

# Interoperability tests of DVB-T2 receivers

Correct and time-saving parameter configuration thanks to predefined DVB-T2 test configurations in the R&S®SFU broadcast test system



## Your task

DTG, NorDig, V&V and Digital Europe<sup>1)</sup> have defined test specifications for interoperability tests on DVB-T2 receivers to ensure compliance with the DVB-T2 standard. Due to the standard's many possibilities for setting parameters, more than 180 DVB-T2 receiver tests are described in the D-Book (DTG) alone. Each test requires the configuration of DVB-T2 parameters such as L1 modulation and code rate. Depending on the test, users may have to configure up to 200 parameters – a time-consuming and error-prone task.

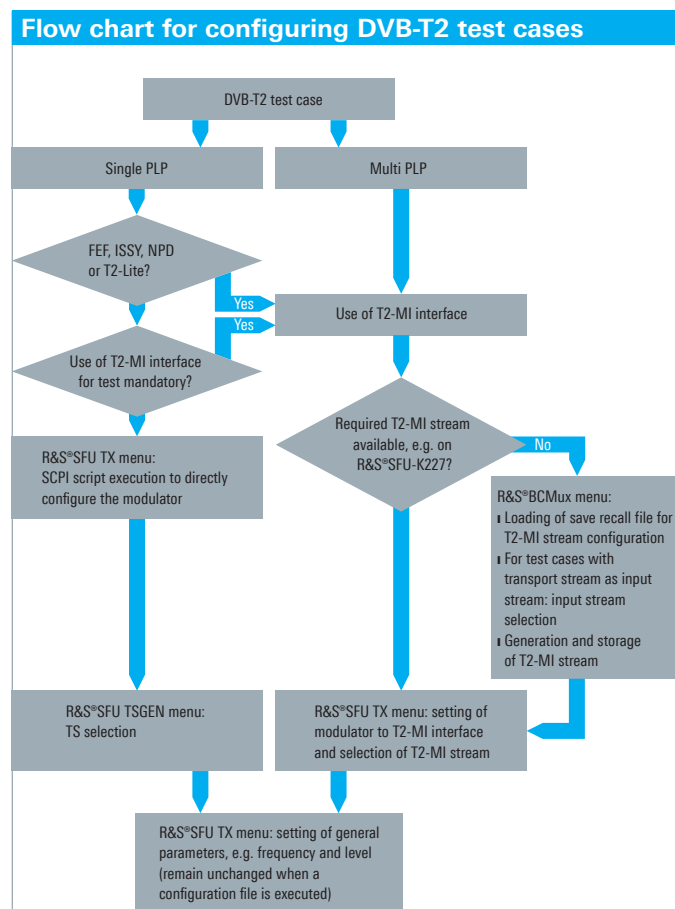
Incorrectly set parameters can result in an invalid DVB-T2 configuration and trigger a message in the generator. Searching for these parameters is time-consuming.

<sup>1)</sup> DTG: <http://www.dtg.org.uk>; NorDig: <http://www.nordig.org>; V&V: <http://www.dvb.org>; Digital Europe: <http://www.digitaleurope.org>

On the other hand, an incorrectly set parameter can also result in a valid DVB-T2 configuration. The signal is then generated without triggering an error message. In the best case, test results are not affected, and any receiver deviations are detected even though the test has not been performed in line with the test specification. In the worst case, the incorrectly set parameters will lead to incorrect results.

## T & M solution

The R&S®SFU with DVB-T2 realtime coder generates standard-compliant DVB-T2 test signals. Depending on the signal, it offers two different types of configuration files which automatically configure all DVB-T2 parameters in line with DTG, NorDig, V&V and Digital Europe when they are loaded.



The T2-MI stream is usually generated in the DVB-T2 gateway and contains the modulator configuration and program multiplex data (payload). The R&S®BCMux broadcast multiplexer software included in the R&S®SFU acts as a DVB-T2 gateway and generates T2-MI streams. The generated T2-MI streams are stored and can be reused.

When selecting input transport streams for R&S®BCMux, users need to make sure that the T2-MI output stream is not longer than the input stream (Output File ▷ Max. File Size) and that the input stream contains data for each PLP.

### Example

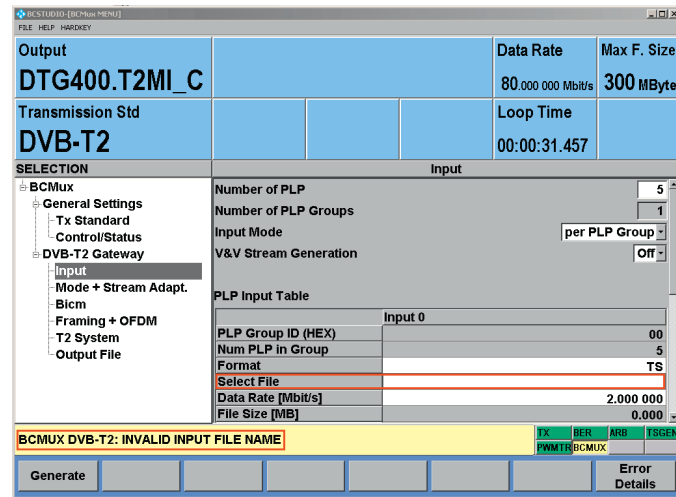
To configure a test using the T2-MI interface, the user selects the appropriate configuration file (FILE ▷ Recall Appl) in the R&S®BCMux software menu (APPL ▷ BCMUX). All DVB-T2 parameters are set automatically. If the test requires a transport stream as input stream, the following message appears: BCMUX DVB-T2: INVALID INPUT FILE NAME. The user then selects an input stream (formats: TS, TRP or T2TRP\_C) in the configuration tree under Input ▷ Select File.

If the data rate of the selected input stream is too high, the following message appears: BCMUX DVB-T2: GATEWAY CONFIGURATION ERROR – CHECK STATUS LOG. Another message in the Control/Status menu provides information about the error: Data processing error. Message: Number of cells used by all BB-Frames exceeds the available cells in the T2-Frame.

The Output File menu shows where the generated T2-MI stream is stored. Stream generation is started by pressing the Generate button.

In the TX menu (APPL ▷ TX), the modulator needs to be set to DVB-T2 (MODULATION ▷ Signal Source and Transmission Standard), and the T2-MI interface needs to be activated (DIGITAL TV ▷ INPUT SIGNAL ▷ T2-MI Interface: On and T2-MI Source: Internal). Finally, the generated T2-MI stream is selected in the TSGEN menu.

Thanks to predefined configuration files, users save valuable time and can be sure that the configuration is correct. Parameters can be adjusted as desired at any time.



R&S®BCMux after loading a save recall file: selection of input stream.

Designation	Type	Order No.
Broadcast Test System	R&S®SFU	2110.2500.02
<b>Options</b>		
Broadcast Multiplexer, integrated in R&S®SFU firmware	R&S®BCMux	included in R&S®SFU firmware
DVB-T2 Coder (single PLP and multi PLP)	R&S®SFU-K16	2110.7847.02
TRP Player (requires installation of R&S®SFU-B6 and R&S®SFU-B4)	R&S®SFU-K22	2110.7499.02
T2-MI Stream Library	R&S®SFU-K227	2115.2120.02
Coder Extension 15, coder hardware extension (for digital television)	R&S®SFU-B15	2110.7918.02
Additional Hard Disk, for TRP player (for R&S®SFU with serial number < 10 1000)	R&S®SFU-B6	2110.7501.02

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