

R&S®SMW-K130/-K355

OneWeb User-Defined Signal Generation, OneWeb Reference Signals

User Manual



1178571402



ROHDE & SCHWARZ

User Manual

Version 05

This document describes the following software options:

- R&S®SMW-K130/-K355
1414.3788.xx, 1414.3742.xx

This manual describes firmware version FW 4.70.026.xx and later of the R&S®SMW200A.

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1 Preface

1.1 About this Manual

This user manual provides all the information **specific to the option OneWeb**. All general instrument functions and settings common to all applications and operating modes are described in the main R&S SMW user manual.

The main focus in this manual is on the provided settings and the tasks required to generate a signal. The following topics are included:

- **Welcome to the OneWeb option R&S SMW-K130/-K355**
Introduction to and getting familiar with the option
- **About the OneWeb option**
Background information on basic terms and principles in the context of the signal generation
- **OneWeb Configuration and Settings**
A concise description of all functions and settings available to configure signal generation with their corresponding remote control command
- **Remote Control Commands**
Remote commands required to configure and perform signal generation in a remote environment, sorted by tasks
(Commands required to set up the instrument or to perform common tasks on the instrument are provided in the main R&S SMW user manual)
Programming examples demonstrate the use of many commands and can usually be executed directly for test purposes
- **Glossary**
Alphabetical list of often used terms and abbreviations
- **List of remote commands**
Alphabetical list of all remote commands described in the manual
- **Index**

1.2 Documentation Overview

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

www.rohde-schwarz.com/manual/smw200a

1.2.1 Getting Started Manual

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

1.2.2 User Manuals and Help

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

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

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

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

1.2.3 Tutorials

The R&S SMW provides interactive examples and demonstrations on operating the instrument in form of tutorials. A set of tutorials is available directly on the instrument.

1.2.4 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>).

1.2.5 Instrument Security Procedures

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

1.2.6 Basic Safety Instructions

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

1.2.7 Data Sheets and Brochures

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

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

See www.rohde-schwarz.com/brochure-datasheet/smw200a

1.2.8 Release Notes and Open Source Acknowledgment (OSA)

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

The open source acknowledgment document provides verbatim license texts of the used open source software.

See www.rohde-schwarz.com/firmware/smw200a

1.2.9 Application Notes, Application Cards, White Papers, etc.

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

See www.rohde-schwarz.com/application/smw200a and www.rohde-schwarz.com/manual/smw200a

1.3 Conventions Used in the Documentation

1.3.1 Typographical Conventions

The following text markers are used throughout this documentation:

Convention	Description
"Graphical user interface elements"	All names of graphical user interface elements on the screen, such as dialog boxes, menus, options, buttons, and softkeys are enclosed by quotation marks.
[Keys]	Key and knob names are enclosed by square brackets.
Filenames, commands, program code	Filenames, commands, coding samples and screen output are distinguished by their font.
<i>Input</i>	Input to be entered by the user is displayed in italics.

Convention	Description
Links	Links that you can click are displayed in blue font.
"References"	References to other parts of the documentation are enclosed by quotation marks.

1.3.2 Conventions for Procedure Descriptions

When operating the instrument, several alternative methods may be available to perform the same task. In this case, the procedure using the touchscreen is described. Any elements that can be activated by touching can also be clicked using an additionally connected mouse. The alternative procedure using the keys on the instrument or the on-screen keyboard is only described if it deviates from the standard operating procedures.

The term "select" may refer to any of the described methods, i.e. using a finger on the touchscreen, a mouse pointer in the display, or a key on the instrument or on a keyboard.

1.3.3 Notes on Screenshots

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

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

2 Welcome to the OneWeb Option

The R&S SMW-K130/-K355 is a firmware application that adds functionality to generate signals based on the OneWeb specification. In particular, R&S SMW-K130 is used for internal user-defined signal generation of OneWeb signals.

With the provided functions, you can load predefined reference signals and generate signals out of them.

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

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

www.rohde-schwarz.com/manual/SMW200A

Installation

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

2.1 Accessing the OneWeb Dialog

To open the dialog with OneWeb settings

1. In the block diagram of the R&S SMW, select "Baseband > OneWeb".
A dialog box opens that displays the provided general settings.
The signal generation is not started immediately.
2. To start signal generation, select "Reference Signals" and select one of the provided files.
3. Select "State > On".

2.2 Scope



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

In particular, it includes:

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

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

3 About OneWeb Option

The OneWeb option enables you to generate signals based on the OneWeb specification.

- [Required Options](#)..... 13
- [Provided Reference Signals](#)..... 13

3.1 Required Options

The basic equipment layout for generating signals according to the OneWeb specifications includes the options:

- Standard or wideband Baseband Generator (R&S SMW-B10/-B9)
- Baseband Main Module (R&S SMW-B13) or Wideband baseband main module (R&S SMW-B13XT)
- Option OneWeb reference signals (R&S SMW-K355)
- Option OneWeb user-defined signal (R&S SMW-K130)
- Frequency option (e.g. R&S SMW-B1003)

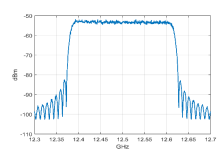
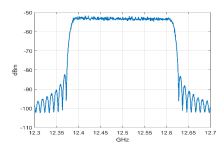
To play back a signal from a waveform file created by the simulation software R&S WinIQSIM2, the corresponding R&S WinIQSIM2 digital standard option must be installed.

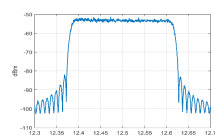
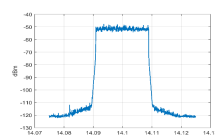
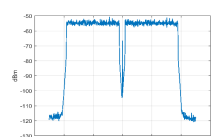
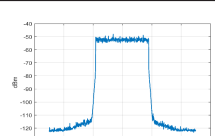
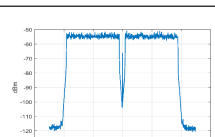
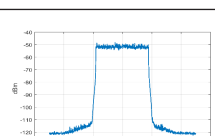
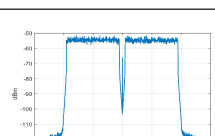
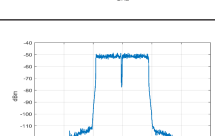
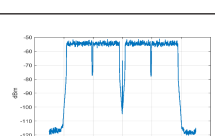
For more information, see data sheet.

3.2 Provided Reference Signals

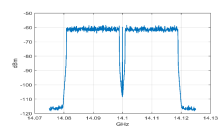
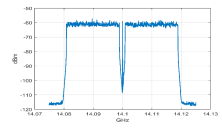
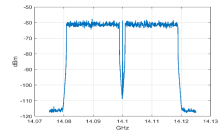
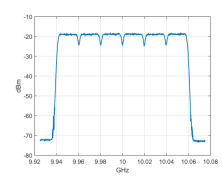
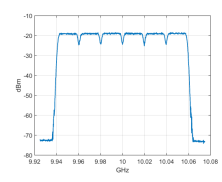
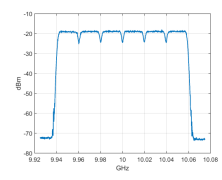
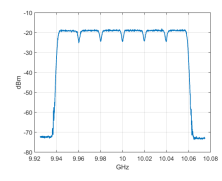
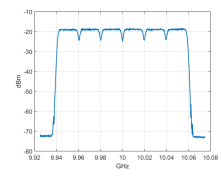
For an overview of the supported reference signals depending on the installed options, see [Table 3-1](#).

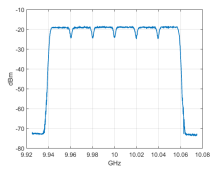
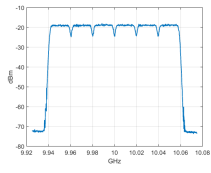
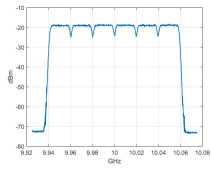
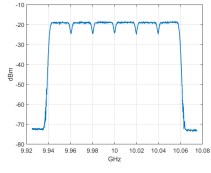
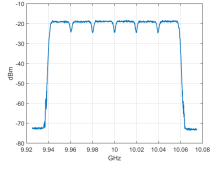
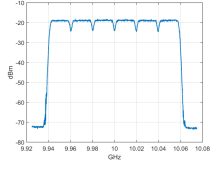
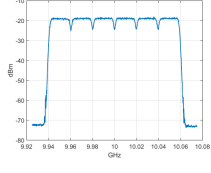
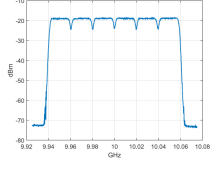
Table 3-1: Reference signals

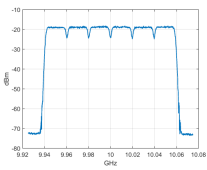
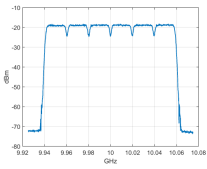
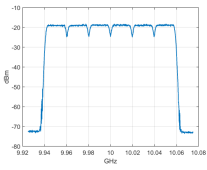
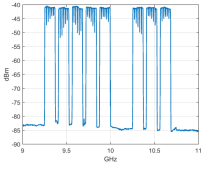
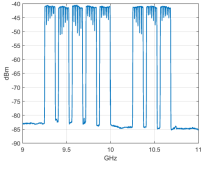
Filename	Description	R&S SMW-B9	R&S SMW-B10	
HY11-H9878-2_2.0_FL_8psk_736399.8358.wv	Length: 1 Frame Sampling Rate: 921.600MHz FL_8PSK	x		
HY11-H9878-2_2.0_FL_16qam_736399.8052.wv	Length: 1 Frame Sampling Rate: 921.600MHz FL_16QAM	x		

Filename	Description	R&S SMW-B9	R&S SMW-B10	
HY11- H9878-2_2.0_FL_qpsk_ 736399.837.wv	Length: 1 Frame Sampling Rate: 921.600MHz FL_QPSK	x		
HY11- H9951-2_2.0_RL_8PSK _1CC_1cl_736371.1831 .wv	Length: 1 Frame Sampling Rate: 30.720MHz RL_8PSK	x	x	
HY11- H9951-2_2.0_RL_8PSK _2CC_1cl_736371.1817 .wv	Length: 1 Frame Sampling Rate: 61.44MHz RL_8PSK	x	x	
HY11- H9951-2_2.0_RL_16QA M_1CC_1cl_736371.18 33.wv	Length: 1 Frame Sampling Rate: 30.72MHz RL_16QAM	x	x	
HY11- H9951-2_2.0_RL_16QA M_2CC_1cl_736371.18 23.wv	Length: 1 Frame Sampling Rate: 61.44MHz RL_16QAM	x	x	
HY11- H9951-2_2.0_RL_QPS K_1CC_1cl_736371.182 7.wv	Length: 1 Frame Sampling Rate: 30.72MHz RL_QPSK	x	x	
HY11- H9951-2_2.0_RL_QPS K_2CC_1cl_736371.18. wv	Length: 1 Frame Sampling Rate: 61.44MHz RL_QPSK	x	x	
HY11- HA563-1_1.0_RL_8PSK _1CC_2cl_736408.2524 .wv	Length: 1 Frame Sampling Rate: 30.72MHz RL_8PSK	x	x	
HY11- HA563-1_1.0_RL_8PSK _2CC_2cl_736408.2531 .wv	Length: 1 Frame Sampling Rate: 61.44MHz RL_8PSK	x	x	

Filename	Description	R&S SMW-B9	R&S SMW-B10	
HY11- HA563-1_1.0_RL_16QA M_1CC_2cl_736408.25 21.wv	Length: 1 Frame Sampling Rate: 30.72MHz RL_16QAM	x	x	
HY11- HA563-1_1.0_RL_16QA M_2CC_2cl_736408.25 28.wv	Length: 1 Frame Sampling Rate: 61.44MHz RL_16QAM	x	x	
HY11- HA563-1_1.0_RL_QPS K_1CC_2cl_736408.251 8.wv	Length: 1 Frame Sampling Rate: 30.72MHz RL_QPSK	x	x	
HY11- HA563-1_1.0_RL_QPS K_2CC_2cl_736408.252 7.wv	Length: 1 Frame Sampling Rate: 61.44MHz RL_QPSK	x	x	
HY11- HA610-1_1.0_FLwvfm7 36292.5983.8psk.notch. wv	Length: 1 Frame Sampling Rate: 921.600MHz FL_8PSK	x		
HY11- HA610-1_1.0_FLwvfm7 36292.5996.qpsk.notch. wv	Length: 1 Frame Sampling Rate: 921.600MHz QPSK	x		
HY11- HA610-1_1.0_FLwvfm7 36345.2465.16qam.notc h.wv	Length: 1 Frame Sampling Rate: 921.600MHz FL_16QAM	x		
HY11- HA674-1_1.0_RL_8PSK _1CC_TDD_736523.40 25.wv	Length: 1 Frame Sampling Rate: 30.72MHz RL_8PSK	x	x	
HY11- HA674-1_1.0_RL_16QA M_1CC_TDD_736523.4 179.wv	Length: 1 Frame Sampling Rate: 30.72MHz RL_16QAM	x	x	
HY11- HA674-1_1.0_RL_QPS K_1CC_TDD_736523.4 201.wv	Length: 1 Frame Sampling Rate: 30.72MHz RL_QPSK	x	x	

Filename	Description	R&S SMW-B9	R&S SMW-B10	
HY11- HA674-2_1.0_RL_8PSK _2CC_TDD_736523.43 83.wv	Length: 1 Frame Sampling Rate: 61.44MHz RL_8PSK	x	x	
HY11- HA674-2_1.0_RL_16QAM _2CC_TDD_736523.4 41.wv	Length: 1 Frame Sampling Rate: 61.44MHz RL_16QAM	x	x	
HY11- HA674-2_1.0_RL_QPSK _2CC_TDD_736523.4 217.wv	Length: 1 Frame Sampling Rate: 61.44MHz RL_QPSK	x	x	
OneWeb_RL_6Car- rier_8PSK_channel1.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_8PSK	x		
OneWeb_RL_6Car- rier_8PSK_channel2.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_8PSK	x		
OneWeb_RL_6Car- rier_8PSK_channel3.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_8PSK	x		
OneWeb_RL_6Car- rier_8PSK_channel4.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_8PSK	x		
OneWeb_RL_6Car- rier_8PSK_channel5.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_8PSK	x		

Filename	Description	R&S SMW-B9	R&S SMW-B10	
OneWeb_RL_6Carrier_8PSK_channel6.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_8PSK	x		
OneWeb_RL_6Carrier_8PSK_channel7.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_8PSK	x		
OneWeb_RL_6Carrier_8PSK_channel8.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_8PSK	x		
OneWeb_RL_6Carrier_QPSK_channel1.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_QPSK	x		
OneWeb_RL_6Carrier_QPSK_channel2.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_QPSK	x		
OneWeb_RL_6Carrier_QPSK_channel3.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_QPSK	x		
OneWeb_RL_6Carrier_QPSK_channel4.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_QPSK	x		
OneWeb_RL_6Carrier_QPSK_channel5.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_QPSK	x		

Filename	Description	R&S SMW-B9	R&S SMW-B10	
OneWeb_RL_6Carrier_QPSK_channel6.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_QPSK	x		
OneWeb_RL_6Carrier_QPSK_channel7.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_QPSK	x		
OneWeb_RL_6Carrier_QPSK_channel8.wv	Length: 1 Frame Sampling Rate: 258.774200 MHz RL_6Carrier_QPSK	x		
OneWeb_RL_48Carrier_8PSK.wv	Length: 1 Frame Sampling Rate:2.4GHz RL_48Carrier_QPSK	x		
OneWeb_RL_48Carrier_QPSK_v4.wv	Length: 1 Frame Sampling Rate:2.4GHz RL_48Carrier_8PSK	x		

4 OneWeb Configuration and Settings

Access:

- Select "Baseband > OneWeb".

The remote commands required to define these settings are described in [Chapter 6, "Remote-Control Commands"](#), on page 137.

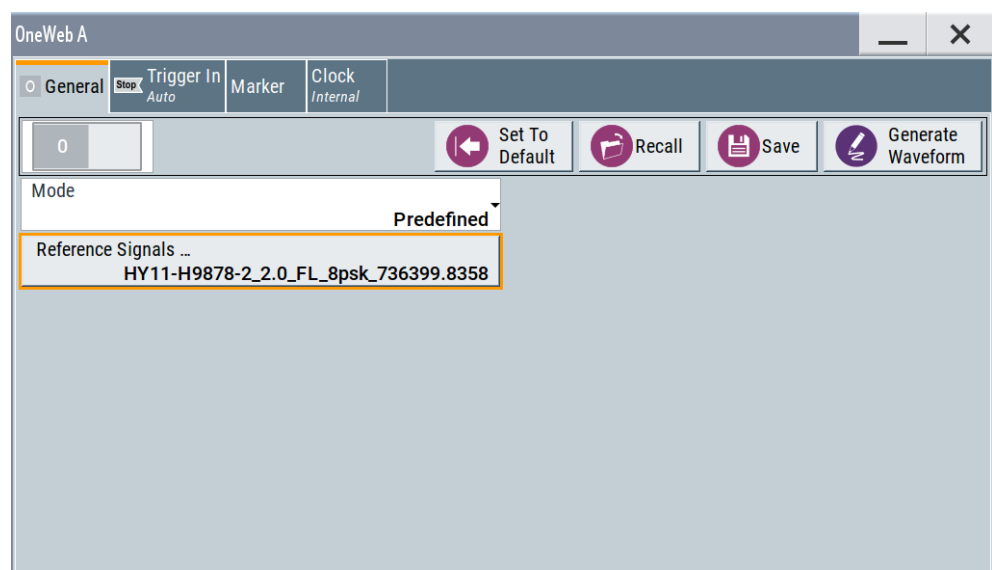
Settings:

• General Settings	19
• Predefined Mode Settings	21
• User-defined Mode Settings	22
• General Downlink Settings	23
• Downlink Frame Configuration	31
• General Uplink Settings	59
• Uplink Frame Configuration	75
• User Equipment Configuration	96
• Trigger Settings	115
• Marker Settings	121
• Clock Settings	122
• Filter/Clipping/ARB Configuration	124
• Local and Global Connector Settings	133

4.1 General Settings

Access:

- Select "Baseband > Beyond 3G Standards > OneWeb".



This dialog comprises the standard general settings.

Settings:

State.....	20
Set to Default.....	20
Save/Recall.....	20
Generate Waveform File.....	20
Mode.....	20

State

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

Remote command:

[:SOURce<hw>] :BB:ONEWeb:STATe on page 139

Set to Default

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

Remote command:

[:SOURce<hw>] :BB:ONEWeb:PRESet on page 139

Save/Recall

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

The filename and the directory, in which the settings are stored, are user-definable; the file extension is predefined.

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

Remote command:

[:SOURce<hw>] :BB:ONEWeb:SETTing:CATalog? on page 140

[:SOURce<hw>] :BB:ONEWeb:SETTing:LOAD on page 140

[:SOURce<hw>] :BB:ONEWeb:SETTing:STORe on page 140

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:ONEWeb:WAVEform:CREate on page 140

Mode

Indicates that predefined configurations can be loaded.

- "Predefined" Option: R&S SMW-K355
You can load predefined configuration files, see [Predefined Mode Settings](#).
- "User-Defined" Option: R&S SMW-K130
Allows the configuration of the frame structure for different link directions in OneWeb system, see [Chapter 4.3, "User-defined Mode Settings"](#), on page 22.
For uplink configuration, see [Chapter 4.7, "Uplink Frame Configuration"](#), on page 75, [Chapter 4.7, "Uplink Frame Configuration"](#), on page 75 and [Chapter 4.8, "User Equipment Configuration"](#), on page 96.
For downlink configuration, see [Chapter 4.4, "General Downlink Settings"](#), on page 23 and [Chapter 4.5, "Downlink Frame Configuration"](#), on page 31.

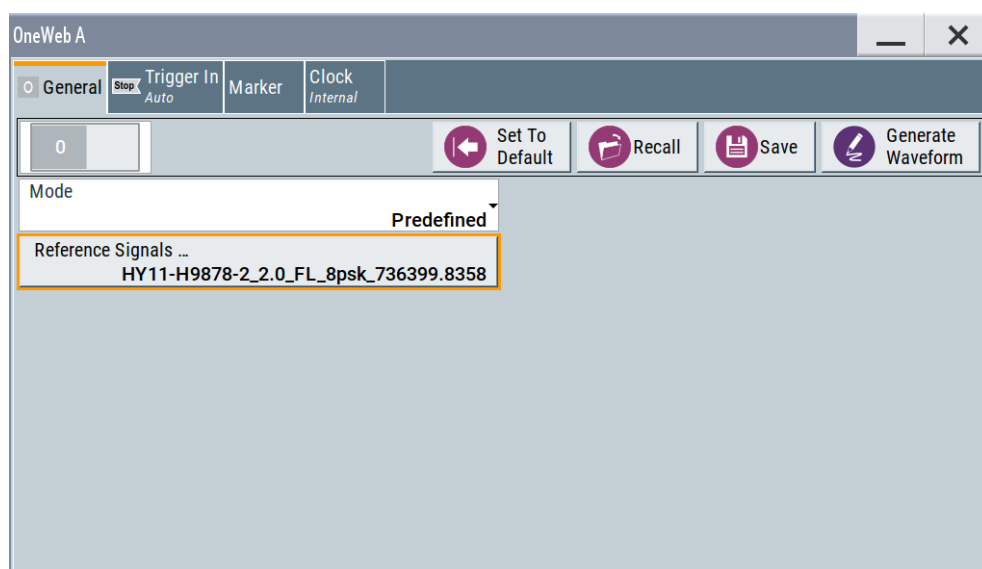
Remote command:

[:SOURce<hw>] :BB:ONEWeb:CMOD on page 141

4.2 Predefined Mode Settings

Access:

1. Select "Baseband" > "Beyond 3G Standards" > "OneWeb".
2. Select "Mode" > "Predefined".



In this mode, you can load the predefined reference signals.

Settings:

[Reference Signal](#).....22

Reference Signal

Selects and loads a predefined reference signal.

For details, see [Chapter 3, "About OneWeb Option"](#), on page 13.

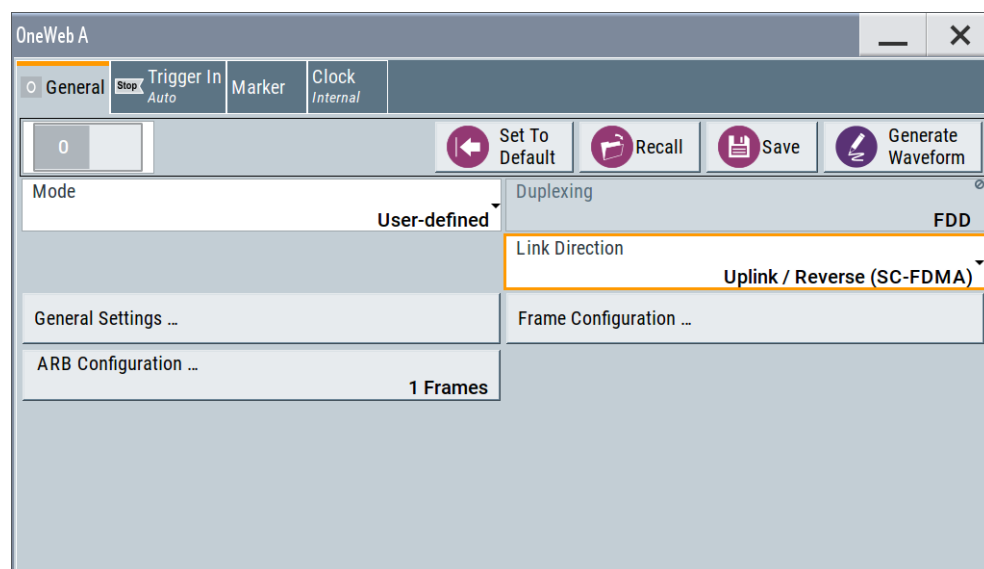
Remote command:

[:SOURce<hw>] :BB:ONEWeb:REFSignal on page 141

4.3 User-defined Mode Settings

Access:

1. Select "Baseband" > "Beyond 3G Standards" > "OneWeb".
2. Select "Mode" > "User-defined".



In this mode, you can defined the uplink and downlink signals for OneWeb.

Note: For uplink signal, only "ARB configuration..." is supported.

For downlink signal, the "Filter/Clipping/ARB..." is supported.

Settings:

Duplexing	22
Link Direction	23
General DL Settings/General UL Settings	23
Frame Configuration	23
Filter/Clipping/ARB Settings	23

Duplexing

Displays the duplexing mode. The duplexing mode determines how the uplink and downlink signals are separated.

Only FDD is supported in both uplink and downlink directions.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:DUPLexing? on page 139

Link Direction

Selects the transmission direction.

"Downlink / Forward (SC-TDM)"

The transmission direction selected is ground station to user terminal.

The signal corresponds to that of a ground station.

"Uplink / Reverse (SC-FDMA)"

The transmission direction selected is user terminal to ground station.

The signal corresponds to that of a user terminal.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:LINK on page 139

General DL Settings/General UL Settings

Accesses the "General DL Settings / General UL Settings" dialog for configuring the OneWeb system.

For description of the available settings, refer to [Chapter 4.4, "General Downlink Settings"](#), on page 23 and [Chapter 4.6, "General Uplink Settings"](#), on page 59 respectively.

Remote command:

n.a.

Frame Configuration

Accesses the "Frame Configuration" dialog for configuring the allocation of the resource blocks to the different users, as well as the configuration of the users.

The available settings depend on the selected link direction. For description, refer to [Chapter 4.5, "Downlink Frame Configuration"](#), on page 31 and [Chapter 4.7, "Uplink Frame Configuration"](#), on page 75 respectively.

Remote command:

n.a.

Filter/Clipping/ARB Settings

Accesses the dialog for setting baseband filtering, clipping, and the sequence length of the arbitrary waveform component, see [Chapter 4.12, "Filter/Clipping/ARB Configuration"](#), on page 124.

Remote command:

n.a.

4.4 General Downlink Settings

Option: R&S SMW-K130

Access:

1. Select "General > Link Direction > Downlink / Forward (SC-TDM)".

2. Select "General Settings "

This dialog allows configuring the OneWeb system for transmission direction downlink.

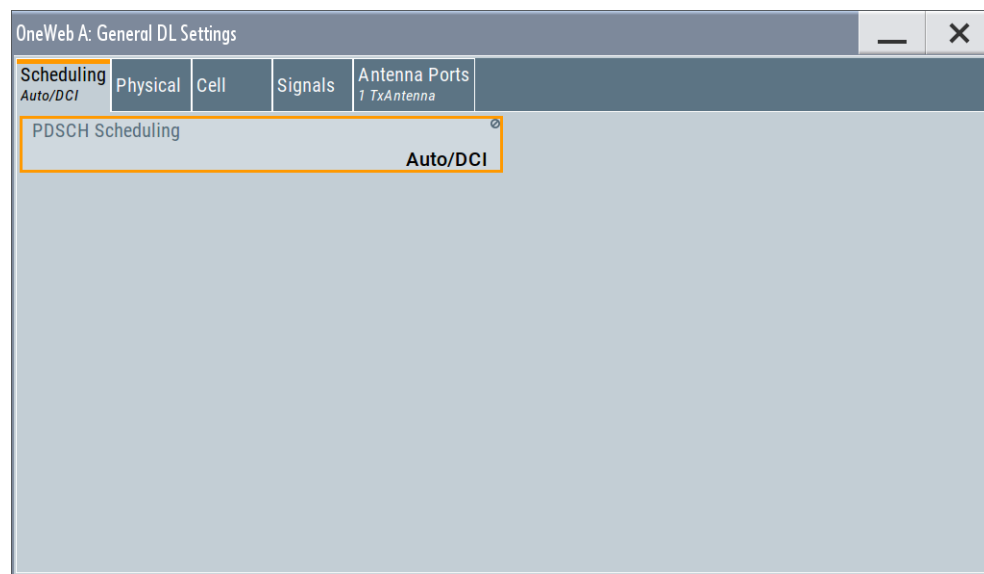
Settings:

• PDSCH Scheduling Settings	24
• Physical Settings	25
• Cell-Specific Settings	27
• Downlink Signals Settings	28
• Antenna Ports Settings	29

4.4.1 PDSCH Scheduling Settings

Access:

1. Select "General > Link Direction > Downlink /Forward (SC-TDM)".
2. Select "General DL Settings > Scheduling".



The "PDSCH scheduling" is fixed to Auto/DCI mode.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL:CONF:MODE? on page 156

Overview of the scheduling methods

In the R&S SMW, there are different approaches to configure and schedule the different PDSCH allocations:

- According to the configuration made for the DCIs ("Auto/DCI")

This mode assures a OneWeb signal and the PDSCH allocations are configured automatically according to the configuration of the PDCCH DCIs.

There are however limitations in the configuration flexibility, especially regarding the power setting, see "[Limitations and interdependencies in the Auto/DCI and Auto Sequence modes](#)" on page 25.

Limitations and interdependencies in the Auto/DCI and Auto Sequence modes

The generation of a compliant signal requires some limitations in the configuration flexibility, especially regarding the power setting:

- The value of the parameter [Reference Signal Power](#) is fixed to 0dB.
- The PDSCH [Power](#) of each allocation belonging to a user is set as configured with the parameter [Power](#) for the corresponding user in the "Configure User" dialog.
- All four users are activated with enabled [Scrambling](#) and [Channel Coding](#).
- Not all combinations of [DCI Table](#), [Users](#) and [UE_ID/n_RNTI](#) are allowed, see [Table 4-1](#).

Table 4-1: DCI Formats dependencies

User	UE ID/n_RNTI	DCI Format
User x	As defined for the corresponding user	0, 10W, 1A, 20W, 3, 3A, 30W
P-RNTI	65534	1A
SI-RNTI	65535	1A
RA-RNTI	As defined with the parameter "General DL Setting" > RA_RNTI	1A

4.4.2 Physical Settings

Access:

1. Select "General > Link Direction > Downlink / Forward (SC-TDM)".

2. Select "General DL Settings > Physical".

OneWeb A: General DL Settings				
Scheduling Auto/DCI	Physical	Cell	Signals	Antenna Ports 1 TxAntenna
Channel Bandwidth	250 MHz	Number of Resource Blocks per Subframe	1152	
Occupied Bandwidth	231.00 MHz	Sampling Rate	230.400 MHz	

In this dialog, the channel bandwidth respectively the number of resource blocks per subframe is selected. The other parameters are fixed and read-only.

Settings:

Channel Bandwidth.....	26
Number of Resource Blocks Per Subframe.....	26
Occupied Bandwidth.....	26
Sampling Rate.....	27

Channel Bandwidth

Displays the channel bandwidth.

The "Sampling Rate" and "Occupied Bandwidth" are therefore determined by the parameter "Number of Resource Blocks Per Subframe".

Remote command:

[:SOURce<hw>] :BB:ONEWeb:DL:BW? on page 156

Number of Resource Blocks Per Subframe

Displays the number of used resource blocks for the selected "Channel Bandwidth".

The number of resource blocks are fixed to 1152.

The sampling rate and the occupied bandwidth are determined by the parameter "Number of Resource Blocks Per Subframe".

Remote command:

[:SOURce<hw>] :BB:ONEWeb:DL:NORB? on page 157

Occupied Bandwidth

Displays the occupied bandwidth, calculated from the parameter "Number of Resource Blocks Per Subframe".

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL:OCCBandwidth? on page 157

Sampling Rate

Displays the sampling rate, calculated from the parameter "Number of Resource Blocks Per Subframe".

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL:SRATe? on page 158

4.4.3 Cell-Specific Settings

Access:

1. Select "General > Link Direction > Downlink / Forward (SC-TDM)".
2. Select "General DL Settings > Cell".

The screenshot shows a software window titled "OneWeb A: General DL Settings". It has several tabs: "Scheduling Auto/DCI", "Physical", "Cell" (which is selected), "Signals", and "Antenna Ports 1 TxAntenna". In the "Cell" tab, there are two input fields: "Cell ID" with the value "0" and "RA_RNTI" with the value "1".

The "Cell-Specific Settings" section comprises the physical layer cell identity settings and the random-access response identity for user.

Settings:

Cell ID.....	27
RA_RNTI.....	28

Cell ID

Sets the cell identity.

There are 256 unique physical layer cell identities (Cell ID).

The Cell ID determinates:

- The downlink reference signal pseudo-random sequence
- The pseudo-random sequence used for scrambling

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL [:PLCI] :CID on page 158

RA_RNTI

Sets the random-access response identity RA-RNTI for the users.

The value selected here determined the value of the parameter [UE_ID/n_RNTI](#) in case a RA_RNTI "User" is selected.

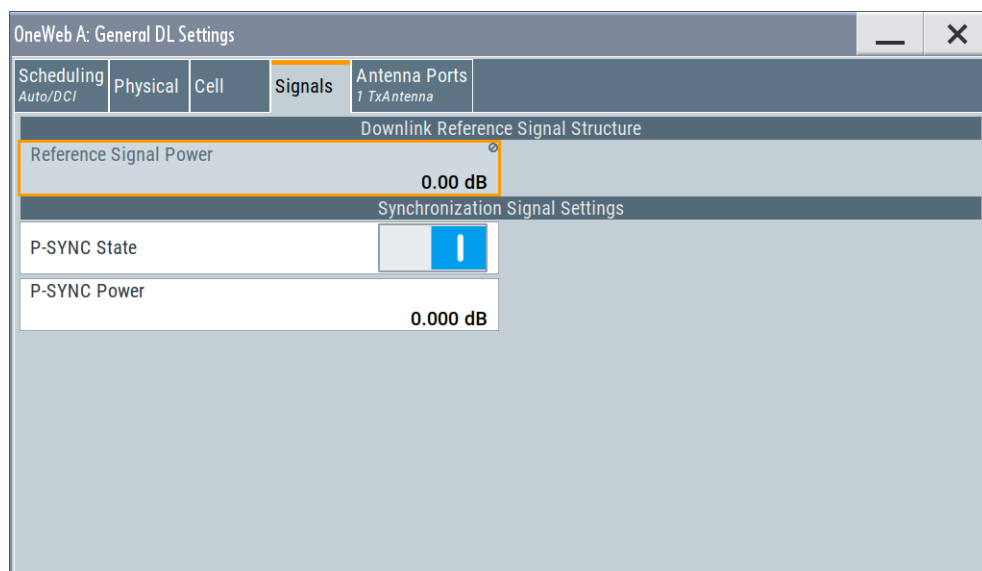
Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL:CSEttings:RARnti on page 158

4.4.4 Downlink Signals Settings

Access:

1. Select "General > Link Direction > Downlink / Forward (SC-TDM)".
2. Select "General DL Settings > Signals".



The "Signals" dialog comprises the settings of all DL signals.

Settings:

Downlink Reference Signal Structure.....	28
L Reference Signal Power.....	29
Synchronization Signal Settings.....	29
L P-SYNC State.....	29
L P-SYNC Power.....	29

Downlink Reference Signal Structure

Comprises the downlink reference signal settings, like the power of the reference signals.

Reference Signal Power ← Downlink Reference Signal Structure

Displays the power of the reference signal.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:DL:REFSig:POWER?](#) on page 158

Synchronization Signal Settings

In the "Synchronization Signal Settings" section, the power of the P-SYNC is set.

P-SYNC State ← Synchronization Signal Settings

Enables/disables the generation of the P-SYNC signal.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:DL:SYNC:PState](#) on page 159

P-SYNC Power ← Synchronization Signal Settings

Sets the power of the P-SYNC allocations.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:DL:SYNC:PPower](#) on page 159

4.4.5 Antenna Ports Settings

Access:

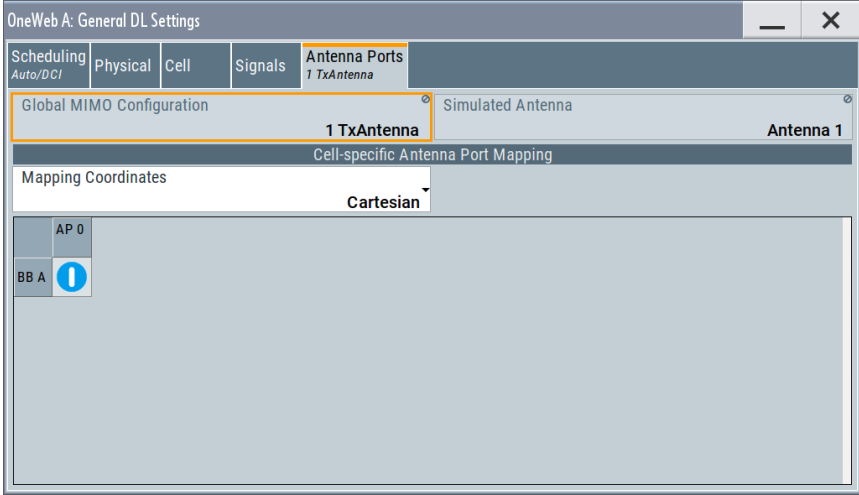
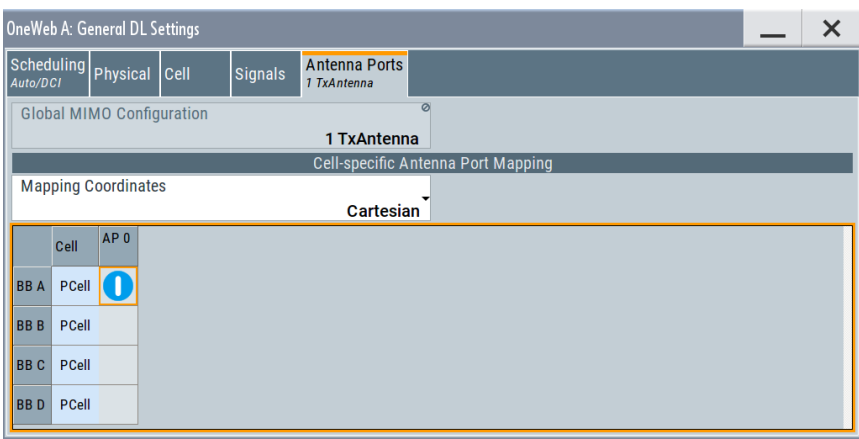
1. Select "General > Link Direction > Downlink / Forward (SC-TDM)".
2. Select "General DL Settings > Antenna Ports".

In the "Antenna Ports" section, TxAntenna is fixed at 1 for both MIMO configuration and simulated antenna.

The provided settings depend on the selected "System Configuration > Fading and Baseband Configuration > Mode" and the enabled LxMxN MIMO scenario, i.e. the number of enabled "Entities", "Basebands" and "Streams". Refer to the user manual of the base unit.

See [Table 4-2](#) and compare the displayed settings for the same 4x4 MIMO configuration.

Table 4-2: Antenna ports settings depending on the enabled MxN MIMO configuration and "System Configuration" mode

"System Configuration > Fading/Baseband Configuration > BB Source Config"	"System Configuration > Fading/Baseband Configuration > 1x4x4"
"Separated"	
"Coupled"	

Settings:

Global MIMO Configuration.....	30
Simulated Antenna.....	31
Cell-Specific Antenna Port Mapping.....	31
L Mapping Coordinates.....	31
L Mapping table.....	31

Global MIMO Configuration

Displays the number of transmit antennas of the simulated OneWeb system.

The "Global MIMO Configuration" is fixed to one TxAntenna.

The [Downlink Reference Signal Structure](#) is set accordingly.

Note: One baseband simulates one antenna.

"1 TxAntenna" Enables single antenna port transmission.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL:MIMO:CONFIguration? on page 159

Simulated Antenna

In "System Configuration > Fading/Baseband Configuration > Mode > Standard", determines the antenna to be simulated in the current baseband.

The "Simulated Antenna" is fixed to one antenna.

The [Downlink Reference Signal Structure](#) is set accordingly.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL:MIMO:ANTenna? on page 160

Cell-Specific Antenna Port Mapping

Comprises the settings for defining the mapping of the logical antenna ports to the available physical Tx antennas (Basebands).

Mapping Coordinates ← Cell-Specific Antenna Port Mapping

Switches representation between the "Cartesian (Real/Imag)" and "Cylindrical (Magn./Phase)" coordinates.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL:MIMO:APM:MAPCoordinates on page 160

Mapping table ← Cell-Specific Antenna Port Mapping

The mapping table is a matrix with number of rows equal to the number of physical Tx antennas and number of columns equal of the number of antenna ports (AP).

The default mapping is selected to fit the current configuration.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL:MIMO:APM:CS:CELL:BB<st0> on page 160

[:SOURCE<hw>] :BB:ONEWeb:DL:MIMO:APM:CS:AP<dir0>:ROW<st0>:REAL on page 160

[:SOURCE<hw>] :BB:ONEWeb:DL:MIMO:APM:CS:AP<dir0>:ROW<st0>:IMAGinary on page 161

4.5 Downlink Frame Configuration

Option: R&S SMW-K130

Access:

1. Select "General > Link Direction > Downlink / Forward (SC-TDM)".
2. Select "Frame Configuration".

The "DL Frame Configuration" dialog allows you to configure the subframes and the OFDMA resource allocations. The dialog consists of several tabs.

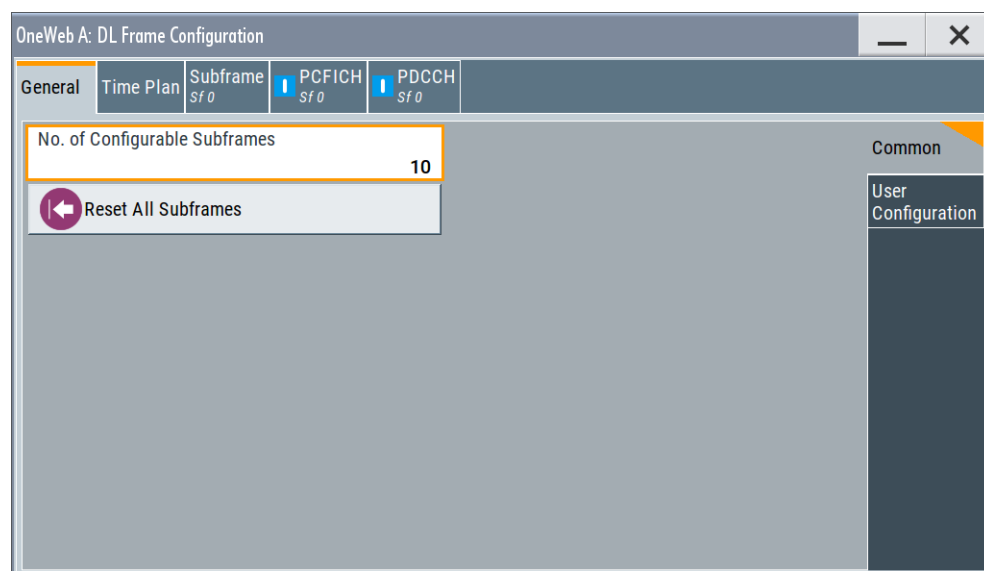
Settings:

• General Frame Configuration Settings	32
• User Configuration Settings	33
• Subframe Configuration Settings	36
• DL Resource Allocation Table	37
• PCFICH Settings	40
• PDCCH Settings	42
• DCI Format Configuration	49
• Enhanced PBCH and PDSCH Settings	54

4.5.1 General Frame Configuration Settings

Access:

1. Select "General > Link Direction > Downlink / Forward (SC-TDM)".
2. Select "Frame Configuration > General".



This dialog comprises the general settings that can be configured in the downlink subframe.

Settings:

No Of Configurable (DL) Subframes	32
Reset All Subframes	33

No Of Configurable (DL) Subframes

Sets the number of configurable subframes. Only the downlink and the special subframes are enabled for configuration.

All downlink/special subframes are filled periodically with the configured subframes except for the P-SYNC. The last are set globally in the "General DL Settings" dialog. The PBCH can only be configured in subframe 0.

For more detailed information about the maximum number of configurable subframes and for description of the dependencies between the parameters, see [Chapter B.3, "Four Configurable Frames in Uplink and Downlink Direction"](#), on page 240.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL:CONSubframes on page 163

Reset All Subframes

Resets settings of all subframes and number of used allocations to the default values.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL:RSTFrame on page 163

4.5.2 User Configuration Settings

Access:

1. Select "General > Link Direction > Downlink / Forward (SC-TDM)"
2. Select "Frame Configuration > General > User Configuration"

	User 1	User 2	User 3	User 4
State	On	On	On	On
Tx Modes	Mode 10W	Mode 10W	Mode 10W	Mode 10W
UL Carriers	Config...	Config...	Config...	Config...
UE Category	1	1	1	1
Scrambling	Config...	Config...	Config...	Config...
Channel Coding	☒	☒	☒	☒
UE ID	0	0	0	0
Data Source	PN9	PN9	PN9	PN9
DList/Pattern	-	-	-	-

Use the provided settings to configure up to four scheduled UEs. To distribute them over the whole frame, set the data source of a certain allocation to "User x". This approach ensures that a common data source is used for allocations of one user equipment also in case that these allocations are non-adjacent.

In one subframe, all allocations belonging to the same "User" use identical settings. Changing, for example, the modulation of one of the allocations of "User 1", changes the modulation in all other allocations of this user in the current subframe.

The aforementioned applies for the following settings:

- **Modulation**

	CW	Modulation	Enhanced Settings	No. RB	Offset RB	Phys. Bits	Data Source	DLIST / Pattern	Power /dB	Content Type	State	Conflict
0	1/1	QPSK	Config...	2	20	1600	MIB	-	0.000	PBCH	On	
1	1/1	QPSK		18	3	7200	PDCCH	-	0.000	PDCCH	On	

- Scrambling settings ([Scrambling](#), [UE ID/n_RNTI](#)) and [Channel Coding State](#). See also the "Enhanced Settings" dialog of each allocation ([Chapter 4.5.8, "Enhanced PBCH and PDSCH Settings"](#), on page 54).

Settings:

User.....	34
State.....	34
Tx Modes.....	34
UL Carriers Configuration.....	34
UE Category.....	35
Scrambling.....	35
Channel Coding State.....	35
UE ID.....	35
Data Source, DList/Pattern.....	35
Power.....	36

User

Displays the consecutive number of the users.

Remote command:

n.a.

State

Enables/disables a user.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL:USER<ch>:STATe on page 163

Tx Modes

Sets the transmission mode of the user.

Consider the following prerequisites and interdependencies:

- The selected "Tx Mode" determines the range of allowed DCI formats ([Chapter 4.5.7, "DCI Format Configuration"](#), on page 49), that is you can only assign valid DCI formats to this user.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL:USER<ch>:TXM on page 163

[:SOURCE<hw>] :BB:ONEWeb:DL:USER<ch>:CELL<st0>:TXM on page 163

UL Carriers Configuration

Sets the state of the associated UL carriers.

Remote command:

n.a.

UE Category

Sets the UE category.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:DL:USER<ch>:UEC on page 164

Scrambling

Queries the scrambling state for all allocations belonging to the selected user.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:DL:USER<ch>:SCRambling:STATe? on page 164

Channel Coding State

Sets channel coding for all allocations belonging to the selected user.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:DL:USER<ch>:CCODing:STATe on page 164

UE ID

Sets the user equipment ID.

This UE ID is used for the generation of the scrambling sequence for the allocations, for which you select the [Downlink Frame Configuration](#) > "Allocation Table" > [Data Source, DList/Pattern](#) = "User x"

Remote command:

[:SOURce<hw>] :BB:ONEWeb:DL:USER<ch>:UEID on page 165

Data Source, DList/Pattern

Selects the data source for the selected user.

The following standard data sources are available:

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

See also:

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

Remote command:

[:SOURce<hw>] :BB:ONEWeb:DL:USER<ch>:DATA on page 165

[:SOURce<hw>] :BB:ONEWeb:DL:USER<ch>:DSElect on page 165

[:SOURce<hw>] :BB:ONEWeb:DL:USER<ch>:PATTern on page 165

Power

Sets PDSCH power factor.

This power value is applied to all allocations that belong to the corresponding user. The power of an allocation is also determined by the parameter "PDSCH Scheduling Mode".

In the "Auto/DCI" mode, the power value is fixed and cannot be adjusted.

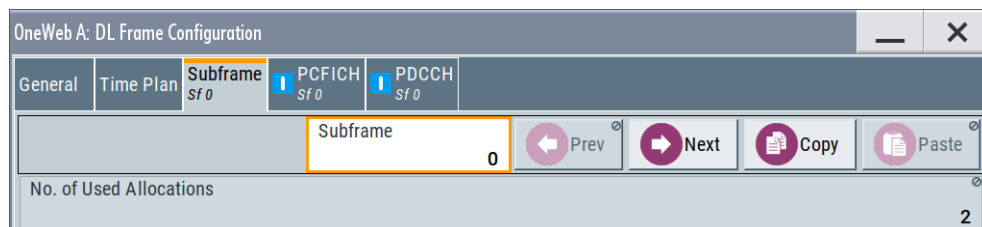
Remote command:

[:SOURce<hw>] :BB:ONEWeb:DL:USER<ch>:PA on page 166

4.5.3 Subframe Configuration Settings

Access:

1. Select "General > Link Direction > Downlink / Forward (SC-TDM)".
2. Select "General > Frame Configuration".
3. To access the common subframe configuration settings, select one of the following:
 - "Frame Configuration > Subframe"
 - "Frame Configuration > PCFICH"
 - "Frame Configuration > PDCCH"



Provided are the following common settings:

Settings:

Subframes.....	36
Next/Prev.....	37
Copy/Paste.....	37
No. Of Used Allocations.....	37

Subframes

Selects the number of subframes to be displayed or configured.

Remote command:

n.a.

Next/Prev

Navigates through the subframes.

Remote command:

n.a.

Copy/Paste

Copies/pastes the settings of the selected subframe. P-SYNC/PBCH settings are not considered.

For more detailed information, see [Chapter A, "Conflict Handling"](#), on page 235.

Remote command:

n.a.

No. Of Used Allocations

Sets the number of scheduled allocations in the selected subframe.

The number of available allocations depends on the allocation's content type for a subframe and the general channel bandwidth setting.

The default value depends on the existence of a PBCH channel in a subframe. In this case, the default value is set to 2, otherwise to 1.

The second or the first allocation is reserved for the PDCCH, regardless whether this allocation is enabled or not.

Remote command:

[\[:SOURce<hw>\]:BB:ONEWeb:DL\[:SUBF<st0>\]:ALCount](#) on page 166

4.5.4 DL Resource Allocation Table

Access:

1. Select "General > Link Direction > Downlink / Forward (SC-TDM)".
2. In the "General" tab, select "Frame Configuration > Subframe".

	CW	Modulation	Enhanced Settings	No. RB	Offset RB	Phys. Bits	Data Source	DList / Pattern	Power /dB	Content Type	State	Conflict
0	1/1	QPSK	Config...	2	20	1600	MIB	-	0.000	PBCH	On	
1	1/1	QPSK		18	3	7200	PDCCH	-	0.000	PDCCH	On	

The resource allocation table comprises the settings necessary to configure the individual allocation parameters for a subframe.

Settings:

Allocation number	38
Codeword	38
Modulation	38
Enhanced Settings	38
No. RB (Resource Blocks)	38
Offset RB	38

Phys. Bits/Number of Physical Bits (DL).....	39
Data Source.....	39
Power.....	40
Content Type.....	40
State.....	40
Conflict.....	40

Allocation number

Displays the consecutive number of the allocation.

Remote command:

n.a.

Codeword

Determines whether one or two codewords use the same physical resource, and whether codeword 1/2 or 2/2 is configured with this allocation table entry.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ALLoc<ch0>:CODWords?

on page 166

Modulation

Displays the modulation scheme for the allocation.

The modulation is fixed at QPSK for PDCCH and PBCH.

For PDSCH, the modulation (QPSK, 8PSK, 16QAM) depends on the MCS in DCI content.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ALLoc<ch0> [:CW<user>] :

MODulation? on page 167

Enhanced Settings

Opens the "Enhanced Settings" dialog for configuration of scrambling and channel coding (see [Chapter 4.5.8, "Enhanced PBCH and PDSCH Settings"](#), on page 54).

Remote command:

n.a.

No. RB (Resource Blocks)

Defines bandwidth of selected allocation in terms of resource blocks in a subframe.

See also [Chapter A, "Conflict Handling"](#), on page 235.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ALLoc<ch0> [:CW<user>] :

RBCount? on page 167

Offset RB

Displays the start resource block of the selected allocation in a subframe.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ALLoc<ch0> [:CW<user>] :

RBOffset? on page 167

Phys. Bits/Number of Physical Bits (DL)

Displays the size of the selected allocation in bits and considering the subcarriers that are used for other signals or channels with higher priority.

The size of the PBCH allocation is fixed to 6400/4 Frames, 1600/1 Frame.

See [Chapter A, "Conflict Handling"](#), on page 235.

Remote command:

`[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ALLoc<ch0> [:CW<user>] :
PHYSbits?` on page 168

`[ :SOURCE<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :USER<ch>:PHYSbits?`
on page 171

Data Source

Selects the data source for the selected allocation.

For PBCH allocation with enabled parameter [MIB \(including SFN\)](#), the "Data Source = MIB" is used.

Use the [User Configuration Settings](#) dialog to configure the data sources for "User 1 .. 4".

The following standard data sources are available:

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

See also:

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

Remote command:

`[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ALLoc<ch0> [:CW<user>] :
DATA?` on page 168

`[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ALLoc<ch0> [:CW<user>] :
DSElect?` on page 168

`[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ALLoc<ch0> [:CW<user>] :
PATtern` on page 169

Power

Displays the power P_{PDSCH} and P_{PBCH} respectively for the selected allocation.

The power of the PDCCH allocation P_{PDCCH} is set in the power of **PDCCH** of the corresponding subframe.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ALLoc<ch0> [ :CW<user> ] :
POWer on page 169
```

Content Type

Indicates the type of the selected allocation.

Note: There can be only one PBCH in subframe 0.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ALLoc<ch0> [ :CW<user> ] :
CONType? on page 170
```

State

Queries the allocation state.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ALLoc<ch0> [ :CW<user> ] :
STATe? on page 170
```

Conflict

Indicates a conflict between allocations.

For more information, see [Chapter A, "Conflict Handling"](#), on page 235.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ALLoc<ch0> [ :CW<user> ] :
CONFlict? on page 171
```

4.5.5 PCFICH Settings

Access:

1. Select "General > Link Direction > Downlink / Forward (SC-TDM)".

2. Select "Frame Configuration > PCFICH".

Use these parameters and the DCI table to configure the multiple scheduling messages (DCIs) with the corresponding PDCCHs.

Settings:

General PCFICH/PDCCH Configuration.....	41
L State.....	41
L Scrambling State	41
PCFICH Configuration.....	41
L PCFICH Power.....	42
L CFI for PDCCH.....	42

General PCFICH/PDCCH Configuration

Comprises the settings common to all DL enhanced channels.

State ← General PCFICH/PDCCH Configuration

Enables/disables the PDCCH and PCFICH allocation.

Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:DL[ :SUBF<st0> ] :ENCC:STATe` on page 173

Scrambling State ← General PCFICH/PDCCH Configuration

Enables/disables the scrambling of all DL enhanced channels.

Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:DL[ :SUBF<st0> ] :ENCC:PCFich:SCRambling:STATe` on page 174

PCFICH Configuration

Comprises the PCFICH settings:

PCFICH Power ← PCFICH Configuration

Sets the power of the PCFICH (P_{PCFICH}).

Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:DL[ :SUBF<st0> ] :ENCC:PCFich:POWer`

on page 174

CFI for PDCCH ← PCFICH Configuration

Sets the control format indicator for PDCCH. It carries information about the number of RBs used for transmission of PDCCHs in a subframe.

See [Table 4-3](#) for the number of RBs possible to use for PDCCH.

See also [Table A-1](#).

Table 4-3: Number of RBs used for PDCCH

Control format indicator (CFI)	Number of RBs for PDCCH (N_{RBPDCCH})
1	9
2	18
3	27
4	36
5	45
6	54
7	63
8	72
9	81
10	90
11	99
12	108

Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:DL[ :SUBF<st0> ] :ENCC:PCFich:CFI` on page 174

4.5.6 PDCCH Settings

Access:

1. Select "General > Link Direction > Downlink / Forward (SC-TDM)".

2. Select "Frame Configuration > PDCCH".

OneWeb A: DL Frame Configuration

General Time Plan Subframe **PDCCH** PCFICH

Subframe 0 Prev Next Copy Paste

PDCCH Format Variable Power 0.000 dB General

Number of PDCCH Bits / REGs / CCEs 3 600 / 1 800 / 50 DCI Table

Use these parameters and the DCI table to configure the multiple scheduling messages (DCIs) with the corresponding PDCCHs.

Settings:

PDCCH Format.....	44
Power.....	44
Number of PDCCH Bits / REGs / CCEs.....	44
Append.....	45
Insert.....	45
Delete.....	45
Down.....	45
Up.....	45
Reset.....	45
Resolve Conflicts.....	46
DCI Table.....	46
L Number of Used PDCCH Items.....	46
L User.....	46
L UE_ID/n_RNTI.....	46
L Cell Index.....	47
L PDCCH.....	47
L DCI Format.....	47
L Search Space.....	48
L Content Config.....	48
L PDCCH Format (Variable).....	48
L Number CCEs.....	49
L CCE Index.....	49
L No. Dummy CCEs.....	49
L Conflict (DCI).....	49

PDCCH Format

Displays the PDCCH format.

The PDCCH format determines how many CCEs (control channel elements) are used for the transmission of the PDCCH.

The PDCCH format is fixed to "Variable". In this mode, a full flexibility by the configuration of the downlink control information (DCI) format and content is enabled.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:FORMat?
```

on page 175

Power

Sets the power of the PDCCH (P_{PDCCH}).

The value sets with this parameter is also displayed in the allocation table for the corresponding allocation.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:POWer
```

on page 174

Number of PDCCH Bits / REGs / CCEs

Displays the number of bits, REGs and CCEs allocated for PDCCH.

"Number of PDCCH Bits"

Indicates the number of bits available for PDCCH.

The number of bits available for PDCCH allocation depends on the selected:

- CFI for PDCCH

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:BITS?
```

on page 175

"Number of PDCCH REGs"

Indicates the number of the REGs that are available for the PDCCH allocation.

The number of REGs available for PDCCH allocation depends on the "Number of PDCCH Bits" ($\# \text{Bits}_{\text{PDCCH}}$) and is calculated as follows:

Number of RB of PDCCH * Number of REGs of single RB

Example:

CFI = 1, Number of RB of PDCCH = 9, Number of REGs of single RB = 200, thus the number of REs available for PDCCH allocation is 1800

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:AVRegs?
```

on page 176

"Number of PDCCH CCEs"

Indicates the number of the control channel elements (CCEs) that are available for the PDCCH allocation.

The PDCCH is mapped to the REs not used for PCFICH and transmitted on one or several CCEs, where a CCE corresponds to 36 REs, i.e. the number of the available CCEs is calculated as follows:

$$\#CCEs_{available_PDCCH} = \text{"Number of PDCCH REs"} / 36$$

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:AVCCes?
```

on page 176

Append

Adds a row at the end of the table.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:APPend
```

on page 176

Insert

Insert a new row before the current one.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:SITem
```

on page 177

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:INSert
```

on page 177

Delete

Deletes the selected row.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:DElete
```

on page 176

Down

Moves the selected row down.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:DOWN
```

on page 178

Up

Moves the selected row up.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:UP
```

on page 178

Reset

Resets the table.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:RESet
on page 177

Resolve Conflicts

The "Resolve Conf." is a built-in algorithm that reassigns automatically the CCE values depending on the configured "Search Space"; previously configured CCE values are not maintained. If the conflict cannot be resolved automatically, the values are left unchanged.

For more information on how to solve DCI conflicts, see [Chapter A, "Conflict Handling"](#), on page 235.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:SOLVe?
on page 178

To query the number of current conflicts:

[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:
CONFlicts? on page 170

DCI Table

Comprises the settings concerning the PDCCH content.

Number of Used PDCCH Items ← DCI Table

Displays the number of the PDCCH items, i.e. the number of rows in the DCI table.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:UITems?
on page 178

User ← DCI Table

Selects the user the DCI is dedicated to. The available [DCI Format](#) depend on the value of this parameter.

Note: To enable one particular user in more than one component carrier, append several table rows and enable the same "User" in the different component carriers.

"User x" Selects one of the four users configured in the [User Configuration Settings](#) dialog.

"P-RNTI/SI-RNTI/RA-RNTI"
A group of users is selected.

"None" Allows free definition of all settings

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:
ITEM<ch0>:USER on page 178

UE_ID/n_RNTI ← DCI Table

Displays the UE_ID or the n_RNTI for the selected PDCCH.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:
ITEM<ch0>:UEID on page 179

Cell Index ← DCI Table

Displays the component carrier on that the corresponding DCI is transmitted.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:
ITEM<ch0>:CELL? on page 179

PDCCH ← DCI Table

Indicates if the DCI is carried by a PDCCH.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:
ITEM<ch0>:PDCChType? on page 179

DCI Format ← DCI Table

Sets the DCI format for the selected PDCCH.

The downlink control information (DCI) is a message used to control the physical layer resource allocation in both the UL and DL direction. It carries scheduling information as well as uplink power control commands.

The DCI is mapped on the PDCCH and depending on the DCI message size and usage are categorized into four different formats that are further subdivided (see [Table 4-4](#)).

Table 4-4: Overview DCI formats

DCI format	Purpose
DCI Format 0	PUSCH and PUACH allocation information
DCI Format 1OW DCI Format 1A	PDSCH information with one codeword
DCI Format 2OW	PDSCH information (two codewords for 2OW)
DCI Format 3/3A	Uplink power control information

The fields of each DCI format are configurable parameters that can be adjusted in the corresponding dialog box. Select [Content Config](#) to access this dialog box for the selected "DCI Format".

Not all DCI formats are always enabled for selection.

The following table gives an overview of the cross-reference between the available DCI formats and the value of the parameter [User](#).

User	DCI format
P-RNTI/SI-RNTI/RA-RNTI	1A
User x	0, 1OW, 1A, 2OW, 3, 3A
None	3, 3A

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:
ITEM<ch0>:DCIFmt on page 180

Search Space ← DCI Table

Defines the search space for the selected DCI, i.e. determines the valid CCE indexes.

The search space determines the set of CCEs a UE monitors. The UE can decode only the control information on a PDCCH that is transmitted over CCEs within the search space this UE monitors.

Note: Avoid the use of the "Auto" values; this value is provided for backwards compatibility reasons only.

"Auto"	Provided for backward compatibility only. An internal mapping to the common and UE-specific search space is applied depending on the value of the parameter "User": - For "User x", "Auto" corresponds to "UE-spec" - In all other cases, "Auto" corresponds to "Common"
"Common"	The DCI is mapped to the common search space. A common search space is used when all or a group of UEs is addressed. The combination "User 1" and common search space is enabled in PCell only.
"UE-spec"	Non-common DCIs are mapped to the UE-specific search space. Each UE has multiple UE-specific search space, determined as a function of the UE_ID and the subframe. A UE-specific search space applies for the User sets to "User x".

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL[ :SUBF<st0> ] :ENCC:PDCCh:EXTC:
ITEM<ch0>:SESPace on page 180
```

Content Config ← DCI Table

Opens the [DCI Format Configuration](#) dialog to configure the DCI fields of the selected [DCI Format](#).

Remote command:

n.a.

PDCCH Format (Variable) ← DCI Table

Sets the PDCCH format.

The PDCCH format determines how many [CCEs](#) are used for the transmission of the PDCCH.

Table 4-5: Supported PDCCH formats

PDCCH format	Number of CCEs
0	2
1	4
2	8
3	16
4	40

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:
ITEM<ch0>:PFMT on page 180
```

Number CCEs ← DCI Table

Defines the number of control channel elements used for the transmission of the PDCCH.

The value depends on the selected [PDCCH format](#).

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:
ITEM<ch0>:NCCes? on page 181
```

CCE Index ← DCI Table

Sets the CCE start index.

The available CCEs depend on the selected [PDCCH format](#).

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:
ITEM<ch0>:CINdex on page 181
```

No. Dummy CCEs ← DCI Table

Defines the number of dummy CCEs that are appended to the corresponding PDCCH.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:
ITEM<ch0>:NDCCes? on page 182
```

Conflict (DCI) ← DCI Table

Indicates a conflict between two DCI formats.

For more information on how to solve DCI conflicts, see [Chapter A.3, "DCI Conflict Handling"](#), on page 236.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:
ITEM<ch0>:CONFLICT? on page 181
```

To query the number of current conflicts:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:
CONFLICTs? on page 170
```

4.5.7 DCI Format Configuration

The following provides the configuration settings for the different DCI format supported in OneWeb system.

Settings:

Bit Data	50
DCI Format 0	50
DCI Format 10W	51

DCI Format 1A.....	52
DCI Format 2OW.....	53
DCI Format 3/3A.....	54

Bit Data

Displays the resulting bit data as selected with the DCI format parameters.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ENCC:PDCCh:EXTC:
ITEM<ch0>:DCIConf:BITData? on page 182
```

DCI Format 0

The DCI Format 0 is used for the scheduling of uplink transmission on PUSCH and PUACH and transmits the information listed in the following table.

DCI Format 0	
Carrier Indicator Field	0
Resource Block Assignment	0
Modulation and Cod. Scheme and Red.Version	0
New Data Indicator	☐
TPC Command for PUSCH	0
Cyclic Shift for DMRS	0
CSI/CQI Request	0
SRS Request	

The resulting **Bit Data** is displayed according to the fields listed in the table.

Control Information Field	SCPI command	Dependencies
"Carrier Indicator Field (CIF)"	[:SOURce<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:CIField on page 182	
"Resource Block Assignment"	[:SOURce<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:RBA on page 184	
"Modulation and Cod. Scheme and Red. Version"	[:SOURce<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:MCSR on page 184	
"New Data Indicator"	[:SOURce<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:NDI on page 184	

Control Information Field	SCPI command	Dependencies
"TPC Command for PUSCH"	[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:TPCC on page 185	
"Cyclic Shift for DMRS"	[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:CSDMrs on page 183	
"CSI/CQI Request"	[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:CSIRequest on page 183	
"SRS Request"	[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:SRSRequest on page 185	"Search Space" other than "Common"

DCI Format 10W

The DCI format 1 carries information for scheduling transmission of one PDSCH code-word. The different fields of this format are summarized in the following table.

OneWeb A: DCI Format Configuration (F0/SF0/0)

Bit Data

0000 0000 0000 0000 0001 0000 0000 0000 0000

DCI Format 10W

Resource Block Assignment	1
Modulation and Coding Scheme	0
HARQ Process Number	0
New Data Indicator	☐
Redundancy Version	0
TPC Command for PUCCH	0

The resulting **Bit Data** is displayed according to the fields listed in the table.

Control Information Field	SCPI command	Dependencies
"Resource Block Assignment"	[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:RBA on page 184	
"Modulation and Coding Scheme"	[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:MCSR on page 184	
"HARQ Process Number"	[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:HPN on page 185	
"New Data Indicator"	[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:NDI on page 184	

Control Information Field	SCPI command	Dependencies
"Redundancy Version"	<code>[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:RV</code> on page 186	
"TPC Command for PUCCH"	<code>[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:TPCC</code> on page 185	

DCI Format 1A

DCI format 1A is used for the compact scheduling of one PDSCH codeword and random access procedure initiated by a PDCCH order.

OneWeb A: DCI Format Configuration (F0/SF0/0)

Bit Data: 1 0000 0000 0000 0000 0000 0000 0000

DCI Format 1A

Mode	PDSCH
Resource Block Assignment	0
Modulation and Coding Scheme	0
HARQ Process Number	0
New Data Indicator	☐
Redundancy Version	0
TPC Command for PUCCH	0
SRS Request	

The resulting **Bit Data** is displayed according to the fields listed in the table.

The contents of DCI Format 1A are listed in the following table; the available fields depend whether a PDSCH or PRACH is transmitted.

Control Information Field	SCPI command	Dependencies
"Mode"	<code>[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:FlAMode</code> on page 186	
"Resource Block Assignment"	<code>[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:RBA</code> on page 184	
"Modulation and Coding Scheme"	<code>[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:MCSR</code> on page 184	PDSCH Mode
"HARQ Process Number"	<code>[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:HPN</code> on page 185	PDSCH Mode
"New Data Indicator"	<code>[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:NDI</code> on page 184	PDSCH Mode
"Redundancy Version"	<code>[:SOURCE<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:RV</code> on page 186	PDSCH Mode

Control Information Field	SCPI command	Dependencies
"TPC Command for PUCCH"	[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:TPCC on page 185	PDSCH Mode
"SRS Request"	[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:SRSRequest on page 185	PDSCH Mode
"Preamble Index"	[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:PRACH:PRIndex on page 187	PRACH Mode
"PRACH Mask Index"	[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:PRACH:MINDEX on page 187	PRACH Mode

DCI Format 20W

The DCI Format 20W is used for the scheduling of downlink transmission on PDSCH with the transmission mode for up to two transport blocks in the following table.

OneWeb A: DCI Format Configuration (F0/SF0/0)	
Bit Data	0000 0000 0000 0000 0010 0000 0000 0000 0010 0100
DCI Format 20W	
Resource Block Assignment	1
TPC Command for PUCCH	0
HARQ Process Number	0
MCS for A First Transmission	0
MCS for A Retransmission	0
Transport Block 1	
New Data Indicator	☒
Redundancy Version	0
Transport Block 2	
New Data Indicator	☒
Redundancy Version	0

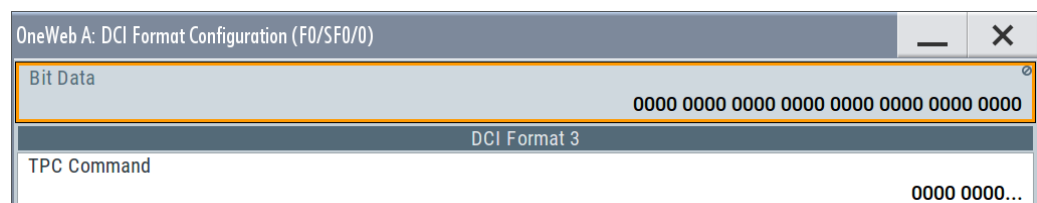
The resulting **Bit Data** is displayed according to the fields listed in the table.

Control Information Field	SCPI command	Dependencies
Resource Block Assignment	[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:RBA on page 184	
TPC Command for PUCCH	[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:TPCC on page 185	

Control Information Field	SCPI command	Dependencies
HARQ Process Number	<code>[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:HPN</code> on page 185	
MCS for A First Transmission	<code>[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:FIRStrans:MCS</code> on page 188	
MCS for A Retransmission	<code>[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:RETRans:MCS</code> on page 188	
"Transport Block 1"		
New Data Indicator	<code>[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:TB1:NDI</code> on page 188	
Redundancy Version	<code>[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:TB1:RV</code> on page 189	
"Transport Block 2"		
New Data Indicator	<code>[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:TB2:NDI</code> on page 188	
Redundancy Version	<code>[:SOURCE<hw>] :BB:ONEWeb:DL[:SUBF<st0>] :ENCC: PDCCh:EXTC:ITEM<ch0>:DCIConf:TB2:RV</code> on page 189	

DCI Format 3/3A

The DCI Format 3/3A is used for the transmission of TPC Commands for PUCCH and PUSCH with 2-bit and a single bit power adjustment respectively.



The "TPC Command" is set as a bit pattern.

The resulting **Bit Data** is displayed according to the fields listed in the table.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:DL[ :SUBF<st0> ] :ENCC:PDCCh:EXTC:
ITEM<ch0>:DCIConf:TPCinstr
```

 on page 189

4.5.8 Enhanced PBCH and PDSCH Settings

Access:

1. Select "General > Link Direction > Downlink / Forward (SC-TDM)".
2. Select "Frame Configuration > PDCCH > DCI Format = 1A".

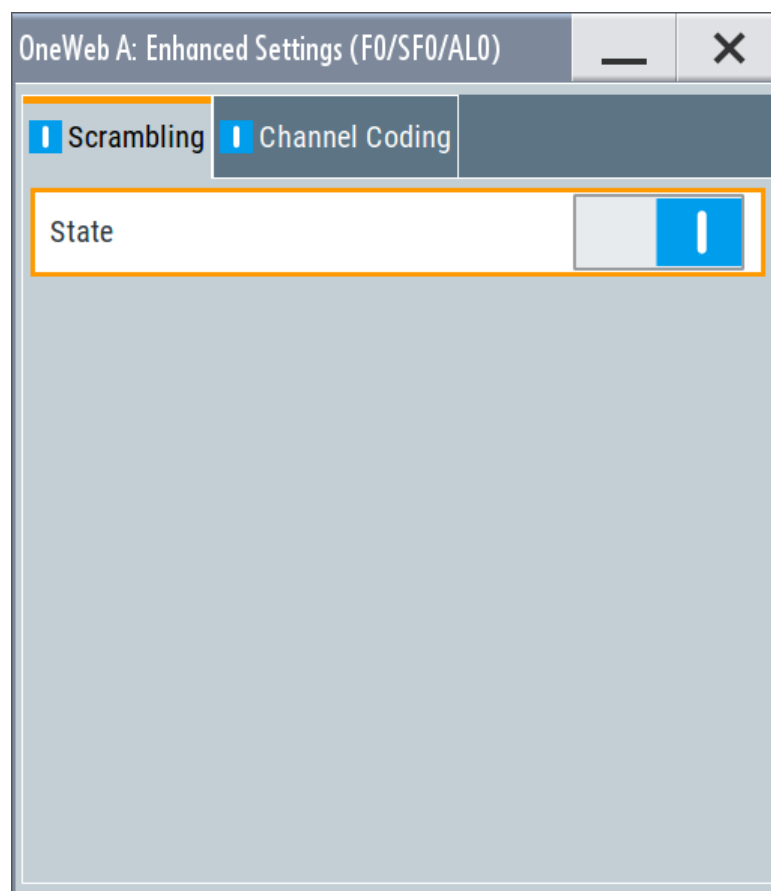
3. Select "Allocation Table > Enhanced Settings > Config...".

In the "Enhanced Settings" dialog, you can define the channel coding settings for the DL channels PBCH and PDSCH. The settings are configurable on a subframe basis.

4.5.8.1 Scrambling Settings

Access:

- Select "Enhanced Settings > Scrambling".



This dialog comprises the settings needed for configuring the scrambling:

Settings:

State Scrambling (DL).....	55
UE ID/n_RNTI (PDSCH).....	56

State Scrambling (DL)

Enables/disables the bit-level scrambling.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ALLoc<ch0> [ :CW<user> ] :
SCRambling:STATe on page 191
```

UE ID/n_RNTI (PDSCH)

Sets the user equipment identifier (n_RNTI) of the user to which the PDSCH transmission is intended. The UE ID is used to calculate the scrambling sequence.

If a "User x" is selected as [Data Source](#) in the allocation table for the corresponding allocation, the "UE ID" is read only. Its value is displayed as set in the [User Configuration Settings](#) dialog for the corresponding user.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ALLoc<ch0> [ :CW<user> ] :
SCRambling:UEID on page 192
```

4.5.8.2 Channel Coding Settings

Access:

- Select "Enhanced Settings > Channel Coding".

PBCH channel coding settings	PDSCH channel coding settings
OneWeb A: Enhanced Settings (F0/SF0/AL0) Scrambling Channel Coding State Type Number Of Physical Bits MIB (including SFN) SFN Offset MIB Spare Bits Transport Block Size/Payload CONV 1/3 6400/4 Frames, 1600/1 Frame ☒ 0 0000 0000 0000 0000 24	OneWeb A: Enhanced Settings (F0/SF0/AL2) Scrambling Channel Coding State Type Number of Physical Bits Transport Block Size/Payload Redundancy Version Index IR Soft Buffer Size TC 1/3 2 000 120 0 31 296

This dialog comprises the settings needed for configuring the channel coding. The settings vary according to the selected "Content Type"

Settings:

State Channel Coding (DL).....	57
Type Channel Coding (DL).....	57
Phys. Bits/Number of Physical Bits (DL).....	57
MIB (including SFN).....	57
SFN Offset.....	58
MIB Spare Bits.....	58
Transport Block Size/Payload (DL).....	58
Redundancy Version Index (PDSCH).....	58
IR Soft Buffer Size (PDSCH).....	58

State Channel Coding (DL)

Enables/disables channel coding for the selected allocation and codeword.

A PBCH can be generated in one of the following modes:

- Without channel coding, i.e. this parameter is disabled.
Dummy data or user-defined data lists are used.
- Channel coding with arbitrary transport block content
Channel coding is activated and parameter [MIB \(including SFN\)](#) is disabled.
- Channel coding with real data (MIB) including SFN
Channel coding and MIB are activated.

For the PBCH allocation with activated channel coding, one block of data (transport block size TBS of 24) is coded jointly and then spread over four frames. Set the ARB sequence length to a value that is a multiple of four.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ALLoc<ch0> [ :CW<user> ] :  
CCODing:STATe on page 191
```

Type Channel Coding (DL)

Displays the used channel coding scheme and channel coding rate.

PBCH uses always tail biting convolution coding with code rate 1/3; PDSCH uses always turbo code with code rate 1/3.

Remote command:

n.a.

Phys. Bits/Number of Physical Bits (DL)

Displays the size of the selected allocation in bits and considering the subcarriers that are used for other signals or channels with higher priority.

The size of the PBCH allocation is fixed to 6400/4 Frames, 1600/1 Frame.

See [Chapter A, "Conflict Handling"](#), on page 235.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :ALLoc<ch0> [ :CW<user> ] :  
PHYSbits? on page 168  
[ :SOURce<hw> ] :BB:ONEWeb:DL [ :SUBF<st0> ] :USER<ch> :PHYSbits?  
on page 171
```

MIB (including SFN)

(for PBCH only)

Enables transmission of real MIB (master information block) data, calculated according to the values of the following "General DL Settings" parameters:

- [Channel Bandwidth](#)

The SFN (system frame number) is included as well.

If this parameter is enabled, the "[Transport Block Size](#)" is fixed to 32 and the [Data Source](#) for the PBCH allocation is set to "MIB".

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:DL:PBCH:MIB](#) on page 190

SFN Offset

(for PBCH only)

By default, the counting of the SFN (system frame number) starts with 0. Use this parameter to set a different start SFN value.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:DL:PBCH:SOFFset](#) on page 191

MIB Spare Bits

(for PBCH only)

Sets the 10 spare bits in the PBCH transmission.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:DL:PBCH:MSpare](#) on page 191

Transport Block Size/Payload (DL)

Queries the size of the transport block/payload in bits.

- One transport block is generated and spread over all allocations.
- In case a spatial multiplexing with two codewords is configured, individual transport blocks for the two code blocks are generated.
- For PBCH allocations with enabled parameter [MIB \(including SFN\)](#), the transport block size is fixed to 32.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:DL\[:SUBF<st0>\]:ALLoc<ch0>\[:CW<user>\]:CCODing:TBSize?](#) on page 193

Redundancy Version Index (PDSCH)

Sets the redundancy version index.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:DL\[:SUBF<st0>\]:ALLoc<ch0>\[:CW<user>\]:CCODing:RVIndex](#) on page 193

IR Soft Buffer Size (PDSCH)

Sets the size of the IR soft buffer for the selected transport block.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:DL\[:SUBF<st0>\]:ALLoc<ch0>\[:CW<user>\]:CCODing:ISBSize](#) on page 192

4.6 General Uplink Settings

Option: R&S SMW-K130

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "General Settings "

This dialog allows configuring the OneWeb system for transmission direction uplink.

Settings:

- [UL Carrier Aggregation Configuration](#).....59
- [UL Physical Settings](#).....62
- [UL Cell Specific Settings](#).....64
- [Signals Settings](#).....66
- [PRACH Settings](#).....69
- [PUCCH Structure](#).....72

4.6.1 UL Carrier Aggregation Configuration

Access:

1. Select "Baseband > OneWeb > General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "General Settings > CA".

OneWeb A: General UL Settings

CA Physical 20 MHz Cell Signals PRACH PUCCH

Activate Carrier Aggregation 0

Cell Index	Phys. Cell ID	Bandwidth	Δf /MHz	Duplexing	n(1)_DMRS	SRS SF Config	SRS BW C_SRS	Delay /ns	State
0	0	20 MHz	0.000 000	FDD	0	15	0	0	On
1	1	20 MHz	0.000 000	FDD	0	15	0	0	Off

PCell (FDD)

U U U U U U U U U U

Figure 4-1: "General Settings > Carrier Aggregation" dialog in "System Config > Fading/Baseband Configuration > BB Source Config > Separated Sources"

The available settings depend on the current "System Configuration" settings, in particular on the selected "BB Source Config".

The dialog provides the settings for the configuration of one primary (PCell) and one secondary cell (SCell). The most important SCell settings are grouped in the "Carrier Aggregation" dialog.



The cell-specific parameters, like the PUSCH and PUACH configuration, the DRS and SRS transmission are configurable in the [Chapter 4.8, "User Equipment Configuration"](#), on page 96 dialog of the corresponding UE.

4.6.1.1 Carrier Aggregation Settings

The cell-specific parameters, like the PUSCH and PUACH configuration, the DRS and SRS transmission are configurable in the [User Equipment Configuration](#) dialog.

Settings

Activate Carrier Aggregation.....	60
Component Carrier Table.....	60
L Cell Index.....	60
L Physical Cell ID.....	61
L Bandwidth.....	61
L delta f / MHz.....	61
L Duplexing.....	61
L n(1)_DMRS.....	61
L SRS Subframe Configuration	61
L SRS Bandwidth Configuration C_SRS	61
L Delay / ns.....	61
L State.....	62

Activate Carrier Aggregation

Enables/disables the generation of several component carriers.

Remote command:

[\[:SOURce<hw>\]:BB:ONEWeb:UL:CA:STATe](#) on page 196

Component Carrier Table

The table provides the settings of the component carriers.

The first row displays the settings of the PCell as configured in the [General Uplink Settings](#) dialog.

The second row provides the configurable settings for the SCells.

Cell Index ← Component Carrier Table

Sets the cell index of the SCell.

The cell index of the PCell is always 0.

Remote command:

[\[:SOURce<hw>\]:BB:ONEWeb:UL:CA:CELL<ch0>:INDEX](#) on page 195

Physical Cell ID ← Component Carrier Table

Sets the physical Cell ID of the corresponding component carrier.

The value of the parameter "General UL Settings" > **Cell ID** is set automatically to the physical cell ID of the PCell.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:CA:CELL<ch0>:ID on page 195

Bandwidth ← Component Carrier Table

The bandwidth is fixed at 20 MHz for the corresponding component carrier.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:CA:CELL<ch0>:BW? on page 194

delta f / MHz ← Component Carrier Table

(enabled in "System Configuration > BB Source Config > Separate Sources" configuration)

Sets the frequency offset between the central frequency of corresponding SCell and the frequency of the PCell.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:CA:CELL<ch0>:DFReq on page 195

Duplexing ← Component Carrier Table

The duplexing mode is fixed at FDD for both PCell and SCell.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:CA:CELL<ch0>:DUPLexing? on page 195

n(1)_DMRS ← Component Carrier Table

Sets the part of the demodulation reference signal (DMRS) index used by the calculation of the DMRS sequence, transmitted by the PCell/SCell.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:CA:CELL<ch0>:DMRS on page 196

SRS Subframe Configuration ← Component Carrier Table

Sets the cell-specific parameter SRS subframe configuration of the PCell/SCell.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:CA:CELL<ch0>:SUConfiguration
on page 196

SRS Bandwidth Configuration C_SRS ← Component Carrier Table

Sets the cell-specific parameter SRS Bandwidth Configuration (C_{SRS}) of the PCell/SCell.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:CA:CELL<ch0>:CSRS on page 196

Delay / ns ← Component Carrier Table

Sets the time delay of the SCell relative to the PCell.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:CA:CELL<ch0>:TDElay on page 197

State ← Component Carrier Table

Activates/deactivates the component carrier.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:CA:CELL<ch0>:STATe on page 197

4.6.2 UL Physical Settings

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "General UL Settings > Physical"

OneWeb A: General UL Settings					
CA	Physical 20 MHz	Cell	Signals	PRACH	PUCCH
Channel Bandwidth		20 MHz		Number of Resource Blocks per Subframe	
FFT Size		2048		100	
Physical Resource Block Bandwidth		12 * 15 kHz		Occupied Bandwidth	
Sampling Rate		30.720 MHz		18.000 MHz	
Number of Left Guard Subcarriers		424		Number of Occupied Subcarriers	
				1 200	
				Number of Right Guard Subcarriers	
				424	

This dialog comprises the physical settings for uplink.

Settings:

Channel Bandwidth.....	62
Number of Resource Blocks Per Subframe.....	63
FFT Size.....	63
Physical Resource Block Bandwidth.....	63
Occupied Bandwidth.....	63
Sampling Rate.....	63
Number Of Occupied Subcarriers.....	63
Number of Left/Right Guard Subcarriers.....	63

Channel Bandwidth

The channel bandwidth is fixed at 20 MHz.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:BW? on page 197

Number of Resource Blocks Per Subframe

Indicates the number of used resource blocks for the selected "Channel Bandwidth".

This is a read-only value, set automatically as function of the "Channel Bandwidth" and "Physical Resource Block Bandwidth".

The sampling rate and the occupied bandwidth are determined by the parameter "Number of Resource Blocks Per Subframe".

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:NORB? on page 198

FFT Size

Sets the FFT (Fast Fourier Transformation) size. The available values depend on the selected "Number of Resource Blocks Per Subframe".

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:FFT? on page 198

Physical Resource Block Bandwidth

Displays the bandwidth of one physical resource block.

Note: The physical resource block is fixed to 12 x 15 kHz.

Remote command:

n.a.

Occupied Bandwidth

Displays the occupied bandwidth, calculated from the parameter "Number of Resource Blocks Per Subframe".

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:OCCBandwidth? on page 199

Sampling Rate

Displays the sampling rate, calculated from the parameter "Number of Resource Blocks Per Subframe".

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:SRATe? on page 199

Number Of Occupied Subcarriers

Displays the number of occupied subcarriers, calculated from the parameter "Number of Resource Blocks Per Subframe".

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:OCCSubcarriers? on page 199

Number of Left/Right Guard Subcarriers

Displays the number of left/right guard subcarriers, calculated from the parameter "Number of Resource Blocks Per Subframe".

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:LGS? on page 198

[:SOURCE<hw>] :BB:ONEWeb:UL:RGS? on page 198

4.6.3 UL Cell Specific Settings

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "General Settings > Cell"

The screenshot shows a software window titled "OneWeb A: General UL Settings". It has a tabbed interface with tabs for "CA", "Physical 20 MHz", "Cell", "Signals", "PRACH", and "PUCCH". The "Cell" tab is currently active. Inside this tab, there are three input fields: "Cell ID" with the value "0", "Cyclic Prefix" with the value "Normal", and "SFN Offset" with the value "0". The "Cell ID" field is highlighted with an orange border.

This dialog comprises the settings needed for configuring the physical layer cell ID settings, the UL Reference Signal settings, the PUCCH and PRACH structures are selected, as well as cell-specific SRS parameters.

Settings:

Cell ID.....	64
Cyclic Prefix.....	65
SFN Offset.....	65

Cell ID

Sets the cell identity.

There are 504 unique physical layer cell identities (cell ID), grouped into 168 unique physical cell identity groups that contain three unique identities each.

There is a cross-reference between the values of these three parameters and changing of one of them results in adjustment in the values of the others.

The cell ID determinates:

- The reference signal grouping hopping pattern
- The reference signal sequence hopping

- The PUSCH demodulation reference signal pseudo-random sequence
- The cyclic shifts and scrambling sequences for all PUCCH formats
- The pseudo-random sequence used for scrambling

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :PLCI ] :CID` on page 200

Cyclic Prefix

Displays the cyclic prefix length for all subframes.

The cyclic prefix length is fixed to normal, i.e. the UL slot contains 7 SC-FDMA symbols.

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL:CPC?` on page 199

SFN Offset

By default, the counting of the SFN (System Frame Number) starts with 0. Use this parameter to set a different start SFN value, e.g. to skip a defined number of frames.

Example: Visualizing the SFN offset in the SC-FDMA time plan

Perform the following:

- Select "OneWeb > General > Standard > OneWeb"
- Select "OneWeb > General > ARB Configuration ...".
- Select "ARB > Sequence Length = 100 Frames".
- Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
- Select "General > General Settings > Cell > SFN Offset = 1".
- Select "General > Frame Configuration > No. of PUCCH Config = No. PUSCH Config. = 40".
- Select "Frame Configuration > Subframe#0 > PUSCH > No. of RB = 50".
- Select "Frame Configuration > Time Plan" and set "Subframes = 20".

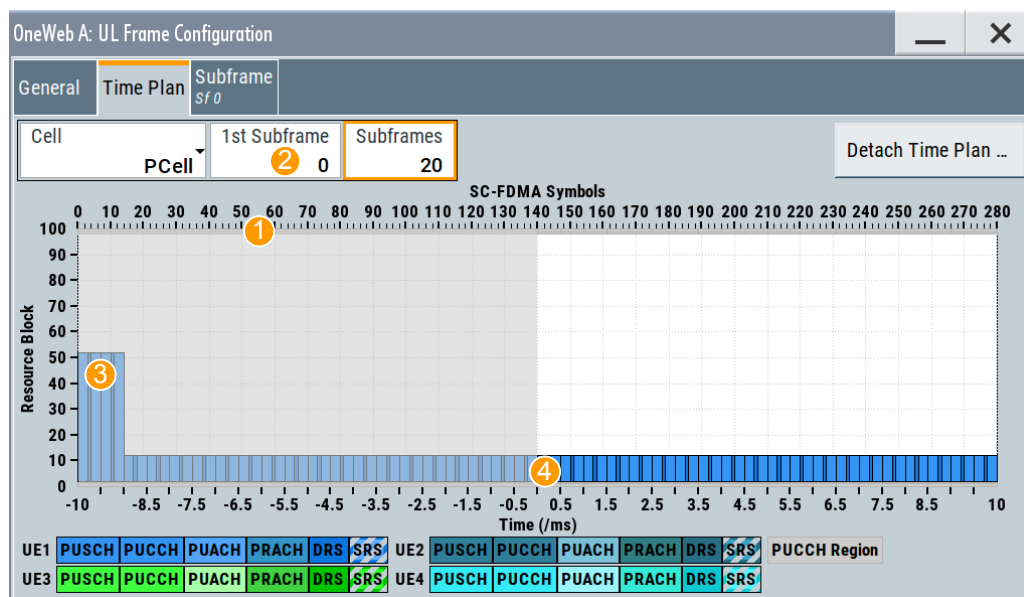


Figure 4-2: Visualization of an enabled SFN offset in the time plan

- 1 = SFN offset = 1 Frame = 10 Subframes
 2 = First (most left) displayed subframe is Subframe#0; 20 subframes = 2 frames are displayed
 3 = PUCCH with "No. of RB = 50" as configured in the Subframe#0
 4 = First 1 frame is skipped; generation starts with the second frame

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:SOFFset on page 200

4.6.4 Signals Settings

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".

2. Select "General UL > Signals"

OneWeb A: General UL Settings	
CA	Physical 20 MHz
Cell	Signals
PRACH	PUCCH
Common	
Group Hopping	☐
Sequence Hopping	☐
Delta Sequence Shift for PUSCH	0
n(1)_DMRS	0
SRS	
SRS Subframe Configuration	15
Configuration Period T_SFC	Reserved
Transmission Offset Delta_SFC	Reserved
SRS Bandwidth Configuration C_SRS	0
A/N+SRS simultaneous Tx	☐

This dialog comprises the settings needed for configuring the uplink reference signals and the SRS structure.

4.6.4.1 UL Reference Signals

The following provides common settings for uplink reference signals demodulation reference signal (DRS) and sounding reference signal (SRS).

Group Hopping.....	67
Sequence Hopping.....	68
Delta Sequence Shift for PUSCH.....	68
n(1)_DMRS.....	68

Group Hopping

Enables/disables group hopping for the uplink reference signals demodulation reference signal (DRS) and sounding reference signal (SRS).

17 different hopping patterns and 30 different sequence shift patterns are used for group hopping.

PUSCH and PUCCH use **the same group hopping pattern** that is calculated if the "Group Hopping" is enabled. The group hopping pattern is generated by a pseudo-random sequence generator. The sequence shift patterns are derived as follows:

- PUCCH
From the physical layer cell ID, [Cell ID](#).
- PUSCH
By the parameter [Delta Sequence Shift for PUSCH](#).

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:REFSig:GRPHopping on page 201

Sequence Hopping

Enables/disables sequence hopping for the uplink reference signals demodulation reference signal (DRS) and sounding reference signal (SRS).

If sequence hopping and [Group Hopping](#) are to be activated simultaneously, only group hopping is applied.

The sequence hopping is generated by a pseudo-random sequence generator.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:UL:REFSig:SEQHopping](#) on page 201

Delta Sequence Shift for PUSCH

Sets the delta sequence shift for PUSCH needed for the calculation of the group hopping pattern.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:UL:REFSig:DSShift](#) on page 201

n(1)_DMRS

Sets the part of the demodulation reference signal (DMRS) index which is broadcasted and therefore valid for the whole cell. This index applies when multiple shifts within a cell are used. It is used for the calculation of the DMRS sequence.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:UL:REFSig:DMRS](#) on page 201

4.6.4.2 Cell-Specific SRS Settings

The cell-specific parameters in this section determine the structure of the sounding reference signal (SRS).

To configure the UE-specific parameters, necessary for the complete definition of the SRS structure and SRS mapping, use the settings in the "UE > User Equipment > SRS" dialog.

Settings:

SRS Subframe Configuration	68
Configuration Period T_SFC	69
Transmission Offset Delta_SFC	69
SRS Bandwidth Configuration C_SRS	69
A/N + SRS simultaneous Tx	69

SRS Subframe Configuration

Sets the cell-specific parameter SRS subframe configuration.

This parameter can also influence the shortening of PUCCH/PUSCH transmissions, regardless whether the UEs are configured to send an SRS in the subframe or not.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:UL:REFSig:SRS:SUConfiguration](#) on page 203

Configuration Period T_SFC

Displays the value for the cell-specific parameter configuration period T_{SFC} in subframes, depending on the selected "SRS Subframe Configuration".

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:REFSig:SRS:TSFC? on page 203

Transmission Offset Delta_SFC

Displays the value for the cell-specific parameter transmission offset Δ_{SFC} in subframes, depending on the selected "SRS Subframe Configuration".

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:REFSig:SRS:DSFC? on page 202

SRS Bandwidth Configuration C_SRS

Sets the cell-specific parameter SRS bandwidth configuration (C_{SRS}).

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:REFSig:SRS:CSRS on page 202

A/N + SRS simultaneous Tx

Enables/disables simultaneous transmission of SRS (sounding reference signal) and ACK/NACK messages, i.e. transmission of SRS and PUCCH in the same subframe.

Simultaneous transmission of SRS and PUCCH is allowed only for PUCCH formats 1, 1a, 1b and 3, since CQI reports are never simultaneously transmitted with SRS.

If this parameter is disabled, the SRS is not transmitted in the corresponding subframe.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:REFSig:SRS:ANSTx on page 202

4.6.5 PRACH Settings

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".

2. Select "General UL Settings > PRACH"

OneWeb A: General UL Settings

CA Physical 20 MHz Cell Signals **PRACH** PUCCH

PRACH Frequency Offset 0

PRACH Configuration 0

Restricted Set (High Speed Mode) ☐

This dialog comprises the cell-specific parameters that determine the PRACH configuration.

The UE-specific parameters, necessary for the complete definition of the PRACH, are configurable in the [User Equipment Configuration](#) dialog of the corresponding UE.

Settings:

PRACH Frequency Offset	70
PRACH Configuration	70
Restricted Set (High Speed Mode)	71

PRACH Frequency Offset

For preamble formats 0-3, sets the prach-FrequencyOffset $n_{PRBOffset}^{RA}$, i.e. determines the first physical resource block available for PRACH expressed as a physical resource block number that fulfills the equation:

$$0 \leq n_{PRBOffset}^{RA} \leq \text{Number of Resource Blocks Per Subframe} - 6$$

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:PRACH:FOFFset on page 203

PRACH Configuration

Sets the PRACH configuration index. PRACH configuration defines the time and frequency resources in which random access preamble transmission is allowed.

The PRACH allocation occupies a bandwidth of 6 RBs.

The PRACH distribution (subframe, length, offset) depends on several other parameters:

- "Cyclic Prefix" which is fixed at "Normal".
- Selected [PRACH Frequency Offset](#) .
- Selected frame format, i.e. on the selected "Duplexing Mode" mode

Not all combinations of channel bandwidth, PRACH configuration and PRACH frequency offset are allowed.

The table below gives an overview on the dependency of the value range of the parameter "PRACH Configuration" and other parameters.

Duplexing Mode	(Global) Cyclic Prefix	PRACH Configuration
FDD	Normal	0 .. 63

The **Preamble Format** is automatically derived from the "PRACH Configuration".

Use the SC-FDMA Time plan to display the PRACH distribution.

Example:

PRACH example configuration:

- "Duplexing Mode = FDD"
- "Cyclic Prefix = Normal"
- "General UL Settings > Physical > Channel Bandwidth which is fixed at 20 MHz"
- "General UL Settings > PRACH > PRACH Frequency Offset = 10"
- "PRACH Configuration = 38"
- (Preamble Format = 2)
- Adjusted the PRACH frequency offset

Observe the timeplan on "**Preamble Format (Burst Format)**" on page 114.

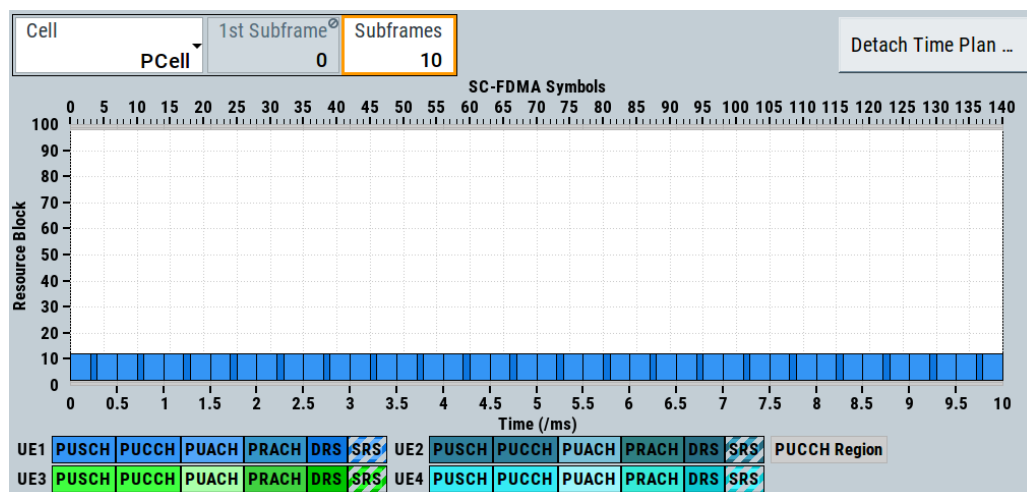


Figure 4-3: PRACH distribution (example)

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL:PRACH:CONFIguration` on page 203

Restricted Set (High Speed Mode)

Selects whether a restricted preamble set (high speed mode) or the unrestricted preamble set (normal mode) will be used.

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL:PRACH:RSET` on page 204

4.6.6 PUCCH Structure

1. To access this dialog, select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "General UL Settings > PUCCH".

OneWeb A: General UL Settings

CA	Physical 20 MHz	Cell	Signals	PRACH	PUCCH
Number of RBs used for PUCCH			Delta Shift		
4			2		
N(1)_cs			N(2)_RB		
6			1		
Range n(1)_PUCCH (Normal CP)			Range n(2)_PUCCH		
0...44			0...15		
Range n(3)_PUCCH					
0...19					

This dialog comprises the cell-specific parameters that determine the PUCCH configuration.

Settings:

Settings:

Number of RBs used for PUCCH	72
Delta Shift	74
N(1)_cs	74
N(2)_RB	74
Range n(1)_PUCCH (Normal CP)	74
Range n(2)_PUCCH	75
Range n(3)_PUCCH	75

Number of RBs used for PUCCH

Sets the PUCCH region in terms of reserved resource blocks, at the edges of the channel bandwidth. See [Figure 4-4](#).

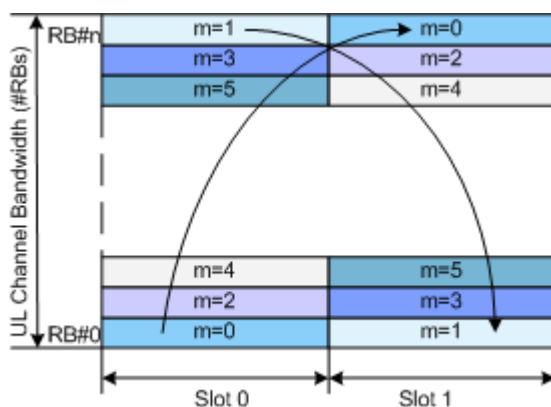


Figure 4-4: PUCCH mapping

The PUCCH region is displayed on the time plan.

Example:

- "Channel Bandwidth fixed at 20 MHz"
- "General Settings > PUCCH> Number of RBs used for PUCCH = 3"
- "Frame Configuration > Subframe > Content > PUCCH"
- "Frame Configuration > Subframe > Enhanced Settings > Common > PUCCH Format = F2a" and "PUCCH State > On"

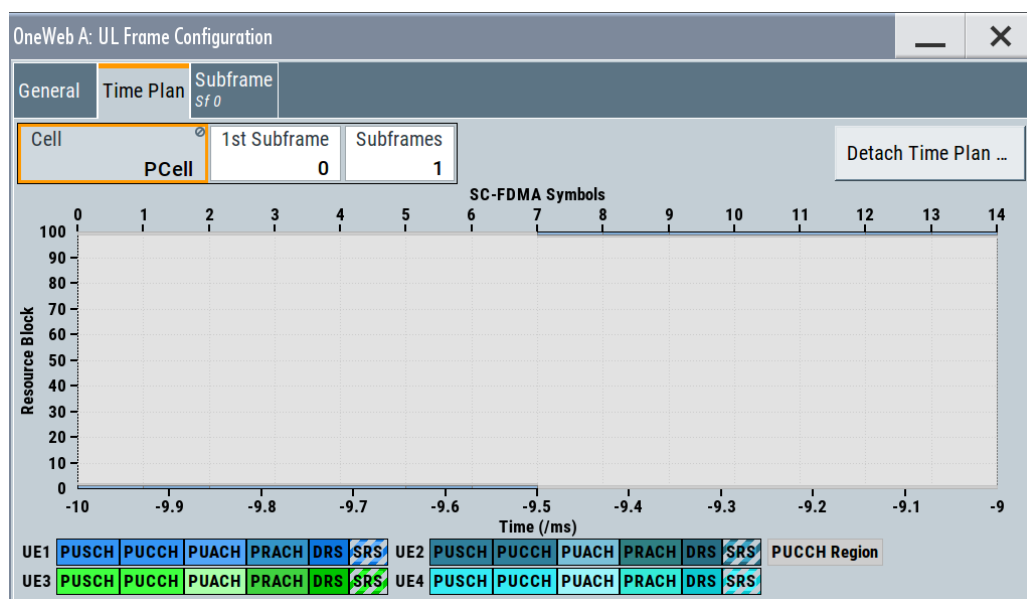


Figure 4-5: Example: Representation of subframe with PUCCH region with three reserved resource blocks on the time plan

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:PUCCh:NORB on page 206

Delta Shift

Sets the delta shift parameter, i.e. the cyclic shift difference between two adjacent PUCCH resource indices with the same orthogonal cover sequence (OC).

The delta shift determinates the number of available sequences in a resource block that can be used for PUCCH formats 1/1a/1b (see also [Table 4-6](#)).

Table 4-6: PUCCH resource indices per PUCCH format

PUCCH format	PUCCH resource indices	Number available within a resource block
1/1a/1b	N(1)_PUCCH	44 for normal CP
2/2a/2b	N(2)_PUCCH	15
3	N(3)_PUCCH	19

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:PUCCh:DESHift on page 204

N(1)_cs

Sets the number of cyclic shifts used for PUCCH format 1/1a/1b in a resource block used for a combination of the formats 1/1a/1b and 2/2a/2b.

Only one resource block per subframe can support a combination of the PUCCH formats 1/1a/1b and 2/2a/2b.

The number of cyclic shifts available for PUCCH format 2/2a/2b N(2)_cs in a block with combination of PUCCH formats is calculated as follows:

$$N(2)_{cs} = 12 - N(1)_{cs} - 2$$

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:PUCCh:N1CS on page 204

N(2)_RB

Sets bandwidth in terms of resource blocks that are reserved for PUCCH formats 2/2a/2b transmission in each subframe.

There can be only one resource block per subframe that supports a combination of the PUCCH formats 1/1a/1b and 2/2a/2b. Hence, the number of RBs per subframe available for PUCCH format 1/1a/1b is determinate by "N(2)_RB".

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:PUCCh:N2RB on page 205

Range n(1)_PUCCH (Normal CP)

Displays the range of the possible PUCCH format 1/1a/1b transmissions from different UEs in one subframe and per cyclic prefix.

Insufficient ranges are displayed as '-'.

The parameter "Range n(1)_PUCCH (Normal CP)" determines the value range of the index "n_PUCCH" for PUCCH format 1/1a/1b.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:PUCCh:N1NMax? on page 205

Range n(2)_PUCCH

Displays the range of possible number of PUCCH format 2/2a/2b transmissions from different UEs in one subframe.

Insufficient ranges are displayed as '-'.
 Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:PUCCh:N2Max? on page 205

Range n(3)_PUCCH

Displays the range of possible number of PUCCH format 3 transmissions from different UEs in one subframe.

Insufficient ranges are displayed as '-'.
 Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:PUCCh:N3Max? on page 206

4.7 Uplink Frame Configuration

Option: R&S SMW-K130

Access:

1. Select "OneWeb General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration"

This dialog allows you to configure the subframes and the SC-FDMA resource allocations.

The dialog consists of the following sections:

Settings:

- [General Scheduling Configuration Settings](#)..... 75
- [Subframe Configuration](#)..... 77
- [UL Allocation Table](#)..... 78
- [Enhanced PUSCH/PUACH Settings](#)..... 83
- [Enhanced PUCCH Settings](#)..... 90

4.7.1 General Scheduling Configuration Settings

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".

2. Select "Frame Configuration > General"

	UE1	UE2	UE3	UE4
	☒ On	☐ On	☐ On	☐ On
No. of PUCCH Config.	1	1	1	1
No. of PUSCH Config.	1	1	1	1
No. of PUACH Config.	1	1	1	1

This dialog provides access to the user equipment settings and settings concerning the UL scheduling, like configuring the subframes and adjusting the PUCCH, PUSCH and PUACH scheduling.

Settings:

UEx.....	76
Number Of PUCCH/PUSCH/PUACH Configurations/ Number Of Configurable Subframes.....	76

UEx

Accesses the [User Equipment Configuration](#) dialog for configuring the UE settings.

The check box activates or deactivates the selected UE.

Note: Disabling the UE deactivates its allocations: the reference signal, PUSCH/PUSCH/PUACH allocations, and PRACH are not transmitted.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:UE<st>:STATe on page 223

Number Of PUCCH/PUSCH/PUACH Configurations/ Number Of Configurable Subframes

Sets the number of configurable subframes in the UEx, i.e. determines the scheduling cycle per UE.

All uplink subframes are filled periodically with the configured subframes except for the Sounding Reference Signal. You can set the SRS individually for each UE in the [User Equipment Configuration](#) dialog.

Note: The maximum number of configurable subframes is 40 subframes, where the maximum number of 40 subframes is available for sequence lengths of at least four frames.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:UE<st>:CONSubframes:PUACh on page 208

[:SOURce<hw>] :BB:ONEWeb:UL:UE<st>:CONSubframes:PUCCh on page 208

[:SOURce<hw>] :BB:ONEWeb:UL:UE<st>:CONSubframes:PUSCh on page 208

4.7.2 Subframe Configuration

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration > Subframe"

UE	Content	CW	Modulation / Format	Enhanced Settings	Set 1 No. RB	Set 1 Offset VRB	Offset PRB Slot (n/n+1)	Physical Bits	Power /dB	State	Conflict
UE1...	PUSCH	1/1	QPSK	Config...	10	2	(2/2)	2880	0.000	On	
UE2...	PUSCH	1/1	QPSK	Config...	10	13	-	-	0.000	Off	
UE3...	PUSCH	1/1	QPSK	Config...	10	24	(0/0)	-	0.000	On	
UE4...	PUSCH	1/1	QPSK	Config...	10	35	-	-	0.000	Off	

Provided are the settings for selecting and configuring the subframes. In the allocation table section, the individual allocation parameters for a subframe are set.

Settings:

Cell.....	77
Subframe.....	78
Next/Prev.....	78
Copy/Paste Subframe Settings.....	78
Subframe Information.....	78
Reset All Subframes.....	78

Cell

In enabled "General UL Settings > CA > Activate Carrier Aggregation > On" state, determines the settings of which cell (Primary Cell or SCell) are displayed.

Remote command:

n.a.

Subframe

Sets the subframe to be configured/displayed in the frame configuration table.

All uplink subframes are filled periodically with the configured subframes except for the Sounding Reference Signal. SRS is set individually for each UE in the [User Equipment Configuration](#) dialog.

Subframes behind the configurable range of the corresponding UE or channel ([Number Of PUCCH/PUSCH/PUACH Configurations/ Number Of Configurable Subframes](#)) are displayed as read-only.

Remote command:

n.a.

Next/Prev

Navigates through the subframes.

Remote command:

n.a.

Copy/Paste Subframe Settings

Copies/pastes the settings of the selected subframe. Sounding Reference Signals are not considered.

For more detailed information, see [Chapter B.1, "Copy/Paste Subframe"](#), on page 239.

Remote command:

n.a.

Subframe Information

Displays the kind of the selected subframe, i.e. "Uplink Subframe", "Downlink Subframe".

For "Uplink Subframe", it is also shown the uplink subframe number.

Remote command:

n.a.

Reset All Subframes

Resets settings of all subframes including cyclic prefix to the default values.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:UL:RSTFrame](#) on page 208

4.7.3 UL Allocation Table

The resource allocation table is where the individual allocation parameters for a subframe are set.

UE	Content	CW	Modulation / Format	Enhanced Settings	Set 1 No. RB	Set 1 Offset VRB	Offset PRB Slot (n/n+1)	Physical Bits	Power /dB	State	Conflict
UE1...	PUSCH	1/1	QPSK	Config...	10	2	(2/2)	2880	0.000	On	
UE2...	PUSCH	1/1	QPSK	Config...	10	13	-	-	0.000	Off	
UE3...	PUSCH	1/1	QPSK	Config...	10	24	(0/0)	-	0.000	On	
UE4...	PUSCH	1/1	QPSK	Config...	10	35	-	-	0.000	Off	

Settings:

User Equipment.....	79
Content (UL).....	79
Codeword (UL).....	79
Modulation/Format.....	80
Enhanced Settings UL.....	80
Set 1 No. RB.....	80
Set 1 Offset VRB.....	81
Offset PRB Slot (n/n+1).....	81
Phys. Bits / Total Number of Physical Bits	82
Power (UL).....	82
State (UL).....	82
Conflict (UL).....	83

User Equipment

Accesses the settings of the UE the selected allocation belongs to, see [Chapter 4.8, "User Equipment Configuration"](#), on page 96.

Remote command:

n.a.

Content (UL)

Selects the content type (PUSCH, PUCCH and PUACH) of the selected allocation.

PUACH is only on the primary cell.

Use the setting in dialog [User Equipment Configuration](#) to configure the PUSCH and PUACH data source.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL [:SUBF<st0>] :ALLoc<ch0>:CONTType

on page 209

Codeword (UL)

The codeword 1/1 is fixed with the selected PUSCH and PUACH allocation.

Remote command:

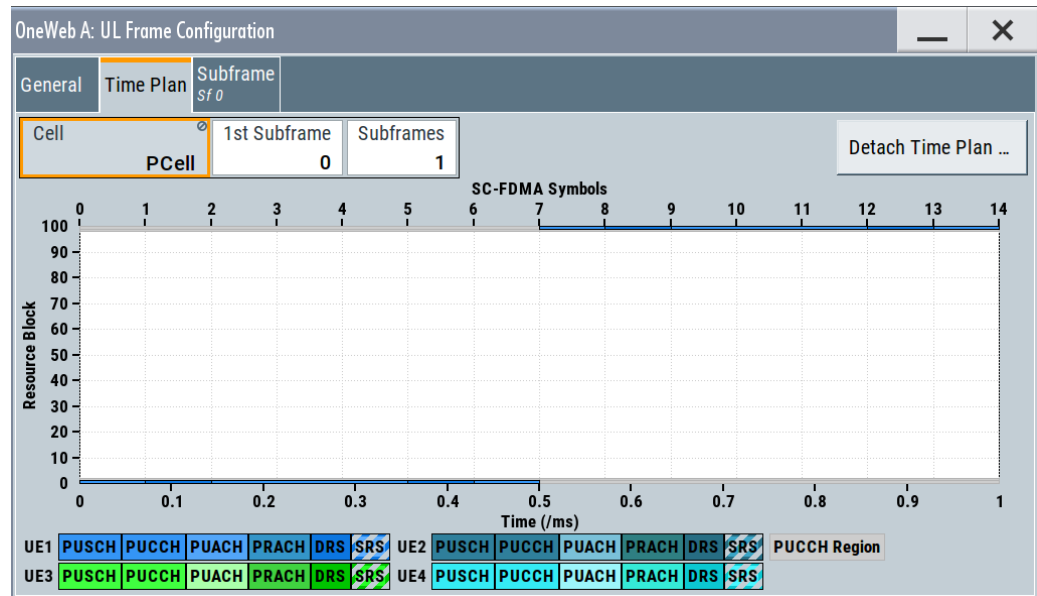
[:SOURce<hw>] :BB:ONEWeb:UL [:CELL<ccidx>] [:SUBF<st0>] :ALLoc<ch0>:
PUACH:CODWords on page 214

[:SOURce<hw>] :BB:ONEWeb:UL [:CELL<ccidx>] [:SUBF<st0>] :ALLoc<ch0>:
PUSCh:CODWords on page 214

Modulation/Format

For PUSCH and PUACH allocation, this parameter sets the modulation scheme (QPSK, 8PSK or 16QAM) for the allocation.

Use the "Time Plan" to visualize the position and structure of the configured PUCCH allocation.



Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL[ :CELL<ccid> ] [ :SUBF<st0> ] :
ALLoc<ch0> [ :CW<cwid> ] :PUACH:MODulation on page 214
[ :SOURCE<hw> ] :BB:ONEWeb:UL[ :CELL<ccid> ] [ :SUBF<st0> ] :
ALLoc<ch0> [ :CW<cwid> ] :PUSCh:MODulation on page 214
[ :SOURCE<hw> ] :BB:ONEWeb:UL[ :SUBF<st0> ] :ALLoc<ch0> [ :PUCCh ] :FORMat
on page 209
```

Enhanced Settings UL

Accesses a dialog with further channel configuration settings, see:

- [Chapter 4.7.4, "Enhanced PUSCH/PUACH Settings"](#), on page 83
- [Chapter 4.7.5, "Enhanced PUCCH Settings"](#), on page 90

Remote command:

n.a.

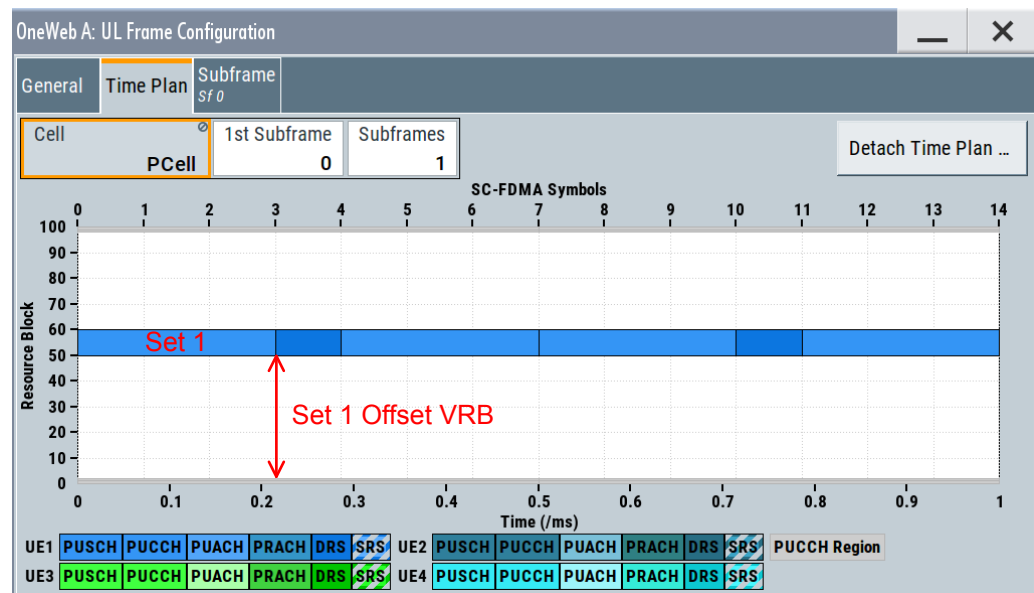
Set 1 No. RB

The PUSCH and PUACH transmission in a "sets" or "clusters" of resource blocks.

The parameter defines the size of the selected allocation in resource blocks of the corresponding set.

Example: Clustered PUSCH/PUACH Transmission

- Enable "User Equipment Configuration (UE1)" to "On".
- In the "UL Frame Configuration > Allocation Table", configure the PUSCH allocation of UE1 as follows:
 - "Set 1 No. RB" = 10, "Set 1 Offs. VRB" = 50
 - "State" = ON
- Select "Time Plan" to visualize the configured allocations



Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :SUBF<st0> ] :ALLoc<ch0> :PUCCh:RBCount?
```

on page 210

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0> :
PUACH:SET<user>:RBCount on page 210
```

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0> :
PUSCh:SET<user>:RBCount on page 210
```

Set 1 Offset VRB

For the corresponding set, sets the virtual resource block offset of the selected sub-frame (see also [Example "Clustered PUSCH/PUACH Transmission"](#) on page 81).

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :SUBF<st0> ] :ALLoc<ch0> :VRBOffset
```

on page 210

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0> :
PUACH:SET<user>:VRBOffset on page 210
```

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0> :
PUSCh:SET<user>:VRBOffset on page 210
```

Offset PRB Slot (n/n+1)

Displays the start resource block of the selected allocation in the first and the second slot of the subframe.

Consider the following interdependencies, if frequency hopping is used:

- The start physical resource blocks in slot n and slot n+1 are set automatically
These values can deviate from the [Set 1 Offset VRB](#)

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :SUBF<st0> ] :SLOT<user0>:ALLOc<ch0>:RBOFFset? on page 211`

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :SUBF<st0> ] :SLOT<user0>:ALLOc<ch0>:PUCCh:RBOFFset? on page 211`

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :SLOT<user0>:ALLOc<ch0>:PUACH:SET<gr>:RBOFFset? on page 211`

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :SLOT<user0>:ALLOc<ch0>:PUSCh:SET<gr>:RBOFFset? on page 211`

Phys. Bits / Total Number of Physical Bits

Displays the size of the selected allocation in bits. The value is set automatically according to the current allocation's settings.

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLOc<ch0> [ :CW<cwid> ] :PUACH:PHYSbits? on page 211`

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :SUBF<st0> ] :ALLOc<ch0>:PUCCh:PHYSbits? on page 211`

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLOc<ch0> [ :CW<cwid> ] :PUSCh:PHYSbits? on page 211`

Power (UL)

Sets the power for the selected allocation, i.e. PUSCH, PUACH or PUCCH power level.

The PUSCH power level (P_{PUSCH}), PPUACH power level (P_{PUACH}) and the PUCCH power level (P_{PUCCH}) can vary per subframe.

Further power-related parameters:

- [UE Power](#) (P_{UE}): for global adjustment of the transmit power of the UE
- [DRS Power Offset](#) ($P_{\text{DRS_offset}}$) and [SRS Power Offset](#) ($P_{\text{SRS_offset}}$): for boosting the reference signals, DRS and SRS, per UE.

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :SUBF<st0> ] :ALLOc<ch0>:POWer on page 211`

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :SUBF<st0> ] :ALLOc<ch0>:PUCCh:POWer on page 211`

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLOc<ch0>:PUACH:POWer on page 212`

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLOc<ch0>:PUSCh:POWer on page 212`

State (UL)

Sets the allocation to active or inactive state.

"On" Enables the allocation of the select UE.

"Off" Disables the allocation.
The PUSCH/PUCCH and the DRS are deactivated.
Other allocations of the same UE and the SRS are not affected.

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :SUBF<st0> ] :ALLoc<ch0>:PUCCh:STATe`
on page 212

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0>:`
`PUAch:STATe` on page 212

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0>:`
`PUSCh:STATe` on page 212

Conflict (UL)

Indicates a conflict between UEs and in case an allocation exceeds the available number of resource blocks.

For more information, see [Chapter B.3, "Four Configurable Frames in Uplink and Downlink Direction"](#), on page 240.

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0>:`
`PUAch:CONFLICT?` on page 212

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :SUBF<st0> ] :ALLoc<ch0>:PUCCh:`
`CONFLICT?` on page 212

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0>:`
`PUSCh:CONFLICT?` on page 212

4.7.4 Enhanced PUSCH/PUACH Settings

This dialog allows you to define and configure the DRS parameters for PUSCH/PUACH.

Access:

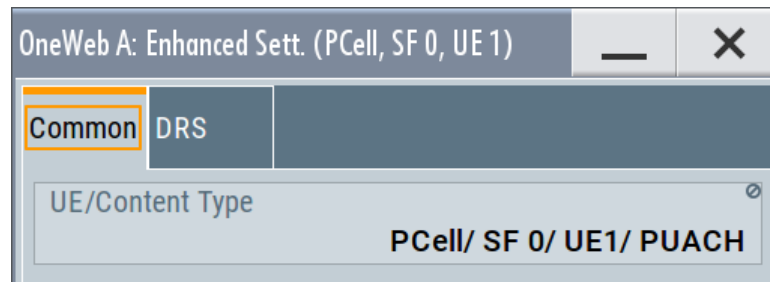
1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration > Subframe > Content > PUSCH".
3. Select "Enhanced Settings > Configure".

4.7.4.1 Common PUSCH/PUACH Settings

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration > Subframe > Content > PUSCH or PUACH".
3. Select "Enhanced Settings > Configure".

4. Select "Common"



Provides common settings for PUSCH/PUACH signals

Settings:

[UE/Content Type](#)84

UE/Content Type

Displays the UE number and the content type of the selected allocation.

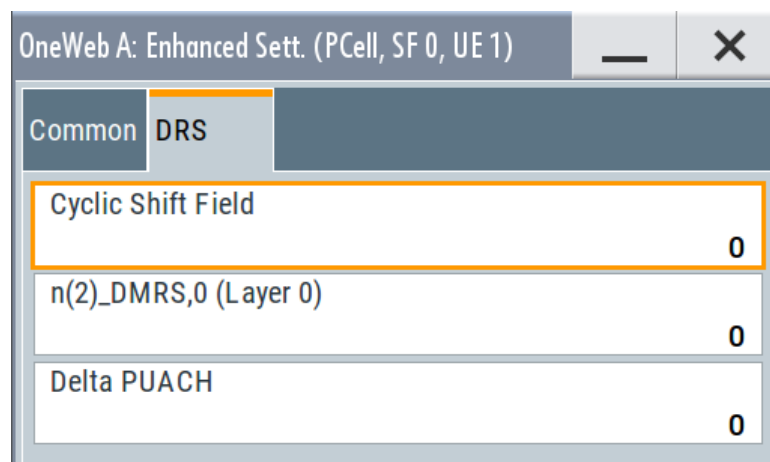
Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL [ :SUBF<st0> ] :ALLoc<ch0>:CONType`
on page 209

4.7.4.2 Demodulation Reference Signal (DRS)

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration > Subframe > Content > PUSCH or PUACH".
3. Select "Enhanced Settings > Configure".
4. Select "DRS".



Provides setting for DRS parameters in PUSCH/PUACH signals

Settings:

Cyclic Shift Field.....	85
$n(2)_{\text{DMRS}, 0}$ (Layer 0).....	85
Delta PUACH.....	85

Cyclic Shift Field

Cyclic shifts are used to separate the DRS signals of different users in the time domain. This parameter sets the cyclic shift field in the uplink-related DCI formats, see [Table 4-7](#).

See also "[DCI Format 3/3A](#)" on page 54.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:UL\[:CELL<ccid>\]\[:SUBF<st0>\]:ALLoc<ch0>:PUACH:DRS:CYCShift](#) on page 215

[\[:SOURCE<hw>\]:BB:ONEWeb:UL\[:CELL<ccid>\]\[:SUBF<st0>\]:ALLoc<ch0>:PUSCh:DRS:CYCShift](#) on page 215

 $n(2)_{\text{DMRS}, 0}$ (Layer 0)

Displays the part of the demodulation reference signal (DMRS) index $n^{(2)}_{\text{DMRS}, \lambda}$ per layer, where the number of layers λ in this case is defined as 0.

Table 4-7: DRS index $n(2)_{\text{DMRS}, \lambda}$ as function of the cyclic shifts and number of layers λ

Cyclic Shift Field in DCI Formats	$\lambda = 0$ (1 layer)
000	0
001	6
010	3
011	4
100	2
101	8
110	10
111	9

The DMRS index is part of the uplink scheduling assignment and valid for one UE in the subframe. This index applies when multiple shifts within a cell are used and is used by the calculation of the DRS sequence.

Remote command:

[\[:SOURCE<hw>\]:BB:ONEWeb:UL\[:CELL<ccid>\]\[:SUBF<st0>\]:ALLoc<ch0>:PUACH:NDMRs](#) on page 215

[\[:SOURCE<hw>\]:BB:ONEWeb:UL\[:CELL<ccid>\]\[:SUBF<st0>\]:ALLoc<ch0>:PUSCh:NDMRs](#) on page 215

Delta PUACH

Delta PUACH is used to differentiate the DMRS (PUSCH DMRS or PUACH DMRS) used in the uplink scheduling assignment.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL[ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0> :
PUACH:DRS:DELTA on page 209
```

4.7.4.3 Channel Coding / Multiplexing

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration > General > Select User Equipment > UE1... UE4"
3. Select "PUSCH > Channel Coding and Multiplexing > State > On" (refer to [Mode Channel Coding](#))
4. Select "Mode > UCI+UL-SCH " or "Mode > UCI only" (refer to [Mode Channel Coding](#))
5. Select "Frame Configuration > Subframe > Content > PUSCH"
6. Select "Enhanced Settings > Configure > Channel Coding/Multiplexing"

In this dialog, you can adjust the parameters for channel coding of the control information (HARQ and CQI) and configure the multiplexing of this control information with the data transmission over the UL-SCH.

Settings:

HARQ ACK Settings.....	87
L ACK/NACK Mode.....	87
L Number of A/N Bits.....	87
L ACK/NACK Pattern.....	87
L Number of Coded A/N Bits (CW).....	88
Channel Quality Indication (CQI) Settings.....	88
L Number of CQI Bits.....	88
L CQI Pattern.....	89
L Number of Coded CQI Bits.....	89
UL-SCH Settings.....	89
L Phys. Bits / Total Number of Physical Bits	90
L Number of Coded UL-SCH Bits.....	90
L Transport Block Size/Payload (PUSCH/PUACH).....	90
L Redundancy Version Index (PUSCH/PUACH).....	90

HARQ ACK Settings

Common	DRS	HARQ ACK	Channel Quality Indication (CQI)	UL-SCH
ACK/NACK Mode Multiplexing				
Number of A/N Bits 1				
ACK/NACK Pattern 0...				
Number of Coded A/N Bits 4				

The following HARQ ACK settings are available:

ACK/NACK Mode ← HARQ ACK Settings

This field is fixed to "Multiplexing" in the ACK/NACK mode.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL[:CELL<ccid>] [:SUBF<st0>] :ALLoc<ch0> :
PUSCh:HARQ:MODE? on page 216
```

Number of A/N Bits ← HARQ ACK Settings

Sets the number of ACK/NACK bits.

Sets this parameter to 0 to deactivate the ACK/NACK transmission for the corresponding subframe.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL[:CELL<ccid>] [:SUBF<st0>] :ALLoc<ch0> :
PUSCh:HARQ:BITS on page 215
```

ACK/NACK Pattern ← HARQ ACK Settings

Sets the ACK/NACK bits in form of a 64 bits long pattern.

A "1" indicates an ACK, a "0" - a NACK.

The pattern is read out cyclically and if the pattern is longer than the selected "Number of ACK/NACK Bits", different bits are transmitted in different subframes using this configuration.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:UL[ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0> :
PUSCh:HARQ:PATtern on page 216
```

Number of Coded A/N Bits (CW) ← HARQ ACK Settings

Displays the number of coded ACK/NACK bits per codeword.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:UL[ :CELL<ccidx> ] [ :SUBF<st0> ] :
ALLoc<ch0> [ :CW<cwid> ] :PUSCh:HARQ:CBITs? on page 216
```

Channel Quality Indication (CQI) Settings

Common	DRS	HARQ ACK	Channel Quality Indication (CQI)	UL-SCH
Number of CQI Bits				10
CQI Pattern				0...
Number of Coded CQI Bits				22

Following CQI settings are available:

Number of CQI Bits ← Channel Quality Indication (CQI) Settings

Sets the number of CQI bits before channel coding.

If a "Channel Coding Mode UCI + UL-SCH" is selected, the [Number of Physical Bits for UL-SCH](#) is determinate by the number of coded bits used for CQI and RI transmission.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0> :
PUSCh:CQI:BITS on page 213
```

CQI Pattern ← Channel Quality Indication (CQI) Settings

Sets the CQI pattern for the PUSCH.

The pattern is read out cyclically and if the pattern is longer than the selected [Number of CQI Bits](#), different bits are transmitted in different subframes using this configuration.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0> :
PUSCh:CQI:PATtern on page 213
```

Number of Coded CQI Bits ← Channel Quality Indication (CQI) Settings

Displays the number of coded CQI bits.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:UL [ :CELL<ccidx> ] [ :SUBF<st0> ] :ALLoc<ch0> :
PUSCh:CQI:CBITs? on page 213
```

UL-SCH Settings

Displays the UL-SCH parameters per codeword.

OneWeb A: Enhanced Sett. (PCell, SF 0, UE 1)	
Common	DRS
HARQ ACK	
Channel Quality Indication (CQI)	
UL-SCH	
UL-SCH Codeword 1	
Total Number Of Physical Bits	2 880
Number Of Coded UL-SCH Bits	2 858
Transport Block Size/Payload	1 500
Redundancy Version Index	0

Phys. Bits / Total Number of Physical Bits ← UL-SCH Settings

Displays the size of the selected allocation in bits. The value is set automatically according to the current allocation's settings.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:UL[ :CELL<ccid> ] [ :SUBF<st0> ] :
ALLoc<ch0> [ :CW<cwid> ] :PUACh:PHYSbits? on page 211
[ :SOURce<hw> ] :BB:ONEWeb:UL[ :SUBF<st0> ] :ALLoc<ch0>:PUCCh:
PHYSbits? on page 211
[ :SOURce<hw> ] :BB:ONEWeb:UL[ :CELL<ccid> ] [ :SUBF<st0> ] :
ALLoc<ch0> [ :CW<cwid> ] :PUSCh:PHYSbits? on page 211
```

Number of Coded UL-SCH Bits ← UL-SCH Settings

Displays the number of physical bits used for UL-SCH transmission.

If a "Channel Coding Mode UCI + UL-SCH" is selected, the value is calculated as follows:

"Number of Coded UL-SCH Bits" = [Total Number of Physical Bits](#) - [Number of Coded CQI Bits](#)

Note: Number of Coded RI Bits for codeword 1 is fixed at 4.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:UL[ :CELL<ccid> ] [ :SUBF<st0> ] :
ALLoc<ch0> [ :CW<cwid> ] :PUACh:ULSch:BITS? on page 218
[ :SOURce<hw> ] :BB:ONEWeb:UL[ :CELL<ccid> ] [ :SUBF<st0> ] :
ALLoc<ch0> [ :CW<cwid> ] :PUSCh:ULSch:BITS? on page 218
```

Transport Block Size/Payload (PUSCH/PUACH) ← UL-SCH Settings

Sets the size of the transport block.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:UL[ :CELL<ccid> ] [ :SUBF<st0> ] :
ALLoc<ch0> [ :CW<cwid> ] :PUACh:CCODing:TBSize on page 217
[ :SOURce<hw> ] :BB:ONEWeb:UL[ :CELL<ccid> ] [ :SUBF<st0> ] :
ALLoc<ch0> [ :CW<cwid> ] :PUSCh:CCODing:TBSize on page 217
```

Redundancy Version Index (PUSCH/PUACH) ← UL-SCH Settings

Sets the redundancy version index.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:UL[ :CELL<ccid> ] [ :SUBF<st0> ] :
ALLoc<ch0> [ :CW<cwid> ] :PUACh:CCODing:RVIndex on page 217
[ :SOURce<hw> ] :BB:ONEWeb:UL[ :CELL<ccid> ] [ :SUBF<st0> ] :
ALLoc<ch0> [ :CW<cwid> ] :PUSCh:CCODing:RVIndex on page 217
```

4.7.5 Enhanced PUCCH Settings

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".

2. Select "Frame Configuration > Subframe > Content > PUCCH".
3. Select "Enhanced Settings > Configure".

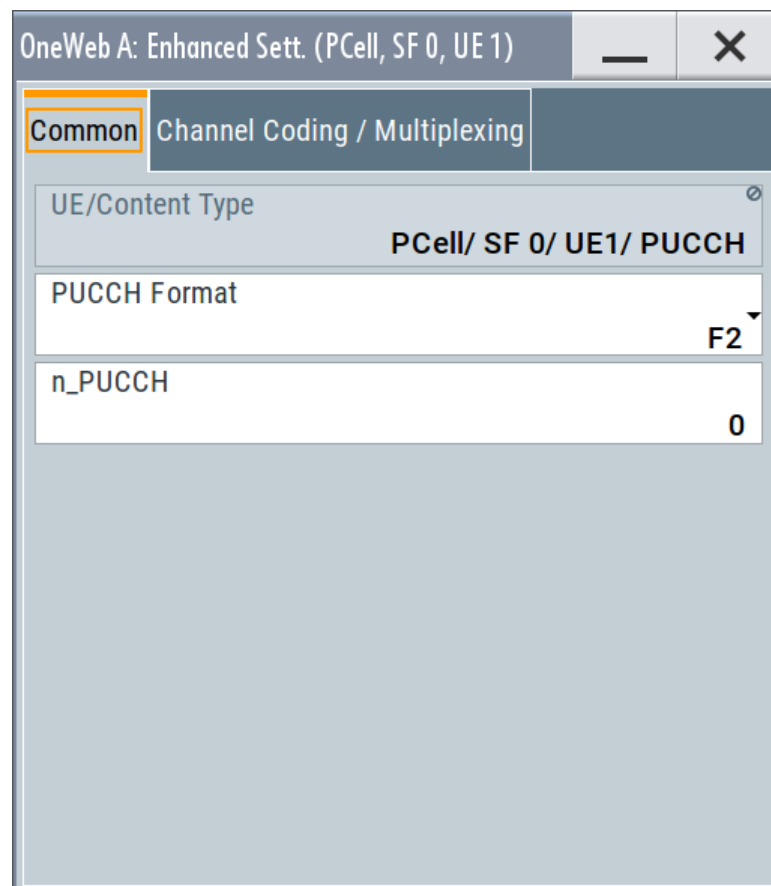
This dialog displays the PUCCH relevant settings and allows you to define and configure the PUCCH resource index:

- [Chapter 4.7.5.1, "Common Settings"](#), on page 91
- [Chapter 4.7.5.2, "Channel Coding / Multiplexing"](#), on page 92

4.7.5.1 Common Settings

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration > Subframe > Content > PUCCH"
3. Select "Enhanced Settings > Configure > Common"



This dialog displays the PUCCH relevant settings and allows you to define and configure the PUCCH resource index.

Settings:

UE/Content Type	92
PUCCH Format.....	92
n_PUCCH.....	92

UE/Content Type

Displays the UE number and the content type of the selected allocation.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL [:SUBF<st0>] :ALLoc<ch0>:CONType
on page 209

PUCCH Format

Displays the selected PUCCH Format.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL [:SUBF<st0>] :ALLoc<ch0> [:PUCCh] :FORMat
on page 209

n_PUCCH

Sets the PUCCH resource index.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL [:SUBF<st0>] :ALLoc<ch0>:PUCCh:NPAR<ap>
on page 220

4.7.5.2 Channel Coding / Multiplexing

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration > Subframe > Content > PUCCH"

3. Select "Enhanced Settings > Configure > Channel Coding/Multiplexing"

OneWeb A: Enhanced Sett. (PCell, SF 0, UE 1)

Common Channel Coding / Multiplexing

Channel Quality Control Information

Number of CQI Bits 4

CQI Pattern 0001...

Number of Coded CQI Bits 20

This dialog and the parameters available for configuration depend on the selected [PUCCH Format](#) for the corresponding allocation.

PUCCH Format F1 carries no control information, i.e. the entire "Channel Coding/Multiplexing" section is not displayed.

CQI control information is carried only by PUCCH formats F2/F2a/F2b and the CQI parameters are enabled only if one of these formats is selected.

Settings:

A/N Pattern / A/N+SR+CSI Pattern	93
Number of CQI Bits	95
PUCCH Format 3 Settings	95
L Number of A/N+SR+CSI Bits	95
L A/N+SR+CSI Pattern	95
L Number of Coded A/N+SR+CSI Bits	95
CQI Pattern	95
Number of Coded CQI Bits	95

A/N Pattern / A/N+SR+CSI Pattern

("A/N Pattern" is enabled for PUCCH formats F1a/F1b, F2a/F2b; "A/N+SR+CSI Pattern" is enabled for PUCCH format F3)

Use this parameter to set the ACK/NACK pattern for the PUCCH for the selected subframe. A "1" indicates an ACK, a "0" indicates a NACK.

In PUCCH format 3, the bits given by the "ACK/NACK+SR Pattern" represent the $o^{\sim\text{ACK}}$ bits, i.e. the up to 22 bits that contain ACK/NACK information for up to two codewords and optionally SR and CSI. The number of bits used per subframe is determined by the value of the parameter "Number of A/N+SR+CSI Bits" on page 95.

To enable the generation of signals with ACK/NACK respectively ACK/NACK+SR information that varies not only per subframe but also differs over the frames, set a pattern with:

- More than 1 bit for the PUCCH formats F1a/F2a
- More than 2 bits for the PUCCH formats F1b/F2b
- More than "Number of A/N+SR+CSI Bits" on page 95 for PUCCH format F3

The ACK/NACK pattern has a maximal length of 32 bits and is read out cyclically.

Example:

"Duplexing Mode > FDD"

"Sequence Length = 4 Frames"

"Number of Configurable Subframes = 8"

"PUCCH Format = F1a or F2a"

"A/N Pattern = 01001"

The generated signal carries ACK/NACK information as shown on the figure below.

Example: PUCCH Format F1a/F2a, ACK/NACK Pattern '01001'

Subframe	#0	#1	#2	#3	#4	#5	#6	#7	#8	#9
Frame#1	ACK/ NACK=0								ACK/ NACK=1	
Frame#2							ACK/ NACK=0			
Frame#3					ACK/ NACK=0					
Frame#4			ACK/ NACK=1							

By changing only the PUCCH Format to F1b or F2b, the ACK/NACK information per subframe changes as shown on the figure below.

Example: PUCCH Format F1b/F2b, ACK/NACK Pattern '01001'

Subframe	#0	#1	#2	#3	#4	#5	#6	#7	#8	#9
Frame#1	ACK/ NACK=01								ACK/ NACK=00	
Frame#2							ACK/ NACK=10			
Frame#3					ACK/ NACK=10					
Frame#4			ACK/ NACK=01							

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL [:SUBF<st0>] :ALLoc<ch0>:PUCCh:HARQ:ANPattern on page 220

[:SOURce<hw>] :BB:ONEWeb:UL [:SUBF<st0>] :ALLoc<ch0>:PUCCh:HARQ:PATtern on page 220

Number of CQI Bits

(enabled for PUCCH formats F2/F2a/F2b only)

Sets the number of CQI bits before channel coding.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL [:SUBF<st0>] :ALLoc<ch0>:PUCCh:CQI:BITS on page 218

PUCCH Format 3 Settings

The PUCCH format F3 is required for sending of the ACK/NACK messages.

Number of A/N+SR+CSI Bits ← PUCCH Format 3 Settings

Sets the number of ACK/NACK+SR+CSI bits before channel coding.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL [:SUBF<st0>] :ALLoc<ch0>:PUCCh:HARQ:BITS on page 219

A/N+SR+CSI Pattern ← PUCCH Format 3 Settings

See "A/N Pattern / A/N+SR+CSI Pattern" on page 93.

Number of Coded A/N+SR+CSI Bits ← PUCCH Format 3 Settings

Displays the number of coded ACK/NACK+SR bits.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL [:SUBF<st0>] :ALLoc<ch0>:PUCCh:HARQ:CBITs? on page 220

CQI Pattern

Sets the CQI pattern for the PUCCH.

The length of the pattern is determinate by the value of the parameter [Number of CQI Bits](#).

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL [:SUBF<st0>] :ALLoc<ch0>:PUCCh:CQI:PATtern on page 219

Number of Coded CQI Bits

Displays the number of coded CQI bits.

The number of coded CQI bits for PUCCH is always 20.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL [:SUBF<st0>] :ALLoc<ch0>:PUCCh:CQI:CBITs? on page 219

4.8 User Equipment Configuration

Option: R&S SMW-K130

Access:

1. Select "OneWeb General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "General Settings > CA > Activate carrier Aggregation > On"
3. Select "Frame Configuration > General > Select User Equipment > UEx".

You can configure up to four scheduled user equipment (UE) and freely distribute them over the time. You can also configure the structure of the demodulation reference signal (DRS) and the sounding reference signal (SRS) per UE.

In advanced mode ("System Configuration > Fading/Baseband Configuration > Mode > Advanced"), the tab names indicate whether the provided settings are cell-specific or common to all cells.

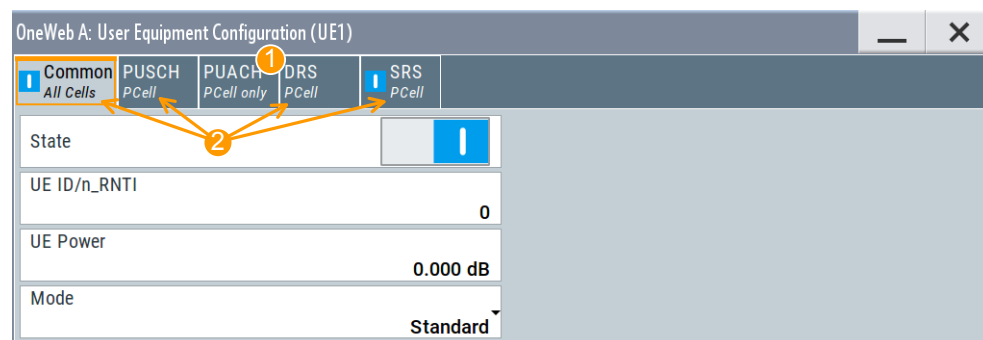
Settings:

• Common Settings	96
• Physical Uplink Shared Channel/Physical Uplink Aloha Channel (PUSCH/PUACH)	98
• Demodulation Reference Signal (DRS)	101
• Sounding Reference Signal (SRS)	102
• PRACH Power Ramping	112
• PRACH Configuration	113

4.8.1 Common Settings

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)"
2. Select "Frame Configuration > General > Select User Equipment > UEx".
3. Select "Common".



1 = PUACH is available in the primary cell (PCell)

2 = Indicate whether the provided settings are cell-specific (PCell or SCell) or common to all cells

The available settings allow you to configure the state of the user equipment, UE ID, and the operational mode.

Settings:

State.....	97
UE ID/n_RNTI.....	97
UE Power.....	97
Mode.....	97

State

Activates or deactivates the user equipment.

Disabling the UE deactivates its allocations: the reference signal, PUSCH, PUACH (or PUCCH) allocations, and PRACH are not transmitted.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:UE<st>:STATE on page 223

UE ID/n_RNTI

Sets the radio network temporary identifier (RNTI) of the UE.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:UE<st>:ID on page 222

UE Power

Sets the power level of the selected UE (P_{UE}).

The P_{UE} determines the power levels of the reference signals (DRS and SRS) and of the allocations, PUSCH (P_{PUSCH}), PUACH (P_{PUACH}) and PUCCH (P_{PUCCH}). Use the P_{UE} for global adjustment of the transmit power of the UEs.

Further power-related parameters:

- **Power**: varies the PUSCH and PUCCH power per subframe.
- **DRS Power Offset** (P_{DSR_offset}): boosts the reference signals DRS per UE.
- **"SRS Power Offset"** on page 104 (P_{SRS_offset}): boosts the reference signals SRS per UE.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:UE<st>:POWER on page 222

Mode

Selects whether the user equipment is in standard or in PRACH mode.

See [Chapter 4.8.6, "PRACH Configuration"](#), on page 113.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:UE<st>:POWER on page 222

4.8.2 Physical Uplink Shared Channel/Physical Uplink Aloha Channel (PUSCH/PUACH)

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration > General > Select User Equipment > UEx"
3. Select "PUSCH/PUACH"

OneWeb A: User Equipment Configuration (UE1)

Common All Cells | **PUSCH PCell** | PUACH PCell only | DRS PCell | SRS PCell

Cell: PCell

Data Source: PN9

Scrambling

State: 0

Channel Coding and Multiplexing

State: 0 Mode: UCI only

I_HARQ_offset: 0 I_CQI_offset: 2

O_CQI-MIN: 1

In this dialog, the data source for the PUSCH/PUACH can be selected and the channel coding can be configured. Use the [Enhanced PUSCH/PUACH Settings](#) dialog to adjust the additional settings for channel coding of the control information and the multiplexing of the data and control information.

Settings:

Cell.....	98
Data Source.....	99
State Scrambling (PUSCH/PUACH).....	99
State Channel Coding and Multiplexing (PUSCH).....	100
Mode Channel Coding.....	100
I_HARQ_offset.....	100
I_CQI_offset.....	100
O_CQI-Min.....	100

Cell

In enabled "General UL Settings > CA > Activate Carrier Aggregation > On" state, determines the settings of which cell (Primary Cell or SCell) are displayed.

Remote command:

n.a.

Data Source

Selects the data source for the PUSCH/PUACH allocation.

The following standard data sources are available:

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

See also:

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

Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :PUSCh:DATA`

on page 225

`[ :SOURce<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :PUSCh:PATtern`

on page 226

`[ :SOURce<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :PUSCh:DSElect`

on page 225

`[ :SOURce<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :PUACH:DATA`

on page 225

`[ :SOURce<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :PUACH:PATtern`

on page 226

`[ :SOURce<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :PUACH:DSElect`

on page 225

State Scrambling (PUSCH/PUACH)

Enables/disables scrambling for all PUSCH/PUACH allocations of the corresponding UE.

Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :PUSCh:`

`SCRambling:STATe` on page 226

`[ :SOURce<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :PUACH:`

`SCRambling:STATe` on page 226

State Channel Coding and Multiplexing (PUSCH)

Enables/disables channel coding and multiplexing of data and control information for all PUSCH/PUACH allocations of the corresponding UE.

If this parameter is disabled, the content retrieved from the [Data Source](#) is forwarded to the scrambler without any coding processing.

Additional parameters for the encoding of control information can be set in [Enhanced PUSCH/PUACH Settings](#) dialog.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccidx> ] :PUSCh:CCODing:
STATe on page 225
```

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccidx> ] :PUACh:CCODing:
STATe on page 225
```

Mode Channel Coding

Defines the information transmitted on the PUSCH/PUACH.

For PUACH, this is a read-only value.

"UCI+UL-SCH" Control information and data are multiplexed into the PUSCH.

"UL-SCH" Only data is transmitted on PUSCH/PUACH.

"UCI only" Only uplink control information is transmitted on PUSCH.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccidx> ] :PUSCh:CCODing:
MODE on page 224
```

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccidx> ] :PUACh:CCODing:
MODE? on page 224
```

I_HARQ_offset

Sets the HARQ-ACK offset index for control information MCS offset determination.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccidx> ] :PUSCh:CCODing:
IHARqoffset on page 223
```

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccidx> ] :PUACh:CCODing:
IHARqoffset on page 223
```

I_CQI_offset

Sets the CQI offset index for control information MCS offset.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccidx> ] :PUSCh:CCODing:
ICQioffset on page 223
```

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccidx> ] :PUACh:CCODing:
ICQioffset on page 223
```

O_CQI-Min

(Enabled in "UCI only" transmission)

Sets the parameter O-CQI-Min, where O_CQI-Min is the number of CQI bits including CRC bits assuming rank equals to 1.

Remote command:

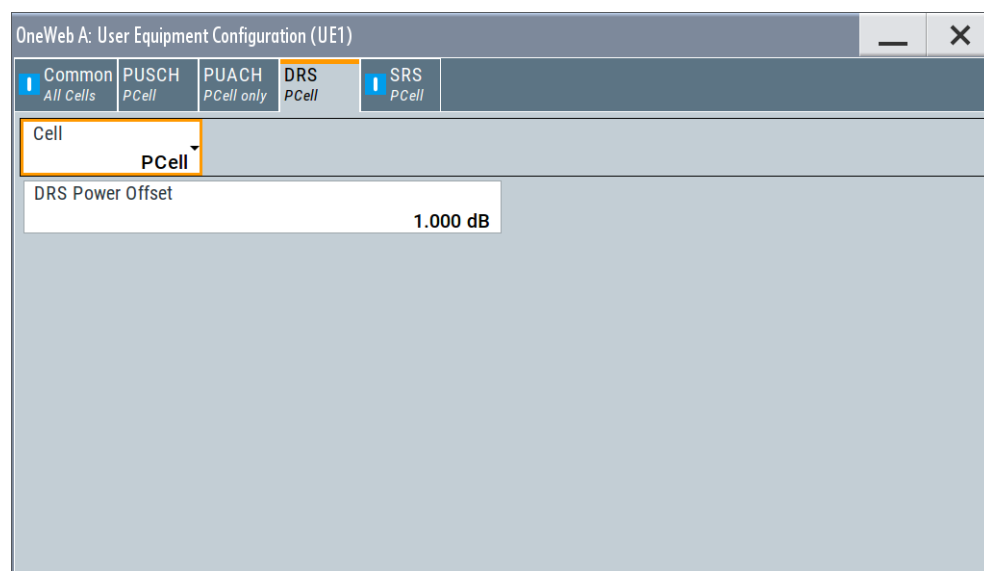
[:SOURce<hw>] :BB:ONEWeb:UL:UE<st> [:CELL<ccidx>] :PUSCh:CCODing:OCQimin on page 224

[:SOURce<hw>] :BB:ONEWeb:UL:UE<st> [:CELL<ccidx>] :PUACh:CCODing:OCQimin on page 224

4.8.3 Demodulation Reference Signal (DRS)

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration > General > Select User Equipment > UEx".
3. Select "DRS".



Comprises the parameters of the demodulation reference signal.

Settings:

Cell.....	101
DRS Power Offset.....	101

Cell

In enabled "General UL Settings > CA > Activate Carrier Aggregation > On" state, determines the settings of which cell (Primary Cell or SCell) are displayed.

Remote command:

n.a.

DRS Power Offset

Sets the power offset of the DRS relative to the power level of the PUSCH/PUACH or PUCCH allocation of the corresponding subframe.

The selected DRS power offset ($P_{\text{DRS_Offset}}$) applies for all subframes.

Depending on the allocation of the subframe, the effective power level of the DRS is calculated as following:

$$P_{\text{DRS}} = P_{\text{UE}} + P_{\text{PUSCH/PUACH/PUCCH}} + P_{\text{DRS_Offset}}$$

The PUSCH/PUACH and PUCCH power levels (P_{PUSCH} and P_{PUACH} and P_{PUCCH}) can vary per subframe.

For global adjustment of the transmit power of the corresponding UE, use the parameter **UE Power** (P_{UE}).

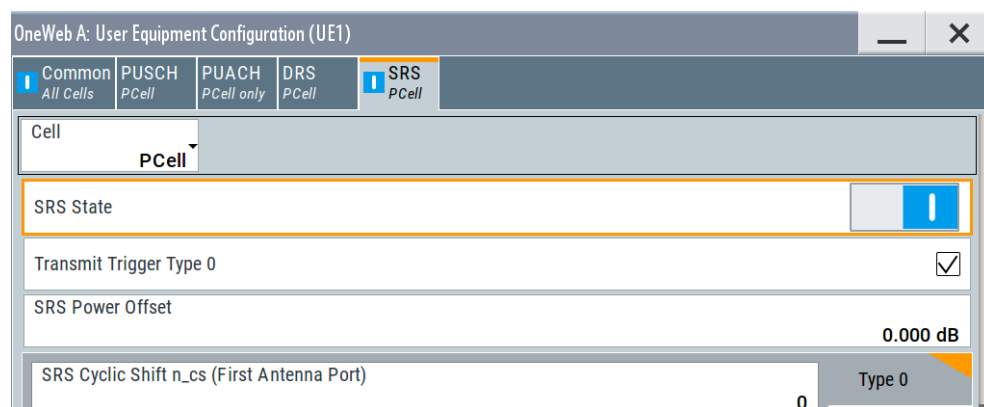
Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccidx> ] :REFSig:DRS:
POWoffset on page 229
```

4.8.4 Sounding Reference Signal (SRS)

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration > General > Select User Equipment > UEx".
3. Select "SRS".



The UE dialog consists of 3 subtabs, one for the "trigger type 0" SRS and 2 for the SRS sets.

OneWeb A: User Equipment Configuration (UE1)

Common All Cells | PUSCH PCell | PUACH PCell only | DRS PCell | **SRS PCell**

SRS Structure

Configuration Index I_SRS	0
Periodicity T_SRS	2 ms
Subframe Offset T_offset	0
SRS Bandwidth B_SRS	0
Transmission Comb k_TC	0
Hopping Bandwidth b_hop	0
Freq. Domain Position n_RRC	0

DCI 0

DCI 1A

In the "SRS Structure" section, you can configure the **UE-specific SRS parameters**.

The **cell-specific parameters**, necessary for the complete definition of the SRS structure and SRS mapping, are configurable in the [General Uplink Settings](#) "General UL Settings" dialog.

Settings:

Cell.....	104
SRS State.....	104
Transmit Trigger Type 0.....	104
SRS Power Offset.....	104
SRS Set Configuration.....	105
L SRS Cyclic Shift n_CS (First Antenna Port).....	105
L SRS Structure.....	105
L Configuration Index I_SRS.....	105
L Periodicity T_SRS.....	105
L Subframe Offset T_offset.....	106
L SRS Bandwidth B_SRS.....	107
L Transmission Comb k_TC.....	110
L Hopping Bandwidth b_hop.....	110
L Freq. Domain Position n_RRC.....	110
L Number of Transmissions.....	110
L Subframes for Transmission.....	110
L ARB Sequence Length.....	111
L Suggested.....	111
L Current ARB Sequence Length.....	111
L Adjust length.....	111
L ARB Settings.....	112

Cell

In enabled "General UL Settings > CA > Activate Carrier Aggregation > On" state, determines the settings of which cell (Primary Cell or SCell) are displayed.

Remote command:

n.a.

SRS State

Enables/disables sending of SRS for the corresponding UE.

In the symbols reserved for SRS transmission, PUSCH is not transmitted.

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccidx> ] :REFSig:SRS:STATe`
on page 230

Transmit Trigger Type 0

There are two types of SRS transmission:

- **Periodic SRS**
SRS occurs at regular time intervals.
Periodic SRS is referred as "trigger type 0" SRS.
- **Aperiodic SRS**
The aperiodic SRS transmission is a single (one-shot) transmission.
Aperiodic SRS is referred as "trigger type 1" SRS.

"On" Trigger type 0 is used.
The SRS is configured by higher levels.
To configure the SRS structure, use the settings in the "Type 0" dialog .

"Off" Trigger type 1 is used.
The SRS is triggered by the PDCCH DCI content, in particular by the DCI format 0/1A.
To configure the SRS structure, use the dedicated settings in the "DCI 0/DCI 1A" dialogs.

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccidx> ] :REFSig:SRS:TT0`
on page 231

SRS Power Offset

Sets the power offset of the SRS relative to the power of the corresponding UE.

The selected SRS power offset applies for all subframes.

The effective power level of the SRS is calculated as follows:

$$P_{\text{SRS}} = P_{\text{UE}} + P_{\text{SRS_Offset}}$$

For global adjustment of the transmit power of the corresponding UE, use the parameter **UE Power** (P_{UE}).

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccidx> ] :REFSig:SRS:POWoffset` on page 230

SRS Set Configuration

There is one SRS set of parameters and one tab, "Type 0", where the SRS structure is defined.

The aperiodic SRS is triggered by the "SRS Request" flag in one of the DCI formats 0 or DCI format 1A

SRS Cyclic Shift n_{CS} (First Antenna Port) ← SRS Set Configuration

Sets the cyclic shift n_{CS} used for the generation of the sounding reference signal CAZAC sequence for the first port. The n_{cs} for the other ports are calculated automatically; they have a fixed relation to the first one.

The different shifts of the same Zadoff-Chu sequence are orthogonal to each other. Thus, you can apply different SRS cyclic shifts to schedule different users to transmit simultaneously their sounding reference signal.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :REFSig:
SRS [<srsidx> ] :CYCShift on page 231
```

SRS Structure ← SRS Set Configuration

Use the following parameters to define the SRS structure:

Configuration Index I_{SRS} ← SRS Structure ← SRS Set Configuration

Sets the UE-specific parameter SRS configuration index I_{SRS} .

Depending on the selected "Duplexing Mode", this parameter determines the parameters [Periodicity \$T_{SRS}\$](#) and [Subframe Offset \$T_{offset}\$](#) .

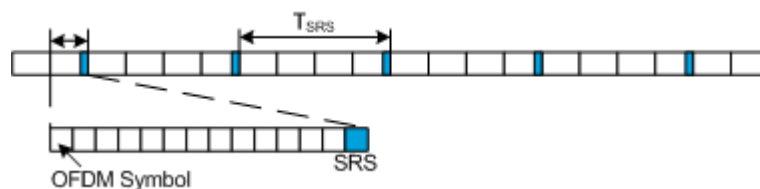
Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :REFSig:
SRS [<srsidx> ] :ISRS on page 232
```

Periodicity T_{SRS} ← SRS Structure ← SRS Set Configuration

Displays the UE-specific parameter SRS periodicity T_{SRS} , i.e. displays the interval of milliseconds after which the SRS is transmitted. The displayed value depends on the selected SRS [Configuration Index \$I_{SRS}\$](#) .

Adjust the SRS configuration index to enable more frequent SRS transmission like each 2 ms or an infrequently SRS transmission like each 320 ms for instance.



Example:

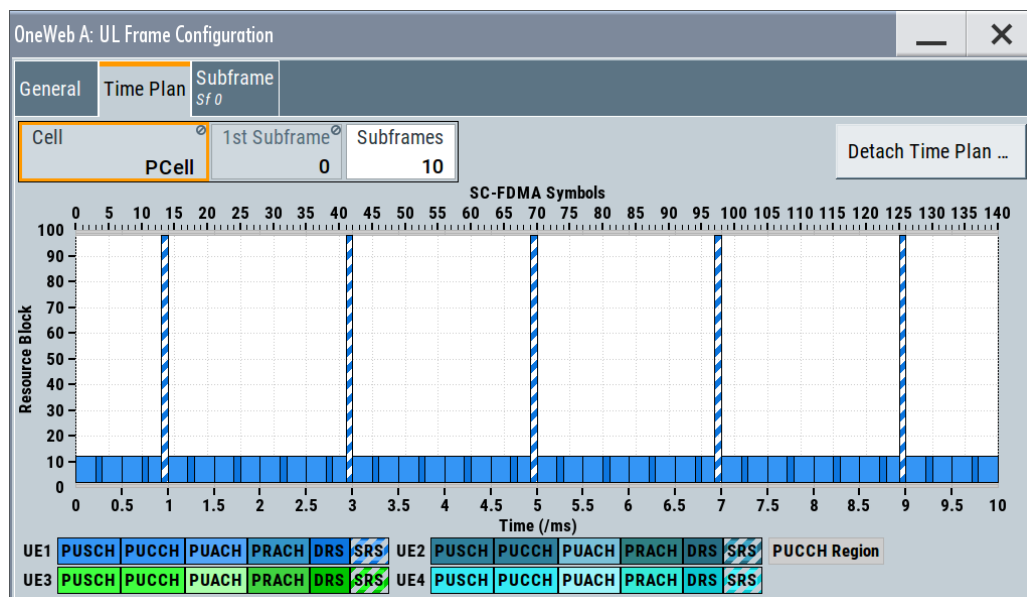
"Configuration Index = 0", i.e. "Periodicity T_{SRS} = 2 ms" and "Subframe Offset T_{offset} = 0"

"SRS State > On"

"Duplexing > FDD"

The default values of all other SRS parameters are left unchanged.

The SRS is transmitted every 2 ms and occupies the entire channel bandwidth.



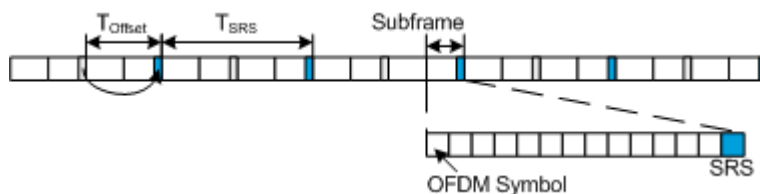
Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :REFSig:
SRS [ <srsidx> ] :TSRS? on page 234
```

Subframe Offset T_{offset} ← SRS Structure ← SRS Set Configuration

Displays the UE-specific parameter SRS subframe offset T_{offset} , depending on the selected SRS [Configuration Index \$I_{\text{SRS}}\$](#) .

An SRS subframe offset shifts the SRS pattern. While SRS periodicity T_{SRS} remains constant, the SRS transmission is delayed with period of time equal to the SRS subframe offset T_{offset} .



Example:

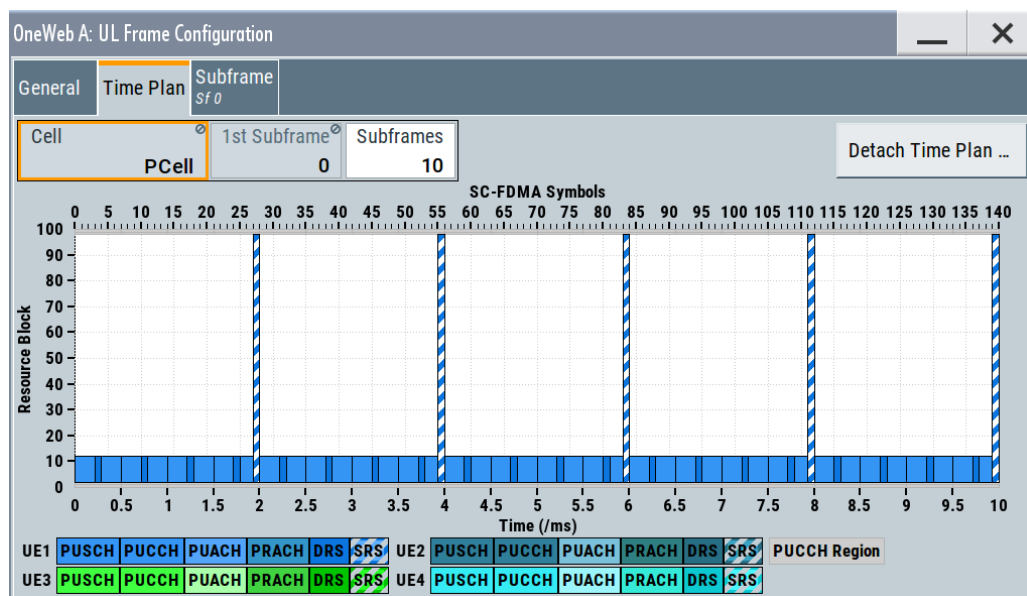
"Configuration Index = 1", i.e. "Periodicity $T_{\text{SRS}} = 2 \text{ ms}$ " and "Subframe Offset $T_{\text{offset}} = 1$ "

"SRS State > On"

"Duplexing > FDD"

The default values of all other SRS parameters are left unchanged.

The SRS is transmitted every 2 ms and occupies the entire channel bandwidth, i.e. frequency hopping is not enabled. Compared to the SRS transmission with $T_{\text{offset}} = 0$, the SRS transmission is delayed with 1 ms.



Remote command:

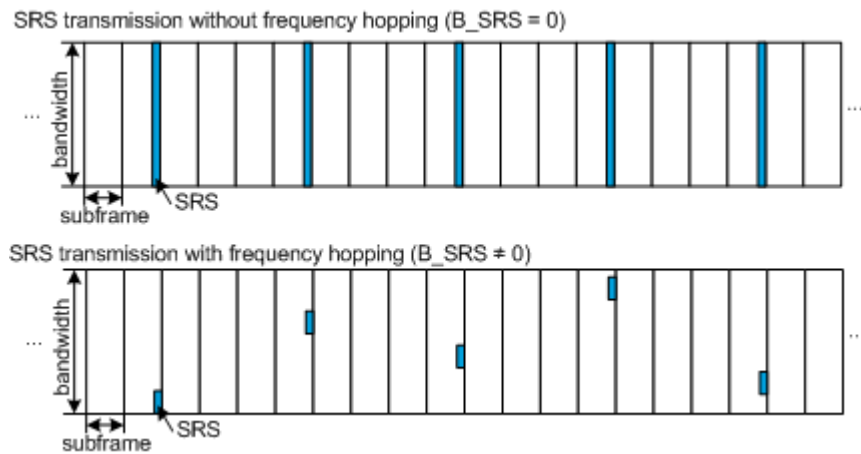
```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:REFSig:
SRS[<srsidx>]:TOFFset? on page 233
```

SRS Bandwidth B_{SRS} ← SRS Structure ← SRS Set Configuration

Sets the bandwidth covered by a single SRS transmission. That is the UE-specific parameter SRS bandwidth B_{SRS} .

The SRS can span the entire frequency bandwidth or use frequency hopping where several narrowband SRSs cover the same total bandwidth.

There are 4 SRS bandwidths defined in the standard. The most narrow SRS bandwidth ($B_{\text{SRS}} = 3$) spans 4 resource blocks and is available for all channel bandwidths. The other 3 values of the parameter B_{SRS} define more wideband SRS bandwidths, available depending on the channel bandwidth.



The SRS transmission bandwidth is determined also by the "SRS Bandwidth Configuration C_{SRS} ".

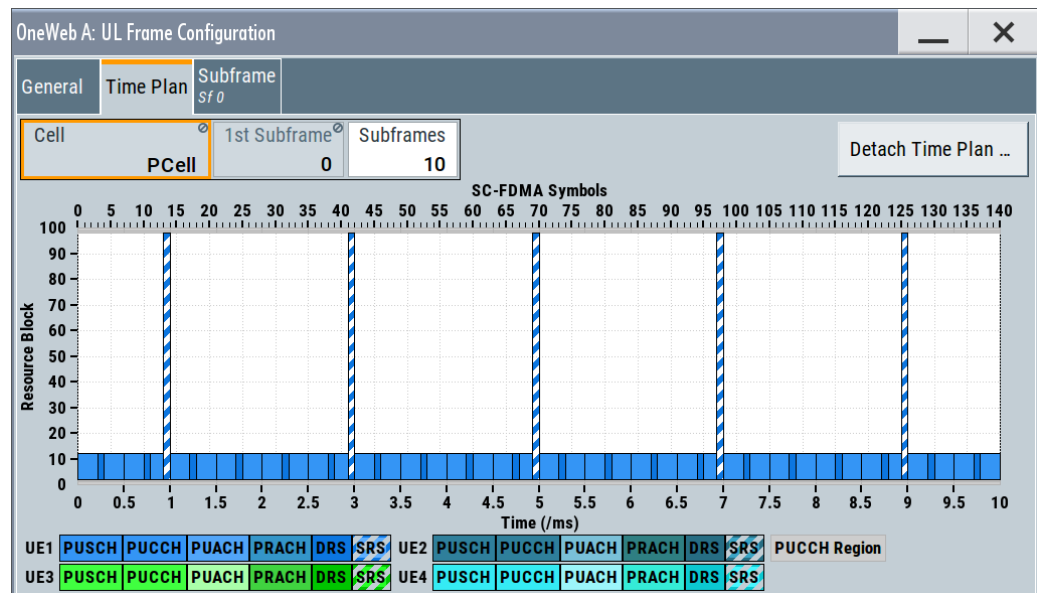
Example:

"SRS State > On"

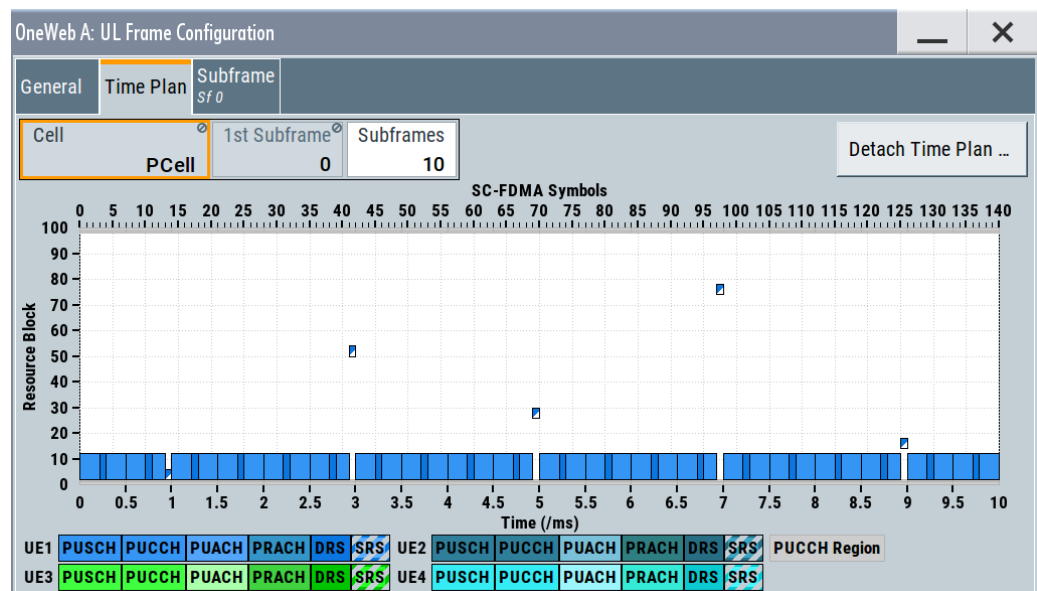
"Duplexing > FDD"

The default values of all other SRS parameters are left unchanged.

For "B_SRS = 0", the SC-FDMA time plan shows a wideband SRS without frequency hopping.



Changing the SRS bandwidth to "B_SRS = 3" results in the most narrowband SRS transmission with SRS bandwidth of 4 RBs and enabled frequency hopping.



Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :REFSig:
SRS [ <srsid> ] :BSRS on page 231
```

Transmission Comb k_{TC} ← SRS Structure ← SRS Set Configuration

Sets the UE-specific parameter transmission comb parameter k_{TC} .

The SRS is transmitted on alternating subcarriers, where with $k_{TC} = 1$ every odd and with $k_{TC} = 0$ every even subcarrier is used.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :REFSig:
SRS [ <srsid> ] :TRComb on page 233
```

Hopping Bandwidth b_{hop} ← SRS Structure ← SRS Set Configuration

(for trigger type 0 SRS ("Type 0"))

Sets the UE-specific parameter frequency hopping bandwidth b_{hop} .

SRS frequency hopping is enabled, if $b_{HOP} < B_{SRS}$. Hopping bandwidth is the frequency band in that the SRS hops.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :REFSig:SRS:BHOP
on page 230
```

Freq. Domain Position n_{RRC} ← SRS Structure ← SRS Set Configuration

Sets the UE-specific parameter `freqDomainPosition` n_{RRC} .

This parameter determines the starting physical resource block of the SRS transmission.

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :REFSig:
SRS [ <srsid> ] :NRRC on page 232
```

Number of Transmissions ← SRS Structure ← SRS Set Configuration

Sets the number of SRS transmissions.

That is, the number of cells in the table [Subframes for Transmission](#).

Remote command:

```
[ :SOURCE<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :REFSig:
SRS [ <srsid> ] :NTRans on page 232
```

Subframes for Transmission ← SRS Structure ← SRS Set Configuration

Sets the subframes in that the SRS is transmitted. The values correspond to the values of the SRS parameter [Configuration Index \$I_{SRS}\$](#) .

A conflict is indicated in the following situations:

- The subframe number is already used in the SRS set
- The subframe number is used in another SRS set of the same UE

Subframes for Transmission											
	1	2	3	4	5	6	7	8	9	10	Conflict
1 - 10	0	5	10								!

Subframe number is too large for the selected ARB sequence length
Subframe number does not match the LTE specification. The next valid number is 11

Suggested: 2 1 Frames Adjust Length ARB Settings ...

Figure 4-6: Example of conflict indication

- The subframe number is outside the current ARB sequence length.

Note: If there is conflict, observe the tooltip.

Change the subframe index or select "Adjust Length" to set the "ARB Sequence Length" to the proposed value.

See ["Adjust length"](#) on page 111.

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:UL:UE<st> [ :CELL<ccid> ] :REFSig:
SRS [ <srsid> ] :SUBF<subfid> on page 233
```

ARB Sequence Length ← SRS Structure ← SRS Set Configuration

Indicates the current and suggested ARB sequence length as number of frames.

Suggested ← ARB Sequence Length ← SRS Structure ← SRS Set Configuration

Displays the suggested ARB sequence length.

This length is calculated depending on the settings of the number of subframes, resource block allocated and DCI format used.

Remote command:

n.a.

Current ARB Sequence Length ← ARB Sequence Length ← SRS Structure ← SRS Set Configuration

Sets the sequence length of the signal in number of frames. One frame corresponds to 10 ms. The signal is calculated in advance and output in the arbitrary waveform generator. The maximum number of frames is calculated as follows:

Max. no. of frames = ARB waveform memory size / ("Sampling Rate" x 10 ms).

Remote command:

```
[ :SOURce<hw> ] :BB:ONEWeb:SENGth on page 145
```

Adjust length ← ARB Sequence Length ← SRS Structure ← SRS Set Configuration

This function is active, if an SRS transmission is configured in subframe number that is outside of the frames in the current "ARB Sequence Length". See ["Subframes for Transmission"](#) on page 110.

Select "Adjust Length" to set the ARB sequence length to the proposed value.

Remote command:

n.a.

ARB Settings ← ARB Sequence Length ← SRS Structure ← SRS Set Configuration

Access the "ARB" dialog and displays the "ARB Sequence Length" value.

See [Chapter 4.12.3, "ARB Settings"](#), on page 131.

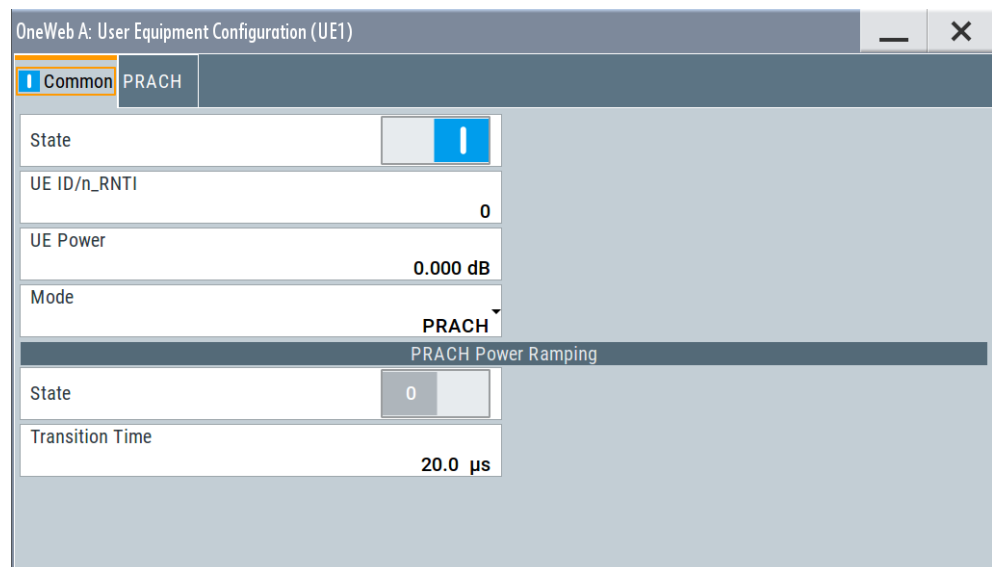
Remote command:

n.a.

4.8.5 PRACH Power Ramping

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration > General > Select User Equipment > UEx"
3. Select "Common > Mode > PRACH"



This dialog comprises the settings needed for configuring the PRACH power ramping.

Settings:

State PRACH Power Ramping	112
Transition Time	113

State PRACH Power Ramping

Activates power ramping for the PRACH preamble. The start and the end of the preamble is cyclically extended and multiplied with a ramping function ($\sin^2$).

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:UE<st>:PRACH:PRStAt e on page 227

Transition Time

Defines the transition time from beginning of the extended preamble to the start of the preamble itself.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:UL:UE<st>:PRACH:PRTT on page 227

4.8.6 PRACH Configuration

Access:

1. Select "General > Link Direction > Uplink / Reverse (SC-FDMA)".
2. Select "Frame Configuration > General > Select User Equipment > UEx"
3. Select "Common > Mode > PRACH"
4. Select "PRACH"

SF	RB Offset	Ncs Config	Logical Root Sequence Index	Sequence Index (v)	Δt /μs	Power /dB	State
0	0	0	0	0	0.00	0.000	Off
1	0	0	0	0	0.00	0.000	On
2	0	0	0	0	0.00	0.000	Off
3	0	0	0	0	0.00	0.000	Off
4	0	0	0	0	0.00	0.000	Off
5	0	0	0	0	0.00	0.000	Off
6	0	0	0	0	0.00	0.000	Off
7	0	0	0	0	0.00	0.000	Off

In this dialog, the UE-specific parameters are displayed for configuration. The cell-specific parameters, necessary for the complete definition of the PRACH, are configurable in the dialog "General UL Settings" > "PRACH".

Settings:

Preamble Format (Burst Format).....	114
SF.....	114
RB Offset.....	114
Ncs Configuration.....	114
Logical Root Sequence Index.....	114
Sequence Index (v).....	115

Delta t_{us}	115
Power (PRACH).....	115
State (PRACH).....	115

Preamble Format (Burst Format)

Displays the preamble format.

The "Preamble Format" is automatically derived from the [PRACH Configuration](#) .

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:UE<st>:PRACH:PRFormat? on page 226

SF

Displays the consecutive number of the subframe.

The subframes available for configuration depend on the "PRACH Configuration".

Remote command:

n.a.

RB Offset

Displays the starting RB, as sets with the parameter [PRACH Frequency Offset](#) .

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:RBOffset?

on page 228

Ncs Configuration

Selects the Ncs configuration of the selected subframe, i.e. determines the Ncs value for the selected preamble set.

The value range of this parameter depends on the selected duplexing mode, PRACH configuration and whether a restricted preamble set is enabled or not.

Parameter	Value range Ncs configuration
Disabled Restricted Set (High Speed Mode)	0 to 15
Enabled "Restricted Preamble Set"	0 to 14

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:NCSCnf

on page 228

Logical Root Sequence Index

Selects the logical root sequence index for the selected subframe.

The value range of this parameter depends on the PRACH configuration.

The value range between 0 to 837.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:RSequence

on page 228

Sequence Index (v)

Selects the sequence index **v** for the selected subframe, i.e. selects which one of the 64 preambles available in a cell is used.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:SINdex
on page 229

Delta t/us

Sets the parameter Delta_t in us.

A value of delta t different than 0 causes a time shift of the configured preamble.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:DT on page 227

Power (PRACH)

Sets the PRACH power relative to the UE power. The PRACH power can be adjusted independently for every configured preamble.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:POWer
on page 228

State (PRACH)

Enables/disables the PRACH for the selected subframe.

The subframes available for configuration depend on the selected PRACH configuration.

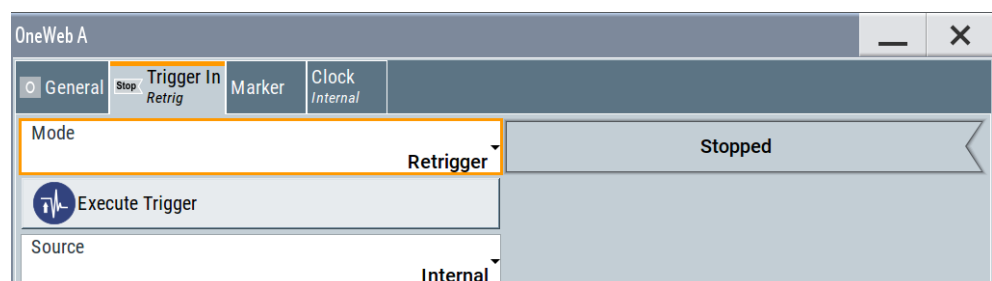
Remote command:

[:SOURCE<hw>] :BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:STATe
on page 229

4.9 Trigger Settings

Access:

- Select "OneWeb > Trigger In".



This tab provides access to the settings necessary to select and configure the trigger, like trigger source and mode, and to arm or trigger an internal trigger manually. The current signal generation status is displayed in the header of the tab together with information on the enabled trigger mode. As in the "Marker" and "Clock" tabs, this tab provides also access to the settings of the related connectors.



This section focuses on the available settings.

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



Routing and enabling a trigger

The provided trigger signals are not dedicated to a particular connector. Trigger signals can be mapped to one or more USER x or T/M connectors.

Use the [Local and Global Connector Settings](#) to configure the signal mapping, the polarity, the trigger threshold and the input impedance of the input connectors.

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

- Define the signal source and the effect of a trigger event.
Select the "Trigger In > Mode" and "Trigger In > Source".
- Define the connector where the selected signal is provided.
Use the "Global Connectors" settings.

Settings:

Trigger Settings Common to All Basebands	116
L Trigger Mode	117
L Signal Duration Unit	117
L Trigger Signal Duration	117
L Running/Stopped	117
L Arm	118
L Execute Trigger	118
L Trigger Source	118
L Sync. Output to External Trigger/Sync. Output to Trigger	119
L External / Trigger Inhibit	119
(External) Delay Unit	120
(Specified) External Delay/(Specified) Trigger Delay	120
Actual Trigger Delay/Actual External Delay	120

Trigger Settings Common to All Basebands

To enable simultaneous signal generation in all basebands, the R&S SMW couples the trigger settings in the available basebands in any instrument's configuration involving signal routing with signal addition. For example, in MIMO configuration, routing and summing of basebands or of streams.

The icon  indicates that common trigger settings are applied.

You can access and configure the common trigger source and trigger mode settings in any of the basebands. An arm or a restart trigger event applies to all basebands, too. You can still apply different delay to each of the triggers individually.

Trigger Mode ← Trigger Settings Common to All Basebands

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

For more information, refer to chapter "Basics" in the R&S SMW user manual.

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

Remote command:

[\[:SOURce<hw>\]:BB:ONEWeb\[:TRIGger\]:SEQuence](#) on page 148

Signal Duration Unit ← Trigger Settings Common to All Basebands

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

Remote command:

[\[:SOURce<hw>\]:BB:ONEWeb:TRIGger:SLUNit](#) on page 149

Trigger Signal Duration ← Trigger Settings Common to All Basebands

Enters the length of the signal sequence to be output in the "Single" trigger mode.

Use this parameter to output part of the signal deliberately, an exact sequence of the signal, or a defined number of repetitions of the signal.

Remote command:

[\[:SOURce<hw>\]:BB:ONEWeb:TRIGger:SLENgth](#) on page 149

Running/Stopped ← Trigger Settings Common to All Basebands

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:ONEWeb:TRIGger:RMODe?](#) on page 149

Arm ← Trigger Settings Common to All Basebands

Stops the signal generation until subsequent trigger event occurs.

Remote command:

[\[:SOURce<hw>\]:BB:ONEWeb:TRIGger:ARM:EXECute](#) on page 150

Execute Trigger ← Trigger Settings Common to All Basebands

For internal trigger source, executes trigger manually.

Remote command:

[\[:SOURce<hw>\]:BB:ONEWeb:TRIGger:EXECute](#) on page 150

Trigger Source ← Trigger Settings Common to All Basebands

The following sources of the trigger signal are available:

- "Internal"
The trigger event is executed manually by the "Execute Trigger".
- "Internal (Baseband A/B)"
The trigger event is provided by the trigger signal from the other basebands.
If common trigger settings are applied, this trigger source is disabled.
- "External Global Trigger"
The trigger event is the active edge of an external trigger signal provided and configured at the USER x connectors.
- "External Local Trigger"
The trigger event is the active edge of an external trigger signal provided and configured at the local T/M/C connector.
With coupled trigger settings, the signal has to be provided at the T/M/C1/2/3 connectors.
- "External Local Clock"
The trigger event is the active edge of an external local clock signal provided and configured at the local T/M/C connector.
With coupled trigger settings, the signal has to be provided at the T/M/C1 connector.

Routing and enabling a trigger

The provided trigger signals are not dedicated to a particular connector. Trigger signals can be mapped to one or more USER x or T/M connectors.

Use the [Local and Global Connector Settings](#) to configure the signal mapping, the polarity, the trigger threshold and the input impedance of the input connectors.

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

- Define the signal source and the effect of a trigger event.
Select the "Trigger In > Mode" and "Trigger In > Source".
- Define the connector where the selected signal is provided.
Use the "Global Connectors" settings.

Remote command:

[\[:SOURce<hw>\]:BB:ONEWeb:TRIGger:SOURce](#) on page 148

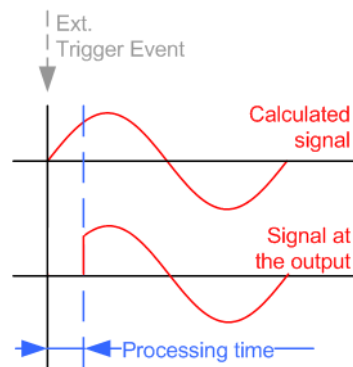
Sync. Output to External Trigger/Sync. Output to Trigger ← Trigger Settings Common to All Basebands

Enables signal output synchronous to the trigger event.

- "On"

Corresponds to the default state of this parameter.

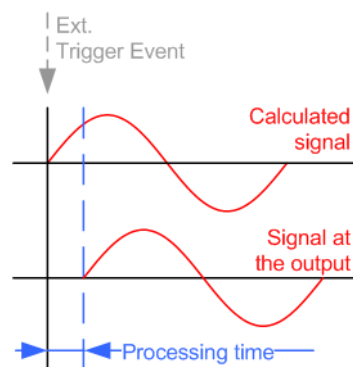
The signal calculation starts simultaneously with the trigger event. Because of the processing time of the instrument, the first samples are cut off and no signal is output. After elapsing of the internal processing time, the output signal is synchronous to the trigger event.



- "Off"

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

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



Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:TRIGger:EXTeRnal:SYNChronize:OUTPut`
on page 150

External / Trigger Inhibit ← Trigger Settings Common to All Basebands

Applies for external trigger signal or trigger signal from the other path.

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

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

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:TRIGger[:EXternal]:INHibit` on page 153

`[ :SOURCE<hw> ] :BB:ONEWeb:TRIGger:OBASeband:INHibit` on page 152

(External) Delay Unit

Determine whatever the trigger delay is expressed in samples or directly defined as a time period (seconds).

To specify the delay, use the parameter [\(Specified\) External Delay/\(Specified\) Trigger Delay](#).

The parameter [Actual Trigger Delay/Actual External Delay](#) displays the delay converted in time.

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:TRIGger:DElay:UNIT` on page 150

(Specified) External Delay/(Specified) Trigger Delay

The name of the parameter and the units the delay is expressed in, changes depending on the parameter [\(External\) Delay Unit](#).

Delays the trigger event of the signal from:

- The external trigger source
- The other path
- The other basebands (internal trigger), if common trigger settings are used.

Use this setting to:

- Synchronize the instrument with the device under test (DUT) or other external devices
- Postpone the signal generation start in the basebands compared to each other

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

The parameter displays the delay converted in time.

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:TRIGger[:EXternal]:DElay` on page 152

`[ :SOURCE<hw> ] :BB:ONEWeb:TRIGger:EXternal:TDElay` on page 152

`[ :SOURCE<hw> ] :BB:ONEWeb:TRIGger:EXternal:TDElay` on page 152

`[ :SOURCE<hw> ] :BB:ONEWeb:TRIGger:OBASeband:TDElay` on page 151

Actual Trigger Delay/Actual External Delay

Indicates the resulting trigger delay in "Time" unit.

See also, chapter Basics in the R&S SMW user manual.

Remote command:

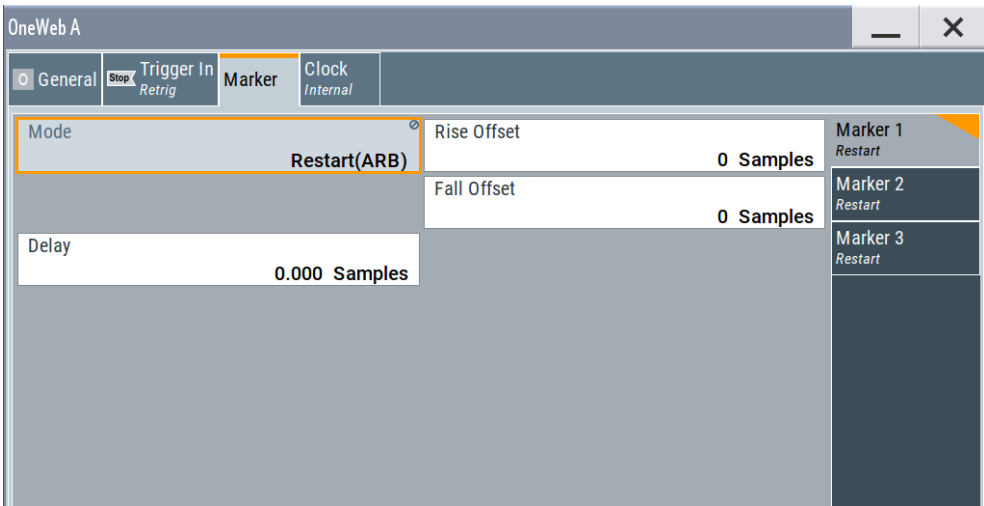
`[ :SOURCE<hw> ] :BB:ONEWeb:TRIGger:EXternal:RDElay?` on page 152

`[ :SOURCE<hw> ] :BB:ONEWeb:TRIGger:OBASeband:RDElay?` on page 151

4.10 Marker Settings

Access:

- Select "OneWeb > Marker".



This tab provides access to the settings necessary to select and configure the marker output signal, like the marker mode or marker delay settings.



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



Routing and enabling a marker
The provided marker signals are not dedicated to a particular connector. They can be mapped to one or more USER x or T/M connectors.
To route and enable a marker signal, perform the following *general steps*:

- Define the shape of the generated marker, i.e. select the "Marker > Mode".
- Define the connector where the selected signal is provided.
Use the [Local and Global Connector Settings](#).

Settings:

Marker Mode	121
Rise/Fall Offset	122
Marker x Delay	122

Marker Mode

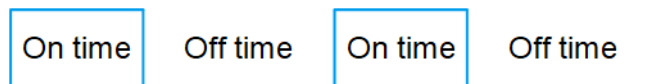
Marker configuration for up to 3 markers. The settings are used to select the marker mode defining the shape and periodicity of the markers. The contents of the dialog change with the selected marker mode; the settings are self-explanatory.

"Restart (ARB)"

A marker signal is generated at the start of each ARB sequence.

"ON/OFF Period"

Generated is a regular marker signal that is defined by an ON/OFF ratio is generated; a period lasts one on and off cycle.



Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:TRIGger:OUTPut<ch>:ONTime` on page 154

`[ :SOURce<hw> ] :BB:ONEWeb:TRIGger:OUTPut<ch>:OFFTime` on page 154

"User Period"

Generated is marker signal that marks the beginning of every user-defined period.

Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:TRIGger:OUTPut<ch>:PERiod` on page 154

Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:TRIGger:OUTPut<ch>:MODE?` on page 153

Rise/Fall Offset

Shifts the rising or falling ramp of the marker by the selected number of samples. Positive values shift the rising ramp to later positions; negative values shift it to earlier positions.

Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:TRIGger:OUTPut<ch>:FOFFset` on page 154

`[ :SOURce<hw> ] :BB:ONEWeb:TRIGger:OUTPut<ch>:ROFFset` on page 154

Marker x Delay

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

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

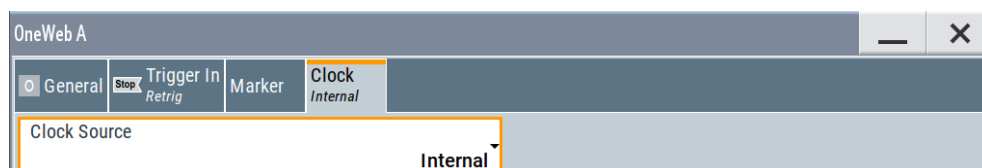
Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:TRIGger:OUTPut<ch>:DELay` on page 154

4.11 Clock Settings

Access:

- Select "OneWeb > Clock".



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



This section focuses on the available settings.

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



Defining the clock

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

Use the [Local and Global Connector Settings](#) to configure the signal mapping, the polarity, the trigger threshold, and the input impedance of the input connectors.

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

- Define the signal source, that is select the "Clock > Source".
- Define the connector where the selected signal is provided.
Use the [Local and Global Connector Settings](#).

Settings:

Clock Source	123
Clock Mode	123
Measured External Clock	124

Clock Source

Selects the clock source.

- "Internal"
The instrument uses its internal clock reference.
- "External Local Clock"
Option: R&S SMW-B10
The instrument expects an external clock reference at the local T/M/C connector.

Defining the clock

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

Use the [Local and Global Connector Settings](#) to configure the signal mapping, the polarity, the trigger threshold, and the input impedance of the input connectors.

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

- Define the signal source, that is select the "Clock > Source".
- Define the connector where the selected signal is provided.
Use the [Local and Global Connector Settings](#).

Remote command:

[:SOURce<hw>] :BB:ONEWeb:CLOCK:SOURce on page 155

Clock Mode

Sets the type of externally supplied clock.

Remote command:

[:SOURCE<hw>] :BB:ONEWeb:CLOCK:MODE on page 155

Measured External Clock

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

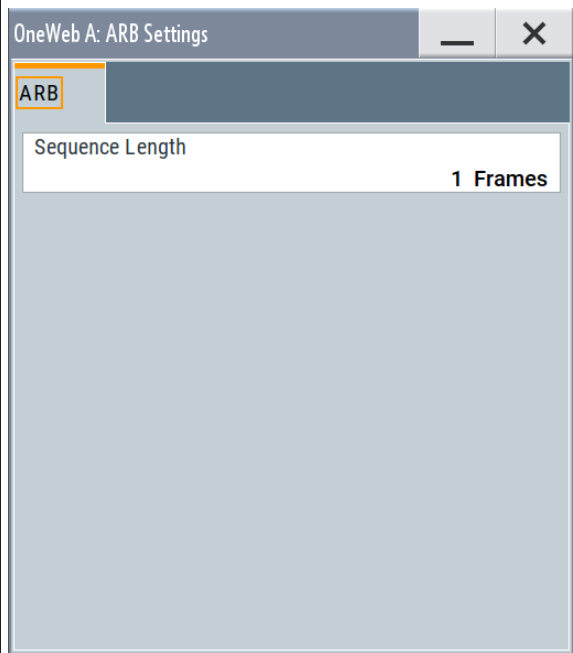
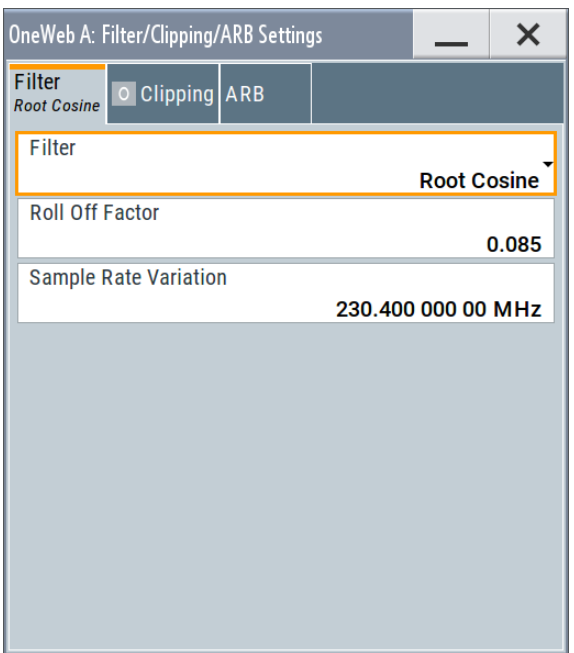
Remote command:

CLOCK:INPut:FREQuency?

4.12 Filter/Clipping/ARB Configuration

Access:

- ▶ • For uplink:
Select "OneWeb > General > ARB Configuration...".
- For downlink:
Select "OneWeb > General > Filter/Clipping/ARB...".

Uplink	Downlink
 OneWeb A: ARB Settings ARB Sequence Length 1 Frames	 OneWeb A: Filter/Clipping/ARB Settings Filter ☒ Clipping ☐ ARB Filter Root Cosine Roll Off Factor 0.085 Sample Rate Variation 230.400 000 00 MHz

This dialog comprises the settings required for configuring the arbitrary waveform .
The settings vary according to the selected "Link Direction"

Settings:

- [Filter Settings](#)..... 125
- [Clipping Settings](#)..... 130
- [ARB Settings](#)..... 131

4.12.1 Filter Settings

Access:

1. Select "OneWeb > General > Link Direction > Downlink SC (TDM)".
2. Select "Filter/Clipping/ARB... > Filter".

The screenshot shows a dialog box titled "OneWeb A: Filter/Clipping/ARB Settings". It has three tabs: "Filter", "Clipping", and "ARB". The "Filter" tab is active, showing a dropdown menu for "Filter" with "Root Cosine" selected. Below this, there are two input fields: "Roll Off Factor" with the value "0.085" and "Sample Rate Variation" with the value "230.400 000 00 MHz".

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

Settings:

Filter.....	126
Optimization.....	126
Load User Filter.....	127
Rolloff factor or BxT.....	128

Cutoff frequency shift.....	128
Cutoff Frequency Factor.....	129
Sample Rate Variation.....	129

Filter

Sets the baseband filter.

Remote command:

[:SOURce<hw>] :BB:ONEWeb:FILTer:TYPE on page 143

Optimization

Selects one of the provided EUTRA/LTE filters.

Each filter is designed for different application field and optimized for a particular performance. Depending on the filter implementation, these filters require different calculation time. The applied upsampling factor also influences the size of the calculated output waveform file.

Waveforms can be calculated in the following ways:

- With the "Generate Waveform File" function
- With the signal generation software R&S WinIQSIM2

The following table outlines the difference between the provided EUTRA/LTE filters by comparing their major specifications.

Table 4-8: Overview of the EUTRA/LTE filters

Characteristic	"Best EVM"	"Best ACP" "Best ACP (Narrow)"	"Best EVM (no upsampling)"
Design goal	An excellent EVM performance while ignoring the effects on ACP	A combination of an excellent ACP performance and a good EVM performance "Best ACP (Narrow)" features also a smoother shape in frequency domain	A combination of an excellent ACP performance and a good EVM performance Small output waveform file size
Calculation time (in real-time processing)	By real-time processing, short calculation time	Long calculation time: the filtered signal is precalculated because of the filter complexity	Long calculation time: the filtered signal is precalculated because of the filter complexity
Upsampling	Upsampling with factor 2 The sample rate of the output waveform is twice the LTE sample rate	Upsampling with factor 2 The sample rate of the output waveform is twice the LTE sample rate The signal processing requires twice as much internal memory. The available memory on the instrument is sufficient for the simulation of half as many frames compared to filter "Best EVM"	Upsampling is not applied The sample rate of the output waveform is not changed
Output waveform file size	Increased file size	Increased file size	File size is maintained The resulting file size is smaller than in the other cases
Recommended application field	Receiver and performance tests with internal real-time generation, where BLER is analyzed	Transmitter and components tests where excellent ACP is required	Receiver and performance tests with pre-generated waveform files, where BLER is analyzed

Remote command:

`[ :SOURCE<hw> ] :BB:ONEWeb:FILTer:PARAmeter:LTE:OPTimization`
on page 145

Load User Filter

If "Filter" on page 126 > "User" is selected, it opens the standard dialog "Select List File User Filter" for loading a user-defined filter file.

User filters are used as offline filters. The following types are supported:

- Files with predefined file format and extensions *.vaf
For information, refer to the description "Introduction to "filtwiz" Filter Editor" on the Rohde & Schwarz web page.
- ASCII files with simple format and file extension *.dat
These files describe filters as a sequence of normalized filter coefficients. Each coefficient is defined as a pair of I and Q samples. The I and Q components alternate at each file line. The I and Q values vary between - 1 and + 1.
A user filter can contain up to 2560 coefficients.
The user filter must be real-valued. For both I and Q components of the coefficients, only real coefficients different than 0 are allowed.
You can create user filter files for example with MATLAB, see [Example "Script that generates user filter file"](#) on page 127.

Example: Script that generates user filter file

This MATLAB script creates a user filter file that fits the LTE default settings: "Channel Bandwidth = 10 MHz", "Number of Resource Blocks = 50", "FFT Size = 1024".

```
n_fft = 1048; %10MHz
n_scs = 50*12; %50RBs*12 subcarriers per RB

trans_region = 0.02 * n_fft/2; %in %, controls steepness of filter slopes,
relative to nyquist frequency

%cutoff frequencies
f = [n_scs/2 n_scs/2+trans_region];

%ripples in dB
rp = 0.01; %passband
rs = 80; %stopband
dev = [(10^(rp/20)-1)/(10^(rp/20)+1) 10^(-rs/20)];

%estimate filter order
[n,fo,ao,w] = firpmord(f,[1 0],dev,n_fft);

%generate filter coefficients
b = firpm(n,fo,ao,w);

fvtool(b); %displays filter response

%write filter out into .dat filter coefficient file
coeffs_out = zeros(2*length(b),1);
```

```

coeffs_out(1:2:end) = real(b);
coeffs_out(2:2:end) = imag(b);

dlmwrite(['smw_user_filter_' num2str(n) 'coeffs_' num2str(n_scs)
'scs_' num2str(n_fft) 'fft.dat'], coeffs_out);

```

Remote command:

[\[:SOURce<hw>\]:BB:ONEWeb:FILTer:PARAmeter:USER](#) on page 145

Rolloff factor or BxT

Sets the filter parameter.

The rolloff factor affects the steepness of the filter slopes. A "Rolloff Factor = 0" results in the steepest slopes; values near to 1 make the slopes more flat.

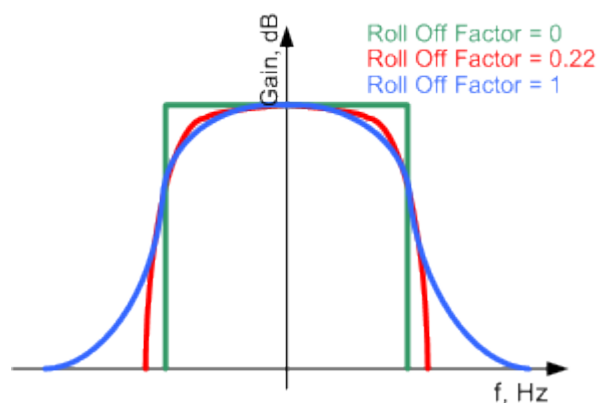


Figure 4-7: Example of the frequency response of a filter with different rolloff factors

For the default cosine filter, a rolloff factor of 0.10 is used.

Remote command:

[\[:SOURce<hw>\]:BB:ONEWeb:FILTer:PARAmeter:COSSine](#) on page 143
[\[:SOURce<hw>\]:BB:ONEWeb:FILTer:PARAmeter:RCOSSine](#) on page 143
[\[:SOURce<hw>\]:BB:ONEWeb:FILTer:PARAmeter:PGAuss](#) on page 143
[\[:SOURce<hw>\]:BB:ONEWeb:FILTer:PARAmeter:GAUSS](#) on page 143
[\[:SOURce<hw>\]:BB:ONEWeb:FILTer:PARAmeter:SPHase](#) on page 143
[\[:SOURce<hw>\]:BB:ONEWeb:FILTer:PARAmeter:APCO25](#) on page 143
[\[:SOURce<hw>\]:BB:ONEWeb:FILTer:PARAmeter:LTE:ROFactor](#) on page 145

Cutoff frequency shift

(available for filter parameter cosine and EUTRA/LTE with EVM optimization only)

The cutoff frequency is a filter characteristic that defines the frequency at the 3 dB down point. The "Cut Off Frequency Shift" affects this frequency in the way that the filter flanks are "moved" and the transition band increases by "Cut Off Frequency Shift" * "Sample Rate".

- A "Cut Off Frequency Shift" = -1 results in a very narrow-band filter
- Increasing the value up to 1 makes the filter more broad-band
- By "Cut Off Frequency Shift" = 0, the -3 dB point is at the frequency determined by the half of the selected "Sample Rate".

Tip: Use this parameter to adjust the cutoff frequency and reach spectrum mask requirements.

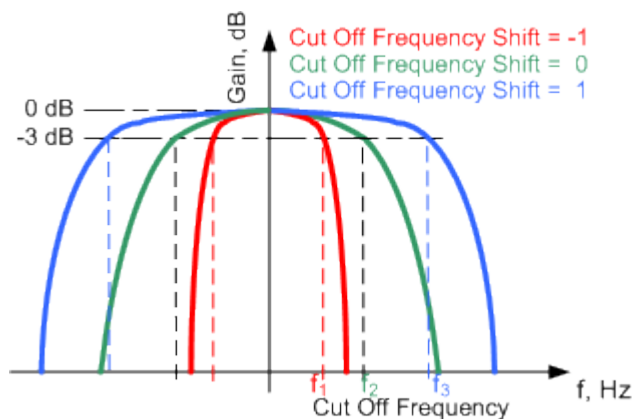


Figure 4-8: Example of the frequency response of a filter with different cutoff frequency shift

Example:

"Channel Bandwidth" = 10 MHz

"Sample Rate" = 15.36 MHz

"Cutoff frequency shift" = 0

Frequency at 3 dB down point = +/- 7.68 MHz

Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:FILTer:PARAmeter:COsine:COFS` on page 144

`[ :SOURce<hw> ] :BB:ONEWeb:FILTer:PARAmeter:LTE:COFS` on page 144

Cutoff Frequency Factor

(available for filter parameter lowpass and EUTRA/LTE with ACP optimization only)

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:ONEWeb:FILTer:PARAmeter:LPASs` on page 143

`[ :SOURce<hw> ] :BB:ONEWeb:FILTer:PARAmeter:LTE:COFFactor` on page 144

`[ :SOURce<hw> ] :BB:ONEWeb:FILTer:PARAmeter:LPASSEVM` on page 143

Sample Rate Variation

Sets the sample rate of the signal. A variation of this parameter affects the ARB clock rate; all other signal parameters remain unchanged.

The value of this parameter is set according to the current physical settings, like the channel bandwidth.

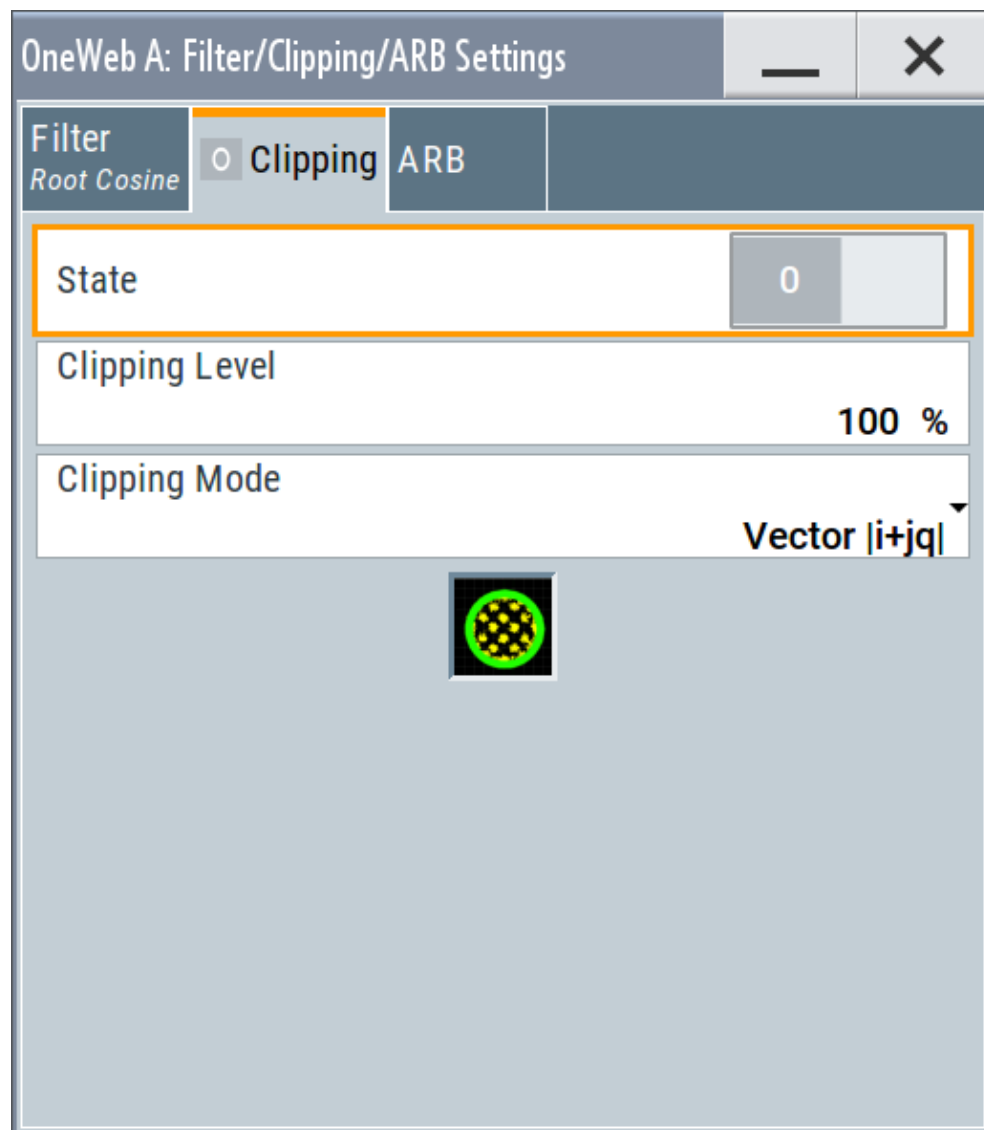
Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:SRATe:VARiation` on page 146

4.12.2 Clipping Settings

Access:

- Select "Filter/Clipping/ARB... > Clipping".



This dialog comprises the settings required for configuring the clipping.

Settings:

Clipping State.....	130
Clipping Level.....	131
Clipping Mode.....	131

Clipping State

Switches baseband clipping on and off.

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

Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:CLIPping:STATe` on page 143

Clipping Level

Sets the limit for clipping.

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

Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:CLIPping:LEVel` on page 142

Clipping Mode

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

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

Selects the clipping method. A graphic illustrates how the two methods work.

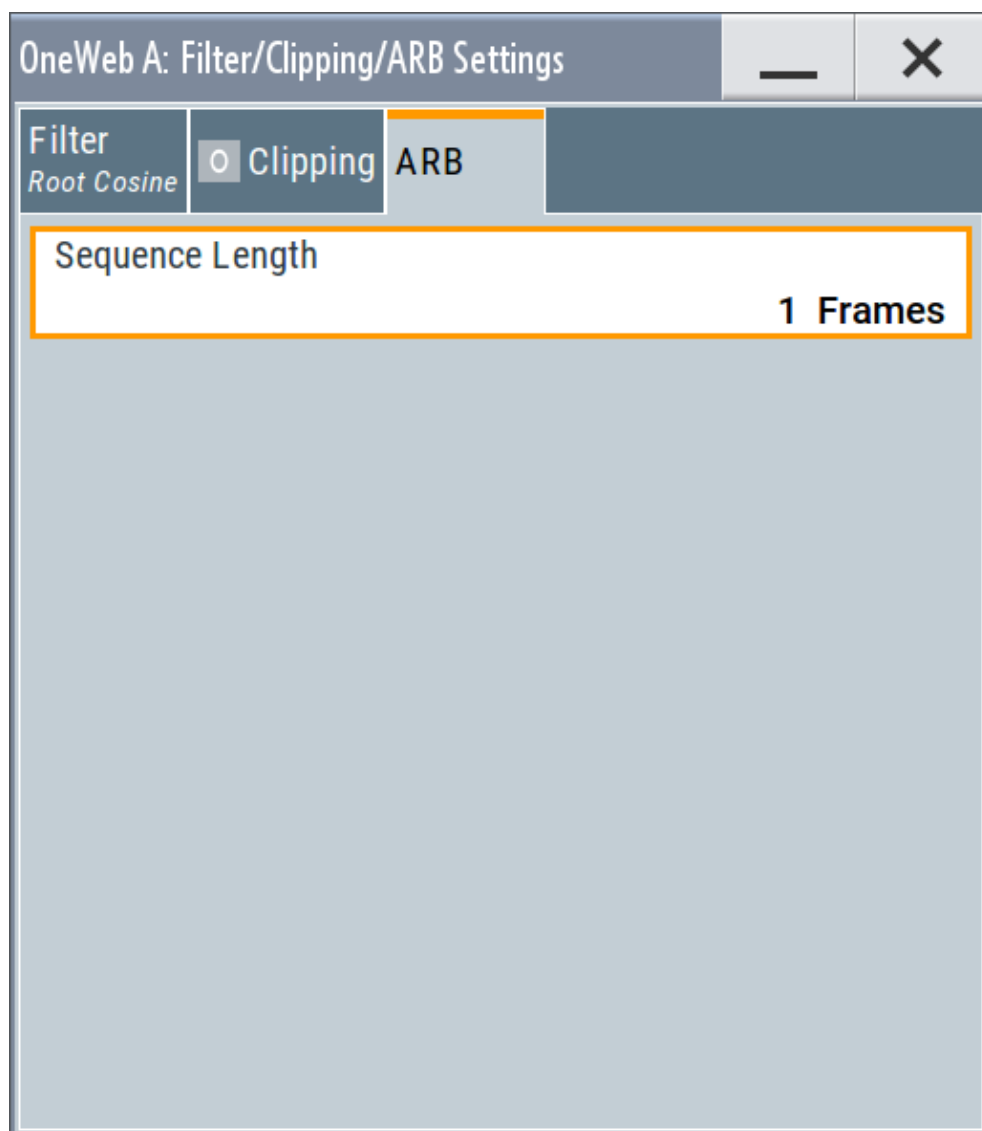
Remote command:

`[ :SOURce<hw> ] :BB:ONEWeb:CLIPping:MODE` on page 142

4.12.3 ARB Settings

Access:

- • For uplink:
Select "ARB Configuration > ARB...".
- For downlink:
Select "Filter/Clipping/ARB... > ARB".



This dialog comprises the settings required for configuring the arbitrary waveform.

Settings:

[Current ARB Sequence Length](#).....132

Current ARB Sequence Length

Sets the sequence length of the signal in number of frames. One frame corresponds to 10 ms. The signal is calculated in advance and output in the arbitrary waveform generator. The maximum number of frames is calculated as follows:

Max. no. of frames = ARB waveform memory size/("Sampling Rate" x 10 ms).

Remote command:

[\[:SOURce<hw>\]:BB:ONEWeb:SLENgth](#) on page 145

4.13 Local and Global Connector Settings

Each of the "Trigger In", "Marker" and "Clock" dialogs and the "Trigger Marker Clock" dialog provides a quick access to the related connector settings.



See also chapter "Local and Global Connector Settings" in the user manual.

5 Observing Current Allocations on the Time Plan

You can observe the current allocations on the time plan. There are dedicated uplink and downlink time plans.

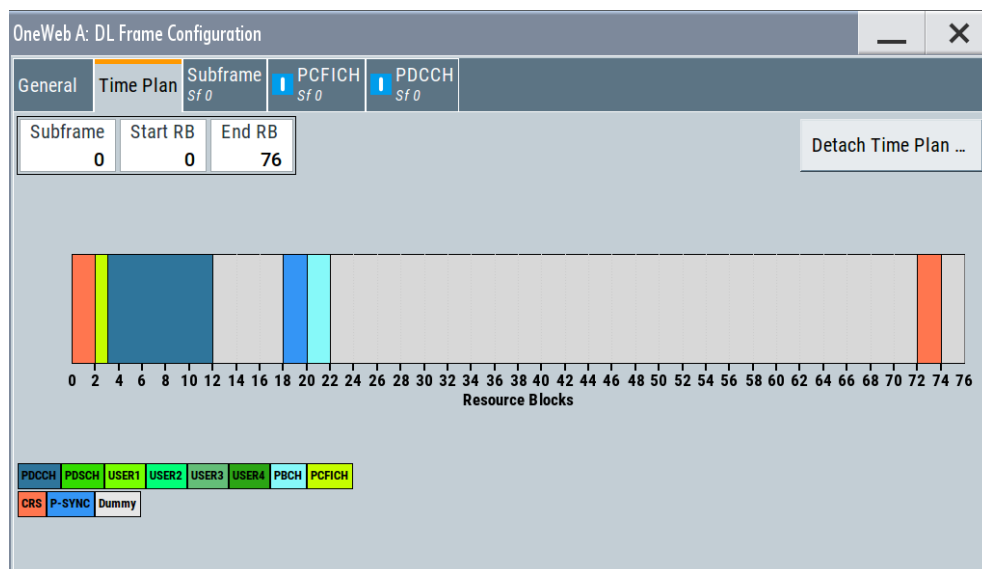
The time plan shows active channels and signals, the allocations of the active UEs and indicates the cell it applies for if a carrier aggregation is used. Per default, the time plan shows the allocation per used channel bandwidth and one subframe but you can extend the displayed time region to up to 40 subframes. You can also scroll over all available subframes and open the time plan in a separate window.

- [SC-TDM Time Plan](#)..... 134
- [SC-FDMA Time Plan](#)..... 135

5.1 SC-TDM Time Plan

Access:

1. Select "General > Link Direction > Downlink / Foward (SC-FDMA)".
2. Select "Frame Configuration > Time Plan".



This dialog shows the downlink time plan.

The x-axis shows allocation in the time domain. The y-axis shows the resource blocks as smallest allocation granularity in the frequency domain. One allocation to a UE can span 1 to up to "No. of Resource Blocks" in the frequency domain.

P-SYNC is automatically calculated according to the settings in [Chapter 4.4, "General Downlink Settings"](#), on page 23.

Subframes

Selects the number of subframes to be displayed or configured.

Remote command:

n.a.

Start RB

Selects the starting number of resource block to be displayed.

Remote command:

n.a.

End RB

Selects the ending number of resource block to be displayed.

Remote command:

n.a.

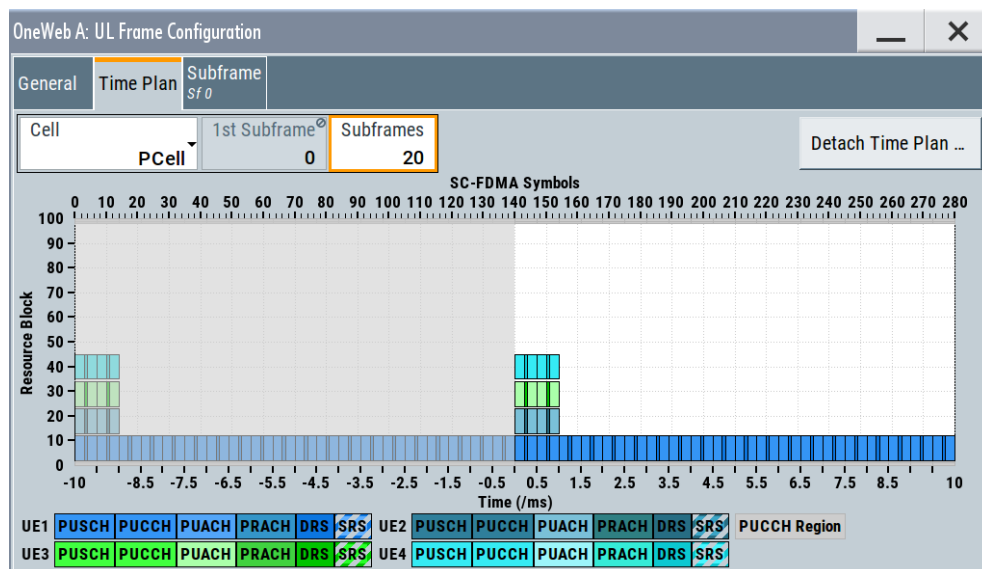
Detach Time Plan

Enlarges the time plan display.

5.2 SC-FDMA Time Plan

Access:

1. Select "General > Link Direction > Uplink / reverse (SC-FDMA)".
2. Select "Frame Configuration > Time Plan".



This dialog shows the uplink time plan.

The x-axis shows allocation in the time domain. The y-axis shows the resource blocks as smallest allocation granularity in the frequency domain. One allocation of a UE can span 1 to up to "No. of Resource Blocks" in the frequency domain.

Sounding Reference Signals are automatically calculated according to the settings for signal structure in "User Equipment" dialog.

An enabled SFN offset is also displayed, see [Chapter 4.6, "General Uplink Settings"](#), on page 59.

Cell

In enabled "General UL Settings > CA > Activate Carrier Aggregation > On" state, determines the settings of which cell (Primary Cell or SCell) are displayed.

Remote command:

n.a.

First Subframe

Selects the first subframe to be displayed.

Remote command:

n.a.

Subframes

Selects the number of subframes to be displayed.

Remote command:

n.a.

Detach Time Plan

Enlarges the time plan display.

6 Remote-Control Commands

The following commands are required to perform signal generation with the option R&S SMW-K130/-K355 in a remote environment. We assume that the R&S SMW has already been set up for remote operation in a network as described in the R&S SMW 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 SMW user manual.

Common Suffixes

The following common suffixes are used in the remote commands:

Suffix	Value range	Description
ENTity<ch>	1 to 4	Entity in a multiple entity configuration with separate baseband sources ENTity3 4 require option R&S SMW-K76
SOURce<hw>	[1] to 4	Available baseband signals Only SOURce1 possible, if the keyword ENTity is used
OUTPut<ch>	1 to 3	Available markers



Using SCPI command aliases for advanced mode with multiple entities

You can address multiple entities configurations by using the SCPI commands starting with the keyword `SOURce` or the alias commands starting with the keyword `ENTity`.

Note that the meaning of the keyword `SOURce<hw>` changes in the second case.

For details, see section "SCPI Command Aliases for Advanced Mode with Multiple Entities" in the R&S SMW user manual.

Programming examples

This description provides simple programming examples. The purpose of the examples is to present **all** commands for a given task. In real applications, one would rather reduce the examples to an appropriate subset of commands.

The programming examples have been tested with a software tool which provides an environment for the development and execution of remote tests. To keep the example as simple as possible, only the "clean" SCPI syntax elements are reported. Non-executable command lines (e.g. comments) start with two `//` characters.

At the beginning of the most remote control program, an instrument (p)reset is recommended to set the instrument to a definite state. The commands `*RST` and `SYSTem:PRESet` are equivalent for this purpose. `*CLS` also resets the status registers and clears the output buffer.

The following commands specific to the R&S SMW-K130/-K355 option are described here:

• General Commands.....	138
• Filter/Clipping/ARB.....	141
• Trigger Commands.....	147
• Marker Commands.....	153
• Clock Commands.....	155
• General Downlink Commands.....	156
• DL Frame Configuration.....	162
• Enhanced PCFICH and PDCCH Configuration Commands.....	172
• Enhanced PBCH and PDSCH Commands.....	190
• General Uplink Commands.....	193
• UL Frame Configuration.....	206
• User Equipment.....	221

6.1 General Commands

Example: Storing current configuration

```
SOURce1:BB:ONEWeb:CMOD PREDefined
SOURce1:BB:ONEWeb:REFSignal:CATalog?
// HY11-H9878-2_2.0_FL_16qam_736399.8052,HY11-H9878-2_2.0_FL_8psk_736399.8358,...
SOURce1:BB:ONEWeb:REFSignal "HY11-HA674-2_1.0_RL_16QAM_2CC_TDD_736523.441"
SOURce1:BB:ONEWeb:SETting:STATe 1
SOURce1:BB:ONEWeb:WAVEform:CREate "/var/user/wv_oweb_conf_1"

SOURce1:BB:ONEWeb:SETting:STORe "/var/user/oweb_conf_1"
*RST
SOURce1:BB:ONEWeb:SETting:CATalog?
// onweb_conf_1, onweb_conf_2, 1web
SOURce1:BB:ONEWeb:SETting:LOAD "/var/user/oweb_conf_1"
SOURce1:BB:ONEWeb:SETting:DEL "1web"
```

[SOURce<hw>]:BB:ONEWeb:STATe.....	139
[SOURce<hw>]:BB:ONEWeb:DUPLexing?.....	139
[SOURce<hw>]:BB:ONEWeb:LINK.....	139
[SOURce<hw>]:BB:ONEWeb:PRESet.....	139
[SOURce<hw>]:BB:ONEWeb:SETting:CATalog?.....	140
[SOURce<hw>]:BB:ONEWeb:SETting:LOAD.....	140
[SOURce<hw>]:BB:ONEWeb:SETting:STORe.....	140
[SOURce<hw>]:BB:ONEWeb:WAVEform:CREate.....	140
[SOURce<hw>]:BB:ONEWeb:CMOD.....	141
[SOURce<hw>]:BB:ONEWeb:REFSignal:CATalog?.....	141
[SOURce<hw>]:BB:ONEWeb:REFSignal.....	141

[:SOURce<hw>]:BB:ONEWeb:STATe <OneWebState>

Activates the standard.

Parameters:

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

Example: See [Chapter 6.1, "General Commands"](#), on page 138.

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

[:SOURce<hw>]:BB:ONEWeb:DUPLexing?

Queries the duplexing mode.

Return values:

<Duplexing> FDD
 *RST: FDD

Example: SOURce1:BB:ONEWeb:DUPLexing?

Usage: Query only

Manual operation: See ["Duplexing"](#) on page 22

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

Sets the transmission direction.

Parameters:

<Link> UP | DOWN
 *RST: UP

Example: SOURce1:BB:ONEWeb:LINK UP

Manual operation: See ["Link Direction"](#) on page 23

[:SOURce<hw>]:BB:ONEWeb: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:ONEWeb:STATe.

Example: SOURce1:BB:ONEWeb:PRESet

Usage: Event

Manual operation: See ["Set to Default"](#) on page 20

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

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

Return values:

<Catalog> string

Example: See [Chapter 6.1, "General Commands"](#), on page 138.

Usage: Query only

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

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

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

Parameters:

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

Example: See [Chapter 6.1, "General Commands"](#), on page 138.

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

[:SOURce<hw>]:BB:ONEWeb:SETTing:STORE <Filename>

Saves the current settings into the selected file; the file extension (`*.ow`) is assigned automatically.

Parameters:

<Filename> string
 Filename or complete file path

Example: See [Chapter 6.1, "General Commands"](#), on page 138.

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

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

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

Setting parameters:

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

Example: See [Chapter 6.1, "General Commands"](#), on page 138.

Usage: Setting only

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

[:SOURce<hw>]:BB:ONEWeb:CMOD <ConfigMode>

Sets the configuration mode.

Parameters:

<ConfigMode> PREDefined | USER
 *RST: PREDefined

Example: See [Example "Storing current configuration"](#) on page 138.

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

[:SOURce<hw>]:BB:ONEWeb:REFSignal:CATalog?

Queries the available reference signals files in the default directory. Only predefined files are listed.

Return values:

<RefSigCataLog> string

Example: See [Example "Storing current configuration"](#) on page 138.

Usage: Query only

[:SOURce<hw>]:BB:ONEWeb:REFSignal <RefSignal>

Selects and loads a predefined reference signal.

Parameters:

<RefSignal> string
 Filename as returned by the query `[ :SOURce<hw>]:BB:ONEWeb:REFSignal:CATalog?`.
 File extension is omitted.

Example: See [Example "Storing current configuration"](#) on page 138.

Manual operation: See ["Reference Signal"](#) on page 22

6.2 Filter/Clipping/ARB

Example: Filter settings

SOURce1:BB:ONEWeb:FILTer:TYPE?

```
[ :SOURce<hw>]:BB:ONEWeb:CLIPping:LEVel..... 142
[ :SOURce<hw>]:BB:ONEWeb:CLIPping:MODE..... 142
[ :SOURce<hw>]:BB:ONEWeb:CLIPping:STAtE..... 143
[ :SOURce<hw>]:BB:ONEWeb:FILTer:TYPE..... 143
[ :SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:APCO25..... 143
[ :SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:COSine..... 143
[ :SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:GAUSS..... 143
```

[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LPASs.....	143
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LPASSEVM.....	143
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:PGAuss.....	143
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:RCOSine.....	143
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:SPHase.....	143
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:COSine:COFS.....	144
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LTE:COFS.....	144
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LTE:COFFactor.....	144
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LTE:OPTimization.....	145
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LTE:ROFactor.....	145
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:USER.....	145
[:SOURce<hw>]:BB:ONEWeb:SLEngth.....	145
[:SOURce<hw>]:BB:ONEWeb:SRATe:VARiation.....	146

`[:SOURce<hw>]:BB:ONEWeb:CLIPping:LEVel <Level>`

Sets the limit for level clipping.

Parameters:

`<Level>` integer
 Range: 1 to 100
 *RST: 100

Example:

`BB:ONEWeb:CLIP:LEV 80PCT`
 Sets the limit for level clipping to 80% of the maximum level.
`BB:ONEWeb:CLIP:STAT ON`
 Activates level clipping.

Manual operation: See "[Clipping Level](#)" on page 131

`[:SOURce<hw>]:BB:ONEWeb:CLIPping:MODE <Mode>`

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:ONEWeb:CLIP:MODE SCAL`
 Selects the absolute maximum of all the I and Q values as the reference level.
`BB:ONEWeb:CLIP:LEV 80PCT`
 Sets the limit for level clipping to 80% of this maximum level.
`BB:ONEWeb:CLIP:STAT ON`
 Activates level clipping.

Manual operation: See ["Clipping Mode"](#) on page 131

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

Activates level clipping (Clipping). The value is defined with the command [:SOURce:] BB:ONEWeb:CLIPping:LEVel, the mode of calculation with the command [:SOURce:] BB:ONEWeb:CLIPping:MODE.

Parameters:

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

Manual operation: See ["Clipping State"](#) on page 130

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

Selects the baseband filter type.

Parameters:

<Type> RCOSine | COSine | GAUSS | LGAuss | CONE | COF705 |
COEqualizer | COFequalizer | C2K3x | RECTangle | PGAuss |
LPASs | DIRac | ENPShape | EWPSshape | LTEFilter |
LPASSEVM | SPHase | APCO25 | USER
*RST: LTEFilter

Example: SOURce1:BB:ONEWeb:FILTer:TYPE COS
Sets the filter type.

Manual operation: See ["Filter"](#) on page 126

[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:APCO25 <Apco25>
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:COsine <Cosine>
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:GAUSS <Gauss>
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LPASs <LPass>
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LPASSEVM <CutoffFrequency>
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:PGAuss <PGauss>
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:RCOSine <RCosine>
[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:SPHase <SPHase>

Sets the filter parameter.

Filter type	Parameter	Parameter name	Min	Max	Increment	Default
APCO25	Rolloff factor	<Apco25>	0.05	0.99	0.01	0.2
COSine	Rolloff factor	<Cosine>	0	1	0.01	0.1
GAUSS	BxT	<Gauss>	0.15	2.5	0.01	0.5
LPASs	Cutoff frequency	<LPass>	0.02	2	0.01	0.34
LPASSEVM	Cutoff frequency	<CutoffFrequency>	0.05	2	0.01	0.29

Filter type	Parameter	Parameter name	Min	Max	Increment	Default
PGAuss	BxT	<PGAuss>	0.15	2.5	0.01	0.5
RCOSine	Rolloff factor	<RCosine>	0	1	0.01	0.22
SPHase	BxT	<SPHase>	0.15	2.5	0.01	2

Parameters:

<SPHase>

float

Range: 0.15 to 2.5

Increment: 0.01

*RST: 2

Example:

SOURce:BB:ONEWeb:FILTer:TYPE COS

SOURce:BB:ONEWeb:FILTer:PARAmeter:COsine 0.1

SOURce:BB:ONEWeb:FILTer:PARAmeter:COsine:COFS -0.2

Manual operation: See ["Rolloff factor or BxT"](#) on page 128

[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:COsine:COFS <Cofs>

[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LTE:COFS <CutOffFreqShift>

Sets the filter parameter.

Parameters:

<CutOffFreqShift>

float

Range: -1 to 1

Increment: 0.01

*RST: -0.2

Example:

SOURce:BB:ONEWeb:FILTer:TYPE LTEF

SOURce:BB:ONEWeb:FILTer:PARAmeter:LTE:OPTimization ACP

SOURce:BB:ONEWeb:FILTer:PARAmeter:LTE:COFS 0.34

Manual operation: See ["Cutoff frequency shift"](#) on page 128

[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LTE:COFFactor <CutoffFactor>

Sets the cutoff frequency factor for the LTE filter type.

Parameters:

<CutoffFactor>

float

Range: 0.02 to 2

Increment: 0.001

*RST: 0.34

Example:

SOURce:BB:ONEWeb:FILTer:TYPE LTEF

SOURce:BB:ONEWeb:FILTer:PARAmeter:LTE:OPTimization EVM

SOURce:BB:ONEWeb:FILTer:PARAmeter:LTE:COFFactor 0.1

SOURce:BB:ONEWeb:FILTer:PARAmeter:LTE:ROFactor -0.2

Manual operation: See ["Cutoff Frequency Factor"](#) on page 129

[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LTE:OPTimization
<Optimization>

Defines the applied LTE filter.

Parameters:

<Optimization> EVM | ACP | ACPN | BENU
 Available are EVM, ACP, ACPN (ACP narrow) and BENU (Best EVM, no upsampling).
 *RST: EVM

Example: See [:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LTE:COFS on page 144

Manual operation: See "Optimization" on page 126

[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:LTE:ROFactor **<RollOffFactor>**

Sets the rolloff factor for the LTE filter type.

Parameters:

<RollOffFactor> float
 Range: 0 to 1
 Increment: 0.01
 *RST: 0.1

Manual operation: See "Rolloff factor or BxT" on page 128

[:SOURce<hw>]:BB:ONEWeb:FILTer:PARAmeter:USER **<Filename>**

Loads the file from the default or the specified directory.

Loaded are files with extension *.vaf or *.dat.

Parameters:

<Filename> string
 Complete file path incl. filename and extension

Example: SOURce:BB:ONEWeb:FILTer:TYPE USER
 SOURce:BB:ONEWeb:FILTer:PARAmeter:USER "/var/user/my_filter.dat"

Manual operation: See "Load User Filter" on page 127

[:SOURce<hw>]:BB:ONEWeb:SLEnGth **<SLength>**

Sets the sequence length of the signal in number of frames. The signal is calculated in advance and output in the arbitrary waveform generator. The maximum number of frames is calculated as follows:

Max. No. of Frames = Arbitrary waveform memory size/(sampling rate x 10 ms).

Parameters:

<SLength> integer
 Range: 1 to dynamic
 *RST: 1

Example:

SOURce1:BB:OneWeb:SLen 4
 Selects the generation of 4 frames.

Manual operation: See ["Current ARB Sequence Length"](#) on page 111

[:SOURce<hw>]:BB:ONEWeb:SRATe:VARiation <SampleRateVar>

Sets the output sample rate.

A variation of this parameter affects the ARB clock rate; all other signal parameters remain unchanged.

The current value of this parameter depends on the current physical settings, like the channel bandwidth.

Parameters:

<SampleRateVar> float
 Range: 400 to 4E7
 Increment: 1E-3
 *RST: 15.360000E6
 Default unit: Hz

Example:

SOURce:BB:ONEWeb:LINK DOWN
 SOURce:BB:ONEWeb:SRATe:VARiation?
 Response: 15360000

Manual operation: See ["Sample Rate Variation"](#) on page 129

6.3 Trigger Commands

Example: Configure and enable triggering

```

SOURCE:BB:ONEWeb:TRIGger:SEquence SINGLE
SOURCE:BB:ONEWeb:TRIGger:SLENgth 200

// the first 200 samples of the current waveform will be output after
// the next trigger event
// SOURCE:BB:ONEWeb:TRIGger:SEquence ARETrigger
// SOURCE:BB:ONEWeb:TRIGger:SOURce EGT1
// external trigger signal must be provided at the USER connector
// SOURCE:BB:ONEWeb:TRIGger:EXternal:SYNChronize:OUTPut ON
// SOURCE:BB:ONEWeb:TRIGger:EXternal:DElay 200
// SOURCE:BB:ONEWeb:TRIGger:EXternal:INHibit 100

// SOURCE:BB:ONEWeb:TRIGger:SOURce INTB
// the internal trigger signal from the other path must be used
// SOURCE:BB:ONEWeb:TRIGger:OBASeband:DElay 25
// SOURCE:BB:ONEWeb:TRIGger:OBASeband:INHibit 10

SOURCE:BB:ONEWeb:TRIGger:SEquence AAUTO
SOURCE:BB:ONEWeb:TRIGger:SOURce INTERNAL
SOURCE:BB:ONEWeb:STAT ON
SOURCE:BB:ONEWeb:TRIGger:EXEC

```

Example: Specifying delay and inhibit values in time units

```

SOURCE1:BB:ONEWeb:CLOCK 1000000
SOURCE1:BB:ONEWeb:TRIGger:SEquence AAUT
SOURCE1:BB:ONEWeb:TRIGger:SOURce EGT1
SOURCE1:BB:ONEWeb:TRIGger:DElay:UNIT SAMP
SOURCE1:BB:ONEWeb:TRIGger:EXternal:DElay 100
SOURCE1:BB:ONEWeb:TRIGger:EXternal:RDElay?
// Response: 100

SOURCE1:BB:ONEWeb:TRIGger:DElay:UNIT TIME
SOURCE1:BB:ONEWeb:TRIGger:EXternal:TDElay 0.00001
SOURCE1:BB:ONEWeb:TRIGger:EXternal:RDElay?
// Response: 0.00001

SOURCE1:BB:ONEWeb:TRIGger:DElay:UNIT SAMP
SOURCE1:BB:ONEWeb:TRIGger:EXternal:DElay 10

```

[SOURCE<hw>]:BB:ONEWeb[:TRIGger]:SEquence.....	148
[SOURCE<hw>]:BB:ONEWeb:TRIGger:SOURce.....	148
[SOURCE<hw>]:BB:ONEWeb:TRIGger:RMODE?.....	149
[SOURCE<hw>]:BB:ONEWeb:TRIGger:SLENgth.....	149
[SOURCE<hw>]:BB:ONEWeb:TRIGger:SLUNit.....	149
[SOURCE<hw>]:BB:ONEWeb:TRIGger:EXECute.....	150

<code>[SOURce<hw>]:BB:ONEWeb:TRIGger:ARM:EXECute</code>	150
<code>[SOURce<hw>]:BB:ONEWeb:TRIGger:EXtErnal:SYNChronize:OUTPut</code>	150
<code>[SOURce<hw>]:BB:ONEWeb:TRIGger:DELay:UNIT</code>	150
<code>[SOURce<hw>]:BB:ONEWeb:TRIGger:OBASeband:DELay</code>	151
<code>[SOURce<hw>]:BB:ONEWeb:TRIGger:OBASeband:RDELay?</code>	151
<code>[SOURce<hw>]:BB:ONEWeb:TRIGger:OBASeband:TDELay</code>	151
<code>[SOURce<hw>]:BB:ONEWeb:TRIGger:OBASeband:INHibit</code>	152
<code>[SOURce<hw>]:BB:ONEWeb:TRIGger[:EXtErnal]:DELay</code>	152
<code>[SOURce<hw>]:BB:ONEWeb:TRIGger:EXtErnal:TDELay</code>	152
<code>[SOURce<hw>]:BB:ONEWeb:TRIGger:EXtErnal:RDELay?</code>	152
<code>[SOURce<hw>]:BB:ONEWeb:TRIGger[:EXtErnal]:INHibit</code>	153

`[SOURce<hw>]:BB:ONEWeb[:TRIGger]:SEquence <TrigMode>`

Selects the trigger mode:

- `AUTO` = auto
- `RETRigger` = retrigger
- `AAUTo` = armed auto
- `ARETRigger` = armed retrigger
- `SINGLE` = single

Parameters:

`<TrigMode>` `AUTO | RETRigger | AAUTo | ARETRigger | SINGLE`
`*RST:` `AUTO`

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Manual operation: See ["Trigger Mode"](#) on page 117

`[SOURce<hw>]:BB:ONEWeb:TRIGger:SOURce <TrigSour>`

Selects the trigger signal source and determines the way the triggering is executed.
 Provided are:

- Internal triggering by a command (`INTErnal`)
- External trigger signal via one of the local or global connectors
 - `EGT1 | EGT2`: External global trigger
 - `EGC1 | EGC2`: External global clock
 - `ELTRigger`: External local trigger
 - `ELCLock`: External local clock
- Internal triggering by a signal from the other basebands (`INTA | INTB`)
- `OBASeband | BEXtErnal | EXtErnal`: Setting only
 Provided only for backward compatibility with other Rohde & Schwarz signal generators.
 The R&S SMW accepts these values and maps them automatically as follows:
`EXtErnal` = `EGT1`, `BEXtErnal` = `EGT2`, `OBASeband` = `INTA` or `INTB`
 (depending on the current baseband)

Parameters:

<TrigSour> INTB|INTernal|OBASeband|EGT1|EGT2|EGC1|EGC2|ELTRig-
ger|INTA|ELCLock|BEXTernal|EXTernal
*RST: INTernal

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Manual operation: See ["Trigger Source"](#) on page 118

[[:SOURce<hw>]:BB:ONEWeb:TRIGger:RMODE?

Queries the signal generation status.

Return values:

<TrigRunMode> STOP | RUN
*RST: 0

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Usage: Query only

Manual operation: See ["Running/Stopped"](#) on page 117

[[:SOURce<hw>]:BB:ONEWeb:TRIGger:SLENGth <TrigSeqLen>

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

Parameters:

<TrigSeqLen> integer
Range: 1 to 4294967295
*RST: 1

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Manual operation: See ["Trigger Signal Duration"](#) on page 117

[[:SOURce<hw>]:BB:ONEWeb:TRIGger:SLUNit <SeqLenUnit>

Defines the unit for the entry of the signal sequence length, generated after the trigger event.

Parameters:

<SeqLenUnit> SEQUENCE | FRAME | SUBFrame | SLOT | SAMPLE
FRAME
Single frame
SEQUENCE
Single sequence.
SUBFrame
Single subframe.
SLOT
Single slot

SAMPLE

Selected number of samples.

*RST: SEQuence

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Manual operation: See ["Signal Duration Unit"](#) on page 117

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

Executes a trigger.

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Usage: Event

Manual operation: See ["Execute Trigger"](#) on page 118

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

Stops signal generation; a subsequent trigger event restarts signal generation.

Example:

```
SOURce1:BB:ONEWeb:TRIGger:SOURce INT
SOURce1:BB:ONEWeb:TRIGger:SEQuence ARETrigger
SOURce1:BB:ONEWeb:TRIGger:EXECute
// executes a trigger, signal generation starts
SOURce1:BB:ONEWeb:TRIGger:ARM:EXECute
// signal generation stops
SOURce1:BB:ONEWeb:TRIGger:EXECute
// executes a trigger, signal generation starts
again
```

Usage: Event

Manual operation: See ["Arm"](#) on page 118

**[[:SOURce<hw>]:BB:ONEWeb:TRIGger:EXTernal:SYNChronize:OUTPut
<TrigSyncOut>**

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

Parameters:

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

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Manual operation: See ["Sync. Output to External Trigger/Sync. Output to Trigger"](#) on page 119

[[:SOURce<hw>]:BB:ONEWeb:TRIGger:DELay:UNIT <TrigDelUnit>

Sets the units the trigger delay is expressed in.

Parameters:

<TrigDelUnit> SAMPLE | TIME
 *RST: SAMPLE

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Manual operation: See ["\(External\) Delay Unit"](#) on page 120

[[:SOURce<hw>]:BB:ONEWeb:TRIGger:OBASeband:DELay <OthDelay>

Sets the trigger delay for triggering by the trigger signal from the other path.

Parameters:

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

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

[[:SOURce<hw>]:BB:ONEWeb:TRIGger:OBASeband:RDELay?

Queries the time a trigger event from the other path is delayed.

Return values:

<OthTimeResDel> float
 Range: 0 to 688
 Increment: 250E-12
 *RST: 0

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Usage: Query only

Manual operation: See ["Actual Trigger Delay/Actual External Delay"](#) on page 120

[[:SOURce<hw>]:BB:ONEWeb:TRIGger:OBASeband:TDELay <OthTimeDelay>

Specifies the trigger delay for triggering by the signal from the other path.

Parameters:

<OthTimeDelay> float
 Range: 0 to 688
 Increment: 250E-12
 *RST: 0

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Manual operation: See ["\(Specified\) External Delay/\(Specified\) Trigger Delay"](#) on page 120

[:SOURce<hw>]:BB:ONEWeb:TRIGger:OBASeband:INHibit <OthInhibit>

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

Parameters:

<OthInhibit> integer
 Range: 0 to 67108863
 *RST: 0

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Manual operation: See ["External / Trigger Inhibit"](#) on page 119

[:SOURce<hw>]:BB:ONEWeb:TRIGger[:EXtErnal]:DELay <TrigExtDelay>

Sets the trigger delay.

Parameters:

<TrigExtDelay> float
 Range: 0 to 68719476735
 Increment: 0.01
 *RST: 0

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Manual operation: See ["\(Specified\) External Delay/\(Specified\) Trigger Delay"](#) on page 120

[:SOURce<hw>]:BB:ONEWeb:TRIGger:EXtErnal:TDELay <TrigExtTimeDel>

Specifies the trigger delay for external triggering. The value affects all external trigger signals.

Parameters:

<TrigExtTimeDel> float
 Range: 0 to 688
 Increment: 250E-12
 *RST: 0

Example: See [Chapter 6.3, "Trigger Commands"](#), on page 147.

Manual operation: See ["\(Specified\) External Delay/\(Specified\) Trigger Delay"](#) on page 120

[:SOURce<hw>]:BB:ONEWeb:TRIGger:EXtErnal:RDELay?

Queries the time (in seconds) an external trigger event is delayed for.

Return values:

<TrigExtTimeResD> float
 Range: 0 to 688
 Increment: 250E-12
 *RST: 0

- Example:** See [Chapter 6.3, "Trigger Commands"](#), on page 147.
- Usage:** Query only
- Manual operation:** See ["Actual Trigger Delay/Actual External Delay"](#) on page 120

[:SOURce<hw>]:BB:ONEWeb:TRIGger[:EXTernal]:INHibit <TrigExtInhibit>

Specifies the duration by which a restart is inhibited.

Parameters:

<TrigExtInhibit> integer

Range: 0 to 67108863

*RST: 0

- Example:** See [Chapter 6.3, "Trigger Commands"](#), on page 147.
- Manual operation:** See ["External / Trigger Inhibit"](#) on page 119

6.4 Marker Commands

Example: Configure and enable standard marker signals

```
SOURce:BB:ONEWeb:TRIGger:OUTPut2:MODE?
// REStart
SOURce:BB:ONEWeb:TRIGger:OUTPut2:FOFFset 10
SOURce:BB:ONEWeb:TRIGger:OUTPut2:ROFFset 20
SOURce:BB:ONEWeb:TRIGger:OUTPut3:DElay 16
```

[:SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:MODE?	153
[:SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:ROFFset	154
[:SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:FOFFset	154
[:SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:PERiod	154
[:SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:DElay	154
[:SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:ONTime	154
[:SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:OFFTime	154

[:SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:MODE?

Queries the signal for the selected marker output.

Return values:

<Mode> REStart

*RST: REStart

- Example:** See [Example "Configure and enable standard marker signals"](#) on page 153.
- Usage:** Query only
- Manual operation:** See ["Marker Mode"](#) on page 121

```
[ :SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:ROFFset <MarkRiseOffs>
[ :SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:FOFFset <MarkFallOffs>
```

Parameters:

```
<MarkFallOffs>      integer
                    Range:    -640000 to 640000
                    *RST:     0
```

Example: See [Example "Configure and enable standard marker signals"](#) on page 153.

Manual operation: See ["Rise/Fall Offset"](#) on page 122

```
[ :SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:PERiod <MarkUsrPer>
```

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

^{*)} If R&S SMW-B9 is installed, the minimum marker duration depends on the sample/symbol rate.

See chapter "Basics on ..." in the R&S SMW user manual.

Parameters:

```
<MarkUsrPer>      integer
                    Range:    1 (R&S SMW-B10) / 1* (R&S SMW-B9) to
                               4294967295
                    *RST:     2
```

Example: See [Example "Configure and enable standard marker signals"](#) on page 153.

Manual operation: See ["Marker Mode"](#) on page 121

```
[ :SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:DELay <MarkDelay>
```

Defines the delay between the signal on the marker outputs and the start of the signals.

Parameters:

```
<MarkDelay>      float
                    Range:    0 to 16777215
                    Increment: 1E-3
                    *RST:     0
```

Example: See [Example "Configure and enable standard marker signals"](#) on page 153.

Manual operation: See ["Marker x Delay"](#) on page 122

```
[ :SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:ONTime <MarkTimeOn>
```

```
[ :SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:OFFTime <MarkTimeOffs>
```

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

^{*)} If R&S SMW-B9 is installed, the minimum marker duration depends on the sample/symbol rate.

See chapter "Basics on ..." in the R&S SMW user manual.

Parameters:

<MarkTimeOffs> integer
 Range: 1 (R&S SMW-B10) / 1* (R&S SMW-B9) to 16777215
 *RST: 1

Example: See [Example "Configure and enable standard marker signals"](#) on page 153.

Manual operation: See ["Marker Mode"](#) on page 121

6.5 Clock Commands

Example: Clock settings

```
SOURce:BB:ONEWeb:CLOCK:SOURce ELCL
SOURce:BB:ONEWeb:CLOCK:MODE SAMP
CLOCK:INPUt:FREQuency?
```

[\[:SOURce<hw>\]:BB:ONEWeb:CLOCK:SOURce](#)..... 155
[\[:SOURce<hw>\]:BB:ONEWeb:CLOCK:MODE](#)..... 155

[\[:SOURce<hw>\]:BB:ONEWeb:CLOCK:SOURce](#) <ClocSource>

Selects the clock source:

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

Parameters:

<ClocSource> INTernal|ELCLock|EXTernal
 *RST: INTernal

Example: See [Example "Clock settings"](#) on page 155.

Manual operation: See ["Clock Source"](#) on page 123

[\[:SOURce<hw>\]:BB:ONEWeb:CLOCK:MODE](#) <ClocMode>

Sets the type of externally supplied clock.

Parameters:

<ClocMode> SAMPLE
 *RST: SAMPLE

Example: See [Example "Clock settings"](#) on page 155.

Manual operation: See ["Clock Mode"](#) on page 123

6.6 General Downlink Commands

Option: R&S SMW-K130

[:SOURce<hw>]:BB:ONEWeb:DL:CONF:MODE?	156
[:SOURce<hw>]:BB:ONEWeb:DL:BW?	156
[:SOURce<hw>]:BB:ONEWeb:DL:NORB?	157
[:SOURce<hw>]:BB:ONEWeb:DL:OCCBandwidth?	157
[:SOURce<hw>]:BB:ONEWeb:DL:OCCSubcarriers?	157
[:SOURce<hw>]:BB:ONEWeb:DL:SRATe?	158
[:SOURce<hw>]:BB:ONEWeb:DL[:PLCI]:CID	158
[:SOURce<hw>]:BB:ONEWeb:DL:CSETtings:RARNTi	158
[:SOURce<hw>]:BB:ONEWeb:DL:REFSig:POWer?	158
[:SOURce<hw>]:BB:ONEWeb:DL:SYNC:PSTate	159
[:SOURce<hw>]:BB:ONEWeb:DL:SYNC:PPOWer	159
[:SOURce<hw>]:BB:ONEWeb:DL:MIMO:CONFiguration?	159
[:SOURce<hw>]:BB:ONEWeb:DL:MIMO:ANTenna?	160
[:SOURce<hw>]:BB:ONEWeb:DL:MIMO:APM:MAPCoordinates	160
[:SOURce<hw>]:BB:ONEWeb:DL:MIMO:APM:CS:CELL:BB<st0>	160
[:SOURce<hw>]:BB:ONEWeb:DL:MIMO:APM:CS:AP<dir0>:ROW<st0>:REAL	160
[:SOURce<hw>]:BB:ONEWeb:DL:MIMO:APM:CS:AP<dir0>:ROW<st0>:IMAGinary	161

[\[:SOURce<hw>\]:BB:ONEWeb:DL:CONF:MODE?](#)

Queries the PDSCH scheduling mode.

Return values:

<Scheduling> AUTO
 Enables the generation of ONEWeb signal and the PDSCH allocations are configured automatically according to the configuration of the PDCCH DCIs.
 *RST: AUTO

Example: BB:ONEWeb:DL:CONF:MODE?

Usage: Query only

[\[:SOURce<hw>\]:BB:ONEWeb:DL:BW?](#)

Queries the DL channel bandwidth.

Return values:

<Bw> BW250_00
 *RST: BW250_00

Example: SOURce:BB:ONEWeb:DL:BW?

Usage: Query only

Manual operation: See ["Channel Bandwidth"](#) on page 26

[SOURce<hw>]:BB:ONEWeb:DL:NORB?

Queries the number of physical resource blocks per subframe.

Return values:

<Norb> integer
 Range: 100 to 1152
 *RST: 1152

Example: SOURce1:BB:ONEWeb:DL:NORB?

Usage: Query only

Manual operation: See ["Number of Resource Blocks Per Subframe"](#) on page 26

[SOURce<hw>]:BB:ONEWeb:DL:OCCBandwidth?

Queries the occupied bandwidth.

Return values:

<OccupBandwidth> integer
 *RST: dynamic

Example: BB:ONEWeb:DL:OCCB?
 Queries the automatically set occupied bandwidth in downlink.

Usage: Query only

Manual operation: See ["Occupied Bandwidth"](#) on page 26

[SOURce<hw>]:BB:ONEWeb:DL:OCCSubcarriers?

Queries the occupied subcarriers.

Return values:

<OccupSubcarr> integer
 Range: 72 to 1321
 *RST: 601

Example: BB:ONEWeb:DL:OCCS?
 Queries the number of occupied subcarriers.

Usage: Query only

[:SOURce<hw>]:BB:ONEWeb:DL:SRATe?

Queries the sampling rate.

Return values:

<SampleRate> float
 Range: 192E4 to 3072E4
 Increment: 1000
 *RST: 1536E4

Example: BB:ONEWeb:DL:SRAT?
 Queries the automatically set sampling rate.

Usage: Query only

Manual operation: See ["Sampling Rate"](#) on page 27

[:SOURce<hw>]:BB:ONEWeb:DL[:PLCI]:CID <CellId>

Sets the cell identity.

Parameters:

<CellId> integer
 Range: 0 to 255
 *RST: 0

Example: BB:ONEWeb:DL:PLC:CID 100
 Sets the Cell ID.

Manual operation: See ["Cell ID"](#) on page 27

[:SOURce<hw>]:BB:ONEWeb:DL:CSETtings:RARnti <RaRnti>

Sets the random-access response identity RA-RNTI.

The value selected here determines the value of the parameter "UE_ID/n_RNTI" in case a RA_RNTI "User" is selected.

Parameters:

<RaRnti> integer
 Range: 1 to 60
 *RST: 1

Example: SOURce1:BB:ONEWeb:DL:CSETtings:RARnti 5

Manual operation: See ["RA_RNTI"](#) on page 28

[:SOURce<hw>]:BB:ONEWeb:DL:REFSig:POWer?

Queries the reference signal power.

Return values:

<Power> float
 Range: -80 to 10
 Increment: 0.01
 *RST: 0

Example: SOURce1:BB:ONEWeb:DL:REFSig:POWER?

Usage: Query only

Manual operation: See ["Reference Signal Power"](#) on page 29

[SOURce<hw>]:BB:ONEWeb:DL:SYNC:PSTate <PSyncState>

Sets the P-SYNC signal transmission state.

Parameters:

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

Example: BB:ONEWeb:DL:SYNC:PST 1

Manual operation: See ["P-SYNC State"](#) on page 29

[SOURce<hw>]:BB:ONEWeb:DL:SYNC:PPower <PPower>

Sets the power of the primary synchronization signal (P-SYNC).

Parameters:

<PPower> float
 Range: -80 to 10
 Increment: 0.001
 *RST: 0

Example: BB:ONEWeb:DL:SYNC:PPower 0.00
 Sets the P-SYNC power to 0.00dB.

Manual operation: See ["P-SYNC Power"](#) on page 29

[SOURce<hw>]:BB:ONEWeb:DL:MIMO:CONFiguration?

Queries the global MIMO configuration.

Return values:

<Configuration> TX1
 *RST: TX1

Example: SOURce1:BB:ONEWeb:DL:MIMO:CONFiguration?
 SOURce1:BB:ONEWeb:DL:MIMO:ANTenna?
 SOURce1:BB:ONEWeb:DL:MIMO:APM:MAPCoordinates
 CARTesian
 SOURce1:BB:ONEWeb:DL:MIMO:APM:CS:AP0:ROW0:REAL
 1

Usage: Query only

Manual operation: See ["Global MIMO Configuration"](#) on page 30

[:SOURce<hw>]:BB:ONEWeb:DL:MIMO:ANTenna?

Queries the simulated antenna.

Return values:

<Antenna> ANT1
*RST: ANT1

Example: See [\[:SOURce<hw>\]:BB:ONEWeb:DL:MIMO:CONFiguration?](#) on page 159

Usage: Query only

Manual operation: See ["Simulated Antenna"](#) on page 31

[:SOURce<hw>]:BB:ONEWeb:DL:MIMO:APM:MAPCoordinates <Type>

Switches between the cartesian and cylindrical coordinates representation.

Parameters:

<Type> CARTesian | CYLindrical
*RST: CARTesian

Example: See [\[:SOURce<hw>\]:BB:ONEWeb:DL:MIMO:CONFiguration?](#) on page 159

Manual operation: See ["Mapping Coordinates"](#) on page 31

**[:SOURce<hw>]:BB:ONEWeb:DL:MIMO:APM:CS:CELL:BB<st0>
<AntPortCCIndex>**

Maps a component carrier to a baseband.

Suffix:

<st0> 0 to 7
baseband identifier, where <st0>=0 indicates BB A

Parameters:

<AntPortCCIndex> PC | SC1
*RST: PC

Example: BB:ONEWeb:DL:MIMO:APM:CS:CELL:BB0 PC

Manual operation: See ["Mapping table"](#) on page 31

**[:SOURce<hw>]:BB:ONEWeb:DL:MIMO:APM:CS:AP<dir0>:ROW<st0>:REAL
<AntPortMapDat>**

Define the mapping of the antenna ports to the physical antennas.

Suffix:

<dir0> 0 | 1 | 2 | 3 | 4 | 6 | 15 to 46
Antenna port
AP0 | 1 | 2 | 3 can only be mapped to the BB0 | 1 | 2 | 3

<st0> 0 to 7
Available basebands

Parameters:

<AntPortMapDat> 0 | 1 (for AP = 0 to 3); float (for AP = 4 | 6 | 15 to 46)
The mapping of the first four APs AP0 | 1 | 2 | 3 depends on the system configuration as follows:
If SCONfiguration:BASEband:SOURce SEParate, then exactly one single AP can be mapped to a BB.
If SCONfiguration:BASEband:SOURce COUPled|CPENtity, then none or exactly one single AP can be mapped to a BB.
To map an AP, use the command
SOURce1:BB:ONEWeb:DL:MIMO:APM:CS:AP0 | 1 | 2 | 3: ROW0 | 1 | 2 | 3: **REAL** 1. The corresponding . . . :CS:AP0 | 1 | 2 | 3: ROW0 | 1 | 2 | 3: IMAG command has no effect.
The **REAL** (Magnitude) and IMAGinary (Phase) values are interdependent. Their value ranges change depending on each other and so that the resulting complex value is as follows:
 $|\text{REAL} + j \cdot \text{IMAGinary}| \leq 1$
Otherwise, the values are normalized to Magnitude = 1.
Range: -1 to 360
Increment: 0.001
*RST: dynamic

Example: See [:SOURce<hw>]:BB:ONEWeb:DL:MIMO: CONFiguration? on page 159

Manual operation: See "Mapping table" on page 31

**[:SOURce<hw>]:BB:ONEWeb:DL:MIMO:APM:CS:AP<dir0>:ROW<st0>:IMAGinary
<AntPortMapDat>**

Define the mapping of the antenna ports to the physical antennas.

Suffix:

<dir0> 4 | 6 | 15 to 46
Antenna port

<st0> 0 to 7
Available basebands

Parameters:

<AntPortMapDat> float

The **REAL** (Magnitude) and **IMAGinary** (Phase) values are interdependent. Their value ranges change depending on each other and so that the resulting complex value is as follows:

$$|\text{REAL} + j * \text{IMAGinary}| \leq 1$$

Otherwise, the values are normalized to Magnitude = 1.

Range: -1 to 360

Increment: 0.001

*RST: dynamic

Example:

See [:SOURce<hw>]:BB:ONEWeb:DL:MIMO:CONFiguration? on page 159

Manual operation: See "Mapping table" on page 31

6.7 DL Frame Configuration

Option: R&S SMW-K130

[:SOURce<hw>]:BB:ONEWeb:DL:CONSubframes.....	163
[:SOURce<hw>]:BB:ONEWeb:DL:RSTFrame.....	163
[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:STATe.....	163
[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:TXM.....	163
[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:CELL<st0>:TXM.....	163
[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:UEC.....	164
[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:SCRambling:STATe?.....	164
[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:CCODing:STATe.....	164
[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:UEID.....	165
[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:DATA.....	165
[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:DSElect.....	165
[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:PATtern.....	165
[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:PA.....	166
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALCount.....	166
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>:CODWords?.....	166
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:MODulation?.....	167
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:RBCount?.....	167
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:RBOffset?.....	167
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[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:DATA?.....	168
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:DSElect?.....	168
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:PATtern.....	169
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:POWer.....	169
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:CONType?.....	170
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:STATe?.....	170
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:CONFlicts?.....	170
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:CONFlict?.....	171
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:USER<ch>:PHYSbits?.....	171

[:SOURce<hw>]:BB:ONEWeb:DL:CONSubframes <ConSubFrames>

Sets the number of configurable subframes.

Parameters:

<ConSubFrames> integer
 Range: 1 to 40
 *RST: 10

Example: BB:ONEWeb:DL:CONS 10
 Ten subframes are configurable in downlink.

Manual operation: See ["No Of Configurable \(DL\) Subframes"](#) on page 32

[:SOURce<hw>]:BB:ONEWeb:DL:RSTFrame

Resets all subframe settings of the selected link direction to the default values.

Example: BB:ONEWeb:DL:RSTF
 Resets the downlink subframe parameters of path A to the default settings.

Manual operation: See ["Reset All Subframes"](#) on page 33

[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:STATe <UserState>

Enables/disables a user.

Parameters:

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

Example: SOURce1:BB:ONEWeb:DL:USER1:STATe OFF

Manual operation: See ["State"](#) on page 34

[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:TXM <TxMode>

Sets the transmission mode.

Parameters:

<TxMode> M1OW | M2OW
 *RST: M1OW

Example: SOURce1:BB:ONEWeb:DL:USER1:TXM M1OW

Manual operation: See ["Tx Modes"](#) on page 34

[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:CELL<st0>:TXM <TxMode>

Sets the transmission mode of the user.

Suffix:
 <st0> 0 to 4
 0 = PCell, 1 to 4 = SCell1 to SCell4

Parameters:
 <TxMode> M1OW | M2OW | M3OW
 *RST: M1OW

Example:
 SOURce1:BB:ONEWeb:DL:USER1:CELL0:TXM M1OW
 SOURce1:BB:ONEWeb:DL:USER1:CELL1:TXM M1OW

Manual operation: See ["Tx Modes"](#) on page 34

[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:UEC <UECategory>

Sets the UE Category.

Parameters:
 <UECategory> C1 | C2 | C3 | C5 | C4
 *RST: C1

Example:
 BB:ONEWeb:DL:USER1:UEC C1

Manual operation: See ["UE Category"](#) on page 35

[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:SCRambling:STATe?

Queries the scrambling state for all allocations belonging to the selected user.

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

Example:
 SOUR:BB:ONEWeb:DL:USER3:SCR:STAT?
 // Returns the scrambling state for allocations belonging to user 3

Usage: Query only

Manual operation: See ["Scrambling"](#) on page 35

[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:CCODing:STATe <State>

Sets the channel coding for all allocations belonging to the selected user.

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

Example:
 BB:ONEWeb:DL:USER2:CCOD:STAT ON
 Enables channel coding for the allocations belonging to user 2.

Manual operation: See ["Channel Coding State"](#) on page 35

[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:UEID <Ueid>

Sets the user equipment ID.

Parameters:

<Ueid> integer
 Range: 0 to 65535
 *RST: 0

Example: BB:ONEWeb:DL:USER2:UEID 3308
 Sets the UE ID.

Manual operation: See "UE ID" on page 35

[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:DATA <Data>

Selects the data source for the selected user configuration.

Parameters:

<Data> PN9 | PN11 | PN15 | PN16 | PN20 | PN21 | PN23 | PATtern |
 DList | ZERO | ONE
 *RST: PN9

Example: SOURce1:BB:ONEWeb:USER0:DATA PN23
 // file oneweb_datalist.dm_iqd must exist in
 the default directory
 SOURce1:BB:ONEWeb:USER2:DATA DList
 SOURce1:BB:ONEWeb:USER2:LIST
 "/var/user/oneweb_datalist.dm_iqd"
 SOURce1:BB:ONEWeb:USER4:DATA PATtern
 SOURce1:BB:ONEWeb:USER4:PATtern #H1C4A9,17

Manual operation: See "Data Source, DList/Pattern" on page 35

[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:DSElect <DSelect>

Selects an existing data list file from the default directory or from the specific directory.

Parameters:

<DSelect> string
 File name incl. file extension or complete file path

Example: See [:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:DATA
 on page 165.

Manual operation: See "Data Source, DList/Pattern" on page 35

[:SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:PATtern <Pattern>, <BitCount>

Sets a bit pattern as data source.

Parameters:

<Pattern> numeric
 *RST: #H0

<BitCount> integer
 Range: 1 to 64
 *RST: 1

Example: See [\[:SOURce<hw>\]:BB:ONEWeb:DL:USER<ch>:DATA](#)
 on page 165.

Manual operation: See ["Data Source, DList/Pattern"](#) on page 35

[\[:SOURce<hw>\]:BB:ONEWeb:DL:USER<ch>:PA](#) <Power>

Sets PDSCH power factor.

Parameters:

<Power> -6.02 | -4.77 | -3.01 | -1.77 | 0.97 | 2.04 | 3.01 | 0
 *RST: 0

Example: [BB:ONEWeb:DL:USER2:PA](#) 0.00

Example: Selects the P_A

Manual operation: See ["Power"](#) on page 36

[\[:SOURce<hw>\]:BB:ONEWeb:DL\[:SUBF<st0>\]:ALCount](#) <AllocCount>

Sets the number of scheduled allocations in the selected subframe. The maximum number of allocations that can be scheduled depends on the number of the selected resource blocks.

Parameters:

<AllocCount> integer
 Range: 0 to dynamic
 *RST: 2 (SUBF0, SUBF10, SUBF20, SUBF30); 1(all other
 subframes)

Example: [BB:ONEWeb:DL:SUBF4:ALC](#) 5
 Five scheduled allocations are assigned to subframe four.

Manual operation: See ["No. Of Used Allocations"](#) on page 37

[\[:SOURce<hw>\]:BB:ONEWeb:DL\[:SUBF<st0>\]:ALLoc<ch0>:CODWords?](#)

Queries the number of codewords for an allocation.

Return values:

<CodeWords> integer
 Range: 1 to 3
 *RST: 1

Example: BB:ONEWeb:DL:SUBF1:ALL5:CODW?
Response: 1

Usage: Query only

Manual operation: See "[Codeword](#)" on page 38

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:
MODulation?**

Queries the modulation scheme for the allocation.

Return values:

<Modulation> QPSK | PSK8 | QAM16
*RST: QPSK

Example: BB:ONEWeb:DL:SUBF4:ALL5:CW1:MOD?
Response: QPSK
Retrun QPSK as the modulation scheme for the allocation.

Usage: Query only

Manual operation: See "[Modulation](#)" on page 38

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:
RBCount?**

Queries the number of resource block for the selected allocation. The value is set automatically according to the current allocation settings.

Return values:

<ResBlockCount> integer
Range: 1 to 1152
*RST: 1

Example: BB:ONEWeb:DL:SUBF0:ALL0:CW1:RBC?
Response: 2

Usage: Query only

Manual operation: See "[No. RB \(Resource Blocks\)](#)" on page 38

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:
RBOffset?**

Queries the start resource block of the selected allocation.

Return values:

<ResBlockOffset> integer
Range: 0 to 1151
*RST: 0

Example: BB:ONEWeb:DL:SUBF0:ALL0:CW1:RBOF?
Response: 20

Usage: Query only

Manual operation: See "Offset RB" on page 38

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:
PHYSbits?**

Queries the number of physical bits for the selected allocation. The value is set automatically according to the current allocation settings.

Return values:

<PhysicalBits> integer
Range: 0 to 105600
*RST: 0

Example: BB:ONEWeb:DL:SUBF4:ALL5:CW:PHYS?
Queries the number of physical bits for allocation five in sub-frame four.

Usage: Query only

Manual operation: See "Phys. Bits/Number of Physical Bits (DL)" on page 39

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:DATA?

Queries the data source for the selected allocation.

Return values:

<Data> USER1 | USER2 | USER3 | USER4 | PN9 | PN11 | PN15 |
PN16 | PN20 | PN21 | PN23 | PATtern | DLISt | ZERO | ONE |
MIB
MIB
Returns value indicates that the PBCH transmits real MIB data.
See also [:SOURce<hw>]:BB:ONEWeb:DL:PBCH:MIB
on page 190
*RST: dynamic

Example: BB:ONEWeb:DL:SUBF4:ALL5:CW1:DATA?
Response: PN9
Returns the data source for the selected allocation as PN9.

Usage: Query only

Manual operation: See "Data Source" on page 39

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:
DSElect?**

Queries an existing data list file from the default directory or from the specific directory.

Return values:

<DSelect> string

Example: BB:ONEWeb:DL:SUBF2:ALL5:CW:DATA DLISt
 BB:ONEWeb:DL:SUBF2:ALL5:CW:DSElect?
 Response: /var/user/Oneweb_list1

Usage: Query only

Manual operation: See "Data Source" on page 39

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:PATtern
<Pattern>, <BitCount>

Sets a bit pattern as data source.

Parameters:

<Pattern> numeric
 *RST: #H0

<BitCount> integer
 Range: 1 to 64
 *RST: 1

Example: BB:ONEWeb:DL:SUBF4:ALL5:CW:DATA PATT
 BB:ONEWeb:DL:SUBF4:ALL5:CW:PATT #H3F,8

Manual operation: See "Data Source" on page 39

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:POWER
<Power>

Sets the power P_{PDSCH} respectively P_{PBCH} for the selected allocation. The power of the PDCCH allocation P_{PDCC} is read-only. The value is set with the command [:

SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:Power.

For allocations with two codewords, the power for the second codeword is automatically set to the power set for first one.

Parameters:

<Power> float
 Range: -80 to 10
 Increment: 0.001
 *RST: 0

Example: P_{PDSCH} , P_{PBCH}
 SOUR:BB:ONEWeb:DL:SUBF1:ALL2:POW 0.00

Example: P_{PDCC}
 SOUR:BB:ONEWeb:DL:SUBF1:ENCC:PDCC:POW 0.00
 SOUR:BB:ONEWeb:DL:SUBF1:ALL1:POW?
 Response: 0

Manual operation: See "Power" on page 40

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:CONType?

Queries the type for the selected allocation.

PBCH can be configured in subframe 0 only.

Return values:

<ConType> PDSCch | PBCH | PDCCh | EPD1 | EPD2
 *RST: PDSCch

Example: BB:ONEWeb:DL:SUBF4:ALL5:CW:CONT?
 Response: PDSC

Usage: Query only

Manual operation: See "Content Type" on page 40

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:STATe?

Queries the allocation state?

Return values:

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

Example: BB:ONEWeb:DL:SUBF4:ALL5:CW1:STAT?
 Response: ON
 Returns value indicates that the selected allocation is activated.

Usage: Query only

Manual operation: See "State" on page 40

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:CONFlicts?

Queries the number of conflicts between the DCI formats.

To query whether there is a conflict in one particular PDCCH item, use the command
[\[:SOURce<hw>\]:BB:ONEWeb:DL\[:SUBF<st0>\]:ENCC:PDCCh:EXTC:ITEM<ch0>:CONFlict?](#) on page 181.

Return values:

<NoOfConf> integer
 Range: 0 to 20
 *RST: 0

Example:

```
SOURce1:BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:FORMat
VARiable
SOURce1:BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:EXTC:
CONFlicts?
Response: 1
SOURce1:BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:EXTC:
UITems?
Response: 2
SOURce1:BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:EXTC:
ITEM0:CONFlict?
Response: 0
SOURce1:BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:EXTC:
ITEM1:CONFlict?
Response: 1
The DCI conflict is in the second PDCCH item
SOURce1:BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:EXTC:
SOLVe
```

Usage: Query only

Manual operation: See ["Resolve Conflicts"](#) on page 46

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:
CONFlict?**

Indicates a conflict between two allocations.

Return values:

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

Example:

```
BB:ONEWeb:DL:SUBF4:ALL5:CW1:CONF?
```

Queries for the selected allocation whether there is a conflict with another allocation.

Usage: Query only

Manual operation: See ["Conflict"](#) on page 40

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:USER<ch>:PHYSbits?

Queries the size of the selected allocation in bits and considering the subcarriers that are used for other signals or channels with higher priority.

If a User 1...4 is selected for the "Data Source" in the allocation table for the corresponding allocation, the value of the parameter "Number of Physical Bits" is the sum of the "Physical Bits" of all single allocations that belong to the same user in the selected subframe.

Return values:

<PhysicalBits> integer
 Range: 0 to 100000
 *RST: 0

Example:

BB:ONEWeb:DL:SUBF1:USER3:PHYS?
 Queries the number of physical bits

Usage:

Query only

Manual operation: See "Phys. Bits/Number of Physical Bits (DL)" on page 39

6.8 Enhanced PCFICH and PDCCH Configuration Commands

Option: R&S SMW-K130

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[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:BITS?.....	175
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:AVCCes?.....	176
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[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:UP.....	178
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:SOLVe?.....	178
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:UITems?.....	178
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[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>: DCIConf:RBA	184
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[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>: DCIConf:TPCC	185
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>: DCIConf:HPN	185
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[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>: DCIConf:PRACH:MINdex	187
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>: DCIConf:PRACH:PRINdex	187
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>: DCIConf:FIRStrans:MCS	188
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>: DCIConf:RETRans:MCS	188
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>: DCIConf:TB1:NDI	188
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>: DCIConf:TB2:NDI	188
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>: DCIConf:TB1:RV	189
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>: DCIConf:TB2:RV	189
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[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>: DCIConf:F3RI	189

[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:STATe <State>

Enables/disables the PDCCH and PCFICH allocation.

Parameters:

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

Example:

BB:ONEWeb:DL:SUBF1:ENCC:STAT ON
 Enables PDCCH and PCFICH.

Manual operation: See ["State"](#) on page 41

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PCFich:SCRambling:STATe
 <State>

Enables/disables the scrambling of the enhanced channels.

Parameters:

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

Example:

SOURce1:BB:ONEWeb:DL:SUBF1:ENCC:PCFich:
 SCRambling:STATe ON

Manual operation: See ["Scrambling State"](#) on page 41

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PCFich:POWer <Power>

Sets the power of the PCFICH (P_{PCFICH}).

Parameters:

<Power> float
 Range: -80 to 10
 Increment: 0.001
 *RST: 0

Example:

BB:ONEWeb:DL:SUBF1:ENCC:PCF:POW 0
 Sets the power of the PCFICH to 0 dBm

Manual operation: See ["PCFICH Power"](#) on page 42

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PCFich:CFI <CFI>

Sets the control format indicator for PDCCH.

Parameters:

<CFI> integer
 Range: 1 to 12
 *RST: 2

Manual operation: See ["CFI for PDCCH"](#) on page 42

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:POWer <Power>

Sets the power of the PDCCH (P_{PDCCH}).

The value set with this parameter is also displayed in the allocation table for the corresponding allocation.

Parameters:

<Power> float
 Range: -80 to 10
 Increment: 0.001
 *RST: 0

Example: BB:ONEWeb:DL:SUBF1:ENCC:PDCC:POW 0.00
 Sets the power of the PDCCH to 0.00 dB

Manual operation: See "Power" on page 44

[[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:FORMAT?

Queries the PDCCH format.

Return values:

<Format> VAR
VAR
 Enables full flexibility by the configuration of the downlink control information (DCI) format and content.

Example: BB:ONEWeb:DL:SUBF2:ENCC:PDCC:FORM?
 Response: VAR
 Returns that the PDCCH format to variable.

Usage: Query only

Manual operation: See "PDCCH Format" on page 44

[[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:BITS?

Queries the number of bits allocated for PDCCH.

Return values:

<PhysBits> integer
 Range: 0 to 1E5
 *RST: 0

Example: BB:ONEWeb:DL:SUBF1:ENCC:STAT ON
 Enables PDCCH.
 BB:ONEWeb:DL:SUBF1:ENCC:PDCC:BITS?
 Queries the number of bits
 Response: 3144

Usage: Query only

Manual operation: See "Number of PDCCH Bits / REGs / CCEs" on page 44

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:AVCCes?

Queries the number of the control channel elements (CCEs) that are available for the PDCCH allocation.

Return values:

<AvailCceCount> integer
 Range: 0 to 1E5
 *RST: 0

Example:

BB:ONEWeb:DL:SUBF1:ENCC:STAT ON
 Enables PDCCH.
 BB:ONEWeb:DL:SUBF1:ENCC:PDCC:AVCC?
 Queries the number of CCEs
 Response 43

Usage: Query only

Manual operation: See ["Number of PDCCH Bits / REGs / CCEs"](#) on page 44

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:AVRegs?

Queries the number of the REGs that are available for the PDCCH allocation.

Return values:

<AvailRegionCoun> integer
 Range: 0 to 1E5
 *RST: 0

Example:

BB:ONEWeb:DL:SUBF1:ENCC:STAT ON
 BB:ONEWeb:DL:SUBF1:ENCC:PDCC:AVR?
 Response: 393

Usage: Query only

Manual operation: See ["Number of PDCCH Bits / REGs / CCEs"](#) on page 44

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:APPend

Adds a new row at the end of the DCI table.

Example:

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
 Sets the PDCCH format.
 BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:APP
 Adds a new row

Manual operation: See ["Append"](#) on page 45

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:DELeTe

Deletes the selected row.

Example: BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
Sets the PDCCH format.
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:SIT 2
Selects the third row in the DCI table
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:DEL
Deletes the third row

Usage: Event

Manual operation: See ["Delete"](#) on page 45

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:INSert

Insert a new row before the currently selected item.

Example: BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
Sets the PDCCH format.
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:SIT 2
Selects the third row in the DCI table
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:INS
Inserts a new row before the third one

Manual operation: See ["Insert"](#) on page 45

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:RESet

Resets the table.

Example: BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
Sets the PDCCH format.
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:RES
Resets the table

Manual operation: See ["Reset"](#) on page 45

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:SITem
<SelectedItem>**

Selects an PDCCH item, i.e. a row in the DCI table.

Parameters:

<SelectedItem> integer
Range: 0 to 39
*RST: 0

Example: BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
Sets the PDCCH format.
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:SIT 2
Selects the third row in the DCI table

Manual operation: See ["Insert"](#) on page 45

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:DOWN
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:UP
```

Moves the selected row down or up.

Example: BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
Sets the PDCCH format.
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:SIT 2
Selects the third row in the DCI table
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:UP
Moves the third row one row up

Manual operation: See ["Up"](#) on page 45

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:SOLVe?
```

Triggers a built-in algorithm that re-assigns automatically the CCE values depending on the configured "Search Space"; previously configured CCE values will not be maintained.

If the conflict cannot be resolved automatically, the values are left unchanged.

Example: :SOURce:BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:
SOLVe

Usage: Query only

Manual operation: See ["Resolve Conflicts"](#) on page 46

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:UITems?
```

Queries the number of used PDCCH items.

Return values:

<UsedItems> integer
Range: 0 to 10
*RST: 0

Example: SOURce1:BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:
UITems?
Response: 2

Usage: Query only

Manual operation: See ["Number of Used PDCCH Items"](#) on page 46

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:  
USER <User>
```

Sets the user which the DCI is dedicated to.

The available DCI Formats depend on the value of this parameter.

Parameters:

<User> USER1 | USER2 | USER3 | USER4 | PRNTi | SIRNTi | RARNti | NONE
 *RST: USER1

Example:

SOURCE1:BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:EXTC:
 ITEM1:USER USER2
 DCI is dedicated to User 2

Manual operation: See "User" on page 46

[:SOURCE<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:UEID <Ueid>

Sets the n_RNTI for the selected PDCCH.

Parameters:

<Ueid> integer
 Range: 0 to 100000
 *RST: 0

Example:

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
 Sets the PDCCH format.
 BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:UEID
 100
 Sets the n_RNTI

Manual operation: See "UE_ID/n_RNTI" on page 46

[:SOURCE<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:CELL?

Queries the component carrier the corresponding DCI is transmitted on.

Return values:

<CellIdx> integer
 Range: 0 to 7
 *RST: 0

Example:

BB:ONEWeb:DL:SUBF4:ENCC:PDCC:EXTC:ITEM0:CELL?
 Response: 0

Usage:

Query only

Manual operation: See "Cell Index" on page 47

[:SOURCE<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:PDCChtype?

Queries if the DCI is carried by a PDCCH.

Return values:

<PdcchType> PDCCh

Example: SOURce1:BB:ONEWeb:DL:SUBF0:ENCC:PDCCh:EXTC:
ITEM1:PDCChType?
Response: PDCC

Usage: Query only

Manual operation: See "PDCCH" on page 47

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
DCIFmt <DciFormat>**

Sets the DCI format for the selected PDCCH.

Parameters:

<DciFormat> F1A | F3 | F3A | F0 | F10W | F20W | F30W
*RST: F0

Example: SOURce1:BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:FORMat
VARiable
SOURce1:BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:EXTC:
ITEM1:DCIFmt F1

Manual operation: See "DCI Format" on page 47

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
SESPace <SearchSpace>**

If enabled, this parameter configures the PDCCH DCI to be transmitted within the common or UE-specific search space.

Parameters:

<SearchSpace> AUTO | COMMON | UE | ON | 1
COMMON|UE
Common and UE-specific search spaces, as defined in the 3GPP specification
OFF|AUTO
For backwards compatibility only.
*RST: AUTO

Example: BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:SESP UE
The DCI is transmitted within the UE-specific search space.

Manual operation: See "Search Space" on page 48

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
PFMT <Format>**

Sets the PDCCH format for the selected PDCCH.

Parameters:

<Format> integer
 Range: 0 to 4
 *RST: 0

Example:

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
 Sets PDCCH format variable.
 BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:PFMT 0
 Sets the PDCCH format.

Manual operation: See ["PDCCH Format \(Variable\)"](#) on page 48

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
 CINDEX <CceIndex>**

Sets the CCE start index.

Parameters:

<CceIndex> integer
 Range: 0 to 1E5
 *RST: 0

Example:

SOURce1:BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:FORMat
 VAR
 Sets the PDCCH format.
 SOURce1:BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:EXTC:
 ITEM1:CINDEX 10
 Sets the CCE start index

Manual operation: See ["CCE Index"](#) on page 49

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
 CONFLICT?**

Queries the conflicts status for the transmission of the PDCCH.

Return values:

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

Example:

SOURce1:BB:ONEWeb:DL:SUBF0:ENCC:PDCCh:EXTC:
 ITEM0:CONFLICT?

Usage:

Query only

Manual operation: See ["Conflict \(DCI\)"](#) on page 49

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
 NCCes?**

Queries the number of control channel elements used for the transmission of the PDCCH.

Return values:

<CceCount> integer
 Range: 0 to 1E5
 *RST: 1

Usage: Query only

Manual operation: See "Number CCEs" on page 49

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:NDCCes?

Queries the number of dummy CCEs that are appended to the PDCCH.

Return values:

<DummyCceCount> integer
 Range: 0 to 1E5
 *RST: 25

Example: BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
 Sets the PDCCH format.
 BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:NDCC?
 Queries the number of dummy CCEs

Usage: Query only

Manual operation: See "No. Dummy CCEs" on page 49

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:BITData?

Queries the resulting bit data as selected with the DCI format parameters.

Return values:

<BitData> string

Example: BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
 Sets the PDCCH format.
 BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:BITD?
 Queries the bit data

Usage: Query only

Manual operation: See "Bit Data" on page 50

[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:DCIConf:CIField <CalndField>

The CIF is present in **each** DCI Format and identifies the component carrier that carries the PDSCH or PUSCH for the particular PDCCH in the cross-carrier approach.

Parameters:

<CalndField> integer
 Range: 0 to 7
 *RST: 0

Example:

BB:ONEWeb:DL:CA:STAT ON
 BB:ONEWeb:DL:USER2:CA:STAT ON
 BB:ONEWeb:DL:CA:CELL0:CIF ON
 BB:ONEWeb:DL:ENCC:PDCC:EXTC:ITEM1:DCIC:CIF 1

Manual operation: See "DCI Format 0" on page 50

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:ITEM<ch0>:
 DCIConf:CSDMRs <CyclicShftDmRs>**

Sets the DCI Format 0 field cyclic shift for DMRS.

Parameters:

<CyclicShftDmRs> integer
 Range: 0 to 7
 *RST: 0

Example:

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
 Sets the PDCCH format.
 BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF F0
 Sets the DCI format
 BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:
 CSDM 1
 Sets the cyclic shift

Manual operation: See "DCI Format 0" on page 50

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:ITEM<ch0>:
 DCIConf:CSIRequest <CsiRequest>**

Sets the DCI Format 0 field CSI/CQI Request.

Parameters:

<CsiRequest> integer
 Range: 0 to 3
 *RST: 0

Example:

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
 BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF F0
 BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:
 CSIR 1

Manual operation: See "DCI Format 0" on page 50

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
DCIConf:MCSR <Mcsr>
```

Sets the DCI Format 0/10W/1A field Modulation and Coding Scheme.

Parameters:

<Mcsr> integer
 Range: 0 to 31
 *RST: 0

Example:

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF F0
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:
MCSR 5
```

Manual operation: See ["DCI Format 0"](#) on page 50

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
DCIConf:NDI <NewDataIndicat>
```

Sets the DCI Format 0/10W/1A field New Data Indicator.

Parameters:

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

Example:

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
Sets the PDCCH format.
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF F0
Sets the DCI format
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:
NDI ON
Sets the New Data Indicator
```

Manual operation: See ["DCI Format 0"](#) on page 50

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
DCIConf:RBA <ResBlockAssign>
```

Sets the DCI Format 0/10W/1A/20W/30W field Resource Block Assignment.

Parameters:

<ResBlockAssign> integer
 Range: 0 to 268435455
 *RST: 0

Example:

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
```

Sets the PDCCH format.

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF F0
```

Sets the DCI format

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:
```

```
RBA 100
```

Sets Resource Block Assignment

Manual operation: See "DCI Format 0" on page 50

```
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:ITEM<ch0>:
DCIConf:SRSRequest <SrsRequest>
```

Sets the SRS Request filed.

Parameters:

```
<SrsRequest> integer
Range:      0 to 1
*RST:      0
```

Manual operation: See "DCI Format 0" on page 50

```
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:ITEM<ch0>:
DCIConf:TPCC <TpcCommand>
```

Sets the DCI Format 0/1OW/1A/2OW/3OW field TPC Command for PUSCH.

Parameters:

```
<TpcCommand> integer
Range:      0 to 3
*RST:      0
```

Example:

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
```

Sets the PDCCH format.

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF F0
```

Sets the DCI format

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:
```

```
TPCC 1
```

Sets the TPC Command for PUSCH

Manual operation: See "DCI Format 0" on page 50

```
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:ITEM<ch0>:
DCIConf:HPN <HarqProcessNumb>
```

Sets the DCI Format 1OW/1A/2OW/3OW field HARQ process number.

Parameters:

```
<HarqProcessNumb> integer
Range:      0 to 15
*RST:      0
```

Example:

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
```

Sets the PDCCH format.

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF  
F1A
```

Sets the DCI format

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:  
HPN 5
```

Sets the HARQ process number

Manual operation: See ["DCI Format 10W"](#) on page 51

```
[[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:ITEM<ch0>:  
DCIConf:RV <RedundVersion>
```

Sets the DCI Format 10W/1A field Redundancy Version.

Parameters:

```
<RedundVersion> integer  
Range: 0 to 3  
*RST: 0
```

Example:

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
```

Sets the PDCCH format.

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF F1
```

Sets the DCI format

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:RV  
1
```

Sets the Redundancy Version

Manual operation: See ["DCI Format 10W"](#) on page 51

```
[[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:ITEM<ch0>:  
DCIConf:F1AMode <Format1aMode>
```

Selects the mode of the DCI format.

Parameters:

```
<Format1aMode> PDSCh | PRACH  
*RST: PDSCh
```

Example:

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
```

Sets the PDCCH format.

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF  
F1A
```

Sets the DCI format

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:  
F1AM PRAC
```

Sets the mode

Manual operation: See ["DCI Format 1A"](#) on page 52

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:ITEM<ch0>:
DCIConf:PRACH:MINDex <MaskIndex>**

(PRACH mode only)

Sets the DCI Format 1A field PRACH Mask Index.

Parameters:

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

Example:

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR

Sets the PDCCH format.

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF
F1A

Sets the DCI format

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:F1AM
PRAC

Sets the mode

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:
PRAC:MIND 10

Sets the preamble index

Manual operation: See "DCI Format 1A" on page 52

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCC:EXTC:ITEM<ch0>:
DCIConf:PRACH:PRINdex <PreambleIndex>**

(PRACH mode only)

Sets the DCI Format 1A field Preamble index.

Parameters:

<PreambleIndex> integer
 Range: 0 to 63
 *RST: 0

Example:

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR

Sets the PDCCH format.

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF
F1A

Sets the DCI format

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:F1AM
PRAC

Sets the mode

BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:
PRAC:PRIN 10

Sets the preamble index

Manual operation: See "DCI Format 1A" on page 52

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
DCIConf:FIRStrans:MCS <Mcs>
```

PDCCH DCI <Modulation and Coding Scheme> - First Transmission

Parameters:

```
<Mcs> float
Range: 0 to 31
Increment: 1
*RST: 0
```

Example: BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:EXTC:ITEM1:
DCIConf:FIRStrans:MCS 2

Manual operation: See "DCI Format 20W" on page 53

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
DCIConf:RETRans:MCS <Mcs>
```

Enhanced Channel Configuration: DCI Format Configuration: Re-Transmission: <Modulation and Coding Scheme>

Parameters:

```
<Mcs> float
Range: 0 to 31
Increment: 1
*RST: 0
```

Example: BB:ONEWeb:DL:SUBF1:ENCC:PDCCh:EXTC:ITEM1:
DCIConf:RETRans:MCS 2

Manual operation: See "DCI Format 20W" on page 53

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
DCIConf:TB1:NDI <NewDataIndicat>
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
DCIConf:TB2:NDI <NewDataIndicat>
```

Sets the DCI Format 20W/30W field New Data Indicator.

Parameters:

```
<NewDataIndicat> 0 | 1 | OFF | ON
*RST: OFF
```

Example: BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
Sets the PDCCH format.
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF
F20W
Sets the DCI format
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:
TB2:NDI ON
Sets the New Data Indicator for TB2

Manual operation: See "DCI Format 20W" on page 53

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
  DCIConf:TB1:RV <RedundVersion>
[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
  DCIConf:TB2:RV <RedundVersion>
```

Sets the DCI Format 20W field Redundancy Version.

Parameters:

<RedundVersion> integer
 Range: 0 to 3
 *RST: 0

Example:

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
Sets the PDCCH format.
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF
F20W
Sets the DCI format
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:
TB2:RV 1
Sets the Redundancy Version for TB2
```

Manual operation: See "DCI Format 20W" on page 53

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
  DCIConf:TPCinstr <TpcCommand>
```

Sets the DCI Format 3/3A field TPC Command.

Parameters:

<TpcCommand> bit pattern

Example:

```
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:FORM VAR
Sets the PDCCH format.
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIF F3
Sets the DCI format
BB:ONEWeb:DL:SUBF1:ENCC:PDCC:EXTC:ITEM1:DCIC:
TPC #B101,3
Sets the TPC Command
```

Manual operation: See "DCI Format 3/3A" on page 54

```
[ :SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ENCC:PDCCh:EXTC:ITEM<ch0>:
  DCIConf:F3RI <Format3ResInd>
```

Sets the DCI Format 30W PUCCH Format 3 resource indicator.

Parameters:

<Format3ResInd> integer
 Range: 0 to 3
 *RST: 0

Example: BB:ONEWeb:DL:SUBF0:ENCC:PDCCh:EXTC:ITEM1:
DCIConf:F3RI 1

6.9 Enhanced PBCH and PDSCH Commands

Option: R&S SMW-K130

[SOURce<hw>]:BB:ONEWeb:DL:PBCH:MIB.....	190
[SOURce<hw>]:BB:ONEWeb:DL:PBCH:MSPare.....	191
[SOURce<hw>]:BB:ONEWeb:DL:PBCH:SOFFset.....	191
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:CCODing:STATe..	191
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:SCRambling: STATe.....	191
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:SCRambling: UEID.....	192
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:CCODing: ISBSize.....	192
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:CCODing: RVIndex.....	193
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:CCODing: TBSize?.....	193

[SOURce<hw>]:BB:ONEWeb:DL:PBCH:MIB <State>

Enables transmission of real MIB data.

Parameters:

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

Example:

```

SOURce1:BB:ONEWeb:DL:SUBF0:ALLoc0:CW1:CONType?
// PBCH
SOURce1:BB:ONEWeb:DL:SUBF0:ALLoc0:CW1:
SCRambling:STATe 1
SOURce1:BB:ONEWeb:DL:SUBF0:ALLoc0:CW1:CCODing:
STATe 1
SOURce1:BB:ONEWeb:DL:PBCH:MIB 1
SOURce1:BB:ONEWeb:DL:PBCH:SOFFset 0
SOURce1:BB:ONEWeb:DL:SUBF0:ALLoc0:CW1:CCODing:
TBSize?
//24
SOURce1:BB:ONEWeb:DL:SUBF0:ALLoc0:CW1:PHYSbits?
//480
SOURce1:BB:ONEWeb:DL:PBCH:MSPare #H001,10
SOURce1:BB:ONEWeb:DL:SUBF0:ALLoc0:CW1:STATe 1

```

Manual operation: See "MIB (including SFN)" on page 57

[:SOURce<hw>]:BB:ONEWeb:DL:PBCH:MSPare <MibSpareBits>

Sets the 10 spare bits in the PBCH transmission.

Parameters:

<MibSpareBits> 64 bit
 *RST: #H0,1

Example: See [:SOURce<hw>]:BB:ONEWeb:DL:PBCH:MIB
 on page 190

Manual operation: See "MIB Spare Bits" on page 58

[:SOURce<hw>]:BB:ONEWeb:DL:PBCH:SOFFset <SfnOffset>

Sets an offset for the start value of the SFN (System Frame Number).

Parameters:

<SfnOffset> integer
 Range: 0 to 1020
 Increment: 4
 *RST: 0

Example: See [:SOURce<hw>]:BB:ONEWeb:DL:PBCH:MIB
 on page 190

Manual operation: See "SFN Offset" on page 58

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:
 CCODing:STATe <State>**

Enables/disables channel coding for the selected allocation and codeword.

Parameters:

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

Example: BB:ONEWeb:DL:SUBF4:ALL5:CW2:CCOD:STAT ON

Manual operation: See "State Channel Coding (DL)" on page 57

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:
 SCRambling:STATe <State>**

Enables/disables the bit-level scrambling.

Parameters:

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

Example: SOUR:BB:ONEWeb:DL:SUBF0:ALL5:CW:DATA PN9
 SOUR:BB:ONEWeb:DL:SUBF0:ALL5:CW:SCR:STAT ON
 Enables scrambling

Example: If a "User 1..4" is selected for the Data Source for the corresponding allocation, this command is query only and the return value corresponds the state determined with the command `[ :SOURce<hw> ] :BB:ONEWeb:DL:USER<ch>:SCRambling:STATe?`.

```

SOUR:BB:ONEWeb:DL:SUBF0:ALL4:CW:DATA USER3
SOUR:BB:ONEWeb:DL:USER3:SCR:STAT ON
SOUR:BB:ONEWeb:DL:SUBF0:ALL4:CW:SCR:STAT?
Response: On

```

Manual operation: See ["State Scrambling \(DL\)"](#) on page 55

[:SOURce<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ALLoc<ch0> [:CW<user>] :SCRambling:UEID <Ueid>

Sets the user equipment identifier (n_RNTI) of the user to which the PDSCH transmission is intended. The UE ID is used to calculate the scrambling sequence.

Parameters:

<Ueid> integer
 Range: 0 to 65535
 *RST: 0

Example: `BB:ONEWeb:DL:SUBF0:ALL5:CW:UEID 120`
 Sets the user equipment identifier.

Manual operation: See ["UE ID/n_RNTI \(PDSCH\)"](#) on page 56

[:SOURce<hw>] :BB:ONEWeb:DL [:SUBF<st0>] :ALLoc<ch0> [:CW<user>] :CCODing:ISBSize <SoftBufSize>

Sets the size of the IR soft buffer.

Parameters:

<SoftBufSize> integer
 Range: 800 to 3667200
 *RST: 3667200

Example: `SOUR:BB:ONEWeb:DL:SUBF9:ALL5:CW:DATA USER3`
`SOUR:BB:ONEWeb:DL:SUBF9:ALL5:PHYS?`
 Response: 2400
`SOUR:BB:ONEWeb:DL:SUBF9:ALL5:CW2:CCOD:TBS?`
 Response: 1500
`SOUR:BB:ONEWeb:DL:SUBF9:ALL5:CW2:CCOD:ISBS 1600`
`SOUR:BB:ONEWeb:DL:SUBF9:ALL4:CW:DATA USER3`
`SOUR:BB:ONEWeb:DL:SUBF9:ALL4:CW2:CCOD:ISBS?`
 Response: 1600

Manual operation: See ["IR Soft Buffer Size \(PDSCH\)"](#) on page 58

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:
CCODing:RVIndex <RedundVersIndex>**

Sets the redundancy version index.

Parameters:

<RedundVersIndex> integer
 Range: 0 to 3
 *RST: 0

Example: BB:ONEWeb:DL:SUBF4:ALL5:CW2:CCOD:RVIN 2
 Sets the redundancy version index to 2

Manual operation: See ["Redundancy Version Index \(PDSCH\)"](#) on page 58

**[:SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:
CCODing:TBSize?**

Queries the size of the transport block.

Note: The parameter depends on the content type and the global MIMO configuration.

Return values:

<TranspBlockSize> integer
 Range: 0 to 850656
 *RST: dynamic

Example: BB:ONEWeb:DL:SUBF0:ALL0:CW1:PHYS?
 Queries the number of physical bits of allocation 0
 Response: 6400
 BB:ONEWeb:DL:SUBF0:ALL0:CW1:CCOD:TBS?
 Response: 24
 Returns the transport block size to of allocation 0.

Usage: Query only

Manual operation: See ["Transport Block Size/Payload \(DL\)"](#) on page 58

6.10 General Uplink Commands

Option: R&S SMW-K130

[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:BW?	194
[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:DFReq.....	195
[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:DUPLexing?.....	195
[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:ID.....	195
[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:INDEX.....	195
[:SOURce<hw>]:BB:ONEWeb:UL:CA:STATe.....	196
[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:DMRS.....	196
[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:SUConfiguration.....	196
[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:CSRS.....	196

[SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:TDElay.....	197
[SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:STATe.....	197
[SOURce<hw>]:BB:ONEWeb:UL:BW?.....	197
[SOURce<hw>]:BB:ONEWeb:UL:FFT?.....	198
[SOURce<hw>]:BB:ONEWeb:UL:LGS?.....	198
[SOURce<hw>]:BB:ONEWeb:UL:RGS?.....	198
[SOURce<hw>]:BB:ONEWeb:UL:NORB?.....	198
[SOURce<hw>]:BB:ONEWeb:UL:OCCBandwidth?.....	199
[SOURce<hw>]:BB:ONEWeb:UL:OCCSubcarriers?.....	199
[SOURce<hw>]:BB:ONEWeb:UL:SRATe?.....	199
[SOURce<hw>]:BB:ONEWeb:UL:CPC?.....	199
[SOURce<hw>]:BB:ONEWeb:UL:SOFFset.....	200
[SOURce<hw>]:BB:ONEWeb:UL[PLCI]:CID.....	200
[SOURce<hw>]:BB:ONEWeb:UL[PLCI]:CIDGroup.....	200
[SOURce<hw>]:BB:ONEWeb:UL:REFSig:DMRS.....	201
[SOURce<hw>]:BB:ONEWeb:UL:REFSig:DSSHift.....	201
[SOURce<hw>]:BB:ONEWeb:UL:REFSig:GRPHopping.....	201
[SOURce<hw>]:BB:ONEWeb:UL:REFSig:SEQHopping.....	201
[SOURce<hw>]:BB:ONEWeb:UL:REFSig:SRS:ANSTx.....	202
[SOURce<hw>]:BB:ONEWeb:UL:REFSig:SRS:CSRS.....	202
[SOURce<hw>]:BB:ONEWeb:UL:REFSig:SRS:DSFC?.....	202
[SOURce<hw>]:BB:ONEWeb:UL:REFSig:SRS:SUConfiguration.....	203
[SOURce<hw>]:BB:ONEWeb:UL:REFSig:SRS:TSFC?.....	203
[SOURce<hw>]:BB:ONEWeb:UL:PRACH:FOFFset.....	203
[SOURce<hw>]:BB:ONEWeb:UL:PRACH:CONFigureation.....	203
[SOURce<hw>]:BB:ONEWeb:UL:PRACH:RSET.....	204
[SOURce<hw>]:BB:ONEWeb:UL:PUCCh:DESHift.....	204
[SOURce<hw>]:BB:ONEWeb:UL:PUCCh:N1CS.....	204
[SOURce<hw>]:BB:ONEWeb:UL:PUCCh:N1NMax?.....	205
[SOURce<hw>]:BB:ONEWeb:UL:PUCCh:N2Max?.....	205
[SOURce<hw>]:BB:ONEWeb:UL:PUCCh:N2RB.....	205
[SOURce<hw>]:BB:ONEWeb:UL:PUCCh:N3Max?.....	206
[SOURce<hw>]:BB:ONEWeb:UL:PUCCh:NORB.....	206

[SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:BW?

Queries the bandwidth of the corresponding component carrier.

Return values:

<ULCaBw> BW20_00
 *RST: BW20_00

Example: See [:SOURce<hw>] :BB:ONEWeb:UL:CA:STATe
 on page 196

Usage: Query only

Manual operation: See "Bandwidth" on page 61

[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:DFReq <ULCaDeltaF>

Sets the frequency offset between the central frequency of corresponding SCell and the frequency of the PCell.

Parameters:

<ULCaDeltaF> float
 Value range depends on the installed options, the number of cells and the cell bandwidth.
 Range: -60 to 60
 Increment: 0.1
 *RST: 0
 Default unit: MHz

Manual operation: See "[delta f / MHz](#)" on page 61

[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:DUPLexing?

Queries the duplexing mode of the component carriers.

Return values:

<ULCaDuplexMode> FDD
 *RST: FDD

Example: See [:SOURce<hw>]:BB:ONEWeb:UL:CA:STATe
 on page 196

Usage: Query only

Manual operation: See "[Duplexing](#)" on page 61

[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:ID <ULCaPhyCellId>

Sets the physical Cell ID of the PCell and the SCells.

Parameters:

<ULCaPhyCellId> integer
 Range: 0 to 503
 *RST: 0

Example: See [:SOURce<hw>]:BB:ONEWeb:UL:CA:STATe
 on page 196

Manual operation: See "[Physical Cell ID](#)" on page 61

[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:INDEX <ULCaCellIndex>

Sets the cell index of the corresponding SCell.

Parameters:

<ULCaCellIndex> integer
 Range: 1 to 7
 *RST: 1

Example: See [:SOURce<hw>] :BB:ONEWeb:UL:CA:STATe
 on page 196

Manual operation: See "Cell Index" on page 60

[:SOURce<hw>] :BB:ONEWeb:UL:CA:STATe <ULCaGlobState>

Enables UL carrier aggregation.

Parameters:

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

Manual operation: See "Activate Carrier Aggregation" on page 60

[:SOURce<hw>] :BB:ONEWeb:UL:CA:CELL<ch0>:DMRS <ULCaN1Dmrs>

Sets the parameter n(1)_DMRS per component carrier.

Parameters:

<ULCaN1Dmrs> integer
 Range: 0 to 11
 *RST: 0

Example: See [:SOURce<hw>] :BB:ONEWeb:UL:CA:STATe
 on page 196

Manual operation: See "n(1)_DMRS" on page 61

**[:SOURce<hw>] :BB:ONEWeb:UL:CA:CELL<ch0>:SUConfiguration
 <ULCaSrsSubfConf>**

Sets the SRS subframe configuration per component carrier.

Parameters:

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

Example: See [:SOURce<hw>] :BB:ONEWeb:UL:CA:STATe
 on page 196

Manual operation: See "SRS Subframe Configuration" on page 61

[:SOURce<hw>] :BB:ONEWeb:UL:CA:CELL<ch0>:CSRS <ULCaSrsCSRS>

Sets the parameter SRS Bandwidth Configuration per component carrier.

Parameters:

<ULCaSrsCSRS> integer
 Range: 0 to 7
 *RST: 0

Example: See [:SOURce<hw>]:BB:ONEWeb:UL:CA:STATe
 on page 196

Manual operation: See "SRS Bandwidth Configuration C_SRS" on page 61

[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:TDElay <TimeDelay>

Sets the time delay of the SCell relative to the PCell.

Parameters:

<TimeDelay> integer
 Range: 0 to 7E5
 *RST: 0

Example: See [:SOURce<hw>]:BB:ONEWeb:UL:CA:STATe
 on page 196

Manual operation: See "Delay / ns" on page 61

[:SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:STATe <ULCaCellState>

Activates the corresponding component carrier.

Parameters:

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

Example: See [:SOURce<hw>]:BB:ONEWeb:UL:CA:STATe
 on page 196

Manual operation: See "State" on page 62

[:SOURce<hw>]:BB:ONEWeb:UL:BW?

Queries the UL channel bandwidth.

Return values:

<BandWidth> BW20_00
 *RST: BW20_00

Example: SOURce:BB:ONEWeb:UL:BW?

Usage: Query only

Manual operation: See "Channel Bandwidth" on page 62

[[:SOURce<hw>]:BB:ONEWeb:UL:FFT?

Queries the FFT (Fast Fourier Transformation) size. The available values depend on the selected number of resource blocks per subframe.

Return values:

<FftSize> integer
Range: 128 to 2048
*RST: 2048

Example: BB:ONEWeb:UL:FFT?
Queries the automatically set FFT size.

Usage: Query only

Manual operation: See " [FFT Size](#)" on page 63

[[:SOURce<hw>]:BB:ONEWeb:UL:LGS?**[[:SOURce<hw>]:BB:ONEWeb:UL:RGS?**

Queries the number of right guard subcarriers. The value is set automatically according to the selected number of resource blocks per subframe.

Return values:

<RgSubCarr> integer
Range: 35 to 601
*RST: 211

Example: BB:ONEWeb:UL:RGS?
Queries the number of right guard subcarriers.

Usage: Query only

Manual operation: See " [Number of Left/Right Guard Subcarriers](#)" on page 63

[[:SOURce<hw>]:BB:ONEWeb:UL:NORB?

Queries the number of physical resource blocks per subframe.

Return values:

<NumResBlocks> integer
Range: 6 to 110
*RST: 100

Example: BB:ONEWeb:UL:BW USER
Sets the bandwidth mode to USER in uplink.
BB:ONEWeb:UL:NORB?
Queries the number of resource blocks.

Usage: Query only

Manual operation: See " [Number of Resource Blocks Per Subframe](#)" on page 63

[:SOURce<hw>]:BB:ONEWeb:UL:OCCBandwidth?

Queries the occupied bandwidth. This value is set automatically according to the selected number of resource blocks per subframe.

Return values:

<OccBandwidth> float

Example:

BB:ONEWeb:UL:OCCB?

Queries the automatically set occupied bandwidth in uplink.

Usage:

Query only

Manual operation: See "[Occupied Bandwidth](#)" on page 63

[:SOURce<hw>]:BB:ONEWeb:UL:OCCSubcarriers?

Queries the occupied subcarriers. The value is set automatically according to the selected number of resource blocks per subframe.

Return values:

<OccSubcarriers> integer

Range: 72 to 1321

*RST: 600

Example:

BB:ONEWeb:UL:OCCS?

Queries the number of occupied subcarriers.

Usage:

Query only

Manual operation: See "[Number Of Occupied Subcarriers](#)" on page 63

[:SOURce<hw>]:BB:ONEWeb:UL:SRATe?

Queries the sampling rate.

Return values:

<SampRate> float

Range: 192E4 to 3072E4

Increment: 1000

*RST: 1536E4

Example:

BB:ONEWeb:UL:SRAT?

Queries the automatically set sampling rate.

Usage:

Query only

Manual operation: See "[Sampling Rate](#)" on page 63

[:SOURce<hw>]:BB:ONEWeb:UL:CPC?

Queries the cyclic prefix length for all subframes.

Return values:

<CyclicPrefix> NORMal
 *RST: NORMal

Example: SOURce1:BB:ONEWeb:UL:CPC?

Usage: Query only

Manual operation: See "[Cyclic Prefix](#)" on page 65

[SOURce<hw>]:BB:ONEWeb:UL:SOFFset <SfnOffset>

Sets the start SFN value.

Parameters:

<SfnOffset> integer
 Range: 0 to 4095
 *RST: 0

Example: :SOURce1:BB:ONEWeb:UL:SOFFset 10
 Sets the SFN start value

Manual operation: See "[SFN Offset](#)" on page 65

[SOURce<hw>]:BB:ONEWeb:UL[:PLCI]:CID <CellId>

Sets the cell identity.

Parameters:

<CellId> integer
 Range: 0 to 503
 *RST: 0

Example: BB:ONEWeb:UL:PLC:CID 100
 Sets the cell ID.

Manual operation: See "[Cell ID](#)" on page 64

[SOURce<hw>]:BB:ONEWeb:UL[:PLCI]:CIDGroup <PhysCellIdGroup>

Sets the ID of the physical cell identity group.

Parameters:

<PhysCellIdGroup> integer
 Range: 0 to 167
 *RST: 0

Example: BB:ONEWeb:UL:PLC:CIDG 100
 Sets the UL physical cell ID group

[[:SOURce<hw>]:BB:ONEWeb:UL:REFSig:DMRS <DrsDmrs>

Sets the part of the demodulation reference signal (DMRS) index which is broadcasted and therefore valid for the whole cell. This index applies when multiple shifts within a cell are used and is used by the calculation of the DMRS sequence.

Parameters:

<DrsDmrs> integer
 Range: 0 to 11
 *RST: 0

Example: BB:ONEWeb:UL:REFS:DMRS 4
 Sets the demodulation reference signal index to 4

Manual operation: See "[n\(1\)_DMRS](#)" on page 68

[[:SOURce<hw>]:BB:ONEWeb:UL:REFSig:DSSHift <DeltaSeqShift>

Sets the delta sequence shift for PUSCH needed for the calculation of the group hopping pattern.

Parameters:

<DeltaSeqShift> integer
 Range: 0 to 29
 *RST: 0

Example: BB:ONEWeb:UL:REFS:DSSH 3
 Sets the delta sequence shift for PUSCH

Manual operation: See "[Delta Sequence Shift for PUSCH](#)" on page 68

[[:SOURce<hw>]:BB:ONEWeb:UL:REFSig:GRPHopping <GroupHopping>

Enables/disables group hopping for the uplink reference signals demodulation reference signal (DRS) and sounding reference signal (SRS).

Parameters:

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

Example: BB:ONEWeb:UL:REFS:GRPH ON
 Enables group hopping

Manual operation: See "[Group Hopping](#)" on page 67

[[:SOURce<hw>]:BB:ONEWeb:UL:REFSig:SEQHopping <SequenceHopping>

Enables/disables sequence hopping for the uplink reference signals demodulation reference signal (DRS) and sounding reference signal (SRS).

Parameters:

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

Example: BB:ONEWeb:UL:REFS:SEQH ON
Enables sequence hopping

Manual operation: See ["Sequence Hopping"](#) on page 68

[:SOURce<hw>]:BB:ONEWeb:UL:REFSig:SRS:ANSTx <AnSrsSimTxState>

Enables/disables simultaneous transmission of SRS (sounding reference signal) and ACK/NACK messages, i.e. transmission of SRS and PUCCH in the same subframe.

Parameters:

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

Example: BB:ONEWeb:UL:REFS:SRS:ANST ON

Manual operation: See ["A/N + SRS simultaneous Tx"](#) on page 69

[:SOURce<hw>]:BB:ONEWeb:UL:REFSig:SRS:CSRS <Csrs>

Sets the cell-specific parameter SRS bandwidth configuration (C_{SRS}).

Parameters:

<Csrs> integer
Range: 0 to 7
*RST: 0

Example: BB:ONEWeb:UL:REFS:SRS:CSRS 4
Sets the SRS bandwidth configuration

Manual operation: See ["SRS Bandwidth Configuration C_SRS"](#) on page 69

[:SOURce<hw>]:BB:ONEWeb:UL:REFSig:SRS:DSFC?

Queries the value for the cell-specific parameter transmission offset Δ_{SFC} in subframes, depending on the selected SRS subframe configuration ([\[:SOURce<hw>\]:BB:ONEWeb:UL:REFSig:SRS:CSRS](#)) and the duplexing mode ([\[:SOURce<hw>\]:BB:ONEWeb:DUPLexing?](#)).

Return values:

<DeltSFC> string

Example: BB:ONEWeb:UL:REFS:SRS:SUC 4
Sets the SRS configuration
BB:ONEWeb:UL:REFS:SRS:DSFC?
Queries the Δ_{SFC} parameter

Usage: Query only

Manual operation: See ["Transmission Offset \$\Delta_{SFC}\$ "](#) on page 69

[:SOURce<hw>]:BB:ONEWeb:UL:REFSig:SRS:SUConfiguration
 <SubFrameConfig>

Sets the cell-specific parameter SRS subframe configuration.

Parameters:

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

Example: BB:ONEWeb:UL:REFS:SRS:SUC 4
 Sets the SRS configuration

Manual operation: See " [SRS Subframe Configuration](#) " on page 68

[:SOURce<hw>]:BB:ONEWeb:UL:REFSig:SRS:TSFC?

Queries the value for the cell-specific parameter configuration period T_{SFC} in sub-frames, depending on the selected SRS subframe configuration ([:SOURce<hw>] : BB:ONEWeb:UL:REFSig:SRS:CSRS) and the duplexing mode ([:SOURce<hw>] : BB:ONEWeb:DUPLexing?).

Return values:

<Tsfc> string

Example: BB:ONEWeb:UL:REFS:SRS:SUC 4
 Sets the SRS configuration
 BB:ONEWeb:UL:REFS:SRS:TSFC?
 Queries the T_{SFC} parameter

Usage: Query only

Manual operation: See " [Configuration Period \$T_{SFC}\$](#) " on page 69

[:SOURce<hw>]:BB:ONEWeb:UL:PRACH:FOFFset <FrequencyOffset>

Sets the prach-FrequencyOffset $n_{PRBoffset}^{RA}$

Parameters:

<FrequencyOffset> integer
 Range: 0 to dynamic
 *RST: 0

Example: BB:ONEWeb:UL:PRAC:FOFF 2
 Sets the frequency offset

Manual operation: See " [PRACH Frequency Offset](#) " on page 70

[:SOURce<hw>]:BB:ONEWeb:UL:PRACH:CONFfiguration <Configuration>

Sets the PRACH configuration number.

Parameters:

<Configuration> integer
 Range: 0 to 63
 *RST: 0

Example:

BB:ONEWeb:UL:PRAC:CONF 10
 Sets the PRACH configuration

Manual operation: See " [PRACH Configuration](#) " on page 70

[:SOURce<hw>]:BB:ONEWeb:UL:PRACH:RSET <RestrictedSet>

Enables/disables using of a restricted preamble set.

Parameters:

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

Example:

BB:ONEWeb:UL:PRAC:RSET ON
 Enables using of restricted set

Manual operation: See " [Restricted Set \(High Speed Mode\)](#) " on page 71

[:SOURce<hw>]:BB:ONEWeb:UL:PUCCh:DESHift <DeltaShift>

Sets the delta shift parameter.

Parameters:

<DeltaShift> integer
 Range: 1 to 3
 *RST: 2

Example:

BB:ONEWeb:PUCCh:DESH 3
 Sets the delta shift parameter

Manual operation: See " [Delta Shift](#) " on page 74

[:SOURce<hw>]:BB:ONEWeb:UL:PUCCh:N1CS <N1Cs>

Sets the number of cyclic shifts used for PUCCH format 1/1a/1b in a resource block used for a combination of the formats 1/1a/1b and 2/2a/2b.

Parameters:

<N1Cs> integer
 Range: 0 to dynamic
 *RST: 6

Example:

BB:ONEWeb:UL:PUCCh:N1CS 5
 5 cyclic shifts are used for PUCCH format F1/F1a/F1b in an RB used for a combination of the PUCCH formats 1/1a/1b and 2/2a/2b

Manual operation: See " [N\(1\)_cs](#) " on page 74

[[:SOURce<hw>]:BB:ONEWeb:UL:PUCCh:N1NMax?

Queries the range of the possible PUCCH format 1/1a/1b transmissions from different users in one subframe and for normal CP.

Return values:

<N1NormCP> integer
 Range: 0 to 110
 *RST: 44

Example:

BB:ONEWeb:UL:PUCCh:N1NM?

Queries the range of the possible PUCCH formats 1/1a/1b transmissions.

Response: 24

Usage: Query only

Manual operation: See " [Range n\(1\)_PUCCH \(Normal CP\)](#) " on page 74

[[:SOURce<hw>]:BB:ONEWeb:UL:PUCCh:N2Max?

Queries the range of possible number of PUCCH format 2/2a/2b transmissions from different users in one subframe.

Return values:

<N2Max> integer
 Range: 0 to 110
 *RST: 15

Example:

BB:ONEWeb:UL:PUCCh:N2M?

Queries the range of the possible PUCCH formats 2/2a/2b transmissions.

Response: 16

Usage: Query only

Manual operation: See " [Range n\(2\)_PUCCH](#) " on page 75

[[:SOURce<hw>]:BB:ONEWeb:UL:PUCCh:N2RB <N2Rb>

Sets bandwidth in terms of resource blocks that are reserved for PUCCH formats 2/2a/2b transmission in each subframe.

Parameters:

<N2Rb> integer
 Range: 0 to dynamic
 *RST: 1

Example:

BB:ONEWeb:UL:PUCCh:N2RB 3

Reserves 3 RB for PUCCH formats 2/2a/2b

Manual operation: See " [N\(2\)_RB](#) " on page 74

[:SOURce<hw>]:BB:ONEWeb:UL:PUCCh:N3Max?

Queries the range of possible number of PUCCH format x transmissions from different users in one subframe.

Return values:

<N3Max> integer
 Range: 0 to 549
 *RST: 19

Usage: Query only

Manual operation: See " [Range n\(3\)_PUCCH](#) " on page 75

[:SOURce<hw>]:BB:ONEWeb:UL:PUCCh:NORB <RbCount>

Sets the PUCCH region in terms of reserved resource blocks, at the edges of the channel bandwidth.

Parameters:

<RbCount> integer
 Range: 0 to 110
 *RST: 4

Example: BB:ONEWeb:UL:PUCCh:NORB 3
 Reserves 3 RBs for PUCCH

Manual operation: See " [Number of RBs used for PUCCH](#) " on page 72

6.11 UL Frame Configuration

Option: R&S SMW-K130

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[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:CONSubframes:PUCCh.....	208
[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:CONSubframes:PUSCh.....	208
[:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:CONType.....	209
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[:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:VRBOffset.....	210
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[SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:SLOT<user0>:ALLoc<ch0>:RBOffset?.....	211
[SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:SLOT<user0>:ALLoc<ch0>:PUCCh: RBOffset?.....	211
[SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:SLOT<user0>: ALLoc<ch0>:PUACh:SET<gr>:RBOffset?.....	211
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[SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:PHYsbits?.....	211
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[SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:STATe.....	212
[SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:PUACh:STATe..	212
[SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:PUSCh:STATe..	212
[SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:PUACh: CONFlt?.....	212
[SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:CONFlt?.....	212
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[SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>[: CW<cwid>]:PUACh:MODulation.....	214
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[SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:PUACh: DRS:CYCShift.....	215
[SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:PUSCh: DRS:CYCShift.....	215
[SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:PUACh: NDMRs.....	215
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[SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccid>][:SUBF<st0>]:ALLoc<ch0>[: CW<cwid>]:PUACh:CCODing:RVINdex.....	217
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[SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccid>][:SUBF<st0>]:ALLoc<ch0>[: CW<cwid>]:PUACh:ULSCh:BITS?.....	218
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[SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:CQI:BITS.....	218
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[SOURce<hw>]:BB:ONEWeb:UL:RSTFrame

Resets all subframe settings of the selected link direction to the default values.

Example:

```
BB:ONEWeb:UL:RSTF
```

Resets the uplink subframe parameters of path A to the default settings.

Manual operation: See "[Reset All Subframes](#)" on page 78

```
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:CONSubframes:PUACh  
<ConfSubframes>
```

```
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:CONSubframes:PUCCh  
<ConSubframes>
```

```
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:CONSubframes:PUSCh  
<ConfSubframes>
```

Sets the number of configurable subframes.

Parameters:

<ConfSubframes> integer
 Range: 1 to 40
 *RST: 1

Example:

```
SOURce1:BB:ONEWeb:UL:UE1:ID 100
SOURce1:BB:ONEWeb:UL:UE2:ID 100
SOURce1:BB:ONEWeb:UL:UE1:CONSubframes:PUCCh 10
SOURce1:BB:ONEWeb:UL:UE1:CONSubframes:PUSCh 10
SOURce1:BB:ONEWeb:UL:UE1:CONSubframes:PUACH 10
SOURce1:BB:ONEWeb:UL:UE2:CONSubframes:PUCCh 8
SOURce1:BB:ONEWeb:UL:UE2:CONSubframes:PUSCh 8
SOURce1:BB:ONEWeb:UL:UE2:CONSubframes:PUACH 8
```

Manual operation: See ["Number Of PUCCH/PUSCH/PUACH Configurations/ Number Of Configurable Subframes"](#) on page 76

[:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:CONType
 <ContentType>

Selects the content type for the selected allocation.

Parameters:

<ContentType> PUSCh | PUCCh | PUACH
 *RST: PUSCh

Example:

```
BB:ONEWeb:UL:SUBF4:ALL2:CONT PUSC
```

Manual operation: See ["Content \(UL\)"](#) on page 79

[:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>[:PUCCh]:FORMat
 <Format>

Sets the PUCCH Format.

Parameters:

<Format> F1 | F1A | F1B | F2 | F2A | F2B | F3
 *RST: F1

Example:

```
SOUR:BB:ONEWeb:UL:SUBF4:ALL2:CONT PUCC
SOUR:BB:ONEWeb:UL:SUBF4:ALL2:FORM F2A
```

Manual operation: See ["Modulation/Format"](#) on page 80

**[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
 PUACH:DRS:DELTA <DeltaPuach>**

Delta PUACH is used to differentiate the DMRS (PUSCH DMRS or PUACH DMRS) used in the uplink scheduling assignment.

Parameters:

<DeltaPuach> integer
 Range: 0 to 1
 *RST: 0

Manual operation: See "[Delta PUACH](#)" on page 85

```
[ :SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:RBCount?
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
  PUACH:SET<user>:RBCount <NumberOfRBs>
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
  PUSCh:SET<user>:RBCount <NumberOfRBs>
```

Sets the size of the selected allocation in resource blocks (per subframe).

Suffix:

<user> 1..2

Parameters:

<NumberOfRBs> integer
 Range: 0 to 110
 *RST: 0

Example:

```
BB:ONEWeb:UL:SUBF0:ALL1:RBC 3
BB:ONEWeb:UL:SUBF0:ALL2:PUCCh:RBC ?
BB:ONEWeb:UL:SUBF0:ALL2:PUSCh:SET1:RBC 4
BB:ONEWeb:UL:SUBF0:ALL2:PUSCh:SET1:VRB 5
```

Manual operation: See "[Set 1 No. RB](#)" on page 80

```
[ :SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:VRBOffset
  <VrbOffset>
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
  PUACH:SET<user>:VRBOffset <NumberOfVRBs>
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
  PUSCh:SET<user>:VRBOffset <NumberOfVRBs>
```

Sets the virtual resource block offset of the selected subframe.

Suffix:

<user> 1..2

Parameters:

<NumberOfVRBs> integer
 Range: 0 to 49
 *RST: 0

Example:

```
BB:ONEWeb:UL:SUBF0:ALL1:VRB 6
BB:ONEWeb:UL:SUBF0:ALL2:PUSCh:SET1:VRB 5
BB:ONEWeb:UL:SUBF0:ALL2:PUSCh:SET1:VRB 15
```

Manual operation: See "[Set 1 Offset VRB](#)" on page 81

```
[ :SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:SLOT<user0>:ALLoc<ch0>:
  RBOffset?
[ :SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:SLOT<user0>:ALLoc<ch0>:
  PUCCh:RBOffset?
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:SLOT<user0>:
  ALLoc<ch0>:PUACh:SET<gr>:RBOffset?
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:SLOT<user0>:
  ALLoc<ch0>:PUSCh:SET<gr>:RBOffset?
```

Queries the start resource block of the selected allocation in slot n of the subframe.

Suffix:

<user0> 0..1
 <s2us> 1..2

Return values:

<RbOffs> integer
 Range: 0 to 49
 *RST: 2

Usage: Query only

Manual operation: See "[Offset PRB Slot \(n/n+1\)](#)" on page 81

```
[ :SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:PHYSbits?
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>[:
  CW<cwid>]:PUACh:PHYSbits?
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>[:
  CW<cwid>]:PUSCh:PHYSbits?
```

Queries the number of physical bits for the selected allocation.

Suffix:

<cwid> 1..2
 Codeword

Return values:

<PuscPhysBits> integer
 Range: -1 to 105600
 *RST: -1

Example: SOURce1:BB:ONEWeb:UL:SUBF4:ALLoc2:CW1:PUSCh:PHYSbits?

Usage: Query only

Manual operation: See "[Phys. Bits / Total Number of Physical Bits](#)" on page 82

```
[ :SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:POWER <Power>
[ :SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:POWER
  <PuccPower>
```

```
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
    PUACH:POWer <PuacPower>
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
    PUSCh:POWer <PuscPower>
```

Sets the power for the selected allocation.

Parameters:

<PuscPower> float
 Range: -80 to 10
 Increment: 0.001
 *RST: 0

Example:

```
BB:ONEWeb:UL:SUBF4:ALL1:POW 3.00
BB:ONEWeb:UL:SUBF4:ALL2:PUSH:POW -1.00
BB:ONEWeb:UL:SUBF4:ALL2:PUCC:POW -1.00
BB:ONEWeb:UL:SUBF4:ALL2:PUAC:POW -1.00
```

Manual operation: See "Power (UL)" on page 82

```
[ :SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:STATe
    <PuccState>
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
    PUACH:STATe <PuacState>
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
    PUSCh:STATe <PuscState>
```

Sets the allocation state to active or inactive.

Note: Disabling an allocation deactivate the PUACH/PUSCH/PUCCH and the corresponding demodulation reference signal, but does not affect other allocations of the UE or the sounding reference signal.

Parameters:

<PuccState> 0 | 1 | OFF | ON
 *RST: dynamic

Manual operation: See "State (UL)" on page 82

```
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
    PUACH:CONFLict?
[ :SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:CONFLict?
[ :SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
    PUSCh:CONFLict?
```

Indicates a conflict between two allocations.

Return values:

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

Usage: Query only

Manual operation: See "Conflict (UL)" on page 83

**[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccid>][:SUBF<st0>]:ALLoc<ch0>:
PUSCh:CQI:BITS <Bits>**

Sets the number of CQI bits before channel coding.

Parameters:

<Bits> integer
Range: dynamic to 1024
*RST: 10

Example: See [:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccid>][:SUBF<st0>]:ALLoc<ch0>:PUSCh:CQI:PATtern on page 213

Manual operation: See "Number of CQI Bits" on page 88

**[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccid>][:SUBF<st0>]:ALLoc<ch0>:
PUSCh:CQI:CBITs?**

Queries the number of coded CQI bits.

Return values:

<CodedBits> integer
Range: 0 to max
*RST: 22

Example: SOURce1:BB:ONEWeb:UL:SUBF4:ALLoc2:PUSCh:CQI:CBITs?
Queries the number of coded CQI bits

Usage: Query only

Manual operation: See "Number of Coded CQI Bits" on page 89

**[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccid>][:SUBF<st0>]:ALLoc<ch0>:
PUSCh:CQI:PATtern <Pattern>, <BitCount>**

Sets the CQI pattern for the PUSCH.

The length of the pattern is determined by the number of CQI bits ([:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccid>][:SUBF<st0>]:ALLoc<ch0>:PUSCh:CQI:CBITs?).

Parameters:

<Pattern> numeric
*RST: #H0

<BitCount> integer
Range: 1 to 1024
*RST: 1

Example: SOURce1:BB:ONEWeb:UL:SUBF4:ALLOc2:PUSCh:CQI:
 BITS 6
 SOURce1:BB:ONEWeb:UL:SUBF4:ALLOc2:PUSCh:CQI:
 PATtern #H100100,6

Manual operation: See "[CQI Pattern](#)" on page 89

**[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLOc<ch0>]:
 PUACh:CODWords <NumOfCodeWords>
 [:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLOc<ch0>]:
 PUSCh:CODWords <NumOfCodeWords>**

Queries the number of the used codeword.

Parameters:

<NumOfCodeWords> integer

Range: 1 to 2

*RST: 1

Example: SOURce1:BB:ONEWeb:UL:CELL0:SUBF0:ALLOc0:PUSCh:
 CODWords?

Manual operation: See "[Codeword \(UL\)](#)" on page 79

**[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLOc<ch0>]:
 CW<cwid>]:PUACh:MODulation <Modulation>
 [:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLOc<ch0>]:
 CW<cwid>]:PUSCh:MODulation <Modulation>**

Selects the modulation scheme for the allocation.

Suffix:

<cwid> 1..2
 Codeword

Parameters:

<Modulation> QPSK | QAM16 | QAM64 | PSK8 | QAM256

*RST: QPSK

Example: SOURce1:BB:ONEWeb:UL:SUBF0:ALLOc0:CONType PUSCh
 SOURce1:BB:ONEWeb:UL:SUBF0:ALLOc0:PUSCh:
 CODWords 1
 SOURce1:BB:ONEWeb:UL:SUBF0:ALLOc0:CW1:
 MODulation QPSK
 SOURce1:BB:ONEWeb:UL:SUBF0:ALLOc0:PHYSbits?

Manual operation: See "[Modulation/Format](#)" on page 80

```
[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
  PUACH:DRS:CYCShift <Cyclicshift>
[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
  PUSCh:DRS:CYCShift <Cyclicshift>
```

Sets the cyclic shift field in the uplink-related DCI formats.

Suffix:

<st0>	0..39 Subframe
<ch0>	0..3 Allocation

Parameters:

<Cyclicshift>	int
Range:	0 to 7
Increment:	1
*RST:	0

Example: See [\[:SOURce<hw>\]:BB:ONEWeb:UL\[:CELL<ccidx>\]\[:SUBF<st0>\]:ALLoc<ch0>:PUSCh:NDMRs](#) on page 215

Manual operation: See ["Cyclic Shift Field"](#) on page 85

```
[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
  PUACH:NDMRs <Ndmrs>
[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
  PUSCh:NDMRs <Ndmrs>
```

Sets the parameter $n(2)_{\text{DMRS},\lambda}$ (Layer λ).

Parameters:

<Ndmrs>	integer
Range:	0 to 10
*RST:	0

Example: `SOURce1:BB:ONEWeb:UL:SUBF0:ALLoc1:PUSCh:DRS:CYCShift 1`
`SOURce1:BB:ONEWeb:UL:SUBF0:ALLoc1:PUSCh:NDMRs 1`

Manual operation: See ["n\(2\)_DMRS, 0 \(Layer 0\)"](#) on page 85

```
[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
  PUSCh:HARQ:BITS <Bits>
```

Sets the number of ACK/NACK bits.

Set this parameter to 0 to deactivate the ACK/NACK transmission for the corresponding subframe.

Parameters:

<Bits> integer
 Range: 0 to dynamic
 *RST: 1

Example: BB:ONEWeb:UL:SUBF4:ALL2:PUSC:HARQ:BITS 2
 Sets the number of A/N bits

Manual operation: See ["Number of A/N Bits"](#) on page 87

**[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
 PUSCh:HARQ:MODE?**

Queries the ACK/NACK mode.

Return values:

<Mode> MUX
 *RST: MUX

Example: BB:ONEWeb:UL:SUBF4:ALL2:PUSC:HARQ:MODE?

Usage: Query only

Manual operation: See ["ACK/NACK Mode"](#) on page 87

**[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>:
 PUSCh:HARQ:PATtern <Pattern>, <BitCount>**

Sets the ACK/NACK pattern for the PUSCH.

Parameters:

<Pattern> numeric
 *RST: #H0
 <BitCount> integer
 Range: 1 to 64
 *RST: 1

Example: // Set 2-bit HARQ-ACK control information
 BB:ONEWeb:UL:SUBF4:ALL2:PUSC:HARQ:ACKT BIT2
 BB:ONEWeb:UL:SUBF4:ALL2:PUSC:HARQ:PATT #B10,2

Manual operation: See ["ACK/NACK Pattern"](#) on page 87

**[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>[:
 CW<cwid>]:PUSCh:HARQ:CBITs?**

Queries the number of coded ACK/NACK bits per codeword.

Suffix:

<cwid> 1..2
 Codeword

Return values:

<Codedbits> integer
 Range: 0 to max
 Increment: 0
 *RST: 2

Example:

SOURce1:BB:ONEWeb:UL:SUBF4:ALLoc2:PUSCh:HARQ:
 BITS 2
 Sets the number of A/N bits
 SOURce1:BB:ONEWeb:UL:SUBF4:ALLoc2:CW1:PUSCh:
 HARQ:CBITs?
 Response: 8

Usage: Query only

Manual operation: See ["Number of Coded A/N Bits \(CW\)"](#) on page 88

```
[SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>[:  

  CW<cwid>]:PUACH:CCODing:RVINdex <RedundVersIndex>  

[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>[:  

  CW<cwid>]:PUSCh:CCODing:RVINdex <RedundVersIndex>
```

Sets the redundancy version index.

Suffix:

<cwid> 1..2
 Codeword

Parameters:

<RedundVersIndex> integer
 Range: 0 to 3
 *RST: 0

Example:

SOURce1:BB:ONEWeb:UL:SUBF4:ALLoc2:CW1:PUSCh:
 CCODing:RVINdex 2
 Sets the redundancy version index

Manual operation: See ["Redundancy Version Index \(PUSCH/PUACH\)"](#) on page 90

```
[SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>[:  

  CW<cwid>]:PUACH:CCODing:TBSiz <TranspBlockSize>  

[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccidx>][:SUBF<st0>]:ALLoc<ch0>[:  

  CW<cwid>]:PUSCh:CCODing:TBSiz <TranspBlockSize>
```

Sets the size of the transport block.

Suffix:

<cwid> 1..2
 Codeword

Parameters:

<TranspBlockSize> integer
 Range: 1 to 100000
 *RST: 1500

Example:

SOURce1:BB:ONEWeb:UL:SUBF4:ALLoc2:CW0:PUSCh:
 CCODing:TBSize 100
 SOURce1:BB:ONEWeb:UL:SUBF4:ALLoc2:CW2:PUSCh:
 CCODing:TBSize 1500

Manual operation: See ["Transport Block Size/Payload \(PUSCH/PUACH\)"](#) on page 90

[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccid>][:SUBF<st0>]:ALLoc<ch0>[:
 CW<cwid>]:PUACH:ULSch:BITS?

[:SOURce<hw>]:BB:ONEWeb:UL[:CELL<ccid>][:SUBF<st0>]:ALLoc<ch0>[:
 CW<cwid>]:PUSCh:ULSch:BITS?

Queries the number of physical bits used for UL-SCH transmission.

Suffix:

<cwid> 1..2
 Codeword

Return values:

<PhysBitCount> integer
 Range: 0 to max
 *RST: 1500

Example:

SOURce1:BB:ONEWeb:UL:SUBF0:ALLoc0:CW1:PUSCh:
 ULSch:BITS?
 Queries the number of physical bits for UL-SCH
 Response: 5688

Usage: Query only

Manual operation: See ["Number of Coded UL-SCH Bits"](#) on page 90

[:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:CQI:BITS
 <Bits>

Sets the number of CQI bits before channel coding.

Parameters:

<Bits> integer
 Range: 1 to 13
 *RST: 4

Example:

See [:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:
 ALLoc<ch0>:PUCCh:CQI:PATtern on page 219

Manual operation: See ["Number of CQI Bits"](#) on page 95

[:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:CQI:CBITs?

Queries the number of coded CQI bits.

Return values:

<CodedBits> integer
 Range: 0 to max
 *RST: 20

Example: SOURce1:BB:ONEWeb:UL:SUBF4:ALLoc2:PUCCh:CQI:CBITs?

Queries sets the number of coded CQI bits

Response: 20

Usage: Query only

Manual operation: See "Number of Coded CQI Bits" on page 95

[:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:CQI:PATtern<Pattern>, <BitCount>

Sets the CQI pattern for the PUCCH.

The length of the pattern is determined by the number of CQI bits ([:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:CQI:CBITs?).

Parameters:

<Pattern> numeric
 *RST: #H1
 <BitCount> integer
 Range: 1 to 13
 *RST: 4

Example: SOURce1:BB:ONEWeb:UL:SUBF4:ALLoc2:PUCCh:CQI:BITS 6

SOURce1:BB:ONEWeb:UL:SUBF4:ALLoc2:PUCCh:CQI:PATtern #B100100,6

Manual operation: See "CQI Pattern" on page 95

[:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:HARQ:BITS<Bits>

(PUCCH format ≥3)

Sets the number of ACK/NACK+SR+CSI bits before channel coding.

Parameters:

<Bits> Max number of bits depend on the PUCCH format
 Range: 1 to dynamic
 *RST: 1

Manual operation: See "Number of A/N+SR+CSI Bits" on page 95

**[:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:HARQ:
PATTERN <Pattern>, <BitCount>**

**[:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:HARQ:
ANPattern <AckNackPattern>, <BitCount>**

Sets the PUCCH ACK/NACK pattern or ACK/NACK + SR pattern per subframe.

Parameters:

<AckNackPattern> numeric
 *RST: #H0

<BitCount> integer
 Range: 1 to 32
 *RST: 1

Example: SOURce1:BB:ONEWeb:SLenGth 4
 SOURce1:BB:ONEWeb:UL:UE1:CONSubframes:PUCCh 8
 SOURce1:BB:ONEWeb:UL:SUBF0:ALLoc1:FORMat F1A
 SOURce1:BB:ONEWeb:UL:SUBF4:ALLoc2:PUCCh:HARQ:
 ANPattern #B01001,5
 SOURce1:BB:ONEWeb:UL:SUBF0:ALLoc1:FORMat F1B

Manual operation: See "[A/N Pattern / A/N+SR+CSI Pattern](#)" on page 93

**[:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:HARQ:
CBits?**

(PUCCH format ≥3)

Queries the number of coded ACK/NACK+SR+CSI bits.

Return values:

<CBits> integer
 Range: 0 to 48
 *RST: 0

Usage: Query only

Manual operation: See "[Number of Coded A/N+SR+CSI Bits](#)" on page 95

**[:SOURce<hw>]:BB:ONEWeb:UL[:SUBF<st0>]:ALLoc<ch0>:PUCCh:NPAR<ap>
<NPar>**

Sets the resource index for the supported PUCCH formats.

Suffix:

<ap> 0..1
 Antenna port index

Parameters:

<NPar>	integer
Range:	0 to $n(1)_{\text{PUCCH_max}} / n(2)_{\text{PUCCH_max}} / n(3)_{\text{PUCCH_max}}$
*RST:	0

Example:

SOURce1:BB:ONEWeb:UL:SUBF1:ALLOc2:PUCCh:NPAR0
10

Sets the n_{PUCCH} parameter

Manual operation: See "[n_PUCCH](#)" on page 92

6.12 User Equipment

Option: R&S SMW-K130

[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:ID.....	222
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:MODE.....	222
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:POWER.....	222
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:STATE.....	223
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUACh:CCODing:ICQioffset.....	223
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUSCh:CCODing:ICQioffset.....	223
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUACh:CCODing:IHARqoffset.....	223
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUSCh:CCODing:IHARqoffset.....	223
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUACh:CCODing:MODE?.....	224
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUSCh:CCODing:MODE.....	224
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUACh:CCODing:OCQimin.....	224
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUSCh:CCODing:OCQimin.....	224
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUACh:CCODing:STATE.....	225
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUSCh:CCODing:STATE.....	225
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUACh:DATA.....	225
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUSCh:DATA.....	225
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUACh:DSElect.....	225
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUSCh:DSElect.....	225
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUACh:PATtern.....	226
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUSCh:PATtern.....	226
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUACh:SCRambling:STATE.....	226
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:PUSCh:SCRambling:STATE.....	226
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:PRFormat?.....	226
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:PRStAte.....	227
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:PRTT.....	227
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:DT.....	227
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:NCSConf.....	228
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:POWER.....	228
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:RBOffset?.....	228
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:RSEquence.....	228
[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:SINdex.....	229
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`[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:ID <Id>`

Sets the radio network temporary identifier (RNTI) of the UE.

Parameters:

`<Id>` integer
 Range: 0 to 65535
 *RST: 0

Example: `BB:ONEWeb:UL:UE3:ID 303`
 Sets the UE ID

Manual operation: See "[UE ID/n_RNTI](#)" on page 97

`[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:MODE <Mode>`

Selects whether the user equipment is in standard or in PRACH mode.

Parameters:

`<Mode>` STD | PRACH
 *RST: STD

Example: `BB:ONEWeb:UL:UE:MODE STD`
 Selects the standard mode for UE1.

`[SOURce<hw>]:BB:ONEWeb:UL:UE<st>:POWer <Power>`

Sets the power level of the selected UE.

Parameters:

`<Power>` float
 Range: -80 to 10
 Increment: 0.001
 *RST: 0

Example: `BB:ONEWeb:UL:UE2:POW -5.0`
 Sets the power of UE2

Manual operation: See "UE Power" on page 97

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:STATe <State>

Selects the user equipment state.

Parameters:

<State> 0 | 1 | OFF | ON
 *RST: 1 (UE1); 0 (UE2 to UE4)

Example: BB:ONEWeb:UL:UE2:STAT ON
 Activates UE2.

Manual operation: See "UEx" on page 76

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUACh:CCODing:ICQioffset <IcqiOffset>

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUSCh:CCODing:ICQioffset <IcqiOffset>

Sets the CQI offset index for control information MCS offset determination.

Parameters:

<IcqiOffset> integer
 Range: 2 to 15
 *RST: 2

Example: BB:ONEWeb:UL:UE2:PUSC:CCOD:MODE COMB
 Enables multiplexing of the control information (UCI) and data (UL-SCH) on the PUSCH for UE2
 BB:ONEWeb:UL:UE2:PUSC:CCOD:ICQ 5
 Sets the CQI offset index

Manual operation: See "I_CQI_offset" on page 100

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUACh:CCODing:IHARqoffset <IHARqOffset>

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUSCh:CCODing:IHARqoffset <IHARqOffset>

Sets the HARQ-ACK offset index for control information MCS offset determination.

Parameters:

<IHARqOffset> integer
 Range: 0 to 14
 *RST: 0

Example: BB:ONEWeb:UL:UE2:PUSC:CCOD:MODE COMB
 Enables multiplexing of the control information (UCI) and data (UL-SCH) on the PUSCH for UE2
 BB:ONEWeb:UL:UE2:PUSC:CCOD:IHAR 5
 Sets the HARQ-ACK offset index

Manual operation: See "[I_HARQ_offset](#)" on page 100

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUACh:CCODing:MODE?

Queries the channel coding and multiplexing mode for PUACH.

Return values:

<Mode> ULSChonly
 *RST: ULSChonly

Usage: Query only

Manual operation: See "[Mode Channel Coding](#)" on page 100

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUSCh:CCODing:MODE<Mode>

Sets the information transmitted on the PUSCH.

Parameters:

<Mode> ULSChonly | UClnonly | COMBined
 COMBined
 Control information and data are multiplexed into the PUSCH.
 ULSChonly
 Only data is transmitted on PUSCH.
 UClnonly
 Only uplink control information is transmitted on PUSCH.
 *RST: ULSChonly

Example: BB:ONEWeb:UL:UE2:PUSCh:CCOD:MODE COMB
 Enables multiplexing of the control information (UCI) and data (UL-SCH) on the PUSCH for UE2

Manual operation: See "[Mode Channel Coding](#)" on page 100

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUACh:CCODing:OCQimin <ChanCodOCQIMin>
[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUSCh:CCODing:OCQimin <ChanCodOCQIMin>

For PUSCH/PUACH channel coding and multiplexing mode UCI only, sets the parameter O_CQI-Min.

Parameters:

<ChanCodOCQIMin> integer
 Range: 1 to 472
 *RST: 1

Example: `SOURce1:BB:ONEWeb:UL:UE1:PUSCh:CCODing:MODE UCI`
`SOURce1:BB:ONEWeb:UL:UE1:PUSCh:CCODing:OCQimin`
`7`

Manual operation: See "[O_CQI-Min](#)" on page 100

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUACh:CCODing:STATe
<State>

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUSCh:CCODing:STATe
<State>

Enables/disables channel coding and multiplexing of data and control information for all PUSCH/PUACH allocations of the corresponding UE.

Parameters:

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

Example: `BB:ONEWeb:UL:UE2:PUSCh:CCOD:STAT ON`
 Enables channel coding for UE2

Manual operation: See "[State Channel Coding and Multiplexing \(PUSCH\)](#)" on page 100

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUACh:DATA <Data>

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUSCh:DATA <Data>

Selects the PUSCH/PUACH data source of the selected UE. For the selected UE, this data source is used for the PUSCH/PUACH channel in every subframe where this channel is configured.

Parameters:

<Data> PN9 | PN11 | PN15 | PN16 | PN20 | PN21 | PN23 | PATtern |
 DLISt | ZERO | ONE
***RST:** PN9

Example: `SOURce1:BB:ONEWeb:UL:UE3:PUSCh:DATA PN11`

Manual operation: See "[Data Source](#)" on page 99

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUACh:DSElect
<Filename>

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUSCh:DSElect
<Filename>

Selects an existing data list file from the default directory or from the specific directory.

Parameters:

<Filename> string
 Filename incl. file extension or complete file path

Example: SOURce1:BB:ONEWeb:UL:UE3:PUSCh:DATA DLISt
 SOURce1:BB:ONEWeb:UL:UE3:PUSCh:DSElect
 "/var/user/oneweb_data_list"

Manual operation: See ["Data Source"](#) on page 99

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUACH:PATtern
 <Pattern>, <BitCount>
[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUSCh:PATtern
 <Pattern>, <BitCount>

Sets the bit pattern.

Parameters:

<Pattern> numeric
 *RST: #H0

 integer
 Range: 1 to 64
 *RST: 1

Example: BB:ONEWeb:UL:UE2:PUSCh:DATA PATT
 BB:ONEWeb:UL:UE2:PUSCh:PATT #H3F, 8

Manual operation: See ["Data Source"](#) on page 99

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUACH:SCRambling:
 STATe <State>
[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:PUSCh:SCRambling:
 STATe <State>

Enables/disables scrambling for all PUSCH/PUACH allocations of the corresponding UE.

Parameters:

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

Example: BB:ONEWeb:UL:UE2:PUSCh:SCR:STAT ON
 Enables scrambling for UE2

Manual operation: See ["State Scrambling \(PUSCH/PUACH\)"](#) on page 99

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:PRFormat?

Queries the preamble format.

Return values:

<PreaFormat> integer
 Range: 0 to 3
 *RST: 0

Example: BB:ONEWeb:UL:UE1:PRAC:PRF?
Queries the preamble format.

Usage: Query only

Manual operation: See ["Preamble Format \(Burst Format\)"](#) on page 114

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:PRSTate <State>

Activates Power Ramping for the PRACH preamble. The start and the end of the preamble is cyclically extended and multiplied with a ramping function ($\sin^2$).

Parameters:

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

Example: BB:ONEWeb:UL:UE1:MODE PRAC
BB:ONEWeb:UL:UE1:PRAC:PRST ON

Manual operation: See ["State PRACH Power Ramping"](#) on page 112

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:PRTT <TransitionTime>

Sets the transition time from beginning of the extended preamble to the start of the preamble itself.

Parameters:

<TransitionTime> float
Range: 0 to 3E-5
Increment: 1E-7
*RST: 2E-5

Example: BB:ONEWeb:UL:UE1:MODE PRAC
BB:ONEWeb:UL:UE1:PRAC:PRST ON
BB:ONEWeb:UL:UE1:PRAC:PRTT 15us

Manual operation: See ["Transition Time"](#) on page 113

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:DT <DeltaTime>

Sets the parameter delta_t in us.

Parameters:

<DeltaTime> float
Range: -500 to 500
Increment: 0.01
*RST: 0
Default unit: us

Example: SOURce1:BB:ONEWeb:UL:UE1:PRACH:SUBF2:DT 300

Manual operation: See ["Delta t/us"](#) on page 115

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:NCSConf
<NcsConfig>

Selects the Ncs configuration of the selected subframe.

Parameters:

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

Example: BB:ONEWeb:UL:UE1:PRAC:SUBF2:NCSC 2
 Sets the Ncs Configuration

Manual operation: See ["Ncs Configuration"](#) on page 114

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:Power <Power>

Sets the PRACH power relative to the UE power. The PRACH power can be adjusted independently for every configured preamble.

Parameters:

<Power> float
 Range: -80 to 10
 Increment: 0.001
 *RST: 0

Example: BB:ONEWeb:UL:UE1:PRAC:SUBF2:POW -3
 Sets the power

Manual operation: See ["Power \(PRACH\)"](#) on page 115

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:RBOffset?

Queries the starting RB, as set with the command [\[:SOURce<hw>\]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:RBOffset?](#).

Return values:

<RbOffset> integer
 Range: 0 to 109
 *RST: 0

Example: BB:ONEWeb:UL:UE1:PRAC:SUBF2:RBOF?
 Queries the RB offset.

Usage: Query only

Manual operation: See ["RB Offset"](#) on page 114

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:RSEQUence
<RootSequence>

Selects the logical root sequence index for the selected subframe.

Parameters:

<RootSequence> integer
 Range: 0 to 838
 *RST: 0

Example: BB:ONEWeb:UL:UE1:PRACH:SUBF2:RSEQ 200
 Sets the root sequence.

Manual operation: See ["Logical Root Sequence Index"](#) on page 114

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:SINdex
 <SequenceIndex>

Selects the sequence index v.

Parameters:

<SequenceIndex> integer
 Range: 0 to 63
 *RST: 0

Example: BB:ONEWeb:UL:UE1:PRACH:SUBF2:SIND 30
 Sets the sequence index

Manual operation: See ["Sequence Index \(v\)"](#) on page 115

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>:PRACH:SUBF<ch0>:STATe <State>

Enables/disables the PRACH for the selected subframe.

The subframes available for configuration depend on the selected PRACH configuration.

Parameters:

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

Example: BB:ONEWeb:UL:UE1:PRACH:SUBF2:STAT ON
 Activates PRACH in subframe 2 for UE1.

Manual operation: See ["State \(PRACH\)"](#) on page 115

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:REFSig:DRS:POWoffset
 <PowerOffset>

Sets the power offset of the demodulation reference signal (DRS) relative to the power level of the PUSCH/PUCCH allocation of the corresponding subframe.

Parameters:

<PowerOffset> float
 Range: -80 to 10
 Increment: 0.001
 *RST: 0

Example: BB:ONEWeb:UL:UE2:REFS:DRS:POW -2

Manual operation: See "DRS Power Offset" on page 101

**[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:REFSig:SRS:BHOP
<BandwidthHopp>**

Sets the UE-specific parameter frequency hopping bandwidth b_{hop} .

Parameters:

<BandwidthHopp> integer
Range: 0 to 3
*RST: 0

Example: BB:ONEWeb:UL:UE2:REFS:SRS:BHOP 2
Sets the SRS hopping bandwidth

Manual operation: See "Hopping Bandwidth b_{hop} " on page 110

**[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:REFSig:SRS:POWoffset
<PowerOffset>**

Sets the power offset of the Sounding Reference Signal (SRS) relative to the power of the corresponding UE.

Parameters:

<PowerOffset> float
Range: -80 to 10
Increment: 0.001
*RST: 0

Example: BB:ONEWeb:UL:UE2:REFS:SRS:POW -2
Sets the sounding reference symbol power offset to -2 dB.

Manual operation: See "SRS Power Offset" on page 104

**[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:REFSig:SRS:STATE
<State>**

Enables sending of SRS for the corresponding UE.

Parameters:

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

Example: See [:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:REFSig:SRS:TT0 on page 231

Manual operation: See "SRS State" on page 104

**[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:REFSig:SRS:TT0
<TType0>**

Enables transmission of trigger type 0.

Parameters:

<TType0> 0 | 1 | OFF | ON
*RST: 1

Example:

```
:SOURce1:BB:ONEWeb:LINK UP
:SOURce1:BB:ONEWeb:UL:UE1:STATe 1
:SOURce1:BB:ONEWeb:UL:UE1:CELL0:REFSig:SRS1:
STATe 1
:SOURce1:BB:ONEWeb:UL:UE1:CELL0:REFSig:SRS1:TT0
1
:SOURce1:BB:ONEWeb:UL:UE1:CELL0:REFSig:SRS1:
CYCShift 3
:SOURce1:BB:ONEWeb:UL:UE1:CELL0:REFSig:SRS1:
ISRS 3
:SOURce1:BB:ONEWeb:UL:UE1:CELL0:REFSig:SRS1:
TRComb 1
:SOURce1:BB:ONEWeb:UL:UE1:CELL0:REFSig:SRS1:
BHOP 2
```

Manual operation: See ["Transmit Trigger Type 0"](#) on page 104

**[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:REFSig:SRS[<srsidx>]:
BSRS <Bsrs>**

Sets the UE-specific parameter SRS bandwidth B_{SRS} .

Parameters:

<Bsrs> integer
Range: 0 to 3
*RST: 0

Example:

```
BB:ONEWeb:UL:UE2:REFS:SRS:BSRS 2
Sets the SRS bandwidth configuration
```

Manual operation: See ["SRS Bandwidth B_SRS"](#) on page 107

**[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:REFSig:SRS[<srsidx>]:
CYCShift <CyclicShift>**

Sets the cyclic shift used for the generation of the sounding reference signal CAZAC sequence.

Parameters:

<CyclicShift> integer
Range: 0 to 7
*RST: 0

Example: BB:ONEWeb:UL:UE2:REFS:SRS:CYCS 5
Sets the SRS cyclic shift for UE2

Manual operation: See ["SRS Cyclic Shift n_CS \(First Antenna Port\)"](#) on page 105

**[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:REFSig:SRS[<srsid>]:
ISRS <lsrs>**

Sets the UE-specific parameter SRS configuration index I_{SRS} .

Parameters:

<lsrs> integer
Range: 0 to 1023
*RST: 0

Example: BB:ONEWeb:DUPL FDD
Sets the duplexing mode
BB:ONEWeb:UL:UE2:REFS:SRS:ISRS 22
Sets the SRS configuration index

Manual operation: See ["Configuration Index I_SRS"](#) on page 105

**[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:REFSig:SRS[<srsid>]:
NRRC <nrrc>**

Sets the UE-specific parameter $freqDomainPosition n_{RR}$

Parameters:

<nrrc> integer
Range: 0 to 23
*RST: 0

Example: BB:ONEWeb:UL:UE2:REFS:SRS:NRRC 10
Sets the SRS frequency domain position

Manual operation: See ["Freq. Domain Position n_RRC"](#) on page 110

**[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:REFSig:SRS[<srsid>]:
NTRans <transmissions>**

Sets the number of SRS transmissions.

Parameters:

<transmissions> integer
Range: 0 to (10*SeqLengthARB - 1)
*RST: 0

Example: See [\[:SOURce<hw>\]:BB:ONEWeb:UL:UE<st>\[:CELL<ccid>\]:REFSig:SRS:TT0](#) on page 231

Manual operation: See ["Number of Transmissions"](#) on page 110

**[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:REFSig:SRS[<srsidx>]:
SUBF<subfdx> <Subframe>**

Sets the subframes in that SRS is transmitted.

Suffix:

<subfdx> 1 to 50
Transmission number, as set with [:SOURce<hw>]:BB:
ONEWeb:UL:UE<st>[:CELL<ccid>]:REFSig:
SRS[<srsidx>]:NTRans

Parameters:

<Subframe> integer
Range: 0 to (10*SeqLengthARB - 1)
*RST: 0

Example: See [:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:
CELL<ccid>]:REFSig:SRS:TT0 on page 231

Manual operation: See "Subframes for Transmission" on page 110

**[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:REFSig:SRS[<srsidx>]:
TOFFset?**

Queries the UE-specific parameter SRS subframe offset T_{offset} .

Return values:

<TOffset> integer
Range: 0 to 320
*RST: 0

Example: BB:ONEWeb:DUPL FDD
Sets the duplexing mode
BB:ONEWeb:UL:UE2:REFS:SRS:ISRS 22
Sets the SRS configuration index
BB:ONEWeb:UL:UE2:REFS:SRS:TOFF?
Queries the SRS subframe offset
Response: 5

Usage: Query only

Manual operation: See "Subframe Offset T_{offset} " on page 106

**[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccid>]:REFSig:SRS[<srsidx>]:
TRComb <TransmComb>**

Sets the UE-specific parameter transmission comb k_{TC} .

Parameters:

<TransmComb> integer
Range: 0 to 1
*RST: 0

Example: BB:ONEWeb:UL:UE2:REFS:SRS:TRC 1
Sets the SRS transmission comb

Manual operation: See ["Transmission Comb k TC"](#) on page 110

[:SOURce<hw>]:BB:ONEWeb:UL:UE<st>[:CELL<ccidx>]:REFSig:SRS[<srsidx>]:TSRS?

Queries the UE-specific parameter SRS periodicity T_{SRS} .

The value depends on the selected SRS configuration index I_{SRS} ([\[:SOURce<hw>\]:BB:ONEWeb:UL:UE<st>\[:CELL<ccidx>\]:REFSig:SRS\[<srsidx>\]:ISRS](#)) and duplexing mode ([\[:SOURce<hw>\]:BB:ONEWeb:DUPLexing?](#)).

Return values:

<PeriodTsrs> integer
Range: 0 to 65535
*RST: 0

Example: BB:ONEWeb:DUPL FDD
Sets the duplexing mode
BB:ONEWeb:UL:UE2:REFS:SRS:ISRS 22
Sets the SRS configuration index
BB:ONEWeb:UL:UE2:REFS:SRS:TSRS?
Queries the SRS periodicity
Response: 20 ms

Usage: Query only

Manual operation: See ["Periodicity \$T_{SRS}\$ "](#) on page 105

Annex

A Conflict Handling

The following chapters provide information on OneWeb conflict handling in downlink, uplink and DCI settings.

A.1 Downlink

R&S SMW supports the following types of downlink signals and channels (see [Figure A-1](#)):

- Reference signals (RS)
- Primary synchronization signal (PSS)
- Physical broadcast channel (PBCH)
- Physical Downlink Control Channel (PDCCH)
- Physical control format indicator channel (PCFICH)
- Physical Downlink Shared Channel (PDSCH)

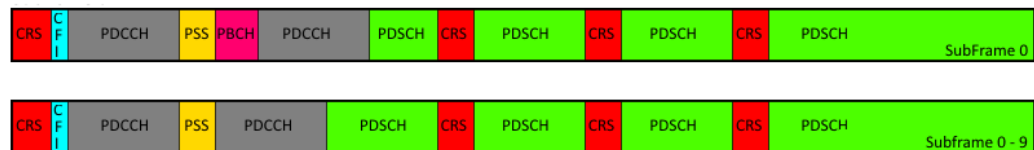


Figure A-1: OneWeb downlink for resource block (RB) mapping in subframes

Due to the concept of the R&S SMW, different situations can appear that need clarification. If several signals and/or channels (of the same or different type) partly share resources, a decision has to be made on how resource blocks are mapped to the affected subcarriers.

The maximum resource block (RB) that can be allocated in one subframe is 1152.

In OneWeb system, the CRS, PCFICH, PSS and PBCH have fix RB position in the subframe. For PDCCH and PDSCH channels, the setting of RB varies in subframes and conflict handling is needed to handle in the following conditions:

- resource block allocation on PDCCH depends on the settings of CFI in [PCFICH](#). See also [Table A-1](#).
- resource block allocation on PDSCH depends on the settings of "Resource Block Assignment" in the [DCI Format Configuration](#).
- Overlapping of RB for multiple allocation of PDSCH in one subframe



Copying allocation from a subframe without PBCH to one subframe with PBCH and vice versa can lead to conflict situation. Auto re-calculation of the resource block offset is made when such situation occurs.

Table A-1: PDCCH resource block as a function of CFI

Control format indicator (CFI)	PDDCH Resource Blocks Allocation		
	Max nos of RBs = CFI x 2	Range of RBs for subframe 0	Range of RBs for subframe 1 to subframe 9
1	9	3 to 11	
2	18	3 to 17 and 22 to 24	3 to 17 and 20 to 22
3	27	3 to 17 and 22 to 33	3 to 17 and 20 to 31
4	36	3 to 17 and 22 to 42	3 to 17 and 20 to 40
5	45	3 to 17 and 22 to 51	3 to 17 and 20 to 49
6	54	3 to 17 and 22 to 60	3 to 17 and 20 to 58
7	63	3 to 17 and 22 to 69	3 to 17 and 20 to 67
8	72	3 to 17 and 22 to 71 and 74 to 80	3 to 17 and 20 to 71 and 74 to 78
9	81	3 to 17 and 22 to 71 and 74 to 89	3 to 17 and 20 to 71 and 74 to 87
10	90	3 to 17 and 22 to 71 and 74 to 98	3 to 17 and 20 to 71 and 74 to 96
11	99	3 to 17 and 22 to 71 and 74 to 107	3 to 17 and 20 to 71 and 74 to 105
12	108	3 to 17 and 22 to 71 and 74 to 116	3 to 17 and 20 to 71 and 74 to 114

A.2 Uplink

In the uplink implementation of the R&S SMW, you can configure different user equipment (UEs) to use the same physical resources. The signals of the different UEs are added, nevertheless a conflict is indicated in the resource allocation table.

Although a conflict is also displayed if the PUSCH and PUCCH allocations of one UE are overlapping, the signals of both allocations are added. However, a conflict can occur between the sounding reference signal of a certain UE and the PUSCH of another UE.

A.3 DCI Conflict Handling

In the R&S SMW, you can configure multiple scheduling messages with their corresponding PDCCHs per subframe. Using the DCI table in the [Chapter 4.5, "Downlink Frame Configuration"](#), on page 31 dialog, you can set appropriate CCE index and define the position of the DCI/PDCCH inside the multiplexed bitstream.

Because the number of CCEs for each PDCCH vary, [Table A-2](#) defines some restriction on the aggregation of CCEs. An aggregation of eight CCEs for instance can only start on CCE numbers evenly dividable by eight. The same principle applies to the other aggregation levels. In this implementation, if the restriction is not fulfilled or two CCEs are overlapping, a conflict is displayed for the DCI/PDCCH with the greater number. This DCI/PDCCH is not considered by the multiplexing, i.e. it is not transmitted.

Table A-2: PDCCH candidates monitored by a UE

Search space			Number of PDCCH candidates
Type	Aggregation level	Size [in CCEs]	
UE specific	2	24	12
	4	48	12
	8	96	12
	16	64	4
	40	160	4
Common	8	32	4
	16	64	4
	40	80	2

The R&S SMW provides the operations "Append", "Insert", "Delete", "Up", "Down" and "Resolve Conf." for flexibly configuration of valid DCIs and for resolving of conflicts.

Example:

This example is based on a DCI table of a control channel with a total "Number of CCEs = 150".

The "DCI Table" indicates a conflict in the fourth DCI/PDCCH. The reason for this conflict is that the CCEs allocated for the fourth DCI/PDCCH are overlapping with the CCEs used by the 3rd one. The fourth DCI/PDCCH is ignored by the multiplexing.

	User	UE_ID n_RNTI	Cell Index	PDCCH	DCI Format	Search Space	Content	PDCCH Format	Number CCEs	CCE Index	No.Dummy CCEs	Conflict
0	User1	0	0	PDCCH	0	Common	Config...	3	16	0	0	
1	User1	0	0	PDCCH	1A	UE-Spec	Config...	0	2	16	6	
2	User1	0	0	PDCCH	0	Common	Config...	2	8	24	18	
3	RA-RNTI	1	0	PDCCH	1A	Common	Config...	2	8	24	-	!

One of the ways to overcome this problem and to resolve the DCI conflict is to use the [Resolve Conflicts](#) function of the software. The built-in algorithm reassigns automatically the CCE values depending on the configured "Search Space"; previously configured CCE values are not maintained. The calculated signal is suitable for receiver tests that demand conflict free CCEs but have no requirements on explicit CCE values. If the conflict cannot be resolved automatically, the values remain unchanged.

If however there is a requirement for CCE indexes with explicit values, you can perform the corrections manually. In this particular example, you can set the CCE index of the third DCI/PDCCH to 4.

	User	UE_ID n_RNTI	Cell Index	PDCCH	DCI Format	Search Space	Content	PDCCH Format	Number CCEs	CCE Index	No.Dummy CCEs	Conflict
0	User1	0	0	PDCCH	0	Auto	Config...	3	16	0	0	
1	User1	0	0	PDCCH	0	Auto	Config...	0	2	16	6	
2	User1	0	0	PDCCH	0	UE-Spec	Config...	2	8	32	10	
3	RA-RNTI	1	0	PDCCH	1A	Common	Config...	2	8	24	0	

The CCEs used by the two subsequent DCIs/PDCCHs are not overlapping and the two DCIs/PDCCHs are configured to be transmitted consecutive, i.e. there is no gap between them ("No. Dummy CCEs" = 0).

The [Figure A-2](#) shows the resulting PDCCH after multiplexing.



Figure A-2: PDCCH multiplexing (example)

B Subframes Handling

The following sections explain the subframes handling concept and implementation in the R&S SMW.

B.1 Copy/Paste Subframe

The required OneWeb test signal consists of several subframes, possibly with the same or similar settings.

In these cases, you can:

- Copy and paste settings from one subframe to another.
- Configure a subset of subframes manually and use them periodically
See [Chapter B.2, "Number of Configurable Subframes"](#), on page 239

Consider, however, that with both methods only subset of settings are inherited.

Both methods maintain the following settings:

- Structure of PDCCH and PDSCH allocations
- Structure of PUSCH and PUCCH allocations

The following settings are not considered:

- P-SYNC
The P-SYNC are global setting ([General Downlink Settings](#) dialog) and therefore cannot be overwritten by the configuration of one particular frame
- PBCH
The PBCH is transmitted in subframe#0 only
- PRACH and sounding reference signals
The SRS and the PRACH are settings dedicated to the individual user equipment ([User Equipment Configuration](#) dialog)

Copying allocations from a subframe without PBCH to one with PBCH and vice versa can lead to conflict situations. In this case, the internal algorithm applies the rules discussed in [Chapter A, "Conflict Handling"](#), on page 235.

B.2 Number of Configurable Subframes

As described in [Chapter B.1, "Copy/Paste Subframe"](#), on page 239, you can simplify the configuration of the OneWeb test signal if you define a small number of subframes manually and use them periodically.

Internally, the R&S SMW applies the [Subframe](#) functionality and the same subset of settings are inherited.

B.3 Four Configurable Frames in Uplink and Downlink Direction

The R&S SMW supports the configuration of up to four frames in uplink and downlink direction. However, there is a limitation for the maximum number of the real configurable subframes in these four frames depending on the transmission direction and several other parameters. The following shows the limitations for the maximum number of the real configurable subframes in these four frames depending on the transmission direction and several other parameters.

B.3.1 Uplink Direction

The maximum number of configurable subframes is 40 subframes, where the maximum number of 40 subframes is available for sequence lengths of at least four frames.

The current subframe to be configured is selected by means of the parameter [Subframe](#).



The configurable range ("Number of configurable uplink subframes") can be selected independently for the individual user equipment (UE). Furthermore, the range can be selected independently for the PUCCH and the PUSCH channel in the UEs.

Subframes behind the configurable range of the corresponding UE or channel are indicated as read-only.

Table B-1: Value range for the parameter "Number of Configurable UL Subframes"

"Duplex-mode"	"UL/DL Configuration"	UL subframes in the first four frames	Number of UL subframes per frame	Number of HARQ processes	Value range for the parameter "Number of Configurable UL Subframes"	
					Disabled realtime feedback	Enabled realtime feedback
FDD	-	0 .. 39	10	8	1 .. 40	1, 2, 4, 8

B.3.2 Downlink Direction

The subframe to be configured is selected by means of the parameter Subframe Selection.

The subframe to be configured is selected by means of the parameter "Subframe Selection". The maximum value for this parameter is then determined by the number of the last configurable subframe (see also [Chapter B.3.2, "Downlink Direction"](#), on page 240).

Table B-2: Value range for the parameter "Number of Configurable DL Subframes"

Duplex- ing mode	UL/DL Configura- tion	DL and special subframes in the first four frames	Number of DL and special subframes per frame	Value range for the parameter "Number of Con- figurable DL Sub- frames"
FDD	-	0 .. 39	10	1 .. 40

List of Commands

[SOURce<hw>]:BB:ONEWeb:CLIPping:LEVel.....	142
[SOURce<hw>]:BB:ONEWeb:CLIPping:MODE.....	142
[SOURce<hw>]:BB:ONEWeb:CLIPping:STATe.....	143
[SOURce<hw>]:BB:ONEWeb:CLOCK:MODE.....	155
[SOURce<hw>]:BB:ONEWeb:CLOCK:SOURce.....	155
[SOURce<hw>]:BB:ONEWeb:CMOD.....	141
[SOURce<hw>]:BB:ONEWeb:DL:BW?.....	156
[SOURce<hw>]:BB:ONEWeb:DL:CONF:MODE?.....	156
[SOURce<hw>]:BB:ONEWeb:DL:CONSubframes.....	163
[SOURce<hw>]:BB:ONEWeb:DL:CSETtings:RARNTi.....	158
[SOURce<hw>]:BB:ONEWeb:DL:MIMO:ANTenna?.....	160
[SOURce<hw>]:BB:ONEWeb:DL:MIMO:APM:CS:AP<dir0>:ROW<st0>:IMAGinary.....	161
[SOURce<hw>]:BB:ONEWeb:DL:MIMO:APM:CS:AP<dir0>:ROW<st0>:REAL.....	160
[SOURce<hw>]:BB:ONEWeb:DL:MIMO:APM:CS:CELL:BB<st0>.....	160
[SOURce<hw>]:BB:ONEWeb:DL:MIMO:APM:MAPCoordinates.....	160
[SOURce<hw>]:BB:ONEWeb:DL:MIMO:CONFiguration?.....	159
[SOURce<hw>]:BB:ONEWeb:DL:NORB?.....	157
[SOURce<hw>]:BB:ONEWeb:DL:OCCBandwidth?.....	157
[SOURce<hw>]:BB:ONEWeb:DL:OCCSubcarriers?.....	157
[SOURce<hw>]:BB:ONEWeb:DL:PBCH:MIB.....	190
[SOURce<hw>]:BB:ONEWeb:DL:PBCH:MSPare.....	191
[SOURce<hw>]:BB:ONEWeb:DL:PBCH:SOFFset.....	191
[SOURce<hw>]:BB:ONEWeb:DL:REFSig:POWer?.....	158
[SOURce<hw>]:BB:ONEWeb:DL:RSTFrame.....	163
[SOURce<hw>]:BB:ONEWeb:DL:SRATe?.....	158
[SOURce<hw>]:BB:ONEWeb:DL:SYNC:PPOWer.....	159
[SOURce<hw>]:BB:ONEWeb:DL:SYNC:PSTATe.....	159
[SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:CCODing:STATe.....	164
[SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:CELL<st0>:TXM.....	163
[SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:DATA.....	165
[SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:DSElect.....	165
[SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:PA.....	166
[SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:PATtern.....	165
[SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:SCRambling:STATe?.....	164
[SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:STATe.....	163
[SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:TXM.....	163
[SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:UEC.....	164
[SOURce<hw>]:BB:ONEWeb:DL:USER<ch>:UEID.....	165
[SOURce<hw>]:BB:ONEWeb:DL[:PLCI]:CID.....	158
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALCount.....	166
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>:CODWords?.....	166
[SOURce<hw>]:BB:ONEWeb:DL[:SUBF<st0>]:ALLoc<ch0>[:CW<user>]:CCODing:ISBSize.....	192
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[SOURce<hw>]:BB:ONEWeb:TRIGger:DElay:UNIT.....	150
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[SOURce<hw>]:BB:ONEWeb:TRIGger:EXTerMal:TDElay.....	152

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[SOURce<hw>]:BB:ONEWeb:TRIGger:OBASeband:INHibit.....	152
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[SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:ONTime.....	154
[SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:PERiod.....	154
[SOURce<hw>]:BB:ONEWeb:TRIGger:OUTPut<ch>:ROFFset.....	154
[SOURce<hw>]:BB:ONEWeb:TRIGger:RMODE?.....	149
[SOURce<hw>]:BB:ONEWeb:TRIGger:SLENgth.....	149
[SOURce<hw>]:BB:ONEWeb:TRIGger:SLUNit.....	149
[SOURce<hw>]:BB:ONEWeb:TRIGger:SOURce.....	148
[SOURce<hw>]:BB:ONEWeb:TRIGger[:EXTErnal]:DElay.....	152
[SOURce<hw>]:BB:ONEWeb:TRIGger[:EXTErnal]:INHibit.....	153
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[SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:CSRS.....	196
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[SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:INDEx.....	195
[SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:STATE.....	197
[SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:SUConfiguration.....	196
[SOURce<hw>]:BB:ONEWeb:UL:CA:CELL<ch0>:TDElay.....	197
[SOURce<hw>]:BB:ONEWeb:UL:CA:STATE.....	196
[SOURce<hw>]:BB:ONEWeb:UL:CPC?.....	199
[SOURce<hw>]:BB:ONEWeb:UL:FFT?.....	198
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