Forward Tx Products

FD722 Board

Specifications. Work Modes

Quick Start

Table of Contents

Notice

The information in this document is subject to change without prior notice in order to improve reliability, design, or function and does not represent a commitment on the part of this company.

In no event will we be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or the inability to use the product or documentation, even if advised of the possibility of such damages.

Throughout this manual, we make reference to product names that are trademarks of other companies. We are using these names for identification purposes only, with no intention of infringement of the trademarks.

FCC Information

FCC ID:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.
Increase the separation between the equipment and receiver.
Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
Consult the dealer or an experienced radio/TV technician for help.

Shielded cables and I/O cards must be used for this equipment to comply with the relevant FCC regulations. Changes or modifications not expressly approved in writing by SoftLab-NSK Ltd. may void the user's authority to operate this equipment.

Limited Warranty

Our company warrants this product against defects in materials and workmanship for a period of one year from the date of purchase. During the warranty period, products determined by us to be defective in form or function will be repaired or replaced at our option, at no charge. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or as a result of service or modification other than by us.

This warranty is in lieu of any other warranty expressed or implied. In no event shall we be held liable for incidental or consequential damages, such as lost revenue or lost business opportunities arising from the purchase of this product.

The FD722 Specifications

The FD722 board is a hardware part of products designed by SoftLab-NSK used to organize digital TV broadcasting. The FD722 board supports SDI and ASI signals.
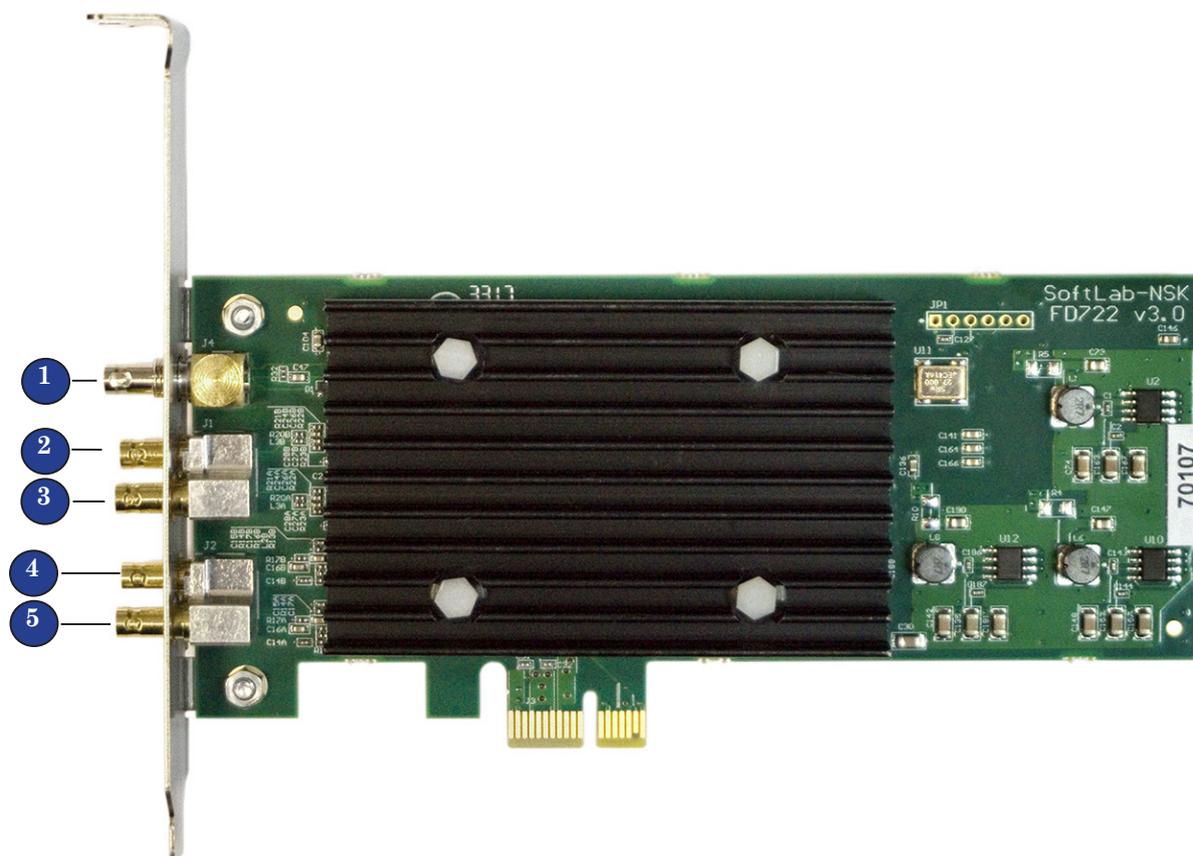
HD-BNC connectors are used to plug signal sources/receivers to board (see the picture):

- 1 – synchronization signal (analog signal);
- 2, 3 – input signals;
- 4, 5 – output signals.

The board allows working with the following types of signals: 3G-SDI, HD-SDI, SD-SDI and ASI. Each input and output can be customized for one of the types independently.

When dealing with 3G-SDI signals only one input can be used, both outputs transmit duplicated signal in this case.

The FD722 board does not have integrated encoder. So, to decode and encode video and audio content from transport stream use software/external encoders and decoders in solutions for processing TV programs from MPTS (board is in ASI mode in this case).

Table 1.   The FD722 Board Specification

Bus	PCI Express 1x (PCI Express 2.0)
Inputs	1 x HD-BNC for genlock 2 x HD-BNC SDI/ASI
Outputs	2 x HD-BNC SDI/ASI
Format of signal on input/output	SDI 10-bit: - SD-SDI: SMPTE 259M - HD-SDI: SMPTE 292M, SMPTE 274M, SMPTE 296M 3G-SDI: SMPTE ST 424, SMPTE ST 425-1 ASI (EN50083-9) Bit rate 0..213 Mbps
Internal signal processing	4:2:2 10-bit on input and output 4:2:2 8-bit internal mixing
Supported video formats	SD: PAL/NTSC HD: 720p 50/59.94/60 (50/59.94/60 frames/sec) 1080i 50/59.94/60 (25/29.97/30 frames/sec) 3G: 1080p 25/29.97/30/50/59.94/60
Audio	24 bit SDI Embedded, up to 8 audio stereo channels on 1 input/output: - SD-SDI: SMPTE 272M-A 3G-SDI, HD-SDI: SMPTE 299M Configurable audio delay (for each input mono channel independently). Audio is synchronized to video.
Genlock	Possible variants: - to external analog signal; - to any of the inputs.
Energy consumption	5 W
Size	Low-profile

Modes of Operation

1. General Information

The FD722 board work mode is customized in the FDConfig2 program window (Start > ForwardT Software > FDConfig2). The ability to use a particular mode depends on the product purchased.

Note: If you need help in selecting the most suitable solution for your tasks solving appeal to «SoftLab-NSK» technical support.
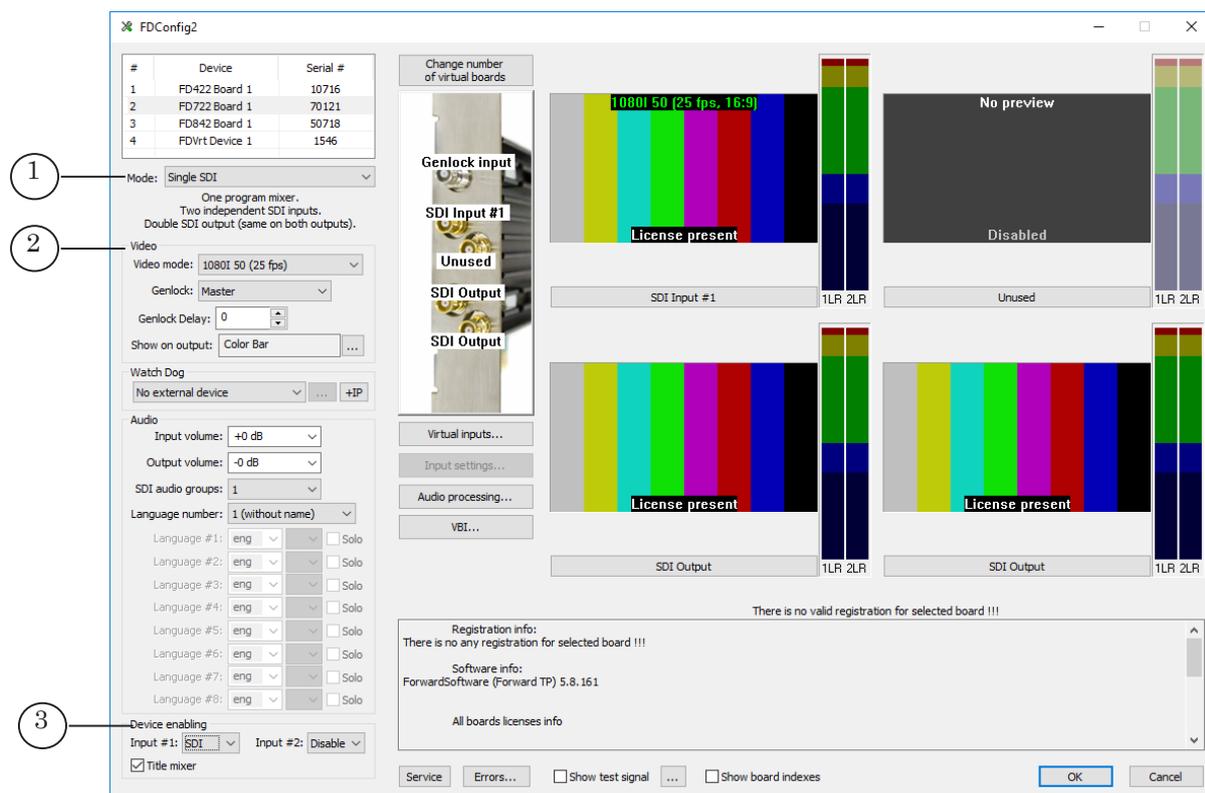
FDConfig2 main window. Control elements:
1 is a drop-down list for selecting mode; 2 are elements for customizing video format (in Mixed mode specifying values for SDI T [å^ # 1, SDI T [å^# 2); 3 denotes device enabling group of elements.

2. Modes List

The table below describes work modes of the FD722 board, i.e. description of items of the Mode drop-down list in the FDConfig2 main program window. Names of modes are given according to names from the FDConfig2 program. See the picture below for more information.

Genlock input

Input # 1

Input # 2

Output # 1

Output # 2
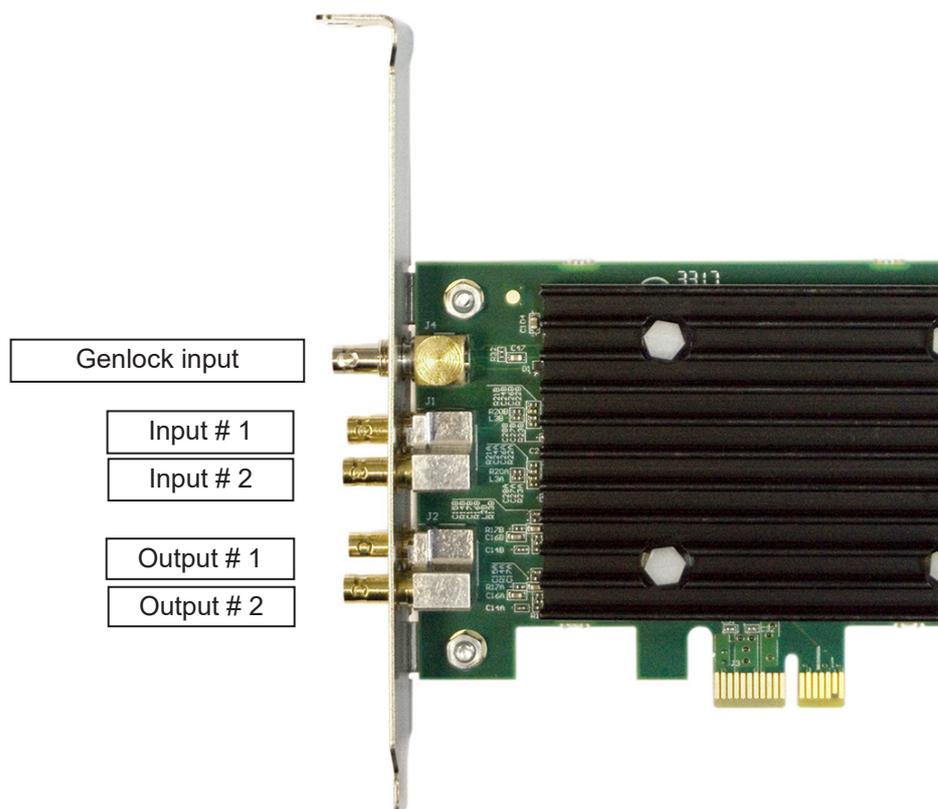
Table 2.   Modes: configuration of board work modes

Mode	Type of signal, content of signals in lines					Mixer
Products	Inputs		Outputs			
	# 1	# 2	# 1	#2	Content	
Single SDI	SDI/ASI	SDI/ASI	SDI	SDI	Content duplicated on both inputs[1]	One
Forward TA (SD-SDI/HD-SDI) 1 channel; Forward TP (SD-SDI/HD-SDI) 1 channel.	Examples of tasks for which ones this mode is preferred: – broadcasting of one channel with switching to FDOnAir between different sources in FDOnAir (VideoInput N command) with insertion of ads in passthrough signal; – broadcasting of one channel with delayed signal via FDTimeShift.					

Mode / Products	Type of signal, content of signals in lines					Mixer
	Inputs		Outputs			
	# 1	# 2	# 1	#2	Content	
Double SDI	SDI/ASI	SDI/ASI	SDI	SDI	Different, independent lines	Two
Forward TA (SD-SDI/HD-SDI) 2 channels; Forward TP (SD-SDI/HD-SDI) 2 channels.	There is a possibility to launch on one board two FDOnAir program instances in this configuration *in mode of a server background*, i.e. to organize two independent broadcasting channels. Examples of tasks for which ones this mode is prefer: – broadcasting of two channels with switching between different sources in FDOnAir (VideoInput N command) with insertion of ads into passthrough signal (all inputs/outputs – SDI); – broadcasting of two channels with delayed signal via FDTimeShift.					
SDI Fill + Key	SDI/ASI	SDI/ASI	SDI filling (Fill)	SDI mask (Key)	Different: # 1 – Fill; # 2 – Key	Absent
Forward TT (SD-SDI/HD-SDI)	The mode is used to organize solutions for overlaying titles over external passthrough video signal. Functions of server in this case are limited only by creating titles and controlling their output to external mixer (on air). Mixing is executed by external mixer, broadcasting of a passthrough video is carried out outside the server. Additionally for solution of other tasks audio and video data from board inputs (SDI/ASI) can be captured. The FDCapture program is used for capturing in this case. Work with graphs[2] to customize and receive ASI signal.					
ASI in/out	ASI	ASI	ASI	ASI	Different, independent lines	Absent
Forward TS-ASI	Examples of tasks for which ones this mode is preferred: – own broadcasting (clips located on PC hard disk); – insertion of ads in N quantity of channels of passthrough video from MPTS. The FDOnAir program works basing on FDVrt[3] board in this configuration. The FD722 board is used here as a device for input-output (ASI interface). Work with graphs[2] to customize and receive ASI signal.					

| Mode | Type of signal, content of signals in lines | | | | | Mixer |
| Products | Inputs | | Outputs | | | |
	# 1	# 2	# 1	#2	Content	
Mixed	SDI/ASI	SDI/ASI	SDI/ASI	SDI/ASI	Different, independent lines	Up to two
Forward TA (SD-SDI/HD-SDI)+ Forward TS-ASI	Examples of tasks for which ones this mode is preferred: – two channels: one is HD, the second is SD. Broadcasting with switching between different sources (VideoInput N commands) with ads insertion; – encoder: SDI signal on input and/to ASI on output; – decoder: program from ASI signal on input to SDI signal on output.					
SDI Monitor	SDI	SDI	SDI	SDI		Up to two
	Special mode. Two independent Raw-SDI inputs (full data).					
SDI Monitor-2	SDI	SDI	SDI	SDI		Up to two
	Special mode. Two independent Raw-SDI inputs (necessary data only).					

Note: [1] – As both outputs have signal with the same content then it is possible to send signal from output # 1 on air, from output # 2 to control monitor to be previewed.

[2] – Creation, customizing, launch and stop of graphs are executed in the SLStreamer Pro or SLStreamer Lite programs included in the Forward TS software set. For more information on the programs see the «SLStreamer Lite. Streamer Pro. Program for Configuring, Monitoring&Managing Digital Broadcasting Schemes» user's guide.

[3] FDVrt virtual board is a program module that processes audio and video data. The board is customized via the FDConfig2 program. The device is marked as Video device: FDExt > FDVrt Device N Output, where N is index of the board on the Configuration tab in the Settings window of FDOnAir.

3. Functionality Availability

The table below provides with a description of elements in the Device enabling group of elements of the main FDConfig2 program window in case of working with the FD722 board. As set and designations of elements depend on specified mode then list of elements is given for each mode separately.

Table 3.   Device Enabling group of elements

Mode	Designation	Comment: where/for what corresponding function is used, etc.

Single SDI	Input # 1:
	    Disable;
	    SDI;
	    ASI.
		Enabling capture of audio and video data from Input 1 input line with SDI/ASI type of signal.
		If the fucntion is off then playback/ capturing/previewing from Input 1 is impossible.
		The function can be used in the following programs:
		1. FDCapture – capture and record of audio and video data to AVI files.
		2. SLStreamCapture – capture and record of WMV stream data to file.
		3. FDReplayCapture/FDPostPlayCapture – input of audio and video data to storage.
		4. The Video2 title element – playback of audio and video from input line specified in window on background of a full screen video (PiP).

	Input # 2: Disable; SDI; ASI.	The same for Input 2 line.
	Title mixer	Enable using board mixer. Necessary for work of programs that playback video on board output, for example, the FDOnAir program. If the function is disabled then the FDOnAir program does not work.
Double SDI	Input # 1: Disable; SDI; ASI; Input # 2: Disable; SDI; ASI.	See comments to the Single SDI mode above.
	Title mixer # 1	Enable using board mixer for programs that playback video on Output 1 of the FD722 board, for example, for FDOnAir instance configured for working on FD722 Board 1 Output 1. If the function is disabled then the FDOnAir program in this configuration does not work.
	Title mixer # 2	The same for Output 2 line.

Mode	Designation	Comment: where/for what corresponding function is used, etc.

SDI Fill + Key	Input # 1:
	    Disable;
	    SDI;
	    ASI.
		Selection of work mode for Input 1 line: disabled, SDI- or ASI- interface.

	Input # 2: Disable; SDI; ASI.	The same for Input # 2 line.
ASI in/out	Input ASI # 1; Input ASI # 2; Output ASI # 1; Input ASI # 2; Clone output # 1.	Specifying enablings for use of corresponding input or output. If the mark is put the function is enabled, in case of absence – disabled. If the mark is put then content from ASI output # 1 is duplicated on ASI output # 2.

Mixed	Input # 1:
	    Disable;
	    ASI;
	    SDI mode # 1;
	    SDI mode # 2.
		Selection of work mode for Input 1 line: disabled, SDI- or ASI- interface in specified mode: SDI mode # 1 or SDI mode # 2.
		Important: see the Note under the table.

	Input # 2:
	    Disable.;
	    ASI;
	    SDI mode # 1;
	    SDI mode # 2.
		The same for Input # 2 line.

	Output # 1:
	    Disable;
	    SDI mode # 1 (Title mixer);
	    SDI mode # 2 (Title mixer);
	    SDI mode # 1 (Render);
	    SDI mode # 2 (Render);
	    ASI.
	Important: comment to items SDI mode... see in the Note under this table.
		Selection of work mode for Output 1 line: disabled, SDI- or ASI- interface in specified mode: SDI mode # 1 (Title mixer); SDI mode # 2 (Title mixer); SDI mode # 1 (Render); SDI mode # 2 (Render).
		
		Variants of SDI... (Title mixer) mode denotes enabling title mixer for programs that playback video on Output # 1.
		Variants of SDI... (Render) mode denotes disabling title mixer for programs that playback video on Output # 1. The variants are used in solutions for Virtual studio.

	Output # 1:
	    Disable;
	    SDI mode # 1 (Title mixer);
	    SDI mode # 2 (Title mixer);
	    SDI mode # 1 (Render);
	    SDI mode # 2 (Render);
	    ASI;
	    Clone output # 1.
		The same for Output # 2 line.
		
		If Clone output # 1 is specified then content from Output # 1 is duplicated on Output # 2.

Mode	Designation	Comment: where/for what corresponding function is used, etc.

SDI Monitor
SDI Monitor-2
	Output # 1:
	    Disable;
	    SDI mode # 1 (Title mixer);
	    SDI mode # 2 (Title mixer);
	    SDI mode # 1 (Render);
	    SDI mode # 2 (Render);
	    ASI.
	Output # 2:
	    Disable;
	    SDI mode # 1 (Title mixer);
	    SDI mode # 2 (Title mixer);
	    SDI mode # 1 (Render);
	    SDI mode # 2 (Render);
	    ASI;
	    Copy of output # 1.
		See comments for the Mixed mode, the Output # 1 item.
		
		See comments for the Mixed mode, the Output # 2 item.

Note: The FD722 board can work in mixed mode: with SDI signals of 2 different resolutions simultaneously, for example: HD-SDI 1080:50 and SD-SDI 576:50 (PAL).

At customizing of the board in mixed mode you should specify necessary configurations of video parameters via the SDI mode # 1 and SDI mode # 2 lists in the Video group of elements (1).
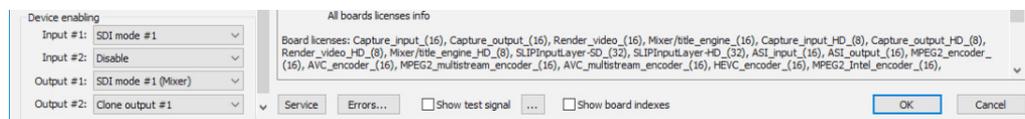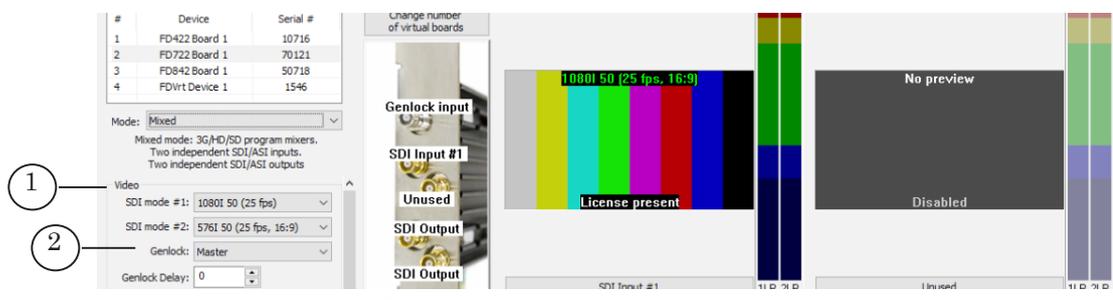
Important: Take into account that in mixed mode synchronization is always performed according to the 1st mode. I.e. synchronization is performed in the following way: the 1st mode is synchronized to signal source (item selected in the Genlock drop-down list (2)), the 2nd mode is synchronized according to the 1st mode.

Useful Links

Description, Software Delivery, Documentation, Ready Solutions

http://softlab.tv/index.html

Support

e-mail: forward@softlab.tv

forward@sl.iae.nsk.su

forward@softlab-nsk.com

Forum

http://www.softlab-nsk.com/forum

Documentation

1. ForwardT Software Setup. User's Guide;

2. FDOnAir. Broadcast Automation. Basic User's Guide;

3. FDOnAir. Additional Sections. User's Guide;

4. FDOnAir Commands List – Broadcast Automation. User's Guide;

5. FDConfig2. Application for Customizing FDExt Set of Boards Parameters. User's Guide;

6. Forward Watch Dog Box. Device for Monitoring Video Servers. User's Guide;

7. SLStreamer Lite. SLStreamer Pro. Program for Configuring, Monitoring & Managing Digital Broadcasting Schemes. User's Guide.