:SOURce<hw>]:BB:EVD0:ANETwork:CCChannel:STATe.................................................. 78
- [:SOURce<hw>]:BB:EVD0:ANETwork:CPMode..................................................................78
- [:SOURce<hw>]:BB:EVD0:ANETwork:OUCount................................................................. 78
- [:SOURce<hw>]:BB:EVD0:ANETwork:PCChannel:STATe?.................................................. 79
- [:SOURce<hw>]:BB:EVD0:ANETwork:RAB:LENGth............................................................. 79
- [:SOURce<hw>]:BB:EVD0:ANETwork:RAB:LEVel............................................................. 79
REMOTE CONTROL COMMANDS

[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:MAC:INDeX
[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:OFFSet
[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:STATe
[:SOURce<hw>]:BB:EVDO:ANETwork:SUBType

### Access Network Commands

#### [:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:PSOFfset <Poffset>
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:**

- **<Poffset>**
  - Type: 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 17

#### [:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:RATE <Rate>
Sets the rate that the control channel messages are transmitted at.

**Parameters:**

- **<Rate>**
  - Type: 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 (Control Channel)" on page 17

#### [:SOURce<hw>]:BB:EVDO:ANETwork:CCHannel:REVision:MAXimum <Maximum>
Sets the value of the maximum revision field within the control channel message.

**Parameters:**

- **<Maximum>**
  - Type: 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 17
Remote-Control Commands

Access Network Commands

[: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 17

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

Enables or disables the control channel messages.

**Parameters:**

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

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

**Manual operation:** See "State (Control Channel)" on page 16

[: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> 0 | 1 | OFF | ON
*RST: 0

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

**Manual operation:** See "Continuous Pilot Mode" on page 16

[: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: \texttt{BB:EVDO:ANET:OUC 5} 
sets the number of additional users to 5.

Manual operation: See "Other Users Count" on page 18

\texttt{[: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: 
\texttt{<State>} 
\begin{tabular}{|c|c|c|c|}
\hline
0 & 1 & OFF & ON \\
\hline
\end{tabular}
*\texttt{RST:} ON

Example: \texttt{BB:EVDO:ANET:PCH:STAT?} 
displays the state of the pilot channel.

Usage: Query only

Manual operation: See "State (Pilot Channel)" on page 16

\texttt{[: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: 
\texttt{<Length>} 
\begin{tabular}{|c|c|c|c|}
\hline
RL8 & RL16 & RL32 & RL64 \\
\hline
\end{tabular}
*\texttt{RST:} 8

Example: \texttt{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 17

\texttt{[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:LEVel <Level>}

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

Parameters: 
\texttt{<Level>} 
\begin{tabular}{|c|}
\hline
float \\
\hline
\end{tabular}
Range: -25 to -7 
Increment: 0.01 
*\texttt{RST:} -7 

Example: \texttt{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 17
[:SOURce<hw>]:BB:EVDO:ANETwork:RAB:MAC:INDex <Index>

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

**Parameters:**
- `<Index>`
  - Type: integer
  - Range: 4 to 127
  - *RST*: 4

**Manual operation:** See "RAB MAC index" on page 18

[: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>`
  - Type: 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 18

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

Activates or deactivates the reverse activity bit (RAB).

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

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

**Manual operation:** See "State (Reverse Activity Bit)" on page 17

[: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>`
  - Values: S1 | S2 | S3
  - *RST*: S2
Example: `BB:EVDO:ANET:SUBT S2`
sets the physical layer subtype to 2.

Options: S3 requires option R&S SMx/AMU-K87


## 4.8 Multi-Carrier Configuration Commands

Multi-Carrier Configuration requires option R&S SMx/AMU-K87

\[
\begin{align*}
[:SOURce<hw>:BB:EVDO:UP:MC:CFrequency?] & :81 \\
[:SOURce<hw>:BB:EVDO:DOWN:MC:CFrequency?] & :81 \\
[:SOURce<hw>:BB:EVDO:UP:MC:CDELay] & :82 \\
[:SOURce<hw>:BB:EVDO:DOWN:MC:CDELay] & :82 \\
\end{align*}
\]

\[
[:SOURce<hw>:BB:EVDO:DOWN:MC:BClass <BandClass>]
\]

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

\textbf{BC17} is supported in downlink only.

Parameters:

\textbf{<BandClass>}


*RST:* BC0

Example: see Example "Generating a downlink multicarrier signal" on page 59

Options: R&S SMx/AMU-K87

Manual operation: See "Band Class" on page 19

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

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 59

Usage: Query only

Options: R&S SMx/AMU-K87

Manual operation: See "Center Frequency (band)" on page 19

[: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 59

Options: R&S SMx/AMU-K87

Manual operation: See "Carrier Delay" on page 19

[: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> 0 | 1 | OFF | ON
*RST: 0

Example: see Example "Generating a downlink multicarrier signal" on page 59

Options: R&S SMx/AMU-K87

Manual operation: See "State" on page 19

[: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 59

Options: R&S SMx/AMU-K87

Manual operation: See "CDMA Channel Number" on page 20

[: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 59

Options: R&S SMx/AMU-K87

Manual operation: See "Center Frequency" on page 20

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

Enables or disables multi-carrier operation.

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

Example: See Example "Generating a downlink multicarrier signal" on page 59

Options: R&S SMx/AMU-K87

4.9 Configure Traffic User Commands

[:SOURce<hw>]:BB:EVDO:USER<st>:DATA:PATTern ........................................................84
[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:LENGth .................................................... 84
[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:OFFSet .................................................... 85
[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:PERiod .....................................................85
Configure Traffic User Commands

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

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 32 bits and in a hexadecimal format.

Parameters:

- <Pattern> 32 bits

Example:

```
BB:EVDO:USER2:DTA:PATT #H55aa55aa
```

Sets the data pattern for user 2.

Manual operation: See "Data Pattern (hex)" on page 28

[: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 30
[:SOURce<hw>]:BB:EVDO:USER<st>:DRCLock:OFSet <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

Sets the reverse link frame offset to 5.

Manual operation: See "Frame Offset" on page 30

[: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 30

[: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> 0 | 1 | OFF | ON
*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 29

[: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**
    - 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:

```plaintext
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 30

```
[: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:

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

Manual operation: See "Interleave Factor" on page 28

```
[: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:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Index&gt;</td>
<td>integer</td>
</tr>
<tr>
<td>Range:</td>
<td>5 to 63 for physical layer subtype 0&amp;1, 6 to 127 for physical layer subtype 2, 4 to 383 for physical layer subtype 3</td>
</tr>
<tr>
<td>*RST:</td>
<td>Physical layer subtype 0&amp;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</td>
</tr>
</tbody>
</table>

Example:

```
BB:EVDO:USER2:MAC:IND 6
```

Sets the MAC index for user 2 to 16.

Manual operation: See "MAC Index" on page 28

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

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

Parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Level&gt;</td>
<td>float</td>
</tr>
<tr>
<td>Range:</td>
<td>-25 to -7</td>
</tr>
<tr>
<td>Increment:</td>
<td>0.01</td>
</tr>
<tr>
<td>*RST:</td>
<td>-7</td>
</tr>
</tbody>
</table>

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 28

[: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:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Count&gt;</td>
<td>integer</td>
</tr>
<tr>
<td>Range:</td>
<td>0 to 65536</td>
</tr>
<tr>
<td>*RST:</td>
<td>65536</td>
</tr>
</tbody>
</table>
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 22

Example:  
[:SOURce<hw>]:BB:EVDO:USER<st>:PACKet:INFinite <Infinite>  
Enables or disables sending an unlimited number of packets to the selected user.

Parameters:  

- **<Infinite>**  
  - 0 | 1 | OFF | ON  
  - **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 to 10.

Manual operation: See "Number of Packets to Send - Infinite" on page 22

Example:  
[: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 to 10.

Manual operation: See "Packet Start Offset" on page 22
[: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:**

<table>
<thead>
<tr>
<th>&lt;PSize&gt;</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PS128</td>
<td>PS256</td>
</tr>
<tr>
<td>PS512</td>
<td>PS768</td>
</tr>
<tr>
<td>PS1024</td>
<td>PS1536</td>
</tr>
<tr>
<td>PS2048</td>
<td>PS3072</td>
</tr>
<tr>
<td>PS4096</td>
<td>PS5120</td>
</tr>
<tr>
<td>PS6144</td>
<td>PS8192</td>
</tr>
<tr>
<td>PS12288</td>
<td>PS1536</td>
</tr>
<tr>
<td>PS7168</td>
<td></td>
</tr>
</tbody>
</table>

*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 rate for user 2.
Response: 76.8 kbps

**Manual operation:** See "Packet Size" on page 27

[: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:**

<table>
<thead>
<tr>
<th>&lt;Rate&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR4K8</td>
</tr>
<tr>
<td>DR9K6</td>
</tr>
<tr>
<td>DR19K2</td>
</tr>
<tr>
<td>DR38K4</td>
</tr>
<tr>
<td>DR76K8</td>
</tr>
<tr>
<td>DR153K6</td>
</tr>
<tr>
<td>DR307K2</td>
</tr>
<tr>
<td>DR614K4</td>
</tr>
<tr>
<td>DR921K6</td>
</tr>
<tr>
<td>DR1228K8</td>
</tr>
<tr>
<td>DR1536K</td>
</tr>
<tr>
<td>DR1843K2</td>
</tr>
<tr>
<td>DR2457K6</td>
</tr>
<tr>
<td>DR3072K</td>
</tr>
<tr>
<td>DR460K8</td>
</tr>
<tr>
<td>DR768K</td>
</tr>
<tr>
<td>DR1075K2</td>
</tr>
<tr>
<td>DR2150K4</td>
</tr>
<tr>
<td>DR3686K4</td>
</tr>
<tr>
<td>DR4300K8</td>
</tr>
<tr>
<td>DR4915K2</td>
</tr>
</tbody>
</table>

*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 27
[: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 23


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:INJ

The user defined RPC pattern is inserted at the end of the current RPC mode.

**Usage:** Event
Remote-Control Commands

[: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 28

[: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 RANGE
    Sets the mode of the Reverse Power Control (RPC) Channel within the MAC channel for user 2 to range.
   Sets the number of RPC bits to 200.

Manual operation: See "RPC Range Count" on page 29

[: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 29

![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 29

![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 27

![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.
4.10 Configure Access Terminal Commands

Parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;State&gt;</td>
<td>0</td>
</tr>
</tbody>
</table>

*RST: ON (user 1); OFF (user 2 .. 4)*

Example:

```
BB:EVDO:USER2:STAT ON
```

Activates user 2.

Manual operation: See "Configure Traffic Channels" on page 15
Configure Access Terminal Commands

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DRCChannel:VALues......................... 110
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DSCChannel:GAIN........................................ 110
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DSCChannel:LENGTH........................................ 110
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DSCChannel:STATE........................................ 111
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DSCChannel:VALues........................................ 111
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:IMASK.............................................................. 111
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:MODE................................................................. 112
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:PCChannel:GAIN........................................... 112
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:PCChannel:STATE?............................................ 112
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:PLENgh.............................................................. 113
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:QMASK............................................................... 113
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:RRIChannel:GAIN............................................. 113
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:RRIChannel:STATE........................................... 113
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:STATA.............................................................. 114
[:SOURce<hw>]:BB:EVDO:TERMinal<st>:SUBType............................................................ 114

[: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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>USER</td>
<td>There are no predefined settings</td>
</tr>
<tr>
<td>ULS1DR9K6</td>
<td>UL, Subtype 1, 9.6 kbps.</td>
</tr>
<tr>
<td>ULS1DR19K2</td>
<td>UL, Subtype 1, 19.2 kbps.</td>
</tr>
<tr>
<td>ULS1DR38K4</td>
<td>UL, Subtype 1, 38.4 kbps.</td>
</tr>
<tr>
<td>ULS1DR76K8</td>
<td>UL, Subtype 1, 76.8 kbps.</td>
</tr>
<tr>
<td>ULS1DR153K6</td>
<td>UL, Subtype 1, 153.6 kbps.</td>
</tr>
<tr>
<td>ULS2PS128LL</td>
<td>UL, Subtype 2, 128 bits payload, Low Latency.</td>
</tr>
<tr>
<td>ULS2PS256HC</td>
<td>UL, Subtype 2, 256 bits payload, High Capacity.</td>
</tr>
<tr>
<td>ULS2PS256LL</td>
<td>UL, Subtype 2, 256 bits payload, Low Latency.</td>
</tr>
<tr>
<td>ULS2PS512LL</td>
<td>UL, Subtype 2, 512 bits payload, Low Latency.</td>
</tr>
<tr>
<td>ULS2PS768LL</td>
<td>UL, Subtype 2, 768 bits payload, Low Latency.</td>
</tr>
<tr>
<td>ULS2PS1024LL</td>
<td>UL, Subtype 2, 1024 bits payload, Low Latency.</td>
</tr>
<tr>
<td>ULS2PS1536LL</td>
<td>UL, Subtype 2, 1536 bits payload, Low Latency.</td>
</tr>
<tr>
<td>ULS2PS2048LL</td>
<td>UL, Subtype 2, 2048 bits payload, Low Latency.</td>
</tr>
<tr>
<td>ULS2PS3072LL</td>
<td>UL, Subtype 2, 3072 bits payload, Low Latency.</td>
</tr>
<tr>
<td>ULS2PS4096LL</td>
<td>UL, Subtype 2, 4096 bits payload, Low Latency.</td>
</tr>
<tr>
<td>ULS2PS6144LL</td>
<td>UL, Subtype 2, 6144 bits payload, Low Latency.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ULS2PS8192LL</td>
<td>UL, Subtype 2, 8192 bits payload, Low Latency.</td>
</tr>
<tr>
<td>ULS2PS12288LL</td>
<td>UL, Subtype 2, 12288 bits payload, Low Latency.</td>
</tr>
</tbody>
</table>

**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.

**Manual operation:** See "Predefined Settings" on page 14

[: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 (ACK Channel)" on page 37

[: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) (ACK Channel)" on page 38

[:SOURce<hw>]:BB:EVDO:TERminal<st>:ACKC:hannel: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 (ACK Channel)" on page 37

[:SOURce<hw>]:BB:EVDO:TERminal<st>:ACKC:hannel:STATe <State>
(enabled for access terminal working in traffic mode)
Enables or disables the ACK channel.

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

Example: BB:EVDO:TERM2:ACKC:STAT OFF
Deactivates the ACK channel for terminal 2.

Manual operation: See "State (ACK Channel)" on page 37
[: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 (ACK Channel)" on page 38

[: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 34

[: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 34

```
[: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 (Auxiliary Pilot Channel)" on page 35

```
[: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 (Auxiliary Pilot Channel)" on page 35

```
[: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>`  
  0 | 1 | OFF | ON  
  *RST:* 1  

**Example:**

```
BB:EVDOD:TERM2:APCH:STAT OFF
```

Deactivates the auxiliary pilot channel for terminal 2.

**Manual operation:** See "State (Auxiliary Pilot Channel)" on page 34

```
[:SOURce<hw>]:BB:EVDOD:TERMinal<st>:DCHannel:CLENgth <CLength>
```

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:EVDOD:TERM2:MODE ACC
```

Enables terminal 2 to work in access mode.

```
BB:EVDOD:TERM2:DCH:CLEN 10
```

For terminal two, ten frames will be transmitted after the preamble.

**Manual operation:** See "Capsule Length (Data Channel)" on page 43

```
[:SOURce<hw>]:BB:EVDOD: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:EVDOD:TERMinal2:DChannel:DATA PATTern
```

Sets the data source of terminal 2 to pattern.

```
SOURce:BB:EVDOD:TERMinal2:DChannel:DATA:PATTern
#H3F,8
```

Sets the pattern for the data source of terminal 2.
Example: SOURce:BB:EVDO:TERminal2:DChannel:DATA DLIS
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 <root>datalists and have a file extension *.dm_iqd.

Manual operation: See "Data List Management" on page 13

[: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 99
Manual operation: See "Data List Management" on page 13

[:SOURce<hw>]:BB:EVDO:TERminal<st>:DChannel:DATA:PATTern <Pattern>
Selects the bit pattern for the data source.
Parameters:
<Pattern> 64 bits
Example: see [:SOURce<hw>]:BB:EVDO:TERminal<st>:DChannel:DATA on page 99
Manual operation: See "Data Source (Data Channel)" on page 43

[: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 (Data Channel)" on page 43

[:SOURce<hw>]:BB:EVDO:TERMi<st>:DCH: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>`
  - `0` | `1` | OFF | ON
  - *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 (Data Channel)" on page 44

[:SOURce<hw>]:BB:EVDO:TERMi<st>:DCH: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 (Data Channel)" on page 43

[:SOURce<hw>]:BB:EVDO:TERMi<st>:DCH<ch>:CCODing

(enabled for an access terminal working in traffic mode)

Activates or deactivates channel coding, including scrambling, turbo encoding and channel interleaving.
Remote-Control Commands

Configure Access Terminal Commands

Parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;CCoding&gt;</td>
<td>0</td>
</tr>
</tbody>
</table>

*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 (Packet)" on page 41

[: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:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Count&gt;</td>
<td>integer</td>
</tr>
<tr>
<td>Range:</td>
<td>0 to 65536</td>
</tr>
<tr>
<td>*RST:</td>
<td>65536</td>
</tr>
</tbody>
</table>

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 number of packets.

Sets number of packets to be sent to 2000.

Manual operation: See "Number of Packets to Send (Packet)" on page 40

[: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 | DLlSt

*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.
PATTern
Sets the data source of terminal 2 to pattern.
DLlSt
Sets the pattern for the data source of terminal 2.

Example:

SOURce:BB:EVDO:TERMinal2:DCHannel:PACKet1:DATA
DLlSt
Sets the data source of terminal 2, packet 1 to data list.
MMEM:CDIR "<root>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 <root>datalists and have a file extension
*.dm_iqd.

Manual operation: See "Data List Management" on page 13

[: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 102

Manual operation: See "Data List Management" on page 13

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:DCHannel:PACKet<ch>:DATA:
PATTern <Pattern>
(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.
Remote-Control Commands

Configure Access Terminal Commands

Parameters:
<Pattern> 64 bits

Example: see [:SOURce<hw>]:BB:EVDO:TERminal<st>:DCHannel:PACKet<ch>:DATA on page 102

Manual operation: See "Data Source (Packet)" on page 41

[: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 (Packet)" on page 41

[: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> 0 | 1 | OFF | ON
*RST: ON

Example:
BB:EVDO:TERM2:MODE ACC
enables terminal 2 to work in access mode.
disables appending of FCS to the MAC layer for terminal 2, packet 1.

Manual operation: See "FCS (Packet)" on page 42

(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>`
  - Type: 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.
Sets the relative gain of packet 3 dB to -10 dB
```

**Manual operation**: See "Relative Gain (Packet)" on page 39


(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>`
  - Values: 0 | 1 | OFF | ON
  - *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 number of packets.
Sets number of packets to be sent to 2000.
```

**Manual operation**: See "Infinite Packets (Packet)" on page 39


[[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:**

<table>
<thead>
<tr>
<th>&lt;Modulation&gt;</th>
<th>B4</th>
<th>Q4</th>
<th>Q2</th>
<th>Q4Q2</th>
<th>E4E2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B4</strong></td>
<td>The modulation type is set to BPSK modulation with 4-ary Walsh cover.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Q4</strong></td>
<td>The modulation type is set to QPSK modulation with 4-ary Walsh cover.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Q2</strong></td>
<td>The modulation type is set to QPSK modulation with 2-ary Walsh cover.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Q4Q2</strong></td>
<td>Sum of Q4 and Q2 modulated symbols.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>E4E2</strong></td>
<td>Sum of E4 (8-PSK modulated with 4-ary Walsh cover) and E2 (8-PSK modulated with 2-ary Walsh cover) modulated symbols.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*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 (Packet)" on page 40


[[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:**

<table>
<thead>
<tr>
<th>&lt;PSize&gt;</th>
<th>PS128</th>
<th>PS256</th>
<th>PS512</th>
<th>PS768</th>
<th>PS1024</th>
<th>PS1536</th>
<th>PS2048</th>
<th>PS3072</th>
<th>PS4096</th>
<th>PS6144</th>
<th>PS8192</th>
<th>PS12288</th>
</tr>
</thead>
</table>

**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.


sets the payload size fro packet 3 to 512.

**Manual operation:**

See "Payload Size (Packet)" on page 40
Remote-Control Commands

[: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>

0 | 1 | OFF | ON

*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 (Packet)" on page 38


(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.
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 "Number of Subpackets (Packet)" on page 40

[: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.
Configure Access Terminal Commands

Parameters:

**<State>**

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<thead>
<tr>
<th>0</th>
<th>1</th>
<th>OFF</th>
<th>ON</th>
</tr>
</thead>
</table>

*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 (Data Channel)" on page 42

\[ [:SOURce<hw>]:BB:EVDO:TER{inal<st>}:DQSPreading <DqSpreading> \]

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

Parameters:

**<DqSpreading>**

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>OFF</th>
<th>ON</th>
</tr>
</thead>
</table>

*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 33

\[ [:SOURce<hw>]:BB:EVDO:TER{inal<st>}:DRCChannel:COVer <Cover> \]

(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 (DRC Channel)" on page 37

\[ [:SOURce<hw>]:BB:EVDO:TER{inal<st>}:DRCChannel:GAIN <Gain> \]

(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:

\(<\text{Gain}>\)  float
Range:  -80 dB  to  10 dB
Increment:  -
*RST:  0 dB

Example:  \(\text{BB:EVDO:TERM2:DRCC:GAIN 10}\)  sets the relative gain for DRC to 10 dB.

Manual operation:  See "Relative Gain (DRC Channel)" on page 36

\([:\text{SOURce<hw>:BB:EVDO:TERMinal<st>:DRCChannel:GATing[:STATe]}<\text{State}>\)  (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 \(\text{DRCLength}-1\) empty slots.
With deactivated gating, each DRC value is repeated for DRC length slots.

Parameters:

\(<\text{State}>\)  0 | 1 | OFF | ON
*RST:  ON


Manual operation:  See "Gating Active (DRC Channel)" on page 37

\([:\text{SOURce<hw>:BB:EVDO:TERMinal<st>:DRCChannel:LENGth}<\text{Length}>\)  (enabled for an access terminal working in traffic mode)
Specifies the transmission duration of the Data Rate Control (DRC) channel in slots.

Parameters:

\(<\text{Length}>\)  DL1 | DL2 | DL4 | DL8
*RST:  DL1

Example:  \(\text{BB:EVDO:TERM2:DRCC:LENG DL2}\)  Sets the transmission duration of DRC to two slots.

Manual operation:  See "Length (DRC Channel)" on page 36

\([:\text{SOURce<hw>:BB:EVDO:TERMinal<st>:DRCChannel:STATe}<\text{State}>\)  (enabled for an access terminal working in traffic mode)
Enables or disables the state of the Data Rate Control (DRC) channel.
Parameters:

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

Example: BB:EVDO:TERM2:DRCC:STAT OFF
deactivates DRC channel.

Manual operation: See "State (DRC Channel)" on page 36

[: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) (DRC Channel)" on page 36

[: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 (DSC Channel)" on page 35

[: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 (DSC Channel)" on page 36

[: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> 0 | 1 | OFF | ON
*RST: ON

Example: BB:EVDO:TERM2:DSCC:STAT OFF
deactivates DSC channel.

Manual operation: See "State (DSC Channel)" on page 35

[: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) (DSC Channel)" on page 36

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:IMASk <IMask>

Sets the long code mask of the I channel.

Parameters:
<IMask> 44 bits
*RST: #H00000000000
Example: \texttt{BB:EVDO:TERM2:IMAS \#H2FFFFFFFFF,42}
sets the long code mask for I channel to \#H2FFFFFFFFF,42.

Manual operation: See "Long Code Mask I (hex)" on page 33

\textbf{[:SOURce<hw>]:BB:EVDO:TERminal<st>:MODE <Mode>}

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

Parameters:
\begin{itemize}
  \item \texttt{<Mode>} \hspace{2cm} \texttt{ACCess | TRAFFic}
  \item \texttt{*RST:} \hspace{2cm} \texttt{TRAFFic}
\end{itemize}

Example: \texttt{BB:EVDO:TERM2:MODE ACC}
sets the mode of terminal 2 to access.

Manual operation: See "Mode (Access Terminal)" on page 33

\textbf{[: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:
\begin{itemize}
  \item \texttt{<Gain>} \hspace{2cm} \texttt{float}
  \item Range: \hspace{2cm} -80 to 10 dB
  \item Increment: \hspace{2cm} 0.01
  \item \texttt{*RST:} \hspace{2cm} 0 dB
\end{itemize}

Example: \texttt{BB:EVDO:TERM2:PCH:GAIN 10}
sets the gain of pilot channel to 10 dB.

Manual operation: See "Gain (Pilot Channel)" on page 34

\textbf{[:SOURce<hw>]:BB:EVDO:TERminal<st>:PCHannel:STATe?}

Displays the state of the pilot channel.

\textbf{Note:} The pilot channel is always switched on.

Return values:
\begin{itemize}
  \item \texttt{<State>} \hspace{2cm} 0 | 1 | OFF | ON
  \item \texttt{*RST:} \hspace{2cm} ON
\end{itemize}

Example: \texttt{BB:EVDO:TERM2:PCH:STAT?}
queries the state of the pilot channel.

Usage: Query only

Manual operation: See "State (Pilot Channel)" on page 34
[: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 34

[: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  
ssets the long code mask for I channel to #H3FFFFFFFFFFF,42.

**Manual operation:**  
See "Long Code Mask Q (hex)" on page 33

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:RRICchannel: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 (RRI Channel)" on page 35

[:SOURce<hw>]:BB:EVDO:TERMinal<st>:RRICchannel: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> 0 | 1 | OFF | ON
*RST: ON

Example: BB:EVDO:TERM2:RRIC:STAT OFF
Disables the RRI channel.

Manual operation: See "State (RRI Channel)" on page 35

[: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> 0 | 1 | OFF | ON
*RST: ON (access terminal 1)

Example: BB:EVDO:TERM2:RRIC:STAT OFF
Disables the RRI channel.

Manual operation: See "Configure Access Terminals" on page 15

[: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 (Access Terminal)" on page 33
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