

R&S®SMCVB-K167

DVB-S

User Manual



1179105802
Version 03

ROHDE & SCHWARZ
Make ideas real



This document describes the following software option:

- R&S®SMCVB-K167 DVB-S / DVB-S2 (1434.3954.xx)

This manual describes firmware version FW 4.90.002.xx and later of the R&S®SMCV100B.

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

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1 Welcome to the DVB-S / DVB-S2 Option

The R&S SMCVB-K167 is a firmware application that adds functionality to generate signals in accordance with the DVB-S / DVB-S2 digital standards.

The R&S SMCVB-K167 option features:

- DVB-S signal generation
- Basic DVB-S2 signal generation

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 SMCV100B user manual. The latest version is available at:

www.rohde-schwarz.com/manual/SMCV100B

Installation

You can find detailed installation instructions in the delivery of the option or in the R&S SMCV100B service manual.

1.1 Accessing the DVB-S / DVB-S2 Dialog

To open the dialog with DVB-S / DVB-S2 settings

- ▶ In the block diagram of the R&S SMCV100B, select "Baseband > DVB-S / DVB-S2".

A dialog box opens that displays the provided general settings.

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

1.2 Documentation Overview

This section provides an overview of the R&S SMCV100B user documentation. Unless specified otherwise, you find the documents on the R&S SMCV100B product page at:

www.rohde-schwarz.com/manual/smcv100b

1.2.1 Getting Started Manual

Introduces the R&S SMCV100B 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 SMCV100B is not included.

The contents of the user manuals are available as help in the R&S SMCV100B. 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 Service Manual

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

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

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

1.2.4 Instrument Security Procedures

Deals with security issues when working with the R&S SMCV100B in secure areas. It is available for download on the Internet.

1.2.5 Printed Safety Instructions

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

1.2.6 Data Sheets and Brochures

The data sheet contains the technical specifications of the R&S SMCV100B. 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/smcv100b

1.2.7 Release Notes and Open Source Acknowledgment (OSA)

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

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

See www.rohde-schwarz.com/firmware/smcv100b

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

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

See www.rohde-schwarz.com/application/smcv100b

1.3 Scope



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

In particular, it includes:

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

For a description of such tasks, see the R&S SMCV100B user manual.

1.4 Notes on Screenshots

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

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

2 About the DVB-S / DVB-S2 Option

DVB-S and DVB-DSNG are DVB standards for satellite services. DSNG is the abbreviation for digital news gathering.

DVB-S complies with specification [EN 300 421](#).

DVB-DSNG complies with specification [EN 301 210](#).

2.1 Required Options

The equipment layout for generating DVB-S / DVB-S2 signals includes:

- Base unit
- Option Enable Broadcast Standard (R&S SMCVB-K519)
- Option DVB-S / DVB-S2 (R&S SMCVB-K167)

3 DVB-S Configuration and Settings

Access:

- ▶ Select "Baseband > DVB-S".

This section provides an overview on the DVB-S / DVB-S2 settings.

The remote commands required to define these settings are described in [Chapter 5, "Remote-Control Commands"](#), on page 43.

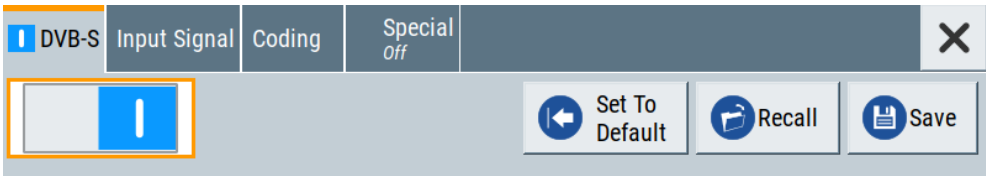
Settings:

• General Settings	10
• Input Signal Settings	11
• Coding Settings	21
• Special Settings	23
• Global Connector Settings	24
• TS Player	24
• Local IP Data Network Settings	33

3.1 General Settings

Access:

- ▶ Select "Baseband > DVB-S".



The tab provides functionality for calling default settings, save and recall settings.

Settings:

State	10
Set To Default	11
Save/Recall	11

State

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

Remote command:

[\[:SOURce<hw>\]:BB:DVBS:STATe](#) on page 44

Set To Default

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

Parameter	Value
State	Not affected by the "Set to Default"

Remote command:

[\[:SOURce<hw>\]:BB:DVBS:PRESet](#) on page 44

Save/Recall

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

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

See also, chapter "File and Data Management" in the R&S SMCV100B user manual.

Remote command:

[\[:SOURce<hw>\]:BB:DVBS:SETTing:CATalog?](#) on page 44

[\[:SOURce<hw>\]:BB:DVBS:SETTing:LOAD](#) on page 45

[\[:SOURce<hw>\]:BB:DVBS:SETTing:STORe](#) on page 45

[\[:SOURce<hw>\]:BB:DVBS:SETTing:DELeTe](#) on page 44

3.2 Input Signal Settings

Access:

- Select "Baseband > DVB-S / DVB-S2 > Input Signal".

The dialog provides access to settings necessary to configure the input signal.

Input signal tasks

The settings allow you to perform the following tasks:

- Selecting an [MPEG TS](#) source
- Displaying information about the selected MPEG TS (e.g. data rate)
- Configuring the internal MPEG TS test packets or internal IP test packets

How to: [Chapter 4.1, "Configuring the Input Signal"](#), on page 36.



Common input signal settings

The setting of the following parameters is used for all broadcast standards.

- "Source"
- "Input/Input Type"
- "IP TS Channel"

Settings:

• General Settings	12
• Info	15
• Test Signal Settings	16
• IP Channel x Settings	18

3.2.1 General Settings

Access:

- Select "Input Signal > General".

The tab provides general settings necessary to configure the input signal.

Settings:

Source	12
Input	13
Input Format	13
IP TS Channel	13
Stuffing	14
Test Signal	14

Source

Sets the modulation source for the input signal.

- "External" Uses a transport stream, that is input at the "TS IN"/"IP Data" interface.
- For more information about connecting to the interfaces, see also:
- "TS IN" interface: Section "Configuring the Global Connectors" in the R&S SMCV100B user manual.
 - "IP Data" interface: [Chapter 3.7, "Local IP Data Network Settings"](#), on page 33.
- Uses an internal transport stream with TS packet data played from a file. The player requires no option.
Playing encrypted files with extension `_c` requires a stream library option R&S SMCVB-KSx.
- See also:
- [Chapter 3.6, "TS Player"](#), on page 24
 - [Supported TS player file types](#)
- "Test Signal" Uses an internal test signal as specified in [Chapter 3.2.3, "Test Signal Settings"](#), on page 16.

Remote command:

`[ :SOURCE<hw> ] :BB:DVBS:SOURCE` on page 46

Input

Requires "Source > External".

Sets the external input interface.

- "TS IN" Input for serial transport stream data. The signal is input at the "User 1" connector.
- "IP" Input for IP-based transport stream data (TSoverIP). The signal is input at the "IP Data" connector.

Remote command:

`[ :SOURCE<hw> ] :BB:DVBS:INPut` on page 46

Input Format

Requires "Input > TS IN".

Sets the format of the input signal.

- "ASI" [ASI](#) format
- "SMPTE 310" [SMPTE](#) 310 format

Remote command:

`[ :SOURCE<hw> ] :BB:DVBS:INPut:FORMat` on page 46

IP TS Channel

Requires "Input > IP".

Selects the IP-based transport stream (TS) channel. You can select 1 out of 4 IP TS channels as input at the "IP Data" interface.

To configure a particular channel, see [Chapter 3.2.4, "IP Channel x Settings"](#), on page 18.

Remote command:

`[ :SOURCE<hw> ] :BB:DVBS:INPut:TSCHannel` on page 46

Stuffing

Requires "Source > External/TS Player".

Activates stuffing.

- "On" The installed input interface provides the transport stream data rate required for the current modulation parameters (regardless of the input data rate of the external transport stream).
- "Off" The data rate of the transport stream source must match the data rate required for the current modulation parameters.
The value equals the ["Max. Useful Data Rate"](#) on page 15.

Remote command:

[\[:SOURCE<hw>\]:BB:DVBS:STUFFing](#) on page 46

Test Signal

Requires "Source > Test Signal".

Defines the test signal data.

The data consists of test [TS](#) packets.

"Test TS Packet"

Standardized packet data used as modulation data in the transport stream. To configure the packet structure, select the side tab "Test Signal > Test TS Packet".

See also ["Test TS Packet"](#) on page 17.

"PRBS before Conv. Enc."

Pure pseudo-random bit sequence (PRBS) data used as modulation data with no packet structure. The sequence is inserted before the convolutional encoder. PRBS data conforms with [ITU-T O.151](#) specification.

To configure the PRBS type, select the side tab "Test Signal > PRBS". See also ["PRBS"](#) on page 17.

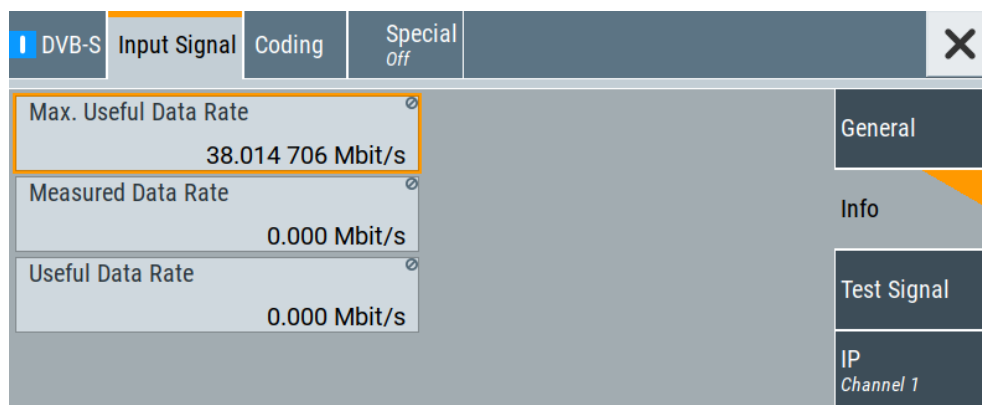
Remote command:

[\[:SOURCE<hw>\]:BB:DVBS:TESTsignal](#) on page 48

3.2.2 Info

Access:

- Select "Input Signal > Info".



The tab displays the information on the input signal.

Settings:

Packet Length.....	15
Max. Useful Data Rate.....	15
Measured Data Rate.....	16
Useful Data Rate.....	16

Packet Length

Requires "Source > External".

Displays the packet length of the external transport stream in bytes.

If the packet length does not match the specified length, the output signal is erroneous. "Packet Length > Invalid" is displayed.

"188" 188 byte packets specified for serial input ("Input > TS IN") and parallel input ("Input > IP").

"204" 204 byte packets specified for serial input and parallel input.

"Invalid" Packet length does not match the specified length.

Remote command:

[:SOURce<hw>] :BB:DVBS:PACKetlength? on page 47

Max. Useful Data Rate

Requires "Source > External/TS Player".

Displays the maximum data rate, that is derived from the current modulation parameter settings.

The value is the optimal value at the TS input interface, that is necessary for the modulator.

If "Stuffing > On", the value indicates the maximum useful data rate, that is allowed in the transport stream.

If "Stuffing > Off", the value indicates the transport stream input data rate that is required for the transport stream.

Remote command:

[\[:SOURce<hw>\]:BB:DVBS:USEFul\[:RATE\]:MAX?](#) on page 47

Measured Data Rate

Requires "Source > External".

Displays the measured value of the data rate r_{meas} of one of the following:

- External transport stream including null packets input at "User 1" connector
- External transport stream including null packets input at "IP Data/LAN" connector (TSoverIP)

The value r_{meas} equals the sum of useful data rate r_{useful} and the rate of null packets r_0 :

If "Stuffing > Off", ensure that the measured data rate equals the maximum useful data rate ($r_{\text{meas}} = r_{\text{max. useful}}$).

Remote command:

[\[:SOURce<hw>\]:BB:DVBS\[:INPut\]:DATarate?](#) on page 48

Useful Data Rate

Requires "Source > External/TS Player".

Displays the data rate of useful data r_{useful} of the external transport stream. The data rate is measured at the input of the installed input interface.

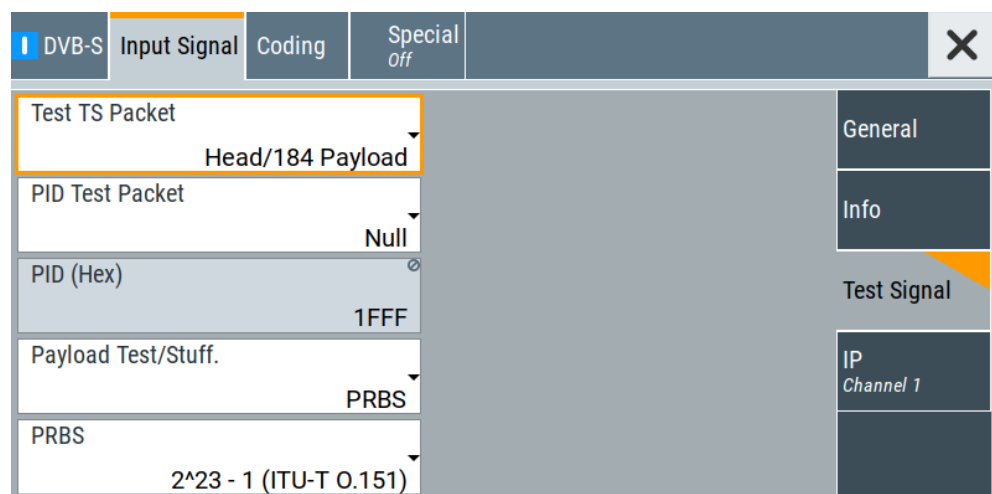
Remote command:

[\[:SOURce<hw>\]:BB:DVBS:USEFul\[:RATE\]?](#) on page 47

3.2.3 Test Signal Settings

Access:

- Select "Input Signal > Test Signal".



The tab provides settings necessary to configure the input test signal.

Settings:

Test TS Packet.....	17
PID Test Packet.....	17
PID (Hex).....	17
Payload Test/Stuff.....	17
PRBS.....	17

Test TS Packet

Specifies the structure of the test transport stream packet that is fed to the modulator.

"Head/184 Payload"

A sync byte (0x47) followed by three header bytes and 184 payload bytes.

"Sync/187 Payload"

A sync byte (0x47) followed by 187 payload bytes.

Remote command:

[:SOURCE<hw>] :BB:DVBS:TSPacket on page 48

PID Test Packet

If a header is present in the test packet ("Test TS Packet > Head/184 Payload"), you can specify a fixed or variable packet identifier (PID).

"Null" The header of the test transport stream packets has a fixed setting of null packet header 1FFF (hex).

"Variable" Uses the header value defined with [PID \(Hex\)](#).

Remote command:

[:SOURCE<hw>] :BB:DVBS:PIDTestpack on page 49

PID (Hex)

Sets the [PID](#).

If "PID Test Packet > Null", "PID (Hex) = 1FFF" is fixed.

If "PID Test Packet > Variable", you can edit the value.

Remote command:

[:SOURCE<hw>] :BB:DVBS:PID on page 49

Payload Test/Stuff.

Defines the payload area content of the [TS](#) packet.

You can select [PRBS](#) or exclusively data in hexadecimal format as payload.

For "Source > Test Signal", the packet is a test packet.

For "Stuffing > On", the packet is a null packet. Null packets are inserted into the external transport stream to adapt the stream data rate. See also "[Measured Data Rate](#)" on page 16.

Remote command:

[:SOURCE<hw>] :BB:DVBS:PAYLoad on page 49

PRBS

Sets the length of the PRBS sequence.

You can select a PRBS 15 or a PRBS 23 sequence as specified by ITU-T O.151.

Remote command:

[:SOURce<hw>] :BB:DVBS:PRBS on page 49

3.2.4 IP Channel x Settings

Access:

1. Select "Input Signal > General".
2. Select "Source > External"
3. Select "Input > IP"
4. Select "Input Signal > IP Channel x"

Input IP ☐	Alias	General
Type	Multicast Address	Info
Unicast	226.0.0.0	
Port	IGMPv3 Source Address	Test Signal
6 002	0.0.0.0	
Ping Source Address	Local IP Data Network ...	IP Channel 1
Ping Result		

The tab provides settings necessary to configure IP channel x.

You can configure settings for 4 IP channels $x = 1$ to 4 individually, see also "Input Signal > General > IP TS Channel".



IP channel settings affect input IP data of the local IP data network. The settings are independent from the used broadcast standard configuration.

Saving/recalling a certain IP channel or local IP data network configuration is not possible via the broadcast standard-specific functionality.

Use the global save/recall functionality instead, see section "Saving and Recalling Instrument Settings" in the R&S SMCV100B user manual.

The table below shows the availability of the tab in the broadcast standard configuration.

Table 3-1: IP channel configuration support in broadcast standards

Baseband standard	"IP Channel x"	Baseband standard	"IP Channel x"
"ATSC/ATSC-M/H"	Yes	"T-DMB/DAB"	Yes
"ATSC 3.0"	No	"DVB-S"	Yes
"DTMB"	Yes	"DVB-S2"	Yes
"DVB-T"	Yes	"DRM"	No
"DVB-T2"	Yes	"Audio AM"	No
"ISDB-T"	Yes	"Audio FM"	No

See also:

- [Chapter 4.1.1, "How to Apply an External IP Input Signal"](#), on page 36
- [Chapter 3.7, "Local IP Data Network Settings"](#), on page 33

Requirements

At your IP source, set the "transport stream packets per internet protocol packet" (TP per IP) parameter as follows:

- If TP packet length = 188 bytes: Set TP per IP to 7 or 6.
- If TP packet length = 204/208 bytes: Set TP per IP to 6.

We recommend that youFurthermore, we recommend that you use a separate LAN infrastructure to stream the transport streams via IP to the IP connector of the baseband board. We recommend that you avoid TS packet losses during IP transmission.

Settings:

Input IP	19
Alias	19
Type	20
Multicast Address	20
Port	20
IGMPv3 Source Address	20
Ping Source Address	20
Ping Result	20
Local IP Data Network	21

Input IP

Activates/deactivates the IP input.

Remote command:

[\[:SOURCE<hw>\]:BB:INPut:IP<ch>\[:STATE\]](#) on page 51

Alias

Sets a unique name for the IP connection.

The definition of a name is optional but facilitates identification in the measurement views. The name input fits maximum 16 characters in ASCII format.

Remote command:

`[ :SOURCE<hw> ] :BB:INPut:IP<ch>:ALias` on page 51

Type

Sets the input signal type.

- | | |
|-------------|---|
| "Unicast" | Analyzes all unicast IP packets that arrive at the specified "Port". |
| "Multicast" | When an IP address is in the multicast address range, an attempt is made to join a multicast group using IGMP . Set "Multicast Address" and "Port". |

Remote command:

`[ :SOURCE<hw> ] :BB:INPut:IP<ch>:TYPE` on page 51

Multicast Address

Editing requires "Type > Multicast".

Sets the destination IP address (IPv4) of the IP connection.

You can set addresses from "224.0.0.0" to "239.255.255.255".

Remote command:

`[ :SOURCE<hw> ] :BB:INPut:IP<ch>:MULTicast:ADDRESS` on page 52

Port

Sets the destination UDP port.

Due to [UDP/RTP](#) autosensing, we recommend that you set a port offset of at least 6 between neighboring IP TS channels.

Remote command:

`[ :SOURCE<hw> ] :BB:INPut:IP<ch>:PORT` on page 51

IGMPv3 Source Address

Requires "Type > Multicast".

Sets the [IGMPv3](#) source address.

If you need to filter the data sent to the multicast address, specify the source address. A source address different from "0.0.0.0" accepts only data originating from the specified IP address.

Remote command:

`[ :SOURCE<hw> ] :BB:INPut:IP<ch>:IGMP [ :SOURCE ] :ADDRESS` on page 52

Ping Source Address

Clicking "Ping Source Address" triggers pinging of the IGMPv3 source address.

If you set a different value from "IGMPv3 Source Address = 0.0.0.0" and click the button, the software checks if the address is reachable.

Remote command:

`[ :SOURCE<hw> ] :BB:INPut:IP<ch>:IGMP [ :SOURCE ] :PING` on page 52

Ping Result

Displays the result after pinging the source address.

If "Ping Result > Ping: Successful", the source address is available in the network.

If "Ping Result > Ping: Transmit Failed. xxx", the source address is not available in the network. "xxx" can be, e.g. "General Failure". Try another "IGMPv3 Source Address".

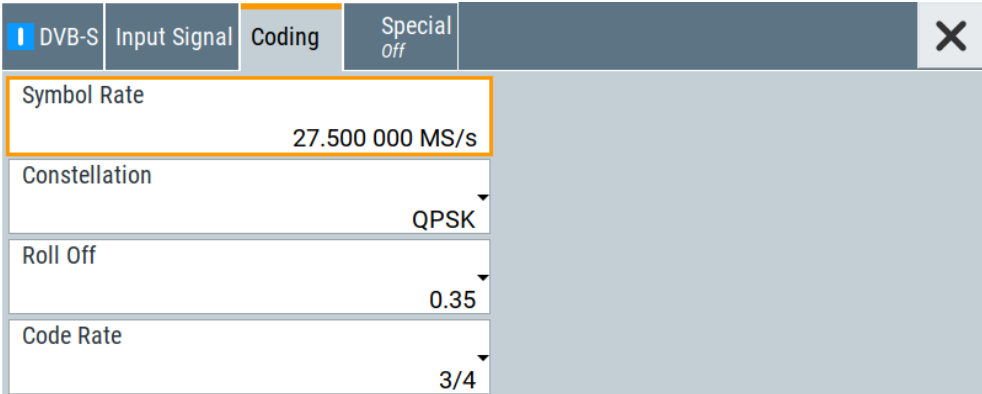
Remote command:
[\[:SOURce<hw>\]:BB:INPut:IP<ch>:IGMP\[:SOURce\]:RESult?](#) on page 52

Local IP Data Network
 Accesses local IP data network settings, see [Chapter 3.7, "Local IP Data Network Settings"](#), on page 33.

3.3 Coding Settings

Access:

- Select "Baseband > DVB-S / DVB-S2 > Coding".



The tab provides settings for coding.

Settings:

Symbol Rate	21
Constellation	21
Roll Off	22
Code Rate	22

Symbol Rate
 Sets the symbol rate.

In the transmission spectrum, the symbol rate represents the 3 dB bandwidth.

Remote command:
[\[:SOURce<hw>\]:BB:DVBS:SYMBols](#) on page 54

Constellation
 Defines the constellation.

If the constellation is changed, the symbol rate is retained. The required transport stream input data rate changes, keeping the necessary channel bandwidth constant. Different code rates are possible in the different constellations.

Remote command:

`[ :SOURce<hw> ] :BB:DVBS:CONStel` on page 53

Roll Off

Sets the roll-off alpha factor value.

The specification of DVB-S defines a roll-off alpha factor of 0.35. The specification of DVB-DSNG defines a roll-off alpha factor of 0.25 or 0.35.

A smaller alpha value produces a steeper drop of the modulation spectrum but the stopband attenuation is lower. A larger alpha value produces a flatter drop of the modulation spectrum. The spectrum is wider but the stopband attenuation is higher.

The 3 dB point of the modulation spectrum is the same for all alpha values. The output signals are pulse-shaped by an FIR filter, yielding a root raised cosine characteristic.

Remote command:

`[ :SOURce<hw> ] :BB:DVBS:ROLLoff` on page 53

Code Rate

Sets the code rate.

The available code rates depend on constellation, see the table below. If you change the constellation and the previously set code rate is not available in the new constellation, an available code rate is automatically selected.

Constellation	Available code rate
QPSK	1/2, 2/3, 3/4, 5/6, 7/8
8PSK	2/3, 5/6, 8/9
16QAM	3/4, 7/8

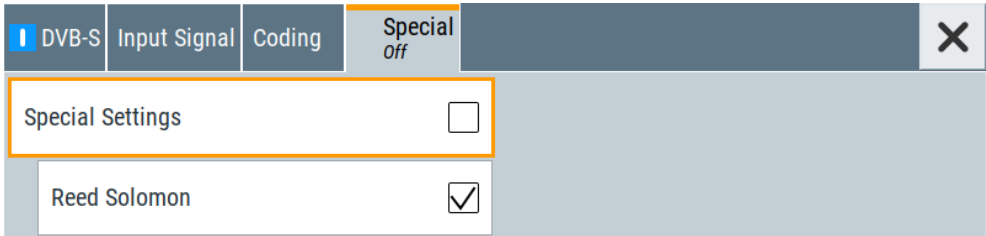
Remote command:

`[ :SOURce<hw> ] :BB:DVBS:RATE` on page 53

3.4 Special Settings

Access:

► Select "Baseband > DVB-S / DVB-S2 > Special".



The tab provides settings, that differ from the specification of the broadcast standard.

The tab provides settings, that differ from the specification of the broadcast standard.

Settings:

Special Settings.....	23
Reed Solomon.....	23

Special Settings
Enables/disables special settings.

The setting allows you to switch between standard-compliant and user-defined channel coding.

Remote command:
`[ :SOURce<hw> ] :BB:DVBS [ :SPECial ] :SETTings [ :STATe ]` on page 54

Reed Solomon
Enables/disables the Reed-Solomon encoder.

Normally, the incoming packet length of a transport stream frame is 188 bytes. In special cases, a length of 204 bytes is possible.

The behavior depends on the "Packet Length":

- "On"
 - If "Packet Length" = 188: The Reed-Solomon encoder adds 16 Reed-Solomon bytes to the incoming 188 bytes of an MPEG transport stream frame. The Reed-Solomon decoder can then correct up to 8 errored bytes in a Reed-Solomon packet (= 204 bytes). The number of incorrect bits in an errored byte is irrelevant.
 - If "Packet Length" = 204: Of the incoming 204 bytes of an MPEG transport stream frame, the Reed-Solomon encoder overwrites the last 16 bytes with its own Reed-Solomon bytes.
- "Off"

Default state.

If "Packet Length" = 188: 16 dummy bytes are transmitted instead of the 16 Reed-Solomon bytes. The data rate is not changed.

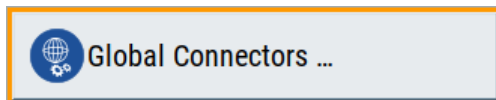
If "Packet Length" = 204: All 204 bytes of an MPEG frame are transmitted unchanged. The data rate is not changed.

Remote command:

`[ :SOURCE<hw> ] :BB:DVBS[:SPECial]:REEDsolomon` on page 54

3.5 Global Connector Settings

The "Input Signal" dialog, the "Trigger/Marker/Clock" dialog and "Trigger In", "Marker" and "Clock" tabs in "Baseband > ARB/Custom Digital Mod" configuration dialogs provide quick access to the related connector settings. Click the "Global Connectors" button to access the settings.



See also chapter "Global Connector Settings" in the user manual.

3.6 TS Player

The "TS Player" application allows you to play stream files for simulation of dedicated transport stream (TS) scenarios. Also, the R&S SMCV100B offers stream libraries containing stream files with a wide range of ready-made signals for testing systems with different transmission parameters. For supported file types, see [Table 3-2](#).

Key features

The key features for playing stream files with "TS Player" application are:

- Support of numerous broadcast transmission standards
- Streaming of high-quality video contents
- Streaming of high-quality audio contents
- Efficient use with dedicated streams

Required options

The equipment layout for processing stream files includes:

- Base unit, including arbitrary waveform generator (64 MSample ARB memory, 60 MHz RF bandwidth)
- Broadcast standard option for the "TS Player" application (R&S SMCVB-Kxxx)
- Enable Broadcast Standards option (R&S SMCVB-K519)
- Optional stream library option (R&S SMCVB-KSxx)

For more information, see data sheet.

To access and download a stream library file

The steps to access a stream library and to download stream library files is analogous as for waveform libraries. See chapter "How to Work with Waveform Libraries" in the R&S SMCV100B user manual.

For information on the content of a stream library, see the user manual of the stream library at:

www.rohde-schwarz.com/manual/smcv100b/ksxx-kvxx-stream-and-waveform-libraries-user-manuals-manuals-gb1_78701-972224.html

To access the "TS Player" application

1. Select "Baseband > DVB-S > Input Signal".
2. Select "Source > TS Player".
3. Select "TS Player" button.

Opens the TS player dialog, where you can load files.

Support in broadcast standard configuration

Various broadcast baseband standards of the R&S SMCV100B support the "TS Player" application. For an overview, see the table below.

Baseband standard	"Source > TS Player"	Baseband standard	"Source > TS Player"
"ATSC/ATSC-M/H"	Yes	"T-DMB/DAB"	Yes
"ATSC 3.0"	Yes	"DVB-S"	Yes
"DTMB"	Yes	"DVB-S2"	Yes
"DVB-T"	Yes	"DRM"	No
"DVB-T2"	Yes	"Audio AM"	No
"ISDB-T"	Yes	"Audio FM"	No

The remote commands required to define these settings are described in [Chapter 5.5, "TSGen Subsystem"](#), on page 55.

Settings:

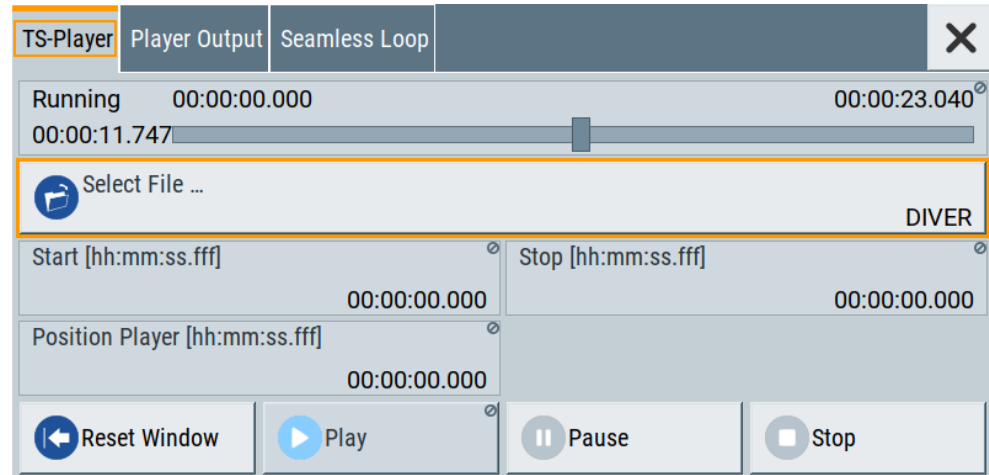
- [TS Player Settings](#)..... 25
- [Player Output Settings](#)..... 28
- [Seamless Loop Settings](#)..... 32

3.6.1 TS Player Settings

Access:

1. Follow the steps in ["To access the "TS Player" application"](#) on page 25.

2. Select "TS Player > TS-Player".



The tab provides settings necessary to configure the general settings of the TS player application.

Settings:

Running/Position Player [hh:mm:ss.fff].....	26
Select File.....	26
Start [hh:mm:ss.fff].....	27
Position Player [hh:mm:ss.fff].....	28
Stop [hh:mm:ss.fff].....	28
Reset Window.....	28
Play.....	28
Pause.....	28
Stop.....	28

Running/Position Player [hh:mm:ss.fff]

Displays the current position in time, while playing the file.

You can set an individual position via [Position Player \[hh:mm:ss.fff\]](#).

Remote command:

[:TSGen:CONFigure:SEEK:POSition](#) on page 59

Select File

Provides access to the standard "File Select" function of the instrument. The provided navigation possibilities in the dialog are self-explanatory.

See also, chapter "File and Data Management" in the R&S SMCV100B User Manual.

The dialog allows you to select user-defined, predefined and recent files. [Table 3-2](#) lists file extensions of supported files.

Table 3-2: Supported TS player file types

File extension	Stream libraries	Remark	Option
*.atasc_c	ATSC/ATSC & Mobile DTV	Encrypted	R&S SMCVB-KS13
*.dab	T-DMB/DAB	Unencrypted	-

File extension	Stream libraries	Remark	Option
*.dab_c	T-DMB/DAB	Encrypted	R&S SMCVB-KS10
*.dabp_c	DAB+	Encrypted	R&S SMCVB-KS11
*.eti	T-DMB/DAB	Unencrypted	-
*.xeti	T-DMB/DAB	Unencrypted	-
*.emc_c	EMC	Encrypted	R&S SMCVB-KS15
*.isdbt_c	ISDB-T	Encrypted	R&S SMCVB-KS12
*.pcap	-	Captured IPv4 stream for ATSC 3.0 player	-
*.t2mi ¹⁾	-	Unencrypted	-
*.t2mi_c	DVB-T2 MI	Encrypted	R&S SMCVB-KS14
*.t2trp_c	DVB-T2 MI	Encrypted	R&S SMCVB-KS14
*.trp	-	Unencrypted	-
*.trp_c	-	Encrypted Included in various stream libraries	R&S SMCVB-KS12 R&S SMCVB-KS17 R&S SMCVB-KS18 R&S SMCVB-KS19 R&S SMCVB-KS20
*.bin	-	Unencrypted	-
*.ts	-	Unencrypted	-
*.mpg	-	Unencrypted	-
*.t10	-	-	-

¹⁾ For T2MI stream files, the data rate of a T2MI file is determined automatically, if the following applies:

- Data rate is not part of the TRP file header information.
- PCR information is not available.
- T2MI TRP file is not encrypted, that means not of type *.t2mi_c.
- TRP file has the *.t2mi file extension.

Remote command:

:TSGen:CONFigure:PLAYfile on page 58

:TSGen:READ:PLAYfile:LENGth? on page 62

:TSGen:READ:FMEMoRy on page 61

Start [hh:mm:ss.fff]

Sets the start position in the loaded player file. Data which chronologically precedes the start position is not replayed by the player.

The entered time stamp must chronologically always precede the entry under [Stop](#).

Remote command:

:TSGen:CONFigure:SEEK:STARt on page 60

Position Player [hh:mm:ss.fff]

Displays the current play position in the file.

Remote command:

[:TSGen:CONFigure:SEEK:POSition](#) on page 59

Stop [hh:mm:ss.fff]

Sets the end position in the player file. Data which chronologically follows the end position is not replayed by the player.

When the player reaches the "Stop" position, it returns to the "Start" position (continuous play).

The entered time stamp must chronologically always follow the entry under [Play](#).

Remote command:

[:TSGen:CONFigure:SEEK:STOP](#) on page 60

Reset Window

Resets "Start/Stop/Position Player" parameters.

Remote command:

[:TSGen:CONFigure:SEEK:RESet](#) on page 60

Play

Plays the selected file.

For supported file types, see [Table 3-2](#).

Remote command:

[:TSGen:CONFigure:COMMand<ch>](#) on page 57

Pause

Pauses the player.

After pausing, you can resume playing the file by clicking "Play" again.

Remote command:

[:TSGen:CONFigure:COMMand<ch>](#) on page 57

Stop

Stops the player and returns to the start position.

Remote command:

[:TSGen:CONFigure:COMMand<ch>](#) on page 57

3.6.2 Player Output Settings

Access:

- Select "TS Player > Player Output".

The tab provides settings necessary to configure the output of the TS player.

3.6.2.1 General Settings

TS-Player	Player Output	Seamless Loop	
Data Rate 5.018 502 Mbit/s			General Stuffing
Orig. Data Rate 5.018 502 Mbit/s			
Packet Length 188			
Nullpacket Stuffing ☐			
Stop Data None			

The tab provides settings necessary to configure general player output properties.

Data Rate.....	29
Orig. Data Rate.....	29
Packet Length.....	29
Nullpacket Stuffing.....	29
Stop Data.....	30

Data Rate

Sets the output data rate of the player.

Note: If "Nullpacket Stuffing > Off", we recommend that you set the output data rate equal to the original data rate.

If you want to use a different data rate, activate "Nullpacket Stuffing". The function ensures that the data stream is replayed in the same way as it was recorded. The time references in the tables of the TS stream are also correct during replay.

Remote command:

[:TSGen:CONFigure:TSRate](#) on page 61

Orig. Data Rate

Displays the calculated original TS data rate.

Remote command:

[:TSGen:READ:ORIGtsrate](#) on page 62

Packet Length

Requires a *.trp, *.trp_c, *.emc or *.emc_c file loaded into the "TS Player" dialog. *.trp files are previously recorded files.

Displays the packet length of the loaded TS player file.

Remote command:

[:TSGen:CONFigure:TSPacket](#) on page 61

Nullpacket Stuffing

Requires a *.trp, *.trp_c, *.emc or *.emc_c file loaded into the "TS Player" dialog. *.trp files are previously recorded files.

Enables or disables nullpacket stuffing.

The output data rate of the TS player equals the original data rate. The equality ensures that the time references in the tables of the played TS stream are correct during replay.

- "On" Activate stuffing, if you need a higher rate than the original data rate. Null packets are inserted into the data stream. To ensure correct time references in the stream tables, activate program clock reference correction ("PCR, DTS/PTS > On").
- "Off" Deactivate stuffing, if you want to use the same data rate as the original data rate.

Remote command:

[:TSGen:CONFigure:STUFFing](#) on page 61

Stop Data

Requires a *.trp, *.trp_c, *.emc or *.emc_c file loaded into the "TS Player" dialog. *.trp files are previously recorded files.

Ensures that a standardized TS data stream is always output at the TS output at the rear of the R&S SMCV100B.

In pause or stop status, the TS generator generates "test packets", which have data and header parts, that can be configured using the [Test TS Packet](#).

Remote command:

[:TSGen:CONFigure:STOPdata](#) on page 60

3.6.2.2 Stuffing Settings

The screenshot shows the 'TS-Player' window with the 'Player Output' tab active. On the right, the 'Stuffing' sub-tab is selected. The main configuration area contains the following settings:

- Test TS Packet:** Head/184 Payload
- PID Test Packet:** Variable
- PID (Hex):** 1000
- Payload Test/Stuff:** PRBS
- PRBS:** 2²³ - 1 (ITU-T O.151)

The tab comprises settings necessary to configure stuffing.

Settings

Test TS Packet.....	31
PID Test Packet.....	31
PID (Hex).....	31
Payload Test/Stuff.....	31
PRBS.....	32

Test TS Packet

Specifies the structure of the test transport stream packet that is fed to the modulator.

"Head/184 Payload"

A sync byte (0x47) followed by three header bytes and 184 payload bytes.

"Sync/187 Payload"

A sync byte (0x47) followed by 187 payload bytes.

"Head/200 Payload"

A sync byte (0x47) followed by three header bytes and 200 payload bytes.

"Sync/203 Payload"

A sync byte (0x47) followed) followed by 203 payload bytes.

"Head/204 Payload"

A sync byte (0x47) followed by three header bytes and 204 payload bytes.

"Sync/207 Payload"

A sync byte (0x47) followed) followed by 207 payload bytes.

Remote command:

:TSGen:CONFigure:TSPacket on page 61

PID Test Packet

If a header is present in the test packet ("Test TS Packet > Head/184 Payload"), you can specify a fixed or variable packet identifier (PID).

"Null"

The header of the test transport stream packets has a fixed setting of null packet header 1FFF (hex).

"Variable"

Uses the header value defined with [PID \(Hex\)](#).

Remote command:

:TSGen:CONFigure:PIDTestpack on page 58

PID (Hex)

Sets the [PID](#).

If "PID Test Packet > Null", "PID (Hex) = 1FFF" is fixed.

If "PID Test Packet > Variable", you can edit the value.

Remote command:

:TSGen:CONFigure:PID on page 57

Payload Test/Stuff

Defines the payload area content of the [TS](#) packet.

"PRBS"PRBS data in accordance with [ITU-T O.151](#)
See also chapter "Internal Modulation Data" in the R&S SMCV100B User Manual.

"0x00"Exclusively 00 (hex) data

"0xFF"Exclusively FF (hex) data

Remote command:
:TSGen:CONFigure:PAYLoad on page 57

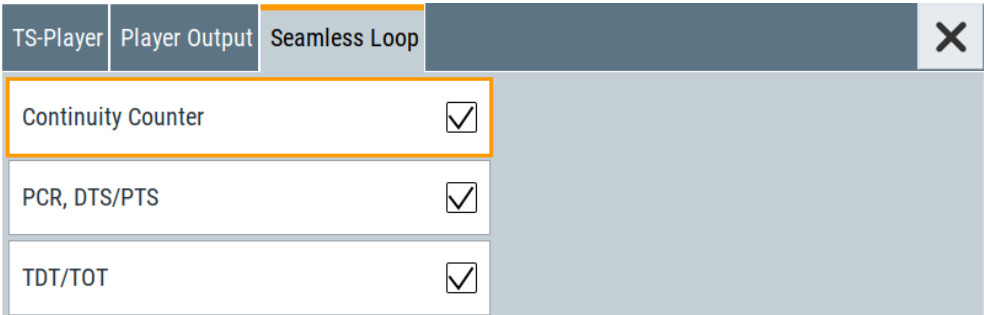
PRBS
Sets the length of the PRBS sequence.
You can select a PRBS 15 or a PRBS 23 sequence as specified by [ITU-T O.151](#).
Remote command:
:TSGen:CONFigure:PRBS[:SEquence] on page 58

3.6.3 Seamless Loop Settings

Displaying the tab requires a *.trp, *.trp_c, *.emc or *.emc_c file loaded into the "TS Player" dialog. *.trp files are previously recorded files.

Access:

► Select "TS Player > Seamless Loop".



The tab provides settings necessary to configure settings for playing the file in a loop.

Settings:

Continuity Counter	32
PCR, DTS/PTS	33
TDT/TOT	33

Continuity Counter
Activates the correction of the continuity counters in the replayed TS data stream. The correction allows you to decode the stream without interruption when the play file is looping.
Remote command:
:TSGen:CONFigure:SEAMless:CC on page 58

PCR, DTS/PTS

Activates the correction of time stamps in the replayed TS data stream. The correction allows you to decode the stream without interruption when the play file is looping.

If you set "Nullpacket Stuffing = On" and "PCR, DTS/PTS = On", the time stamps in the streams are corrected when nullpackets are inserted into the stream.

Remote command:

[:TSGen:CONFigure:SEAMless:PCR](#) on page 59

TDT/TOT

Activates the correction of the time and date table in the replayed TS data stream. The correction allows you to decode the stream without interruption when the play file is looping.

Remote command:

[:TSGen:CONFigure:SEAMless:TT](#) on page 59

3.7 Local IP Data Network Settings

Access:

1. Select "Input Signal > General > Source > External".
2. Select "Input Signal > General > Input > IP"
3. Select "Input Signal > IP Channel x > Local IP Data Network".

Local IP Data Network		
Network Status ● Connected		Restart Network
Board Name		
Hostname smcv100b-565371-IP-Data		
Board Address		
Address Mode Auto (DHCP)	Protocol UDP	Show Connector ...
IP Address 10.214.2.24	Subnet Mask 255.255.252.0	MAC Address 90:b8:21:71:2e

The tab provides access to local IP data settings necessary to configure the board address.

The remote commands necessary to configure local IP data network settings are described in [Chapter 5.6, "BCIP Subsystem"](#), on page 62.

How to: [Chapter 4.1.1, "How to Apply an External IP Input Signal"](#), on page 36

Settings:

Network Status.....	34
Restart Network.....	34
Hostname.....	34
Address Mode.....	34
IP Address.....	35
Protocol.....	35
Subnet Mask.....	35
Show Connector.....	35
MAC Address.....	35

Network Status

Indicates that the instrument is connected to the network.

If the instrument is disconnected, try "Restart Network".

Remote command:

`:SYSTem:COMMunicate:BCIP<hw>:NETWork:STATus` on page 65

Restart Network

Terminates the network connection of the instrument and sets it up again later. You can use this function to fix network problems.

Note: This function restarts only the connection of the instrument to the network. It does not impact the network itself.

Remote command:

`:SYSTem:COMMunicate:BCIP<hw>:NETWork:REStart` on page 65

Hostname

Displays the hostname.

Displayed is the board name, that is the name of the IP data board of the R&S SMCV100B, e.g. SMCV100B-123456-IP-Data.

Each instrument is delivered with an assigned hostname, a logical name which can be used instead of the IP address. With the default network settings, the IP address is allocated by the DHCP server. This address can change each time the instrument is reconnected. Unlike the IP address, the hostname name does not change.

Note:

This function is password-protected. Unlock the protection level 1 to access it.

We recommend that you do not change the default network settings or the hostname to avoid problems with the network connection.

Remote command:

`:SYSTem:COMMunicate:BCIP<hw>:NETWork:COMMON:HOSTname` on page 63

Address Mode

Selects the mode for assigning the IP address.

"Auto (DHCP)"

Assigns the IP address automatically, provided the network supports **DHCP**.

"Static"

Enables you to assign the IP address manually.

Remote command:

`:SYSTem:COMMunicate:BCIP<hw>:NETWork:IPAdDress:MODE` on page 64

IP Address

Displays the IP address of the instrument in the local IP data network.

By default, the R&S SMCV100B is configured to use dynamic TCP/IP configuration and to obtain the whole address information automatically.

If the network does not support DHCP or the attempt does not succeed, the instrument tries to obtain the IP address via Zeroconf (APIPA) protocol. IP addresses assigned via Zeroconf start with the number blocks 169.254.*.*.

Note: An IP address that is assigned via the Zeroconf protocol although the network requires an IP address assigned via the DHCP server can cause network connection failures.

Remote command:

`:SYSTem:COMMunicate:BCIP<hw>:NETWork:IPAdDress` on page 64

Protocol

Sets the protocol type of the input IP data.

The current firmware supports **UDP** and **UDP/RTP**.

Remote command:

`:SYSTem:COMMunicate:BCIP<hw>:NETWork:PROTOcol` on page 65

Subnet Mask

Displays the bit group of the subnet in the host identifier.

To assign the subnet mask manually, select "Address Mode > Static".

Remote command:

`:SYSTem:COMMunicate:BCIP<hw>:NETWork:IPAdDress:SUBNet:MASK`
on page 64

Show Connector

Accesses a dialog that displays the physical location of the selected connector on the front/rear panel of the instrument.

MAC Address

Displays the MAC address, a unique identifier of the network adapter in the R&S SMCV100B.

Remote command:

`:SYSTem:COMMunicate:BCIP<hw>:NETWork:MACaddress` on page 64

4 Performing DVB-S / DVB-S2 Signal Generation Tasks

This chapter tells you how to configure the R&S SMCV100B to generate signals for simple receiver tests.

- [Configuring the Input Signal](#).....36
- [Monitoring the Input Signal](#)..... 41

4.1 Configuring the Input Signal

This chapter provides an overview of the different input signals, that the R&S SMCV100B uses as modulation data.

- [How to Apply an External IP Input Signal](#)..... 36
- [How to Apply an External TS Input Signal](#)..... 39
- [How to Generate an Internal TS Signal](#)..... 40

4.1.1 How to Apply an External IP Input Signal

To connect the R&S SMCV100B to local IP data network

1. Connect the IP source to the "IP Data" connector of the R&S SMCV100B.
See chapter "Connecting to IP Data Interface" in the R&S SMCV100B Getting Started user manual.
2. Select "Input Signal > General > Source > External".
3. Select "Input Signal > General > Input > IP".
4. In the "IP Channel x" side tab, click "Local IP Data Network".
By default, the R&S SMCV100B assigns the IP address automatically using [DHCP](#) ("Address Mode > Auto (DHCP)").
5. If "Network Status > Disconnected", try "Restart Network".

Local IP Data Network		
Network Status ● Connected		Restart Network
Board Name smcv100b-565371-IP-Data		
Board Address		
Address Mode Auto (DHCP)	Protocol UDP	Show Connector ...
IP Address 10.214.2.24	Subnet Mask 255.255.252.0	MAC Address 90:b8:21:71:2e

The R&S SMCV100B is connected to the local IP data network.

6. If DHCP does not assign an IP address, assign the IP address manually.
See chapter "How to Assign the IP Address" in the R&S SMCV100B user manual.
7. Specify the protocol type of the input IP data.
The current firmware supports [UDP](#) and [UDP/RTP](#).

To configure an external IP input signal

The R&S SMCV100B is connected to a local IP data network, see ["To connect the R&S SMCV100B to local IP data network"](#) on page 36.

1. Specify general IP input signal properties:
 - a) Select "Input Signal > General > Source > External".
 - b) Select "Input > IP".
 - c) Specify the IP TS Channel, e.g. "IP TS Channel > 1".

The "IP Channel 1" side tab appears, where you can configure the IP connection for channel 1 and channel-independent local IP network settings.

Input Signal	
Source External	General Info Test Signal IP Channel 1
Global Connectors ...	
Input IP	
IP Channel 1	
Stuffing ☒	

1 = IP channel notation: IP TS Channel

2. Optionally, if supported, activate "Stuffing" to adjust the TS data rate.
3. Specify IP TS channel properties, e.g. for "IP TS Channel > 1":
 - a) Define the input type, e.g. "Type > Multicast".
 - b) Specify the "Multicast Address", that is the destination IPv4 address of the IP connection.
Note: Use the destination address also in the IP data source, e.g. a stream program.
 - c) Specify the port, that is the destination port of the IP connection.
Note: Use the destination port also in the IP data source.
 - d) Specify the **IGMPv3** source address, that is the source IPv4 address of the IP connection.
 A source address different from "0.0.0.0" accepts only data originating from the specified IP address.
 - e) Optionally, to check availability of the "IGMPv3 Source Address", click "Ping Source Address"
 - If "Ping Result > Ping: Successful", the source address is available.
 - If "Ping Result > Ping: Transmit Failed. Destination Host Unreachable", try another address.
 - f) Optionally, specify a name for the IP connection, e.g. "Alias > Service".
 - g) Activate the IP channel, select "Input IP > On".

Input Signal		
Input IP ☒	Alias	General
Type	Multicast Address	Info
Multicast	224.3.2.1	
Port	IGMPv3 Source Address	Test Signal
6 002	123.4.5.6	
Ping Source Address	Local IP Data Network ...	IP Channel 1
Ping Result		

The R&S SMCV100B is prepared for receiving IP TS data, that is input at the "IP Data" connector.

Monitor IP data stream properties in the "Info" side tab, see [Chapter 4.2.1, "How to Monitor External IP Input Data"](#), on page 41.

4.1.2 How to Apply an External TS Input Signal

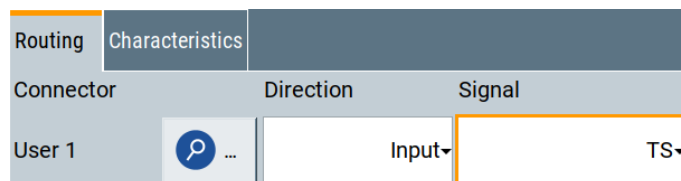
To connect to the external TS input interface

1. Use a double-shielded 75 Ω BNC cable for connection between R&S SMCV100B and the external [MPEG](#) TS data source.
See also Section "Cable selection and electromagnetic interference (EMI)" in the R&S SMCV100B Getting Started user manual.
2. At the R&S SMCV100B, connect the cable to the "User 1" connector.
The connector is on the rear panel of the R&S SMCV100B.
How to: Section "To connect to non-screwable connectors (BNC)" in the R&S SMCV100B Getting Started user manual.

To specify the TS input interface at the R&S SMCV100B

The R&S SMCV100B is [connected](#) to an [MPEG](#) TS data source via the "User 1" connector.

1. Select "Input Signal > General > Source > External".
2. Select "General > Global Connectors".
3. In the "Global Connectors" dialog, configure the "User 1" connector for a TS input signal:
 - a) Select "Direction > Input".
 - b) Select "Signal > TS".

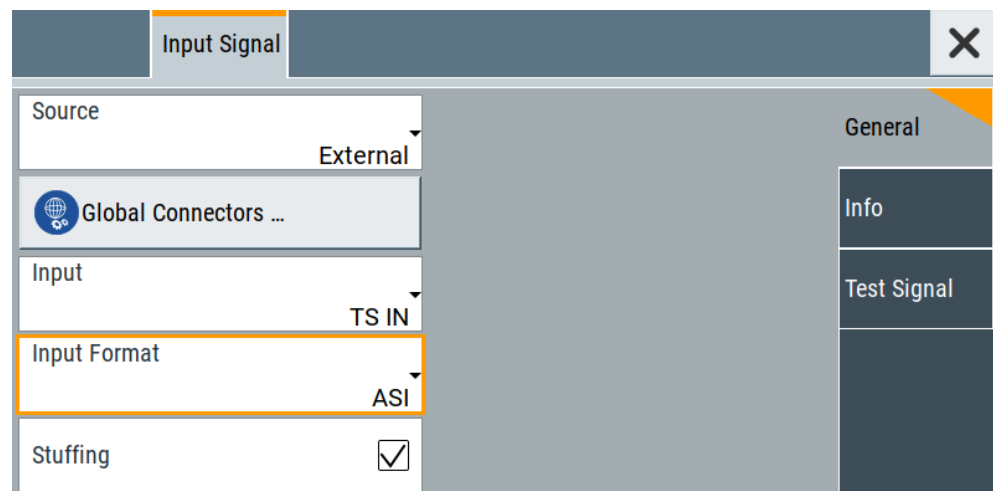


To configure an external TS input signal

The R&S SMCV100B is [prepared](#) for receiving a TS input signal at the "User 1" connector.

1. Specify general TS input signal properties:
 - a) Select "Input Signal > General > Source > External".
 - b) Select "Input > TS IN".
 - c) Specify the format of the input signal:
 - Select "ASI", if you have a source supporting [ASI](#) format.
 - Select "SMPTE 310", if you have a source supporting [SMPTE 310](#) format.
2. Optionally, activate "Stuffing" to adjust the TS data rate.

You can further specify the payload of the stuffing data, see "Test Signal > Payload Test/Stuff."



The R&S SMCV100B is prepared for receiving TS data, that is input at the "User 1" connector.

Monitor TS data stream properties in the "Info" side tab, see [Chapter 4.2.2, "How to Monitor an External TS Input Signal"](#), on page 42.

4.1.3 How to Generate an Internal TS Signal

To play a TS file with the "TS Player"

1. Select "Input Signal > Source > TS Player".
The "TS Player" button appears below.
2. Click "TS Player".
The "TS Player" dialog for playing TS data files opens.
3. Click "Play" to play the default file `DIVER.trp`.
Playing the file requires no option.

To play a file of stream library with the "TS Player"

1. Download the
2. Select "Input Signal > Source > TS Player".
The "TS Player" button appears below.
3. Click "TS Player".
The "TS Player" dialog for playing TS data files opens.
4. Click "Play" to play the default file `DIVER.trp`.

Playing the file requires no option.

4.2 Monitoring the Input Signal

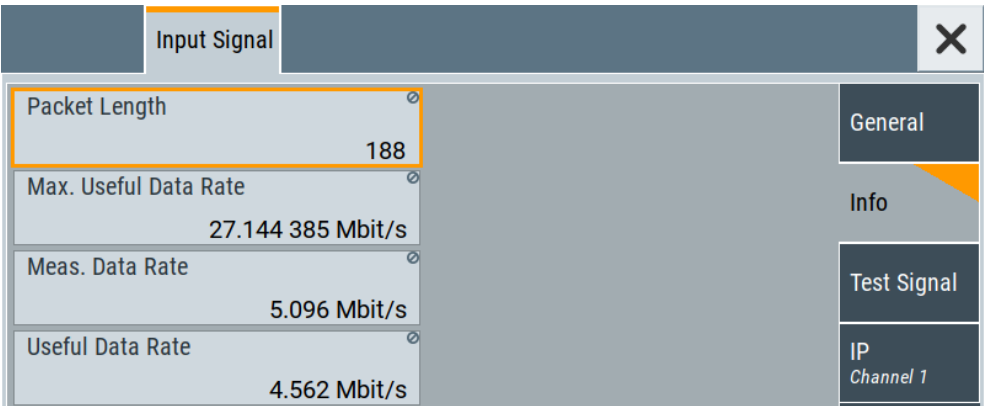
This chapter provides an overview of the different input signals, that the R&S SMCV100B uses as modulation data.

- [How to Monitor External IP Input Data](#).....41
- [How to Monitor an External TS Input Signal](#).....42
- [How to Monitor an Internal TS Player Signal](#).....42

4.2.1 How to Monitor External IP Input Data

The R&S SMCV100B receives external IP input data as described in [Chapter 4.1.1, "How to Apply an External IP Input Signal"](#), on page 36.

- Select "Input Signal > Info"



The "Info" side tab displays physical properties of the input IP stream data.

The standard packet length is 188 byte. The maximum useful data rate is specified by the broadcast standard.

The measured data rate is lower and depends on the [TS](#) source settings. The useful data rate is lower than the measured data rate due to null packets present in the transport stream.

If "Stuffing > On", the useful data rate can be lower than the maximum useful data rate.

4.2.2 How to Monitor an External TS Input Signal

The R&S SMCV100B receives external TS input data as described in [Chapter 4.1.2, "How to Apply an External TS Input Signal"](#), on page 39.

- Select "Input Signal > Info"

Input Signal		
Packet Length	188	General
Max. Useful Data Rate	19.392 659 Mbit/s	Info
Measured Data Rate	13.058 Mbit/s	Test Signal
Useful Data Rate	12.998 Mbit/s	

The "Info" side tab displays physical properties of the input TS stream data.

4.2.3 How to Monitor an Internal TS Player Signal

The R&S SMCV100B receives internal TS input data as described in [Chapter 4.1.3, "How to Generate an Internal TS Signal"](#), on page 40.

- Select "Input Signal > Info"

Input Signal		
Max. Useful Data Rate	38.014 706 Mbit/s	General
Useful Data Rate	21.298 475 Mbit/s	Info
		Test Signal

The "Info" side tab displays physical properties of the TS player stream data.

5 Remote-Control Commands

The following commands are required to generate signals with the DVB-S / DVB-S2 option in a remote environment. We assume that the R&S SMCV100B has already been set up for remote operation in a network as described in the R&S SMCV100B 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 SMCV100B user manual.

Common suffixes

The following common suffixes are used in the remote commands:

Suffix	Value range	Description
SOURce<hw>	1	Available baseband signals

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 preset/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 DVB-S / DVB-S2 are described here:

• General Commands	44
• Input Signal Commands	45
• Coding Commands	53
• Special Commands	54
• TSGen Subsystem	55
• BCIP Subsystem	62

5.1 General Commands

[:SOURce<hw>]:BB:DVBS:PRESet.....	44
[:SOURce<hw>]:BB:DVBS:STATe.....	44
[:SOURce<hw>]:BB:DVBS:SETTing:CATalog?.....	44
[:SOURce<hw>]:BB:DVBS:SETTing:DELeTe.....	44
[:SOURce<hw>]:BB:DVBS:SETTing:LOAD.....	45
[:SOURce<hw>]:BB:DVBS:SETTing:STORe.....	45

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

Setting parameters:

<Preset> select

Usage: Event

Manual operation: See ["Set To Default"](#) on page 11

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

Enables/disables the DVB-S standard.

Parameters:

<State> 0 | 1 | OFF | ON

*RST: 0

Manual operation: See ["State"](#) on page 10

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

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

Return values:

<Catalog> <filename1>,<filename2>,...

Returns a string of filenames separated by commas.

Usage: Query only

Manual operation: See ["Save/Recall"](#) on page 11

[:SOURce<hw>]:BB:DVBS:SETTing:DELeTe <Delete>

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

Setting parameters:

<Delete> string
 Filename or complete file path; file extension can be omitted

Usage: Setting only

Manual operation: See ["Save/Recall"](#) on page 11

[:SOURce<hw>]:BB:DVBS:SETTing:LOAD <Recall>

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

Parameters:

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

Manual operation: See ["Save/Recall"](#) on page 11

[:SOURce<hw>]:BB:DVBS:SETTing:STORe <Save>

Saves the current settings into the selected file; the file extension (*.dvbs) is assigned automatically.

Parameters:

<Save> "<filename>"
 Filename or complete file path

Manual operation: See ["Save/Recall"](#) on page 11

5.2 Input Signal Commands

• General Commands	45
• Info Commands	47
• Test Signal Commands	48
• IP Subsystem	50

5.2.1 General Commands

[:SOURce<hw>]:BB:DVBS:SOURce	46
[:SOURce<hw>]:BB:DVBS:INPut	46
[:SOURce<hw>]:BB:DVBS:INPut:FORMat	46
[:SOURce<hw>]:BB:DVBS:INPut:TSCHannel	46
[:SOURce<hw>]:BB:DVBS:STUFfing	46

[:SOURce<hw>]:BB:DVBS:SOURce <InpSigSource>

Parameters:

<InpSigSource> EXternal | TSPLayer | TESTsignal
 *RST: EXternal

Manual operation: See ["Source"](#) on page 12

[:SOURce<hw>]:BB:DVBS:INPut <InpSigInput>

Sets the external input.

Parameters:

<InpSigInput> TS | IP
 *RST: TS

Manual operation: See ["Input"](#) on page 13

[:SOURce<hw>]:BB:DVBS:INPut:FORMat <InpSigFormat>

Sets the format of the "TS IN" input signal.

Parameters:

<InpSigFormat> ASI | SMPTE
 *RST: ASI

Manual operation: See ["Input Format"](#) on page 13

[:SOURce<hw>]:BB:DVBS:INPut:TSCChannel <InpSigTSChannel>

Selects the IP-based transport stream (TS) channel. You can select 1 out of 4 IP TS channels as input at the "IP Data" interface.

To configure a particular channel, see [Chapter 3.2.4, "IP Channel x Settings"](#), on page 18.

For configuring IP channel settings and local IP data network parameters, see:

- [Chapter 5.2.4, "IP Subsystem"](#), on page 50
- [Chapter 5.6, "BCIP Subsystem"](#), on page 62

Parameters:

<InpSigTSChannel> 1 | 2 | 3 | 4
 *RST: 1

Manual operation: See ["IP TS Channel"](#) on page 13

[:SOURce<hw>]:BB:DVBS:STUFfing <InpSigStuffing>

Activates stuffing.

Parameters:

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

Manual operation: See "Stuffing" on page 14

5.2.2 Info Commands

[:SOURce<hw>]:BB:DVBS:PACKetlength?	47
[:SOURce<hw>]:BB:DVBS:USEFul[:RATE]?	47
[:SOURce<hw>]:BB:DVBS:USEFul[:RATE]:MAX?	47
[:SOURce<hw>]:BB:DVBS[:INPut]:DATarate?	48

[\[:SOURce<hw>\]:BB:DVBS:PACKetlength?](#)

Queries the packet length of the external transport stream in bytes.

Return values:

<InpSigPLength> P188 | Invalid | P204

P188|P204

188/208 byte packets specified for serial input and parallel input.

INValid

Packet length does not match the specified length.

*RST: INValid

Usage: Query only

Manual operation: See "Packet Length" on page 15

[\[:SOURce<hw>\]:BB:DVBS:USEFul\[:RATE\]?](#)

Displays the data rate of the useful data that is present in the transport stream at the transport stream input interface selected to supply the modulation data. This is a measured value.

Return values:

<InpSigUsefull> float
 Range: 0 to 999999999
 Increment: 0.001
 *RST: 0

Usage: Query only

Manual operation: See "Useful Data Rate" on page 16

[\[:SOURce<hw>\]:BB:DVBS:USEFul\[:RATE\]:MAX?](#)

Displays the transport stream data rate that is derived from the current modulation parameter settings and is required by the modulator at the input.

For "Stuffing > On", the value indicates the maximum useful data rate (payload) that is allowed in the transport stream.

Return values:

<InpSigMaxRate> float
 Range: 0 to 999999999
 Increment: 0.000001
 *RST: 0

Usage: Query only

Manual operation: See "[Max. Useful Data Rate](#)" on page 15

[:SOURce<hw>]:BB:DVBS:INPut:DATarate?

Displays the current data rate of the external transport stream applied at the transport stream input interface (useful data rate + "null packets").

Return values:

<InpSigDatarate> float
 Range: 0 to 999999999
 Increment: 0.001
 *RST: 0

Usage: Query only

Manual operation: See "[Measured Data Rate](#)" on page 16

5.2.3 Test Signal Commands

[:SOURce<hw>]:BB:DVBS:TESTsignal.....	48
[:SOURce<hw>]:BB:DVBS:TSPacket.....	48
[:SOURce<hw>]:BB:DVBS:PAYLoad.....	49
[:SOURce<hw>]:BB:DVBS:PID.....	49
[:SOURce<hw>]:BB:DVBS:PIDTestpack.....	49
[:SOURce<hw>]:BB:DVBS:PRBS.....	49

[:SOURce<hw>]:BB:DVBS:TESTsignal <InpSigTestSig>**Parameters:**

<InpSigTestSig> TTSP | PBEC
 *RST: TTSP

Manual operation: See "[Test Signal](#)" on page 14

[:SOURce<hw>]:BB:DVBS:TSPacket <SetTSPacket>

Specifies the structure of the test transport stream packet that is fed to the modulator.

Parameters:

<SetTSPacket> H184 | S187
 *RST: H184

Manual operation: See "[Test TS Packet](#)" on page 17

[:SOURce<hw>]:BB:DVBS:PAYLoad <SetPayload>

Sets the payload area content of the transport stream packet.

Parameters:

<SetPayload> PRBS | H00 | HFF
 *RST: PRBS

Manual operation: See "[Payload Test/Stuff.](#)" on page 17

[:SOURce<hw>]:BB:DVBS:PID <SetPID>

Sets/queries the packet identifier (PID).

Set/query individual PID values for variable PID test packets or query a fixed PID value 1FFF for null PID test packets.

Parameters:

<SetPID> integer
 Range: 0 to 8191
 *RST: 8191

Manual operation: See "[PID \(Hex\)](#)" on page 17

[:SOURce<hw>]:BB:DVBS:PIDTestpack <SetPIDTestpack>

Parameters:

<SetPIDTestpack> NULL | VARiable
 *RST: NULL

Manual operation: See "[PID Test Packet](#)" on page 17

[:SOURce<hw>]:BB:DVBS:PRBS <SetPRBS>

Sets the period length of the PRBS generator which fills the payload area of the transport stream packet (test signal or null packet).

Parameters:

<SetPRBS> P23_1 | P15_1
 *RST: P23_1

Manual operation: See "[PRBS](#)" on page 17

5.2.4 IP Subsystem

The `SOURCE:BB:INPut:IP` subsystem contains the commands for configuring input IP data from a local IP data network.

To configure local IP data network parameters, see [Chapter 5.6, "BCIP Subsystem"](#), on page 62.

Common suffixes

The following common suffixes are used in the `SOURCE:BB:INPut:IP` remote commands:

Suffix	Value range	Description
IP<ch>	1 to 4	IP channel number

Example: Configure IP channel 2 properties

```
// Use the data from IP channel 2 as input for modulation data.
:SOURCE1:BB:INPut:IP2:STATe ON
// Specify alias as "Alias 2".
:SOURCE1:BB:INPut:IP2:ALIAS "Alias 2"

//*****
// Define Unicast properties.
//*****
:SOURCE1:BB:INPut:IP2:TYPE UNI
// Local IP data interface is configured for Unicast reception
:SOURCE1:BB:INPut:IP2:PORT 6002

//*****
// Define Multicast properties.
//*****
:SOURCE1:BB:INPut:IP2:TYPE MULT
// Local IP data interface is configured for Multicast reception
:SOURCE1:BB:INPut:IP2:MULTicast:ADDRESS?
// Response: "226.0.0.0"
:SOURCE1:BB:INPut:IP2:IGMP:SOURce:ADDRESS?
// Response: "0.0.0.0"
:SOURCE1:BB:INPut:IP2:IGMP:SOURce:ADDRESS "192.168.10.1"
:SOURCE1:BB:INPut:IP2:IGMP:SOURce:PING
:SOURCE1:BB:INPut:IP2:IGMP:SOURce:RESult?
// Response: "Ping: Successful"
```

Commands

<code>[SOURCE<hw>]:BB:INPut:IP<ch>[:STATe]</code>	51
<code>[SOURCE<hw>]:BB:INPut:IP<ch>:ALIAS</code>	51
<code>[SOURCE<hw>]:BB:INPut:IP<ch>:PORT</code>	51
<code>[SOURCE<hw>]:BB:INPut:IP<ch>:TYPE</code>	51
<code>[SOURCE<hw>]:BB:INPut:IP<ch>:MULTicast:ADDRESS</code>	52

[:SOURce<hw>]:BB:INPut:IP<ch>:IGMP[:SOURce]:ADDReSS.....	52
[:SOURce<hw>]:BB:INPut:IP<ch>:IGMP[:SOURce]:PING.....	52
[:SOURce<hw>]:BB:INPut:IP<ch>:IGMP[:SOURce]:RESult?.....	52

`[:SOURce<hw>]:BB:INPut:IP<ch>[:STATe] <Alias>`

Activates/deactivates the "IP Channel x" as IP input.

Specify the current IP TS Channel with the command

`SOURce1:BB:DigStd:INPut:TSChannel`. `DigStd` stands for the IP TS Channel in the corresponding broadcast standard.

Parameters:

`<Alias>` 0 | 1 | OFF | ON
 *RST: 0

Example: See [Example "Configure IP channel 2 properties"](#) on page 50.

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

`[:SOURce<hw>]:BB:INPut:IP<ch>:ALIAS <Alias>`

Specifies an alias, i.e. name for the IP connection.

Parameters:

`<Alias>` string

Example: See [Example "Configure IP channel 2 properties"](#) on page 50.

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

`[:SOURce<hw>]:BB:INPut:IP<ch>:PORT <Port>`

Sets the port of the input IP data at the "IP Data" connector.

Parameters:

`<Port>` integer
 Range: 0 to 65535
 *RST: 6002

Example: See [Example "Configure IP channel 2 properties"](#) on page 50.

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

`[:SOURce<hw>]:BB:INPut:IP<ch>:TYPE <Type>`

Sets the IP input type.

Parameters:

`<Type>` UNicast | MULTicast

UNicast

Analyzes all unicast IP packets that arrive at the specified port.

See [\[:SOURce<hw>\]:BB:INPut:IP<ch>:PORT](#) on page 51.

MULTicast

When an IP address is in the multicast address range, an attempt is made to join a multicast group using [IGMP](#). Set multi-cast address and port.

See:

[\[:SOURce<hw>\]:BB:INPut:IP<ch>:MULTicast:ADDRess](#) on page 52

[\[:SOURce<hw>\]:BB:INPut:IP<ch>:PORT](#) on page 51

*RST: UNicast

Example: See [Example "Configure IP channel 2 properties"](#) on page 50.

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

[\[:SOURce<hw>\]:BB:INPut:IP<ch>:MULTicast:ADDRess](#)

Sets the destination IP address (IPv4) of the IP connection.

Parameters:

<Address> string
Range: 224.0.0.0 to 239.255.255.255

Example: See [Example "Configure IP channel 2 properties"](#) on page 50.

Manual operation: See ["Multicast Address"](#) on page 20

[\[:SOURce<hw>\]:BB:INPut:IP<ch>:IGMP\[:SOURce\]:ADDRess](#)

Specifies the IGMP source address of the network.

Parameters:

<Address> string

Example: See [Example "Configure IP channel 2 properties"](#) on page 50.

Manual operation: See ["IGMPv3 Source Address"](#) on page 20

[\[:SOURce<hw>\]:BB:INPut:IP<ch>:IGMP\[:SOURce\]:PING](#)

Triggers pinging of the IGMP source address in the local IP data network. Query the result via [\[:SOURce<hw>\]:BB:INPut:IP<ch>:IGMP\[:SOURce\]:RESult?](#) on page 52.

Example: See [Example "Configure IP channel 2 properties"](#) on page 50.

Usage: Event

Manual operation: See ["Ping Source Address"](#) on page 20

[\[:SOURce<hw>\]:BB:INPut:IP<ch>:IGMP\[:SOURce\]:RESult?](#)

Queries the result of pinging the [IGMP](#) source address.

See [\[:SOURce<hw>\]:BB:INPut:IP<ch>:IGMP\[:SOURce\]:PING](#) on page 52.

Return values:

<PingResult> string
Returns ping messages.

Example: See [Example "Configure IP channel 2 properties"](#) on page 50.

Usage: Query only

Manual operation: See ["Ping Result"](#) on page 20

5.3 Coding Commands

[:SOURce<hw>]:BB:DVBS:CONStel	53
[:SOURce<hw>]:BB:DVBS:RATE	53
[:SOURce<hw>]:BB:DVBS:ROLLoff	53
[:SOURce<hw>]:BB:DVBS:SYMBols	54

[\[:SOURce<hw>\]:BB:DVBS:CONStel](#) <Constel>

Defines the constellation.

Parameters:

<Constel> S4 | S8 | S16
S4
[QPSK](#)
S8
[8PSK](#)
S16
[16QAM](#)
***RST:** S4

Manual operation: See ["Constellation"](#) on page 21

[\[:SOURce<hw>\]:BB:DVBS:RATE](#) <CodeRate>

Defines the code rate. The available code rates depend on the value of [\[:SOURce<hw>\]:BB:DVBS:CONStel](#).

Parameters:

<CodeRate> R1_2 | R2_3 | R3_4 | R5_6 | R7_8 | R8_9
***RST:** R3_4

Manual operation: See ["Code Rate"](#) on page 22

[\[:SOURce<hw>\]:BB:DVBS:ROLLoff](#) <RollOff>

Sets the roll-off alpha factor value.

Parameters:

<RollOff> 0.20 | 0.25 | 0.35
 *RST: 0.35

Manual operation: See "[Roll Off](#)" on page 22

[:SOURce<hw>]:BB:DVBS:SYMBOLs <Symbolrate>

Sets the symbol rate.

Parameters:

<Symbolrate> integer
 Range: 1.00E+05 to 9.00E+07
 *RST: 27.5e6

Manual operation: See "[Symbol Rate](#)" on page 21

5.4 Special Commands

[:SOURce<hw>]:BB:DVBS[:SPECIAL]:SETTings[:STATe].....	54
[:SOURce<hw>]:BB:DVBS[:SPECIAL]:REEDsolomon.....	54

[:SOURce<hw>]:BB:DVBS[:SPECIAL]:SETTings[:STATe] <SpecialState>

Enables/disables special settings.

The setting allows you to switch between standard-compliant and user-defined channel coding.

Parameters:

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

Manual operation: See "[Special Settings](#)" on page 23

[:SOURce<hw>]:BB:DVBS[:SPECIAL]:REEDsolomon <ReedSolomon>

Enables the Reed-Solomon encoder. The standard stipulates a Reed-Solomon RS (204, 188).

Parameters:

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

Manual operation: See "[Reed Solomon](#)" on page 23

5.5 TSGen Subsystem

The TSGen subsystem contains the commands for configuring the TS player.

Example: Play a TS player file

```
//*****
// Select a file, e.g. a user-defined setting.
//*****
:TSGen:CONFigure:PLAYfile "/var/user/my_test_player_test.trp"
// Selects the file "my_test_player_test" with extension *.trp.

//*****
// Within the file, define a section, that you want to play.
// You can set start/stop position for a maximum section length of 10 hours.
//*****
:TSGen:CONFigure:SEEK:START 60000 // milliseconds
// Section start is after one minute from the original file start.
// The first minute is ignored.
:TSGen:CONFigure:SEEK:STOP 120000 // milliseconds
// Section stop is after one minute from the original file start.
// The total section length is one minute.

//*****
// Navigate to a certain position within the file/section of the file.
//*****
:TSGen:CONFigure:SEEK:POSition 100000 // milliseconds
// The current player position of file/section of the file is at 1 minute 40 seconds.

//*****
// Reset play-related settings
//*****
:TSGen:CONFigure:SEEK:RESet

//*****
// Pause, stop, play the file.
//*****
:TSGen:CONFigure:COMManD PAUS
// Pauses playing the file.
:TSGen:CONFigure:COMManD STOP
// Stops playing the file.
:TSGen:CONFigure:COMManD PLAY
// Activates playing the file.
```

Example: Configure and monitor TS player output

```

//*****
// Configure general and stuffing parameters of the TS player output.
//*****
:TSGen:CONFigure:STUFFing ON
:TSGen:CONFigure:STOPdata TTSP
:TSGen:CONFigure:TSPacket H184
//:TSGen:CONFigure:PIDTestpacket VAR
:TSGen:CONFigure:PIDTestpack VAR
:TSGen:CONFigure:PID 8100
// Corresponds to a PID = 1FA4 in hexadecimal format.
:TSGen:CONFigure:PAYLoad PRBS
:TSGen:CONFigure:PRBS:SEquence P23_1

//*****
// Monitor TS player output data.
//*****
:TSGen:CONFigure:COMMand STOP
// TSRate can only be changed if player is in stop mode
:TSGen:CONFigure:TSRate 350E6 // net data rate = 350 MBit/s
:TSGen:CONFigure:COMMand PLAY

:TSGen:CONFigure:PLENght?
// Response: P188 // packet length = 188 byte
:TSGen:READ:ORIGtsrate?
// Response: 5018502 bit/s

```

Example: Configure seamless loop parameters

```

:TSGen:CONFigure:SEAMless:CC ON
:TSGen:CONFigure:SEAMless:PCR OFF
:TSGen:CONFigure:SEAMless:TT ON

```

Commands

:TSGen:CONFigure:COMMand<ch>.....	57
:TSGen:CONFigure:PAYLoad.....	57
:TSGen:CONFigure:PID.....	57
:TSGen:CONFigure:PIDTestpack.....	58
:TSGen:CONFigure:PLAYfile.....	58
:TSGen:CONFigure:PLENght.....	58
:TSGen:CONFigure:PRBS[:SEquence].....	58
:TSGen:CONFigure:SEAMless:CC.....	58
:TSGen:CONFigure:SEAMless:PCR.....	59
:TSGen:CONFigure:SEAMless:TT.....	59
:TSGen:CONFigure:SEEK:POSition.....	59
:TSGen:CONFigure:SEEK:RESet.....	60
:TSGen:CONFigure:SEEK:STARt.....	60
:TSGen:CONFigure:SEEK:STOP.....	60
:TSGen:CONFigure:STOPdata.....	60
:TSGen:CONFigure:STUFFing.....	61

:TSGen:CONFigure:TSPacket.....	61
:TSGen:CONFigure:TSRate.....	61
:TSGen:READ:FMEemory.....	61
:TSGen:READ:ORIGtsrate.....	62
:TSGen:READ:PLAYfile:LENGth?.....	62

:TSGen:CONFigure:COMMand<ch>

Triggers playing, pausing and stopping of the TS player file selected with **:TSGen:CONFigure:PLAYfile**.

Setting parameters:

<PlayerStatus> STOP | PLAY | PAUSE
 *RST: STOP

Example: See [Example "Play a TS player file"](#) on page 55.

Usage: Event

Manual operation: See ["Play"](#) on page 28

:TSGen:CONFigure:PAYLoad <PayLoad>

Determines the payload of the test packet. Also influences the payload of the generated stuffing packets while the TS player is running.

Parameters:

<PayLoad> HFF | H00 | PRBS
 *RST: PRBS

Example: See [Example "Configure and monitor TS player output"](#) on page 56.

Manual operation: See ["Payload Test/Stuff"](#) on page 31

:TSGen:CONFigure:PID <PID>

The available values depend on the settings of **:TSGen:CONFigure:PIDTestpack**.

If **:TSGen:CONFigure:PIDTestpack** is set to NULL,
 then **:TSGen:CONFigure:PID** is 1FFF (hex) .

Otherwise the values are variable.

Parameters:

<PID> integer
 Range: 0 to 8191
 *RST: 8191

Example: See [Example "Configure and monitor TS player output"](#) on page 56.

Manual operation: See ["PID \(Hex\)"](#) on page 31

:TSGen:CONFigure:PIDTestpack <PIDTestpack>

Sets the PID, if [:TSGen:CONFigure:TSPacket](#) is H184 | H200 | H204.

Parameters:

<PIDTestpack> VARiable | NULL
*RST: NULL

Example: See [Example "Configure and monitor TS player output"](#) on page 56.

Manual operation: See ["PID Test Packet"](#) on page 31

:TSGen:CONFigure:PLAYfile <PlayFile>

Specifies the file path and filename of the TS player file.

Parameters:

<PlayFile> string

Example: See [Example "Play a TS player file"](#) on page 55.

Manual operation: See ["Select File"](#) on page 26

:TSGen:CONFigure:PLENgtH <PLength>

Queries the packet length of the loaded file.

Parameters:

<PLength> P188 | P204 | P208 | INV
*RST: INV

Example: See [Example "Configure and monitor TS player output"](#) on page 56.

:TSGen:CONFigure:PRBS[:SEquence] <PRBS>

Sets the length of the PRBS sequence.

Parameters:

<PRBS> P15_1 | P23_1
*RST: P23_1

Example: See [Example "Configure and monitor TS player output"](#) on page 56.

Manual operation: See ["PRBS"](#) on page 32

:TSGen:CONFigure:SEAMless:CC <CC>

Activates the correction of the continuity counters in the replayed TS data stream. The correction allows you to decode the stream without interruption when the play file is looping.

Parameters:

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

Example: See [Example "Configure seamless loop parameters"](#) on page 56.

Manual operation: See ["Continuity Counter"](#) on page 32

:TSGen:CONFigure:SEAMless:PCR <PCR>

Activates the correction of time stamps in the replayed TS data stream. The correction allows you to decode the stream without interruption when the play file is looping.

Parameters:

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

Example: See [Example "Configure seamless loop parameters"](#) on page 56.

Manual operation: See ["PCR, DTS/PTS"](#) on page 33

:TSGen:CONFigure:SEAMless:TT <TT>

Activates the correction of the time and date table in the replayed TS data stream. The correction allows you to decode the stream without interruption when the play file is looping.

Parameters:

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

Example: See [Example "Configure seamless loop parameters"](#) on page 56.

Manual operation: See ["TDT/TOT"](#) on page 33

:TSGen:CONFigure:SEEK:POSition <Position>

Sets the position, that is the current playing time position.

You can select a value in a 10-hour range.

Parameters:

<Position> float
 Range: 0 to 36000000
 Increment: 0.1
 *RST: 0

Example: See [Example "Play a TS player file"](#) on page 55.

Manual operation: See ["Running/Position Player \[hh:mm:ss:fff\]"](#) on page 26

:TSGen:CONFigure:SEEK:RESet

Resets the following parameters to their default state:

- [:TSGen:CONFigure:SEEK:START](#) on page 60
- [:TSGen:CONFigure:SEEK:STOP](#) on page 60

Example: See [Example "Play a TS player file"](#) on page 55.

Manual operation: See ["Reset Window"](#) on page 28

:TSGen:CONFigure:SEEK:START <Start>

Sets an individual start time.

You can select a value in a 10-hour range.

Parameters:

<Start>	float
Range:	0 to 36000000
Increment:	0.1
*RST:	0

Example: See [Example "Play a TS player file"](#) on page 55.

Manual operation: See ["Start \[hh:mm:ss.fff\]"](#) on page 27

:TSGen:CONFigure:SEEK:STOP <Stop>

Sets an individual stop time.

You can select a value in a 10-hour range.

Parameters:

<Stop>	float
Range:	0 to 36000000
Increment:	0.1
*RST:	23040.2

Example: See [Example "Play a TS player file"](#) on page 55.

Manual operation: See ["Stop \[hh:mm:ss.fff\]"](#) on page 28

:TSGen:CONFigure:STOPdata <StopData>

Ensures that a standardized TS data stream is always output at the TS output at the rear of the R&S SMCV100B.

Parameters:

<StopData>	TTSP NONE
*RST:	NONE

Example: See [Example "Configure and monitor TS player output"](#) on page 56.

Manual operation: See ["Stop Data"](#) on page 30

:TSGen:CONFigure:STUFFing <Stuffing>

Enables or disables nullpacket stuffing.

Parameters:

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

Example: See [Example "Configure and monitor TS player output"](#) on page 56.

Manual operation: See ["Nullpacket Stuffing"](#) on page 29

:TSGen:CONFigure:TSPacket <TSPaket>

Sets the structure of the generated test packets in pause or stop status.

Parameters:

<TSPaket> H184 | H200 | H204 | S187 | S203 | S207
 S187|S203|S207
 A sync byte (0x47) followed by 187/203/207 payload bytes.
 H184|H200|H204
 A sync byte (0x47) followed by three header bytes and
 184/200/204 payload bytes.
 *RST: H184

Example: See [Example "Configure and monitor TS player output"](#) on page 56.

Manual operation: See ["Packet Length"](#) on page 29

:TSGen:CONFigure:TSRate <TSRate>

Sets the output data rate of the player.

Parameters:

<TSRate> integer
 Range: 1 to 35E7
 *RST: 5018502

Example: See [Example "Configure and monitor TS player output"](#) on page 56.

Manual operation: See ["Data Rate"](#) on page 29

:TSGen:READ:FMEMory <FMemory>

Queries the file size of the TS player file.

Parameters:

<FMemory> integer
 Range: 0 to 10
 *RST: 0

Example: See [Example "Configure and monitor TS player output"](#) on page 56.

Manual operation: See ["Select File"](#) on page 26

:TSGen:READ:ORIGtsrate <ORIGtsrate>

Displays the calculated original TS data rate.

Parameters:

<ORIGtsrate> integer
 Range: 1 to 350000000
 *RST: 5018502

Example: See [Example "Configure and monitor TS player output"](#) on page 56.

Manual operation: See ["Orig. Data Rate"](#) on page 29

:TSGen:READ:PLAYfile:LENGTH?

Queries calculated original loop time.

Return values:

<Length> integer
 Range: 0 to 100
 *RST: 0

Example: See [Example "Configure and monitor TS player output"](#) on page 56.

Usage: Query only

Manual operation: See ["Select File"](#) on page 26

5.6 BCIP Subsystem

The `SYSTEM:COMMunicate:BCIP` subsystem contains the commands for configuring local IP data network parameters.

Common suffixes

The following common suffixes are used in the remote commands:

Suffix	Value range	Description
BCIP<hw>	1	Available local IP LAN interfaces

Example: Retrieving information on local network-related settings

```
//*****
// Monitor IP interface 1 local network status.
//*****
:SYSTem:COMMunicate:BCIP1:NETWork:STATus?
// Response: "0"
// The instrument is diconnected from the local IP network.
:SYSTem:COMMunicate:BCIP1:NETWork:REStart
:SYSTem:COMMunicate:BCIP1:NETWork:STATus?
// Response: "1"

//*****
// Query local IP data network properties.
//*****
:SYSTem:COMMunicate:BCIP1:NETWork:COMMon:HOSTname?
// Response: "SMCV100B-123456-IP-Data"
:SYSTem:COMMunicate:BCIP1:NETWork:IPAdDress:MODE STAT
:SYSTem:COMMunicate:BCIP1:NETWork:IPAdDress "10.113.0.104"
:SYSTem:COMMunicate:BCIP1:NETWork:IPAdDress:SUBNet:MASK "255.255.252.0"
:SYSTem:COMMunicate:BCIP1:NETWork:MACAdDress?
// Response: "00 90 B8 21 89 F8"
:SYSTem:COMMunicate:BCIP1:NETWork:PROToCol?
// Response: "UDP"
```

Commands

:SYSTem:COMMunicate:BCIP<hw>:NETWork:COMMon:HOSTname	63
:SYSTem:COMMunicate:BCIP<hw>:NETWork:IPAdDress	64
:SYSTem:COMMunicate:BCIP<hw>:NETWork:IPAdDress:MODE	64
:SYSTem:COMMunicate:BCIP<hw>:NETWork:IPAdDress:SUBNet:MASK	64
:SYSTem:COMMunicate:BCIP<hw>:NETWork:MACAdDress	64
:SYSTem:COMMunicate:BCIP<hw>:NETWork:PROToCol	65
:SYSTem:COMMunicate:BCIP<hw>:NETWork:REStart	65
:SYSTem:COMMunicate:BCIP<hw>:NETWork:STATus	65

:SYSTem:COMMunicate:BCIP<hw>:NETWork:COMMon:HOSTname <Hostname>

Sets an individual hostname for the vector signal generator.

Note: We recommend that you do not change the hostname to avoid problems with the network connection. If you change the hostname, be sure to use a unique name.

Parameters:

<Hostname> string

Example:

See [Example "Retrieving information on local network-related settings"](#) on page 63.

Manual operation: See ["Hostname"](#) on page 34

:SYSTem:COMMunicate:BCIP<hw>:NETWork:IPADdress

Sets the IP address.

Parameters:

<IpAddress> string
 Range: 0.0.0.0 to 255.255.255.255
 *RST: 0.0.0.0

Example: See [Example "Retrieving information on local network-related settings"](#) on page 63.

Manual operation: See ["IP Address"](#) on page 35

:SYSTem:COMMunicate:BCIP<hw>:NETWork:IPADdress:MODE <IPMode>

Selects manual or automatic setting of the IP address.

Parameters:

<IPMode> AUTO | STATic
 *RST: AUTO

Example: See [Example "Retrieving information on local network-related settings"](#) on page 63.

Manual operation: See ["Address Mode"](#) on page 34

:SYSTem:COMMunicate:BCIP<hw>:NETWork:IPADdress:SUBNet:MASK

Sets the subnet mask.

Parameters:

<Mask> string
 Range: 0.0.0.0 to 255.255.255.255
 *RST: 0.0.0.0

Example: See [Example "Retrieving information on local network-related settings"](#) on page 63.

Manual operation: See ["Subnet Mask"](#) on page 35

:SYSTem:COMMunicate:BCIP<hw>:NETWork:MACAddress <MACAddress>

Queries the MAC address of the network adapter.

Parameters:

<MACAddress> string
 Range: 00:00:00:00:00:00 to ff:ff:ff:ff:ff:ff

Example: See [Example "Retrieving information on local network-related settings"](#) on page 63.

Manual operation: See ["MAC Address"](#) on page 35

:SYSTem:COMMunicate:BCIP<hw>:NETWork:PROToCol <Protocol>

Specifies the network protocol.

Parameters:

<Protocol> UDP
*RST: UDP

Example: See [Example "Retrieving information on local network-related settings"](#) on page 63.

Manual operation: See ["Protocol"](#) on page 35

:SYSTem:COMMunicate:BCIP<hw>:NETWork:REStart

Triggers a restart of the network.

Example: See [Example "Retrieving information on local network-related settings"](#) on page 63.

Usage: Event

Manual operation: See ["Restart Network"](#) on page 34

:SYSTem:COMMunicate:BCIP<hw>:NETWork:STATus <NetworkStatus>

Queries the network connection state.

Parameters:

<NetworkStatus> 0 | 1 | OFF | ON
*RST: n.a. (no preset. default: 0)

Example: See [Example "Retrieving information on local network-related settings"](#) on page 63.

Manual operation: See ["Network Status"](#) on page 34

Glossary: Abbreviations

A

ASI: Asynchronous Serial Interface

D

DHCP: Dynamic Host Configuration Protocol

DVB-S: Digital Video Broadcast - Satellite

I

IGMP: Internet Group Management Protocol

IGMPv3: Internet Group Management Protocol version 3

M

MAC: Media Access Control

MPEG: Moving Picture Experts Group
<https://mpeg.chiariglione.org/>

P

PID: Packet Identifier

PRBS: Pseudo-Random Bit Sequence

PSK: Phase Shift Keying

Q

QAM: Quadrature Amplitude Modulation

QPSK: Quaternary Phase Shift Keying

R

RTP: Real-Time Transport Protocol

S

SMPTE: Society of Motion Picture and Television Engineers
<https://www.smpete.org/>

T

TCP: Transmission Control Protocol

TS: Transport Stream

U

UDP: User Datagram Protocol

Glossary: Specifications

E

EN 300 421: Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for 11/12 GHz satellite services

https://www.etsi.org/deliver/etsi_en/300400_300499/300421/

EN 301 210: Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for Digital Satellite News Gathering (DSNG) and other contribution applications by satellite

https://www.etsi.org/deliver/etsi_en/301200_301299/301210/

I

ITU-T O.151: ITU-T Recommendation O.151

<https://www.itu.int/rec/T-REC-O.151-199210-I/en>

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