

FDConfig2



Program For Control and Customizing of
FDExt Boards Work Parameters

*Revision as of
December 29, 2012*

User's Guide

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Increase the separation between the equipment and receiver.

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Introduction

The document describes the FDConfig2 program and the way of its configuration using boards of the FDEExt type. The first section provides with the information on use of FDEExt boards included into hardware–software sets developed by SoftLab-NSK.

The FDConfig2 program is designed for testing a current state and setting of working parameters of FDEExt boards: FD322, FD422, FD842, FDVrt.

FDConfig2 is included into SoftLab-NSK products software set where one of the FDEExt boards is a hardware part.

The program is used at configuring of solutions and assists in implementing of the following functions:

- specifying of board working mode: inputs configuration, outputs configuration, hardware mixer configuration;
- specifying and configuration of mode of video and audio processing;
- configuration of synchronization mode;
- configuration of the WatchDog function (necessary for organising of a reserve broadcasting server);
- control over audio and video data on input/output lines;
- viewing of information on registered products, indices of plugged boards, software version, etc.;
- diagnostics of a current board state.

The program can be launched at working of other applications using the board, for example FDonAir, simultaneously.



Preliminary Information

Boards of the FDEExt Type

Boards of the FDEExt type are included into hardware and software set of products developed by SoftLab-NSK. The boards are used to organize TV broadcasting.

1. Types of Boards

FDEExt line includes the following types of boards:

- FD322 board is used for working with analog signal: CVBS, Y/C (S-video), YUV, RGB; up to 2 input lines;
- FD422 board is used for working with SDI and/or ASI signal; SD/HD format; up to 2 input lines; up to 2 independent output lines;
- FD842 board is used for working with SDI signal; SD or HD; 4 input lines, up to 2 independent output lines;
- FDVrt virtual device – a program module that processes audio and video data without hardware board. The module is available at having of a corresponding licence.

More information on technical characteristics of the boards you can find in the following sections.

2. Control Over Boards Functionality

Set of functional possibilities of the FDEExt type boards is broader than a set of functions for board available to be used in the limits of a concrete product.

Note: For example, basing on FD422 board you can customize solutions that differ in types of processed signal – SDI/ASI, video resolution – SD/HD, quantity of independent broadcasting channels on one board – one/two etc.

Licences necessary to use functions of board or use virtual board are available at purchasing of product. Information on licences is stored in product registration key and at its activation the information is recorded into system registry.



- ✓ **Important:** Set of available board functions is limited by licences that are in set of a purchased product.

At the beginning after installation of software a standard configuration that specifies mode of board functioning is active.

User can modify standard configuration by customizing mode of board working according to his needs (taking into account available licences) via the FDConfig2 program.

3. Serial Number and Marking of Board in the System

Each board supplied in SoftLab-NSK products set has a unique serial number. The index is located on board surface and is also written in its chip. Serial number is an external identifier of board. Product registration key is attached to this number.

- ✓ **Important:** When appealing to the Support department concerning questions of board and products functioning (for example, in case of registration key lost) you must necessarily inform on number of your used board.

At plugging of board into PC (or activating of virtual board) it receives the name automatically – a unique internal device identifier. The name has board type designation and index – its sequential number, for example, FD322 Board 1, FD422 Board 3, FDVrt Device 1, etc.

Note: For boards: numbering depends on placing of boards in slots of PC mother board. If there are several boards of one type then at boards replacing their names can be modified.

The name is used for marking of board in programs included into SoftLab-NSK products sets. For example, the name is necessary to specify device at customizing in FDO nAir. Serial number and name of each board are displayed in FDConfig2 program window.

4. FDEExt Service

FDEExt service is a service of boards of the FDEExt type. The service is launched at each switching on/restarting of PC. FDEExt service can be stopped and started manually via PC standard means.

At closing of FDConfig2 with changed settings FDEExt service is automatically restarted.

Note: Additionally FDEExt Service can be launched/stopped via FDP o s tPlay Indicator program menu if you work with a product with PostPlay software.



Registration of Product

To use any product developed by SoftLab-NSK you should first register, i.e. activate product registration key on PC where you will work. If the product is not registered its functions are blocked.

Information on registration of product is displayed in FDConfig2 program window.

Registration key is supplied in a set of products. The key can be either a special registration file (*.reg) that is attached only to serial board number or a set that includes HASP HL USB key with registration file (for products that do not require board). USB key is identified according to the index located on its surface.

- ✓ **Important:** When appealing to the Support department concerning registration of products (for example, in case of registration key lost) you must necessarily inform on number of your used board or USB key index.

At purchasing of product you will be provided with a permanent registration key. Moreover, on user appeal he can be provided with a temporary key to use any product to examine its possibilities.

- ✓ **Important:** You must necessarily activate registration key before configuring and using product.

We recommend activating registration key right after plugging of board into PC. Complete the following before installing product software:

1. Double-click name of registration file. After this necessary information is added into Windows Registry. Then restart your PC. Name of registration file has the reg extension. This file is located on installation disk in the Registration folder.
2. Complete this step if you deal with HASP HL USB key. Install key drivers on your PC. Drivers installer is located in the HASPDrivers folder on installation disk. Then insert key into PC USB. The key must be in PC during all time of working with product.



Boards Input Lines

1. Use Order

Boards of the FD322/FD422 type have two independent lines (input lines) via which video received from sources plugged to the board is transmitted. Boards of the FD842 type have four input lines.

Mode of input lines working depends on current configuration specified in FDConfig2. Set of licences to use input lines depends on type of a purchased product (more information on this issue see in the «Products Functionality» document).

Note: Generally the following functions that activate input lines can be available in products from set:

- broadcasting of a full-screen passthrough video and audio data received from source plugged to board, with a possibility of sources switching – FDO nAir (application designed for automated control over broadcasting process) commands: Video Input 1–Video Input 6;
- broadcasting of video and audio data received from source plugged to board in the «picture in picture» mode (in window on a full-screen video background) – Video 2 title element;
- capturing and recording of video and audio data from input/output line:
 - into AVI files via the FDCapture program;
 - into WMV files via the SLStreamCapture program;
- capturing and recording of video and audio data into storage of the PostPlay system – the FDP o s t P l a y C a p t u r e program;
- viewing content of input/output signal on PC monitor – the FDP r e v i e w program;
- synchronization from external source.

Take into account that some of the functions can be absent in different products.

2. Marking

In programs included into SoftLab-NSK products set input lines are marked as Input 1 and Input 2 (there are additional Input 3 and Input 4 on FD842 board). These marking can be a part of a composite name of video device (including board index), for example:

FD322 board 1 Input 1 denotes input line #1 of the FD322 board number 1.



3. Selection of Sources

Right after launch of FDExt Service signal sources for the Input 1 and Input 2 (Input 1, Input 2, Input 3, Input 4 for FD842 board) lines are automatically specified according to active scheme of plugging of sources to board and according to initial settings.

Initial sources selection is actual till a command of passthrough video switching is activated in FDO nAir (VideoInput 1–VideoInput 6). At executing of the VideoInput 1–VideoInput 6 commands sources can be respecified according to commands settings automatically.

At the first system launch input lines have standard initial settings. These settings can be modified via the FDConfig2 program (the Input Settings window):

- for the FD322 board – it is possible to select necessary sources of audio and video data;
- for the FD422/FD842 boards (in SDI mode) – it is possible to select necessary audio data from SDI signal.

Boards Output Lines

1. Using Order

There are two lines that deal with output video data on FD322/FD422/FD842 boards. The lines can be used either independently or duplicate each other. The FDVrt board has only one output line.

Mode of output lines working depends on current configuration specified in FDConfig2. Set of licences to use output lines depends on type of a purchased product (mode details on this issue see in the «Products Functionality» document).

To activate board in broadcasting system you should specify a corresponding output line in FDO nAir program (application designed for automated control over broadcasting process) at its configuring.

Note: Generally the following functions that activate output lines can be available in products from set:

- up to two independent broadcasting channels – functioning in FDO nAir in mode of a background server (1 background server – 1 independent channel);
- broadcasting of video and audio data received from source plugged to board in the mode of «picture in picture» (in window on a full-screen video background) – Video 2 title element;
- capturing and recording of video and audio data from input/output line:



- into AVI files via the FDCapture program;
- into WMV files via the SLStreamCapture program;
- viewing on PC monitor content of input/output signal – the FDPreview program.

Take into account that some of the functions can be absent in different products.

2. Marking

In programs included into SoftLab-NSK products set output board lines are marked as Output 1 and Output 2. If mode that enables only one independent broadcasting channel is selected (for example, for FD322 – Output 1 ch) then marking without index is used: Output.

These marking can be a part of a composite name of video device (including board index), for example:

FD322 board 1 Output 1 denotes output line #1 of the FD322 board number 1.

3. Selection of Video Receivers

Receivers of signal for the FD422/FD842 boards are plugged via Output #1 and Output #2 slots.

To specify receivers for the FD322 board you should specify commutation lines to which receivers are plugged in FDConfig2 program. At first system launch standard settings are active.

4. Mode of Audio Output Working

Mode of audio output working specifies quantity of audio tracks (stereopairs) in output signal: for simple boards – one/two, for virtual boards – up to three.

If quantity of audio tracks is more than one then you must specify identifier of audio track (language) for each stereopair. It is necessary for audio streams to be distributed according to stereopairs correctly.

Working mode of audio output identifier for stereopairs is specified in the FDConfig2 window.

5. Initial Settings for Output Lines

Initial settings of output lines specify sources of audio and video data for output board lines for the period of time from launching of FDExt Service and till either switching to another audio or video data manually or automatically is implemented, for example, right after PC launch and till either the VideoInput N (N is an index from 1 up to 6) or Show Clip command in FDO nAir is not activated.

Initial settings are used for both hardware and virtual boards. Each line in mode with two independent output lines has its own settings.



At first system launch standard settings are active. The settings can be changed via the FDConfig2 program.

Mode of Synchronization

In solutions based on FDExt boards synchronization can be implemented via either internal generator of used board or via some external source plugged to one of the input board lines (genlock).

Synchronization mode is configured in the FDConfig2 program.

Reserving of the System. WatchDog Function

To organize a correct work of a broadcasting complex based on FDExt boards the WatchDog function can be used. The function provides with a possibility of controlling current state of the main air server and in case of its failure (in case of absence of a response during some period of time, 1 second is by default) it switches to a passthrough signal or to reserve server.

There are several variants of WatchDog function use:

- Forward WatchDog Box external device that is used for working with solutions that deal with analog signal (FD300/FD322 boards) or with SDI signal (FD422/FD842 boards);
- Forward ASI WatchDog Box external device that is used for solutions that deal with ASI signal (FD422 board);
- integrated board functions (FD322/FD422 boards).

The WatchDog function is configured in FDConfig2 program.

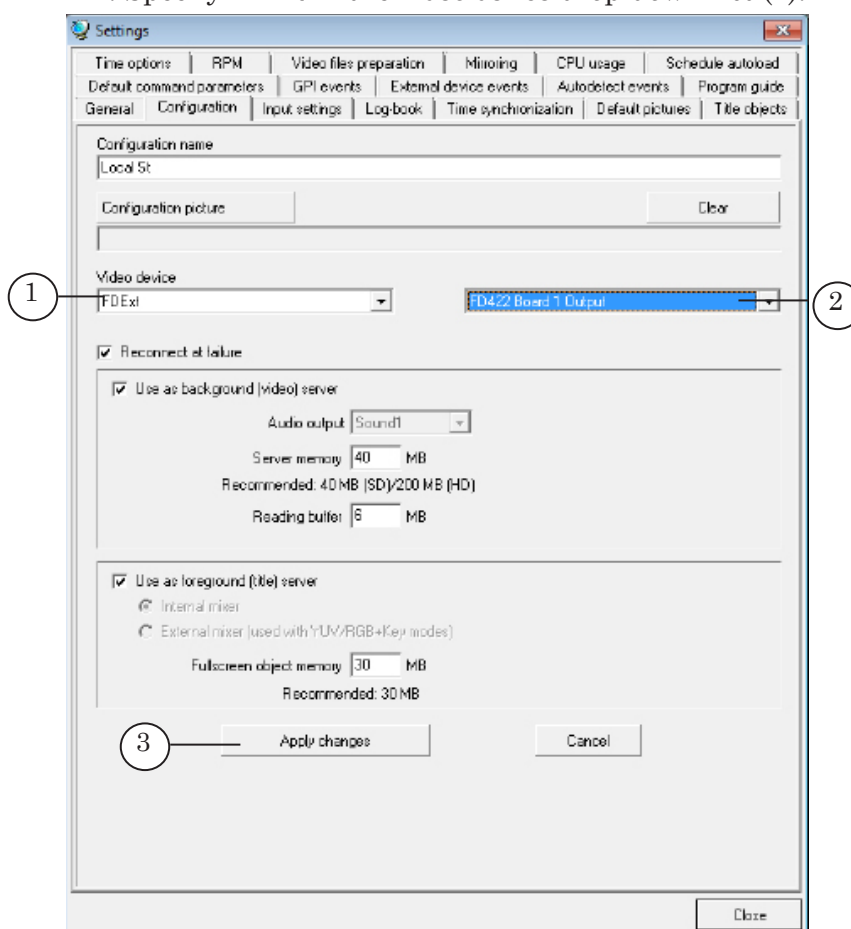


Configuration of Program That Controls Broadcasting to Work with Board

The FDOAir program is the most important program in SoftLab-NSK solutions designed for automated control over TV broadcasting.

Open the main FDOAir window after necessary configuration is specified and saved in FDConfig2 program to configure FDOAir for working with FDEExt type board. Open window with its settings and complete the following:

1. Select video device for processing and output of video and audio data on the Configuration tab:
 1. Specify FDEExt in the Video device drop-down list (1).



2. Specify necessary output line in the near located drop-down list (2). Contents of the list depends on a set of FDEExt boards present in the system and specified for each of the board mode in FDConfig2. For example, the following combinations can be for the FD422 board:

- in a double channel mode:
 - FD422 Board N Output 1 – line Output 1;



- FD422 Board N Output 2 – line Output 2;
- in a single-channel mode: FD422 Board N Output (the only output line);
- in the SDI Fill + Key mode: FD422 Board N Output (Fill + Key).

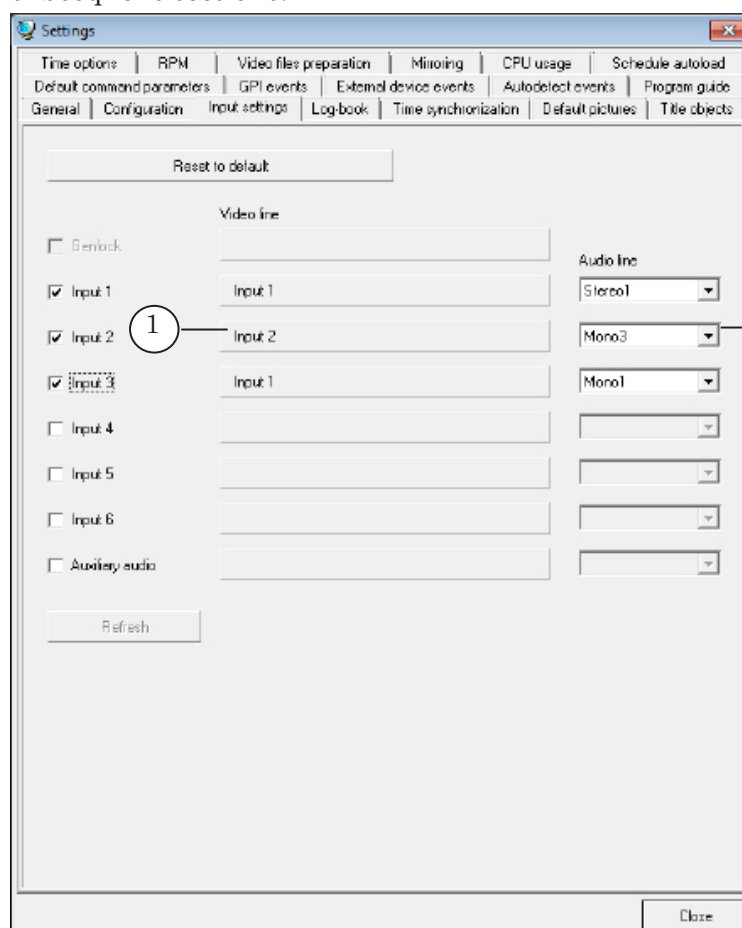
N is an index of used FD422 board.

3. Click Apply changes (3) to apply new configuration and wait till the button becomes grey (it may take several seconds).

2. Specify sources of video and audio data for the VideoInput 1 – VideoInput 6 commands. Click Prepare in the main program window.

The commands are used to control broadcasting of a passthrough video data received from specified sources. The commands can be activated either on schedule or manually via buttons of interactive control.

Sequence of commands configuration depends on type of used board. More information on this issue see in the subsequent sections.





FDConfig2. General Information

Program Launch

The FDConfig2 program can be launched at any moment regardless if other programs that work with FDEXT boards are launched.

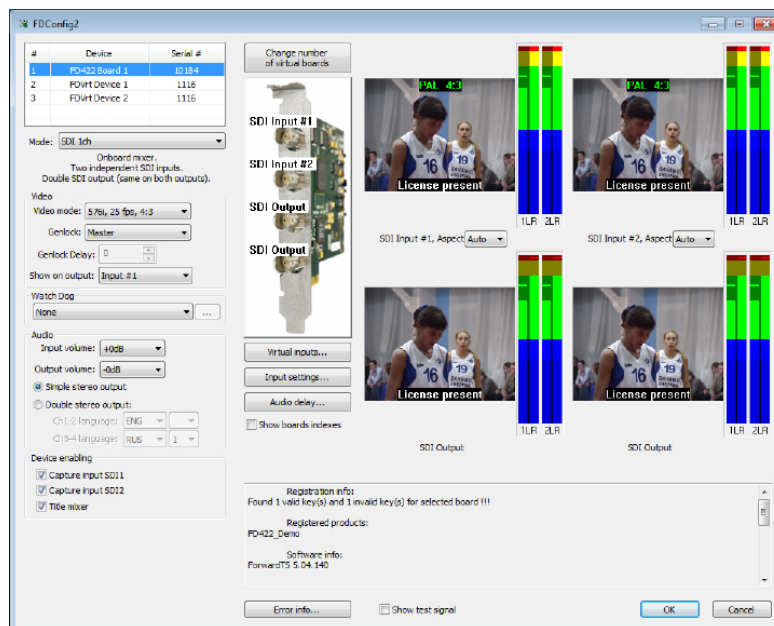
The program can be launched at opening of the ~\FDConfig2\FDConfig2.exe file, where ~ denotes a full path to the folder where product software set is installed (at standard installation the path is: C:\Program Files\ForwardT Software).

To launch the program you can use:

- the Start menu command: Programs > ForwardT Software > Board Setup > FDConfig2;
- program shortcut located on desktop:



When the program is launched its main window opens.

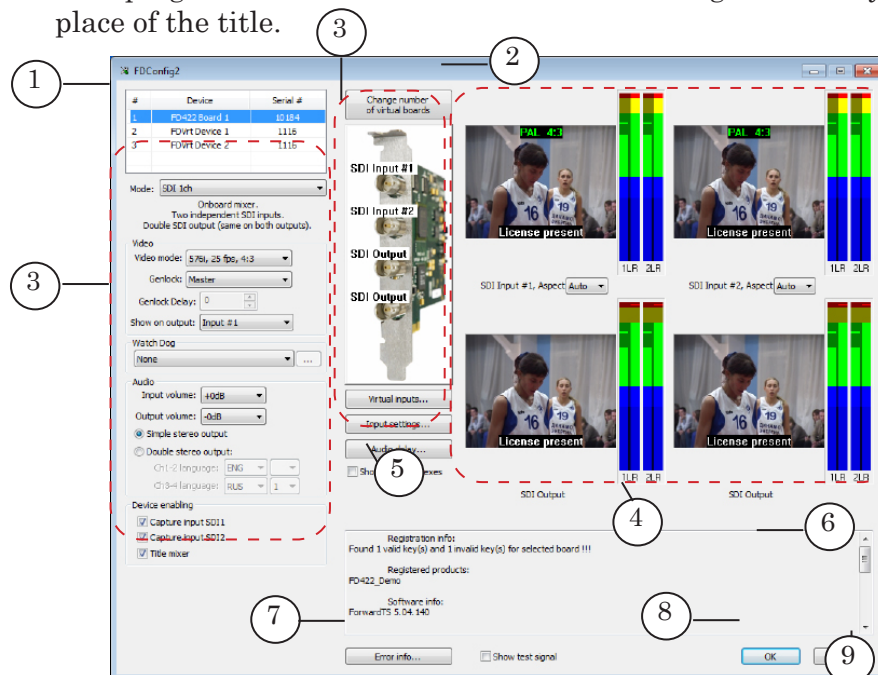




Program Interface

1. Main Program Window

The main program window is used to control and configure working parameters of FDEXT boards present in the system. User interface language is selected at the first program launch automatically – Russian or English. To change the language use commands of the main window system menu. To open the menu click program icon in the main window title or right-click any place of the title.



Main window. Control elements:

1 – selection of board to control and configure; 2 – add/remove virtual boards; 3 – customizing of work configuration for selected board; 4 – control over audio and video data on board input and output; 5 – display/hide titles on boards outputs; 6 – information on used products, registrations, licences; 7 – checking board errors; 8 – close program window applying changes; 9 – close program window without applying changes.

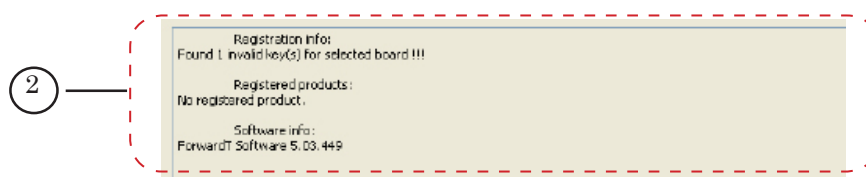
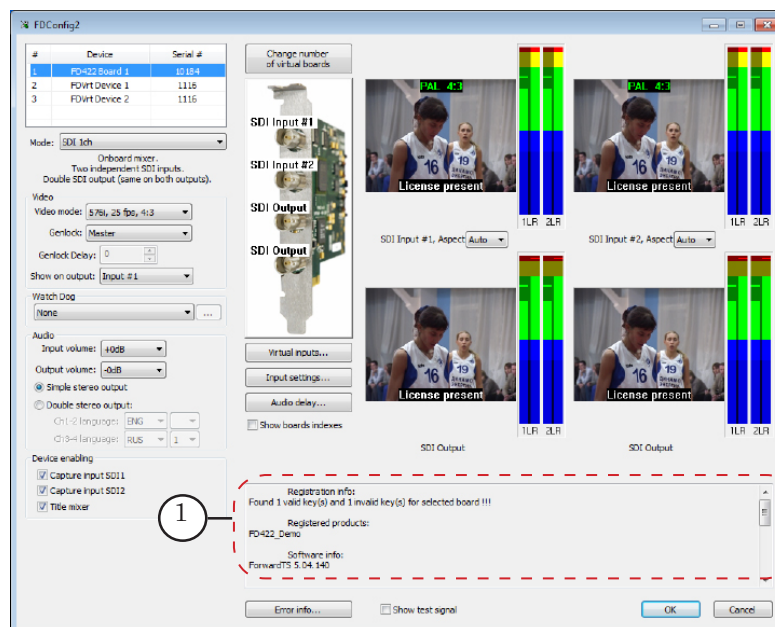
Table (1) has a list of boards of FDEXT type (including virtual ones) that are present in the system.

Set of control elements in groups (3) and (4) depends on type of selected board and mode of board working. All information that is displayed and can be changed concerns selected board.



2. Registration

Information area (1) of the main program window displays data on activated registrations for used products. Information on versions of installed software is also displayed here.



Information area:

1 – registration is implemented correctly; 2 – registration is not implemented.

✓ **Important:** The No registered product denotes that registration for a purchased product is not implemented. Product functions are blocked. Close FDConfig2 and implement registration in this case.

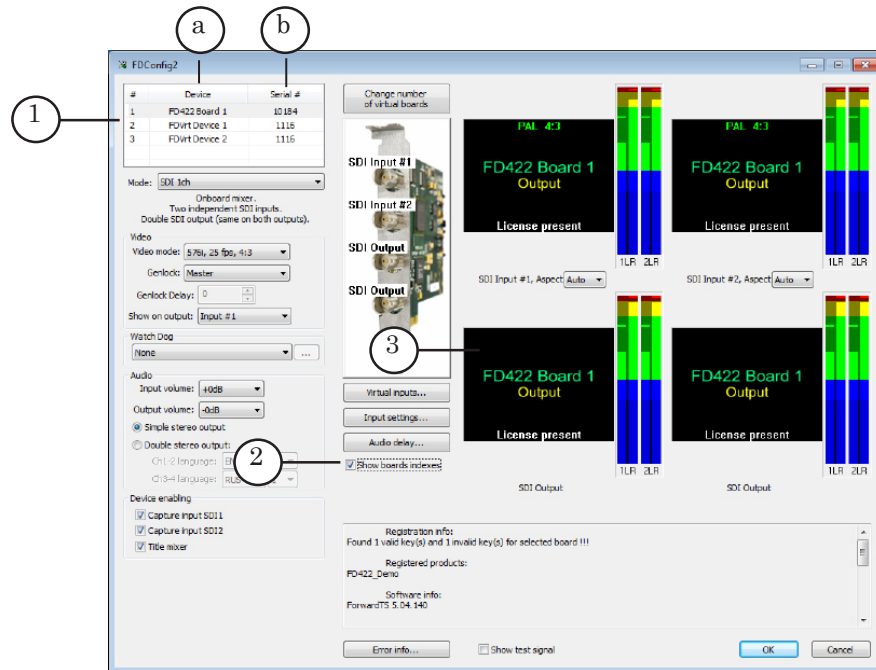
For more information on registration see the «Registration of product» section above.



3. Indices of Boards

Table with a list of boards (1) displays sequential indices of boards (a) and their names (b). The name is identifier of the board in the system. Name of board must be specify so that it can be used in other applications, for example, in FDO nAir.

Note: FDExt virtual boards can have HASP key number of a product as a serial number.



Put the Show boards indexes check mark (2) to display information on boards names in output signal. As a result boards names are displayed on outputs of all FDExt boards simultaneously (3). The names are displayed till the mark is put and till the FDCOnfig2 program window is opened.



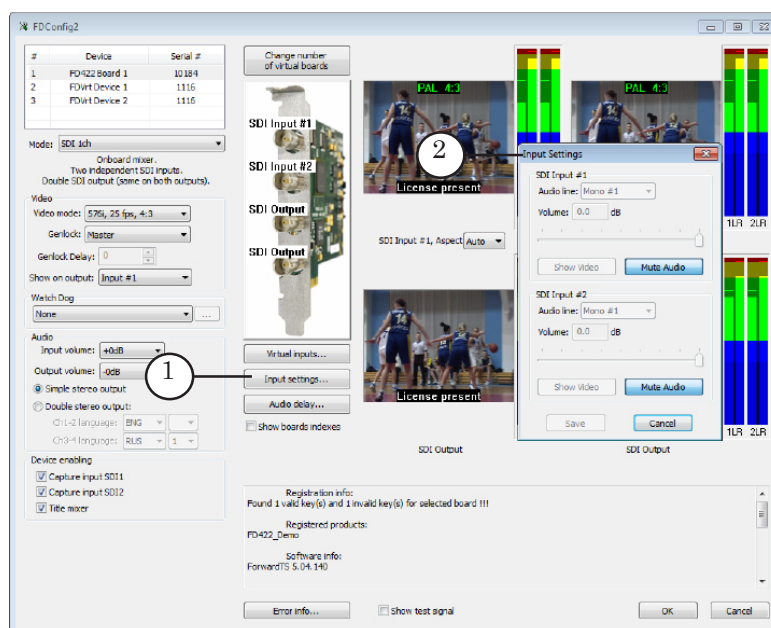
4. Configuration of Inputs: Initial Settings for Input Lines

Initial settings specified in the FDConfig2 program specify sources of audio and video data for input board lines:

- for FD322 – sources of video and audio data for Input 1/Input 2 lines;
- for FD422 – audio lines from SDI signal for Input 1/Input 2 lines;
- for FD842 board – audio lines from SDI signal for Input 1/ Input 2/ Input 3/ Input 4 lines.

Note: Initial settings of input lines are active from the moment of FDExt Service launching and till FDO nAir command of switching to a passthrough video is activated (VideoInput 1 – VideoInput 6 commands). More information on board lines see above in the «Preliminary Information» section.

Use the Input Settings... button (1) to open a window for customizing of initial input settings. Appearance of the window (2) depends on type of configured board. More information on order of settings customizing you may find in sections corresponding to each board type in the «Features of Customizing of Different Board Types» section.





5. Configuration of Outputs: Initial Settings for Output Lines

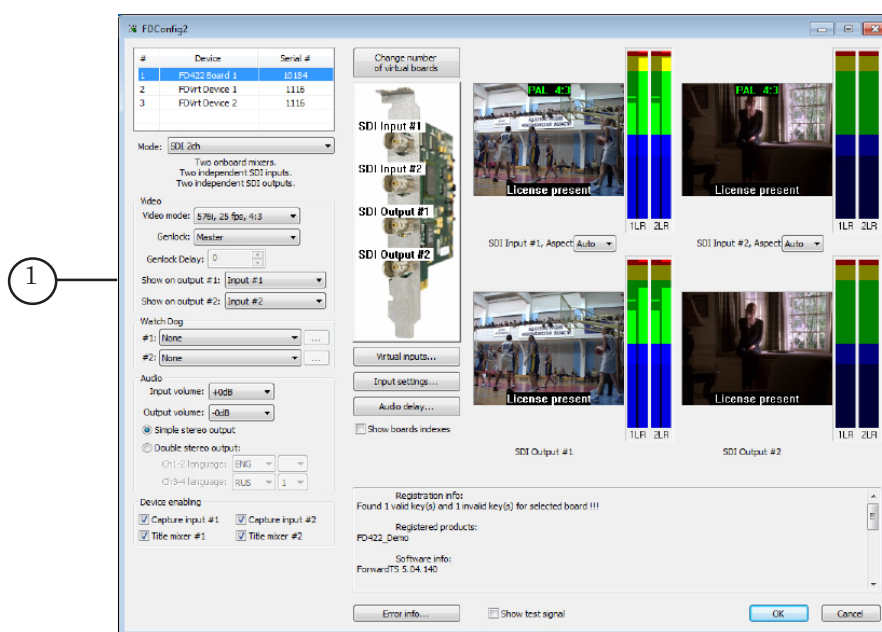
Initial settings of output lines are for both hardware and virtual boards.

The settings specify what audio and video data is output on board outputs starting from the moment of FDEXT Service launching (immediately after PC launch, for example) and till switching to necessary video or audio data manually or automatically is not implemented (till VideoInput N is not activated in FDOAir, for example).

Use the Show on output drop-down lists (1) to customize initial settings; when dealing with FDVrt – the lists are a group of radio buttons. Possible values here are:

- CBG – color bar generator;
- Input 1 – passthrough video from Input 1 line and audio data from a corresponding audio line (see the «Configuration of Inputs» section above);
- Input 2 – passthrough video and audio data from Input 2 line;
- file (picture) from specified graphic file (for FDVrt boards).

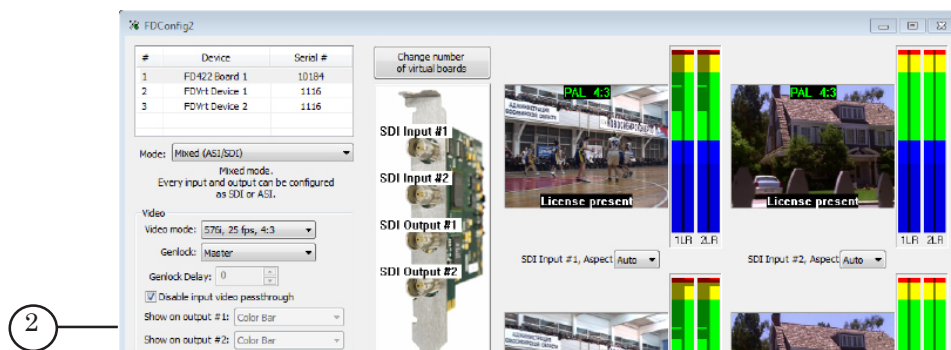
Each line is configured separately in mode of working with 2 independent output lines.



Note: CBG is displayed on output of virtual board only till FDOAir launch.



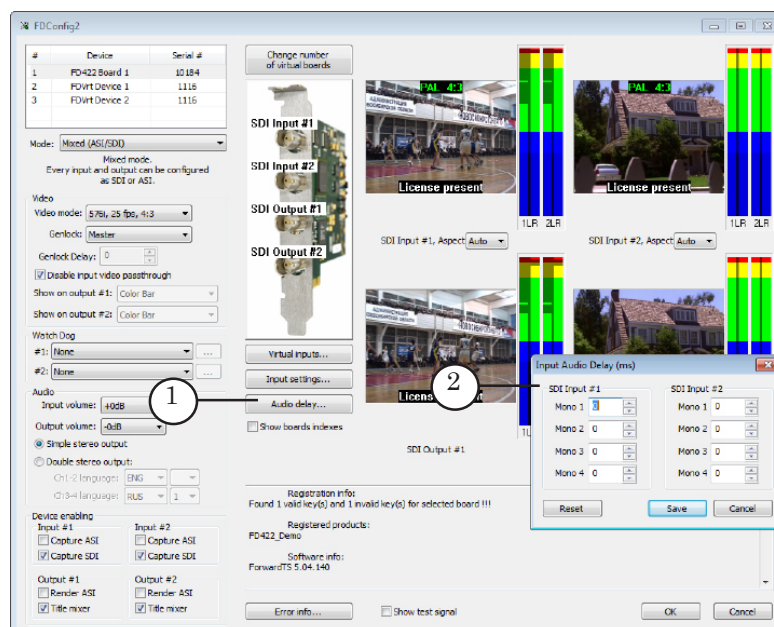
In some modes (with software mixer) the Disable input video passthrough radio button (2) is available additionally. If the mark is put then a passthrough video data is not output without special command. It allows optimizing PC resources usage.



6. Configuration of Audio Delay

The Audio delay... button (1) is used for opening window and customizing delay of input audio data relatively to video data (2).

Appearance of the window depends on type of configured board. Each monochannel of input audio data can be configured independently. Value of delay is specified in milliseconds.

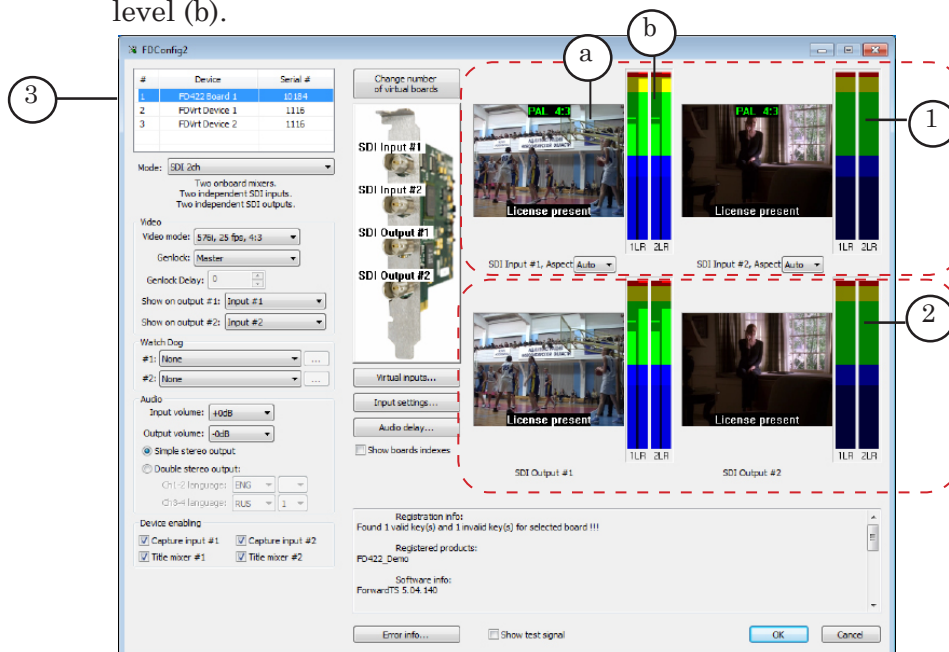




7. Control Over Audio and Video Data on Boards Outputs/Inputs

1. Groups of Elements

The main program window has groups of elements used to control over audio and video data on inputs (1) and outputs (2) of board: preview window (a) and graphic indicators of audio level (b).



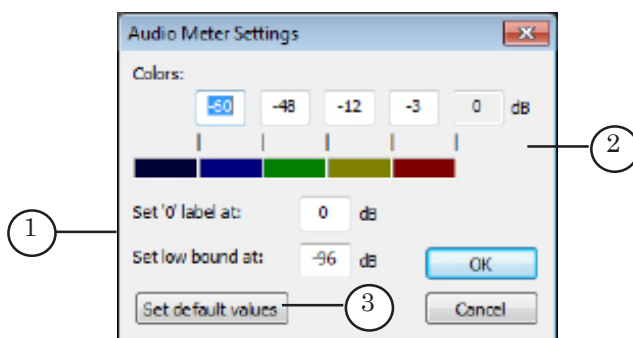
Quantity and grouping of elements depend on type of board specified in general list (3).

Note: A possibility to control audio and video data on boards inputs/outputs in FDCConfig2 program window is useful at customizing of solution. Deal with the FDPReview program when solution is being used. More information on this program you can find in the «FDPReview. Previewing of Audio and Video Data on Boards Inputs/Outputs» user's guide.

2. Features of Audio Meter. Configuration

Changing of audio meters colors indicates a current audio level in both left and right monochannels of stereopairs. To view a value that corresponds to any of the place on a scale click this place on the scale. The mark is displayed till the button is clicked.

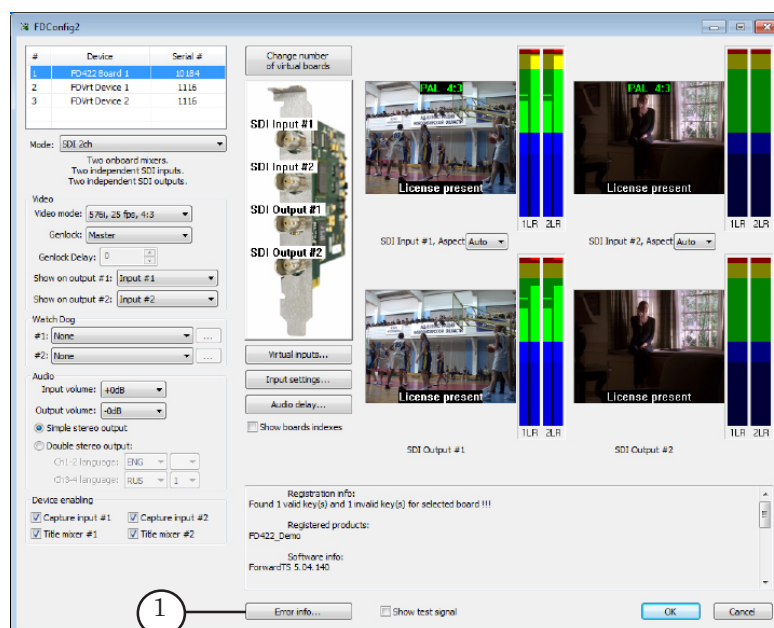
Audio meter scale range and used color indications can be varied. To do this right-click the meter and select the Audio Meter Settings... command in the appeared context menu. Specify '0' label (1) and low bound values and customize correspondence between color marking and audio level range values (2).



If the Set default values button (3) is clicked default values of audio meter parameters are set.

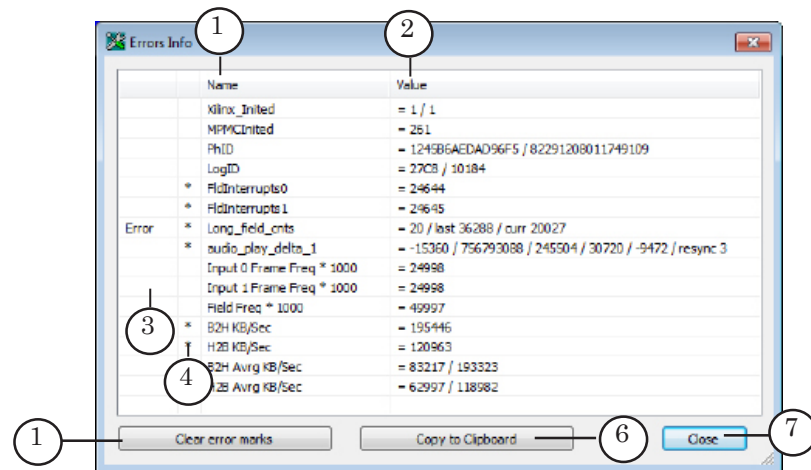
8. Board Testing

The Error info... button (1) located in the main program window is used to launch a procedure of board parameters diagnostics. The results are displayed in the special Error info... window.





While the Error info... window is opened current board state is checked once a second automatically. The results are updated in the window.



Results of diagnostic are presented in the form of a table: list of tested parameters (1) and their current values (2).

If any of the values is incorrect then Error is displayed in the first column (3). If value of some of the parameters is changed during the last second the «*» mark in the second bar (4) appears.

When you click the Clear error marks button (5) all found errors are reset and parameters values are recalculated. If diagnostic is launched at first time from the moment of system start we recommend resetting errors.

Click the Copy to Clipboard button (6) and save window screenshot in any of the graphic editors to send information on results of diagnostic to the Support department. Apply saved file to the e-mail.

Click the Close button (7) to close the window and to stop a procedure of board diagnostic.



9. Collecting of Data on Current Settings and Output of a Report

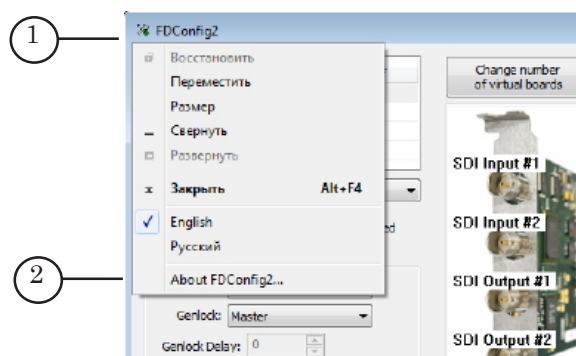
To collect and save all data on current work parameters of board, used software in text file and further procedure of sending of this file to SoftLab-NSK Support department (when necessary) the SLSaveInfo program is used.

Use the Start menu command:

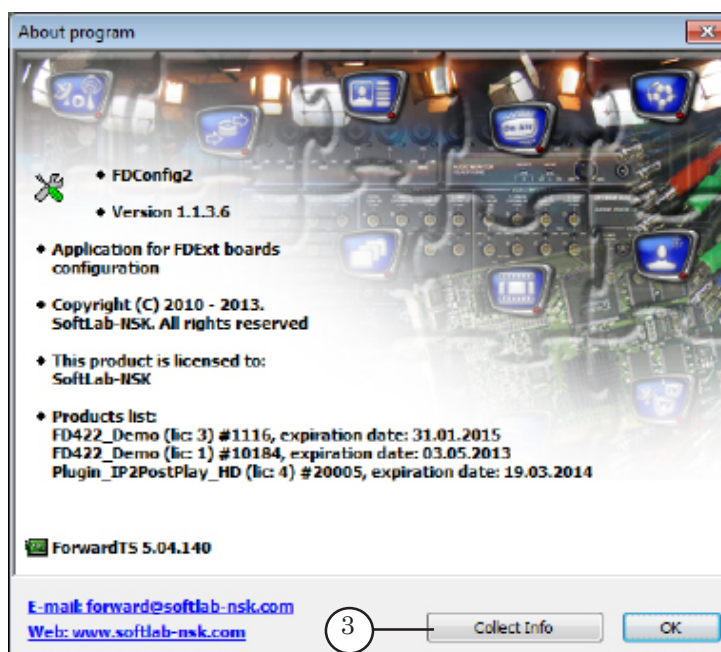
Programs > ForwardT Software > Tools > Save Info to open the program.

The program can be also opened without exiting FDConfig2 window by:

1. Clicking program icon in title bar of the main program window (1) or right-clicking any place of title bar.
2. Select the About FDConfig2... menu item (2) in the appeared window.

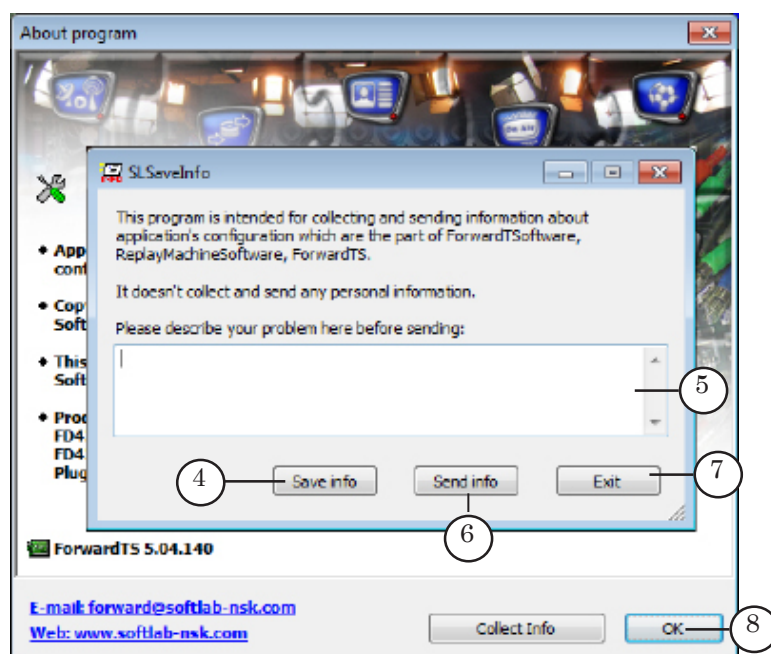


3. Click the Collect Info button (3) in the About program window. SLSaveInfo program window appears. Complete the steps in this window.





4. Click the Save info button (4) in SLSaveInfo window to collect and save data on current work parameters in file. You can view file with a report in any text editor.



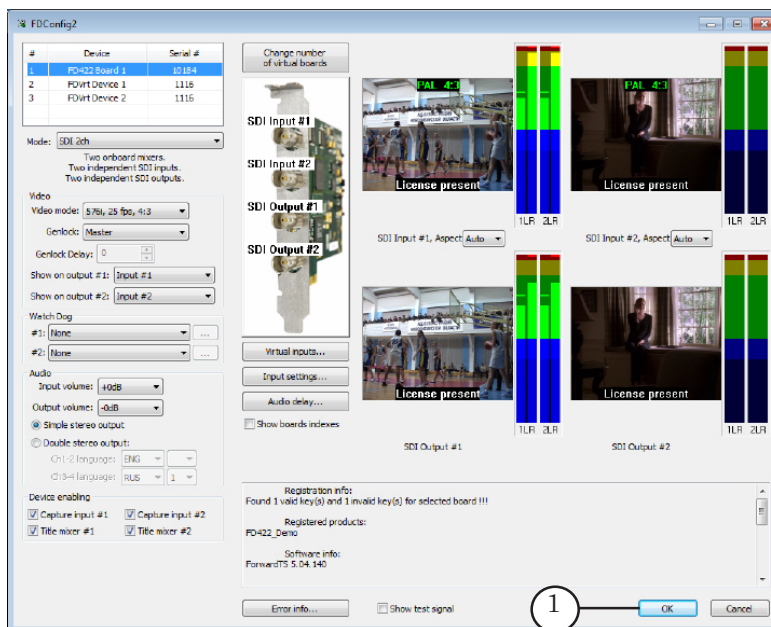
5. If it is necessary to send the report to SoftLab-NSK Support department describe the problem (5) and click the Send info button (6). The e-mail with the attached report will be sent.
6. Click Exit (7) to finish working with the program.
7. Click OK (8) to close the window with information on program.



10. Saving of Changes

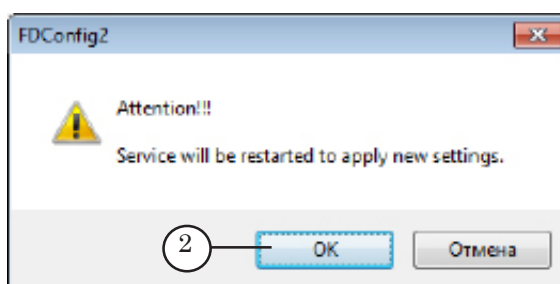
Close the window applying new configuration completed in FDConfig2 program window for them to become active:

1. Be sure that all applications that use selected board are closed.
2. Click the OK button (1) in FDConfig2 program window.



3. The following message appears. Click OK (2) in message window to restart FDEXT Service service.

✓ **Important:** Preliminary close all programs that use selected board to restart FDEXT Service service.





-
4. After clicking OK the FDConfig2 program window is closed and the service is restarted automatically. New configuration becomes active.

✓ **Important:** New configuration becomes active only after restarting of board service.

- Note:
1. If you deal with Forward TS set: closing of the program via the OK button results also into restarting of all SLGraph services automatically (including FDExtService).
 2. Remember that if you change completed configuration in FDConfig2 program then all programs that use the board must be adjusted to new parameters, for example, you must specify again a corresponding video device in FDO nAir or create another graph.



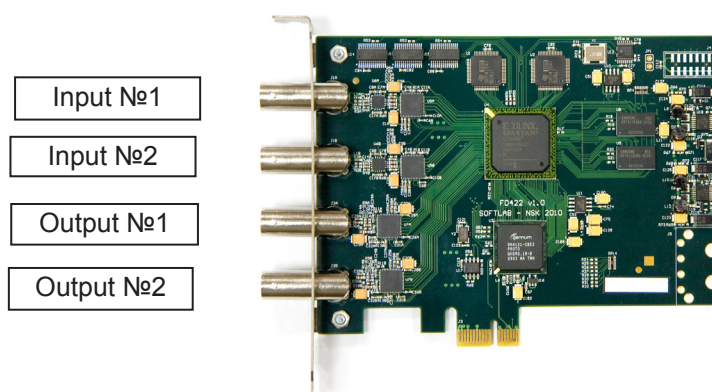
Features of Different Boards Customizing

FD422

1. Features and Specifications

The FD422 board (see the picture below) is a hardware component of products used for organization of TV broadcasting in a digital format. The board is used for solutions that deal with SDI and/or ASI signal.

Note: To work with analog signal the FD300/FD322 board is used.



FD422 board. Connectors of the board.

The FD422 board drivers are included into software set and are installed at software installation automatically.

✓ **Important:** The board must be installed in PC before installation of the software (otherwise drivers won't be installed).



The FD422 board has two input and two output lines. Each of the lines can be customized for processing SDI/ASI signal. Desired configuration is customized in FDConfig2 program.

Table 1. The FD422 Board Specifications

Bus	PCI Express 1x
Inputs	2 x BNC SDI/ASI
Outputs	2 x BNC SDI/ASI
Formats of input/output signal	SDI 10-bit (SMPTE 259M) ASI (EN50083-9)
Internal processing of signal	4:2:2 10-bit on output and input 4:2:2 8-bit external mixing
	PAL: 720x576, 25 fps NTSC: 720x480, 29.97 fps
Audio	
	<ul style="list-style-type: none">• embedded sound (SMPTE272M-A)• genlock to any of the inputs• synchronization of audio to video

The FD422 board supports input and output of 2 pairs of audio channels (2 stereopairs) in SDI signal.

Take into account that the board does not have embedded on-board encoders/decoders at organizing of solutions for processing of MPTS video programs (the board is in the ASI mode). That is why program coders and decoders are used for coding and decoding of video and audio data received from a transport stream.

Also note that a small delay appears when using FD422 for working with a passthrough video. The delay can be: 2 frames for modes with a hardware mixer (SDI 1ch, SDI 2ch and SDI + ASI output) and up to 6 frames for other modes.

2. Modes of Working

Selection of a corresponding mode of working and activating of functions in the limits of this mode is FD422 board functionality.

The following parameters depend on selected mode:

- permissible resolution of video on input and output – SD or HD;
- permissible types of signal on each of the input lines – SDI and/or ASI;
- quantity of independent sources;
- permissible types of signal on each of the output lines – SDI and/or ASI;



- a possibility of using of output lines independently;
- board mixer is on/off;
- set of accessible board functions: output of data from board inputs/outputs; use of mixer, etc.

A possibility of mode use depends on purchased product.

The table below presents a list of FD422 board modes. The names correspond designations accepted for FDConfig2 program window.

For each mode there is specified configuration of input–output board lines and mixer. Also, name of the product and some additional comments are given. Basing on this product you can organize solution using the given board mode.

- Note:
1. See the picture given in the «Features and Specificities of the FD422 board» section above to recognize board inputs and outputs correctly when examining the table.
 2. We recommend appealing to SoftLab-NSK Support department to select the most suitable solution to solve your tasks before purchasing a product.

Table 2. Modes: Configuration of Board Parameters

Mode	Type of signal, content of signal in line					Mixer
Product	Input lines		Output lines			
	# 1	# 2	# 1	# 2	Content	
SDI 1 ch Forward TA (SD–SDI)/ Forward TP (SD–SDI)	SDI	SDI	SDI	SDI	The same, duplicated on 2 outputs (see note 1 below)	Present
	For solving of the following examples of tasks this mode is recommended: – broadcasting of one channel in FDO nAir with switching among different sources (commands for broadcasting of a passthrough video VideoInput N); – insertion of advertisement into a passthrough signal.					
SDI + ASI output Forward TA (SD–SDI) + ASIOut MPEG2/AVC option	SDI	SDI	SDI	ASI	Different, independent lines	Present
	For solving of the following examples of tasks this mode is recommended: – solutions presented in the above given example (SDI 1 ch), additional functions of transmitting TV programs via TS using output # 2 that works in ASI interface mode. For working with TS graphs (see note 2 below) are used.					



Mode	Type of signal, content of signal in line					Mixer	
Product	Input lines		Output lines			Content	
	# 1	# 2	# 1	# 2			
SDI 2 ch Forward TA (SD–SDI, 2 channels)/ Forward TP (SD–SDI, 2 channels)	SDI	SDI	SDI	SDI	Different, independent lines	Present	<p>There is a possibility in this configuration to launch two instances of FDO nAir in a background mode via 1 board, i.e. to organize 2 independent broadcasting channels.</p> <p>Examples of solutions for which this mode is recommended:</p> <ul style="list-style-type: none"> – 2 broadcasting channels in FDO nAir with a possibility of switching among different sources (commands of broadcasting of a passthrough video VideoInput N); – insertion of advertisement into 2 channels of a passthrough video (all inputs/outputs – SDI); – broadcasting of 2 channels of a delayed signal via FDTimeShift.
SDI Fill + Key Forward TT (SD–SDI)	SDI/ASI	SDI/ASI	SDI (Fill)	SDI (Key)	Different: # 1 – Fill; # 2 – Key	Absent	<p>The mode is used to organize solutions for laying of titles over a passthrough video signal.</p> <p>In this case functions of server are limited only by creation of titles and control over their output on external mixer (on air). Mixing is implemented via external mixer, control over broadcasting of a passthrough video is implemented within server limits.</p> <p>To solve other tasks capturing of audiovideo data from board input can be implemented additionally. Use graphs for configuring and control over capturing of ASI signal, for SDI capturing – FDCapture.</p>
Mixed (ASI/SDI) Forward TS-ASI (SD) + Additional SDI input-output	SDI/ASI	SDI/ASI	SDI/ASI	SDI/ASI	Different, independent lines	Absent	<p>For solving of the following examples of tasks this mode is recommended:</p> <ul style="list-style-type: none"> – own broadcasting (clips from hard disk); – insertion of advertisement into N quantity of channels of a passthrough video from MPTS. <p>FDO nAir functions via a virtual device – Virtual board (see note 3 below)/ Videoprocessor (see note 4 below) in this configuration. The FD422 board is used as a device of input/output (ASI- or/and SDI interface). Use graphs (see note 2 below) for configuring.</p> <p>There is a longer delay (up to 6 frames) for a passthrough video in this mode comparing with the SDI 1ch mode.</p>



Mode	Type of signal, content of signal in line					Mixer	
Product	Input lines		Output lines			Content	Mixer
	# 1	# 2	# 1	# 2			
ASI in/out	ASI	ASI	ASI	ASI		Different, independent lines	Absent
Forward TS-ASI (SD)	For solving of the following examples of tasks this mode is recommended: – see comments for the above given Mixed (ASI/SDI) configuration but taking into account that there is no possibility to work with SDI signal. Use graphs (see note 2 below) for configuring.						
HD-SDI	HD-SDI	–	HD-SDI	HD-SDI		The same, duplicated on 2 outputs (see note 1 below)	Absent
Forward TA HD-SDI	Solutions for HD TV broadcasting. Only input # 1 is used for video capturing.						
HD-SDI to ASI	HD-SDI	ASI/SD-SDI	–	ASI	–		Absent
HD-SDI to SD-SDI	HD-SDI	ASI/SD-SDI	–	SD-SDI			Absent
ASI to HD-SDI	HD-SDI	ASI	HD-SDI	–			Absent
SD-SDI to HD-SDI	HD-SDI	SD-SDI	HD-SDI	–			Absent

Note: 1 – There is a possibility to send a signal from output # 1 on air and from output # 2 to control monitor for viewing as both outputs receive a signal with the same content.

2 – Creation, customizing, launch and stop of graphs are implemented in SLStreamer Pro or SLStreamer Lite programs included in Forward TS software set.

3 – The Virtual board virtual device is a program module that processes audio and video data. Customize and launch Virtual board via the FDConfig2 program. In FDO nAir the board is specified as Videodevice, this element is in the Settings window, on the Configuration tab: FDExt > FDVrt Device N Output, N is virtual board index.



4 – The Videoprocessor device is a program module that processes audio and video data, for example, overlaying titles. Customize and launch Videoprocessor via graphs. In FDO nAir the processor is specified as Videodevice, this element is in the Settings window, on the Configuration tab: Videoprocessor > Videoprocessor N, where N is video processor index.

3. The Device Enabling Group of Elements in FDConfig2

The table below describes check boxes that are elements of the Device enabling group located in the FDConfig2 main program window used in case of the FD422 board customizing. As set and designations of elements in the group depend on selected mode then the list is given for each mode independently.

Table 3. The Device Enabling Group of Elements

Mode	Designation	Comments: where is used/with what purpose, function, etc.
SDI 1ch	Capture SDI Input # 1	Enabling capturing of audio and video data from Input 1 line. Can be used in: 1. FDCapture program – capturing and recording of audio and video data into AVI files. 2. SLStreamCapture program – capturing and recording of streaming data in WMV format. 3. FDReplayCapture/FDPostPlayCapture – input of audio and video data into storages. 4. Video2 title element – playback of video and audio data from specified line in window with a fullscreen video background (PiP). If the function is off then playback/viewing/capturing of data from Input2 line is impossible.
	Capture SDI Input # 2	The same for Input2 line.
	Title Mixer	Enabling using title mixer. Is needed for programs that playback video on board output, for example, FDO nAir. If the function is off the program does not work.
SDI + ASI output	Render SDI Output # 1; Capture SDI Input # 2; Title mixer	See comments for the SDI 1ch mode.
	Capture ASI Output # 2	Enabling transmitting of stream audio and video data via output #2 in ASI interface mode.



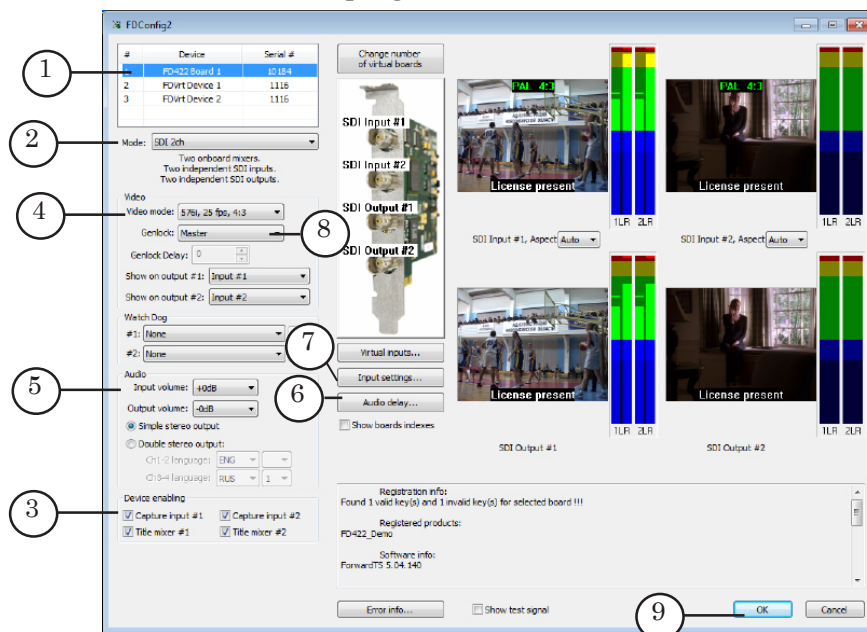
Mode	Designation	Comments: where is used/with what purpose, function, etc.
SDI 2ch	Capture Input #1; Capture Input #2	See comments for the SDI 1ch mode.
	Title Mixer # 1	Enabling using board mixer for programs that playback video on input #1 of FD422 board, for example, for the FDO nAir program instance that is customized for working with the FD422 Board 1 Output 1 video device. If enabling is on then FDO nAir does not work in this configuration.
	Title Mixer # 2	The same for Output2 line.
SDI Fill + Key	Input # 1 group: Capture ASI; Capture SDI	Check marks used for selecting of input # 1 mode: ASI or SDI-interface.
	Input # 2 group: Capture ASI; Capture SDI	The same for Input #2.
Mixed (ASI/SDI)	Input # 1 group: Capture ASI; Capture SDI	Check marks used for selecting of input # 1 mode: ASI or SDI-interface.
	Input # 2 group: Capture ASI; Capture SDI	The same for Input #2.
	Output # 1 group: Render ASI	Radio button used to select mode of output # 1 working. If the mark is put then output works as ASI interface, if absent then as SDI interface.
	Title Mixer	Enabling use of board mixer for programs that play a passthrough video on output # 1. Is necessary if output #1 works in SDI interface.
	Output # 2 group: Render ASI; Title Mixer	The same for Input #2.
ASI in/out	ASI #1 Input; ASI #2 Input; ASI #1 Output; ASI #2 Output.	Enabling use of corresponding board input or output. If the mark is put enabling is activated, if there is no mark then enabling is disabled.
HD-SDI	Capture HD-SDI input	Enabling capturing audio and video data from Input 1. If the mark is put capturing is enabled, if there is no mark then capturing is disabled. For more detail see comments to the SDI 1ch mode.
	Title Mixer	Enabling use of board mixer for programs that play a passthrough video from board, for example, FDO nAir. Program instance is customized to work with the FD422 Board 1 Output HD video device. If function is off the program will not work.



4. Board Configuration

The picture below presents a general workflow of FD422 board customizing via FDConfig2. Then a detailed description of each step is given.

Implement all steps of configuring when dealing with SDI signal. Implement only steps 1–3 and 9 in FDConfig2 when dealing with ASI signal. Sound and video parameters are customized at configuring of broadcasting schemes in the SLStreamer Pro program.

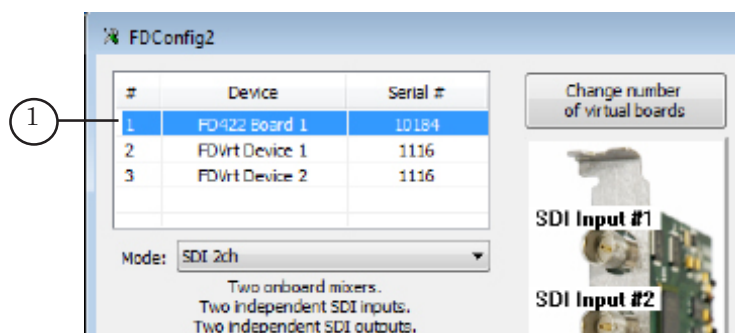


Note that it is very important to follow the given workflow as a set of FDConfig2 control elements and possible parameters values on further steps depend on value specified on the previous step.



Step 1. Specifying of Board to be Configured

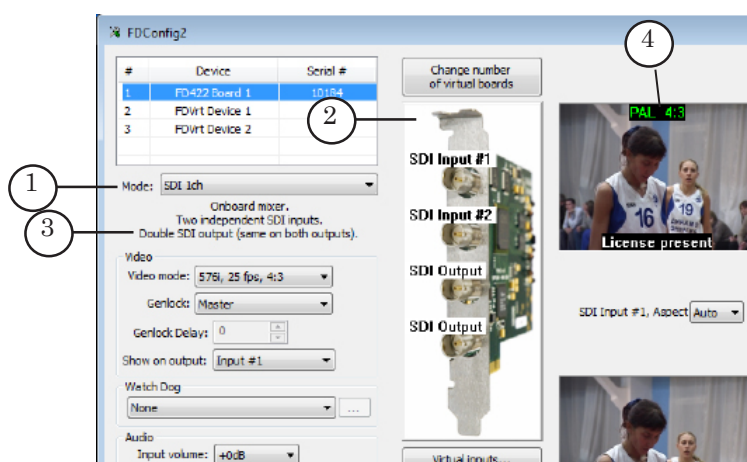
Select necessary board from the table (1) if several FDEXT boards are in the system.



Step 2. Mode

Specify necessary mode of board working via the Mode drop-down list (1). For more information see the «FD422 Board Modes of Working» section above.

✓ **Important:** Specified mode must correspond to functional possibilities of a purchased product. For example, the Forward TA SD-SDI product set does not have a function of working of board in ASI mode. That is why it is unreasonable to select mode that enables work with ASI signal.

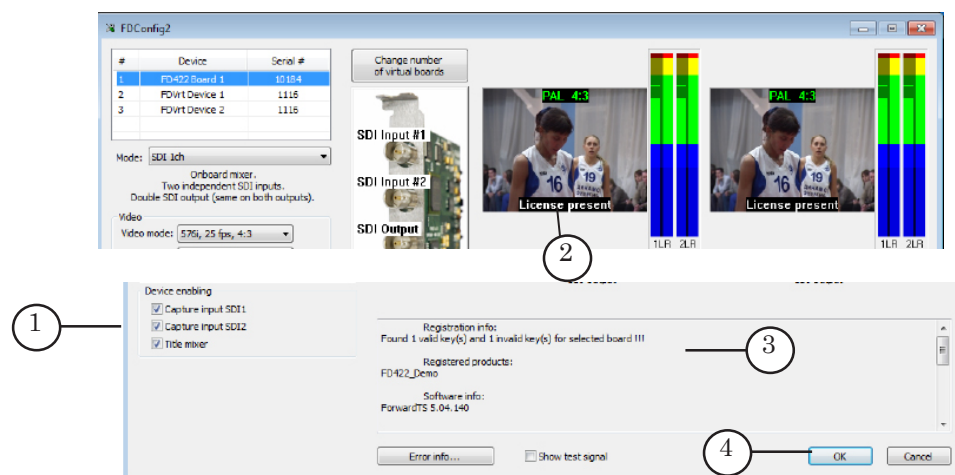


The (2) picture displays some additional information on selected type of signal on each input and output board lines in specified mode. Also, there are some tips (3) in preview windows (4).



Step 3. Control Over Board Functions

1. Be sure that marks for all board functions necessary to be activated are put in the Device enabling group of elements (1). Set of elements in this group depends on specified mode (more information on this issue see in the «Device enabling group of elements» section above).

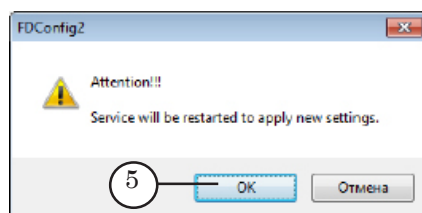


2. To activate a function you must firstly activate it by putting the mark in the Device enabling group of elements and secondly you must be provided by a corresponding license.

Be sure that you are provided with a license for activating of a function. The information on licenses for capturing of video from input/output lines is given, for example, in corresponding preview windows (2). Also, the data is located in the information area (3).

Note: Set (set itself and quantity) of licenses necessary to use board functions depend on a purchased product. Information on licenses is stored in a registration key and recorded into PC system registry at its activating. If the system has several boards then the whole quantity of licenses of a corresponding type given for working with all purchased products is taken into account.

3. If you want to change a set of enabled functions:
 1. Put the marks for functions that must be enabled and take marks off for those functions that must be disabled.
 2. To activate new settings: close program window by clicking OK (4) and then again click OK (5) in the FDExtService service message box.



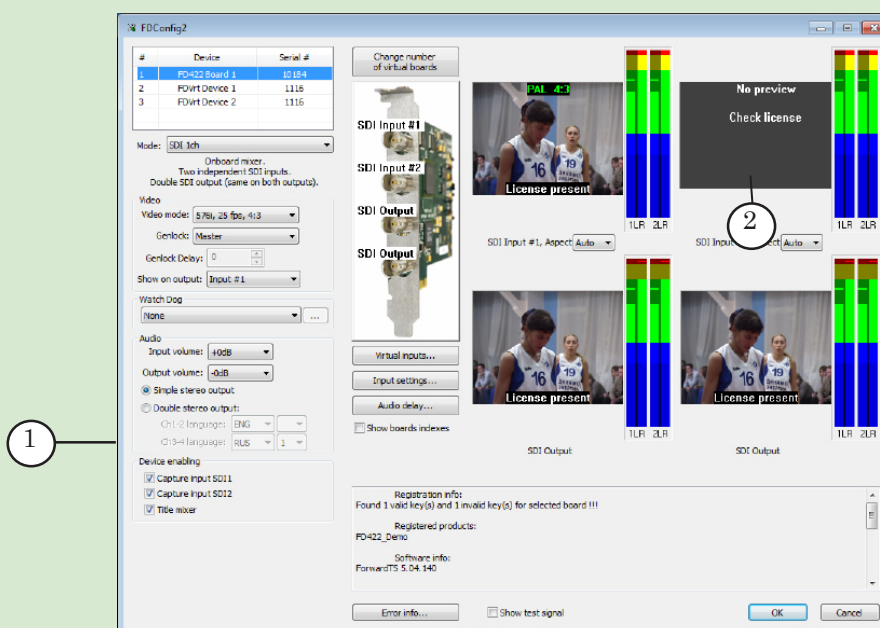
✓ **Important:** You must restart the service to start activating of new settings and redistribute the licenses.

3. Launch the FDConfig2 program again via, for example, shortcut.

4. Be sure that there is enough licenses for activating of selected functions.

➡ **Example:** If there is one license of the «Capturing board input» type only one of the following functions can be activated at once: Capture SDI Input #1 or Capture SDI Input #2.

Trying to work with both lines for capturing (1) there will be a notification on checking licenses in preview window (2).

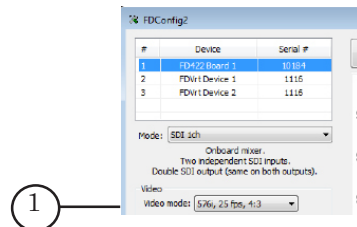




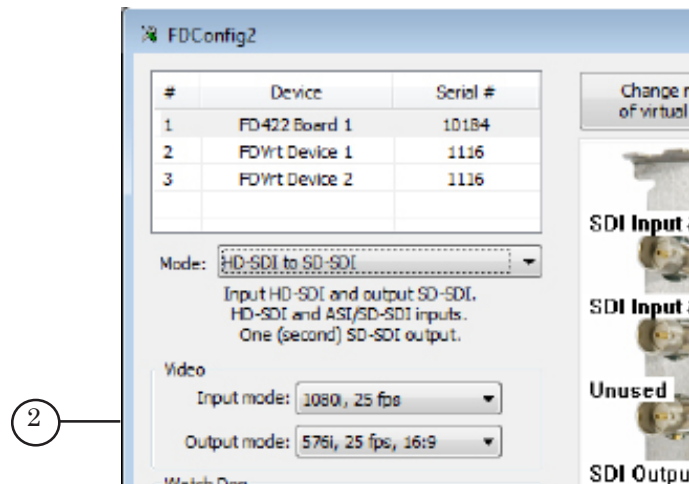
- Tip:**
1. Do not set the marks that are put automatically off if there is one FD422 board in the system.
 2. Make sure that all necessary marks are put for the specified board (because they can be distributed in another way automatically) if there are more than one FD422 board in the system.
 3. By putting/taking the marks off you can control licenses. If there is more than one board in the system then a part of owned licenses (enabled functions) can be attributed to another board by refusing some function for one board (by taking the mark off) and accepting the function for another board.

Step 4. Video Format

Select a video format via the Video mode drop-down list (1) of the Video group of elements. Set of possible variants of the list depends on selected resolution – SD/HD.



If current mode assumes different standards of video on input and output then the Input mode, Output mode (2) lists become available.



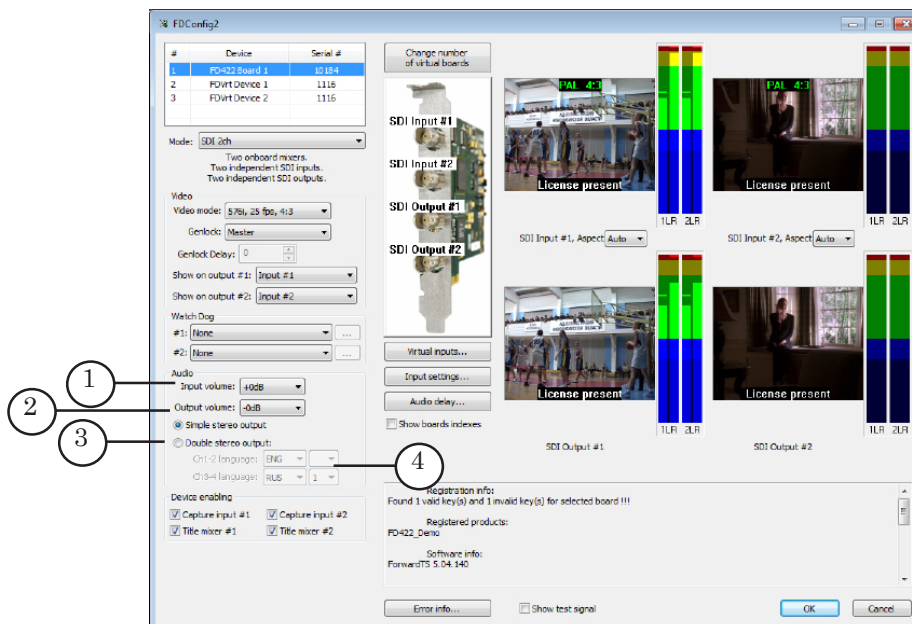


Step 5. Audio Format

In case of working with SDI signal you should customize audio parameters of board input and output volume in the Audio group of elements. If the mode with two independent output lines, for example, SDI 2 ch is selected then the settings specified in the Audio group are active for each line.

1. Specify necessary volume value in the Input volume list (1) if needed to increase volume of the signal on board input.
2. Specify necessary volume value in the Output volume list (2) if needed to decrease volume of the signal on board output.
3. Specify mode of working of audio output by specifying a quantity of processed audio lines in a signal using the following radio buttons (3):
 - Simple stereo output – one stereopair;
 - Double stereo output – two stereopairs.
4. If the Double stereo output mode is selected then configure a correspondence of stereopairs in output signal serial indices (1-2 channels – the first pair; 3-4 channels – the second pair) and languages.

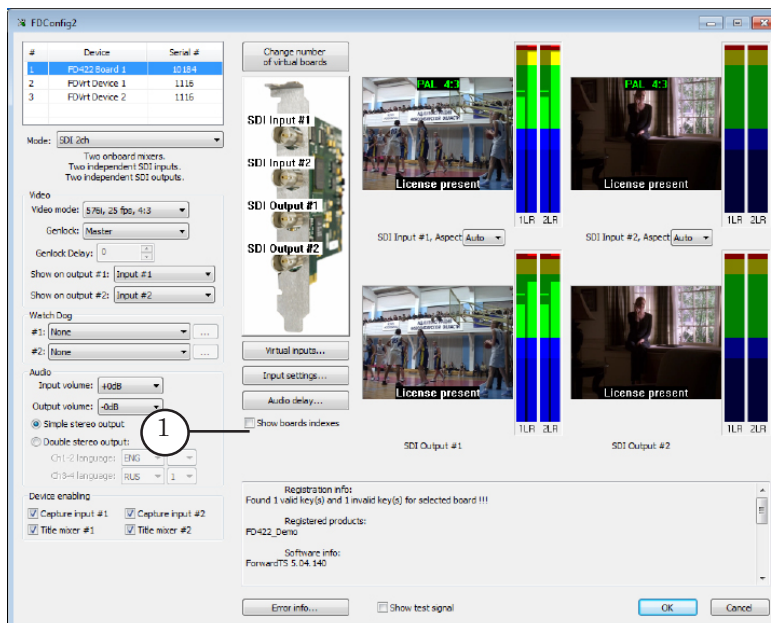
Specify identifier for each stereopair using the (4) drop-down lists. Identifier is a letter or letter combined with number identification (standardly) of audio line language.



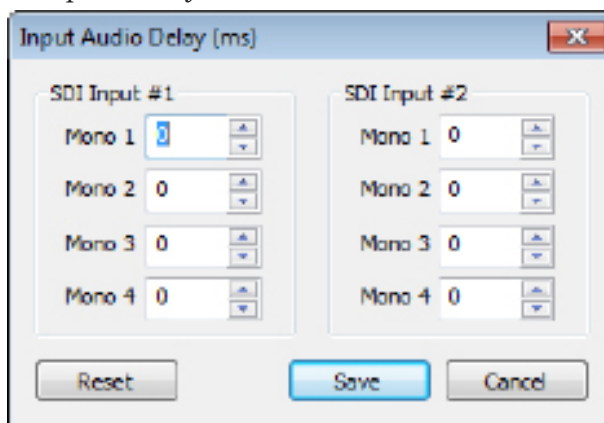


Step 6. Audio Delay

If needed to customize audio delay click the Audio delay... button (1) to open window for customizing.



Specify necessary values in the appeared window (in milliseconds). Each monochannel of input channel is customized independently.

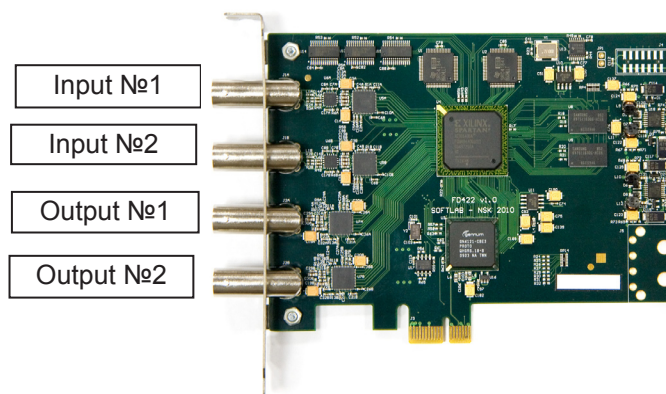




Step 7. Input Lines

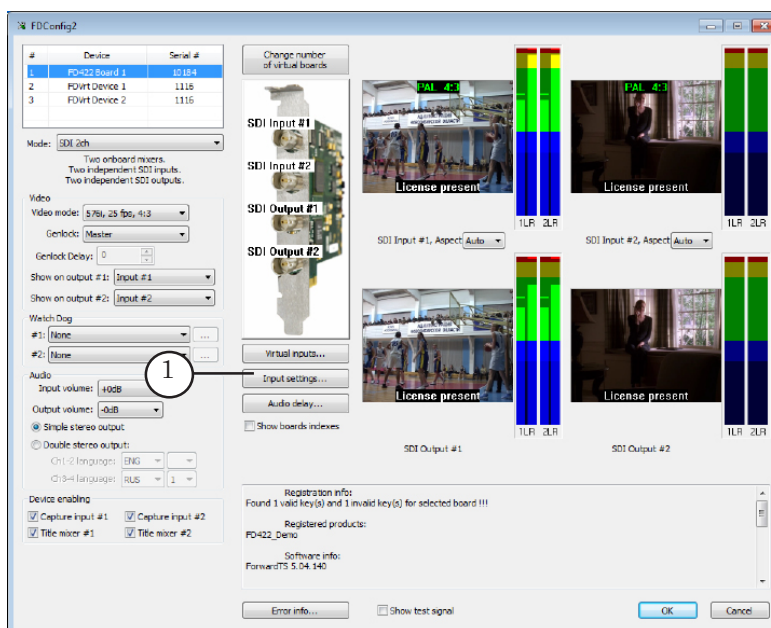
Customizing of board input lines is implemented in FDConfig2 window if you work with SDI signal.

Note: Two sources of SDI signal can be plugged to FD422 board. Board input line specified as Input 1 receives signal from source plugged to connector #1, the second line – Input 2 receives signal from source plugged to connector #2 (see picture below).



Up to 4 audio channels from each input SDI signal can be processed via the board. At the step of configuring you specify audio lines (for each of the lines Input 1 and Input 2 independently) that are selected from SDI signal to be processed with video: one of monochannels, one of 2 stereopairs or all 4 channels simultaneously.

1. Click Input settings... (1) in the main program window to customize the lines.





Note: The Simple or Double stereo output mode of board audio output must be selected preliminary as a set of audio lines in lists depends on selected mode of working.

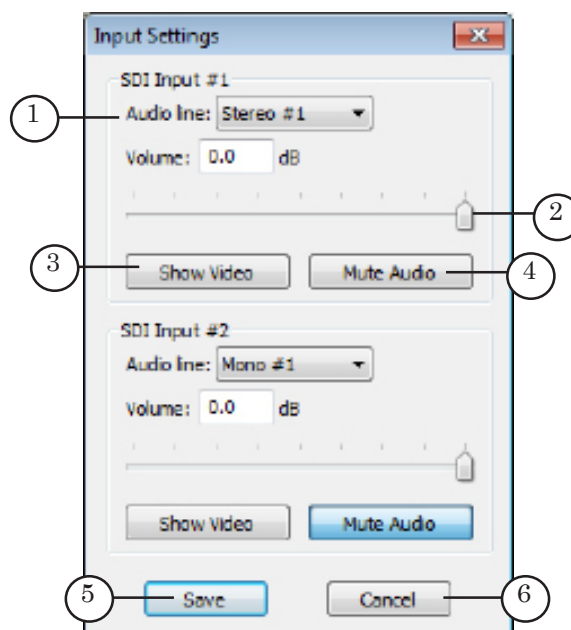
2. Customize Input 1 line via the elements of the SDI Input1 group:

1. The Audio line list (1) has a list of audio lines from SDI signal of the Input 1 board input. Specify what audio channel (channels) are transmitted to output at broadcasting of a signal from Input 1 line: one of monochannels, one of stereochannels or both of them (only for the Double stereo output mode).

2. Specify necessary value in the Volume field or use volume slider (2) to change volume.

3. Click Show Video (3) to display a video on Input 1 on immediately.

4. Click Mute Audio (4) to switch sound on line off.



3. Customize Input 2 by implementing steps of the previous item in the SDI Input #2 group of elements.

The Audio line list of the SDI Input #2 group includes audio tracks from SDI signal from Input #2 connector.

4. Click Save (5) to close the window and save made configuration.

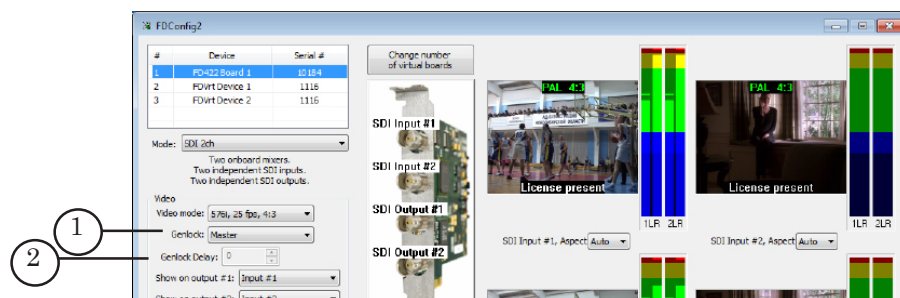
Note: Configuration implemented in this window is actual till the command of switching of a passthrough video in FDO nAir is activated (VideoInput 1 – VideoInput 6) as other audio lines that correspond to video lines can be specified.



Step 8. Mode of Synchronization

Customize mode of synchronization.

1. Specify device in the Genlock drop-down list (1) needed for synchronizing. Possible variants here are:
 - Master – internal board configurator;
 - Input # 1 – external source plugged to Input 1 line;
 - Input # 2 – external source plugged to Input 2 line.
2. Specify value in the Genlock Delay field (2) if you deal with external source of synchronization. The delay compensates delay of a synchrosignal. The delay appears at passing of a signal through a cable. The value is specified experimentally. The value is 0 by default.



Step 9. Saving of Changes

1. Be sure that all applications that use selected board are closed.
2. Click OK (8) in the FDConfig2 program main window.
3. Message on service (FDExt board Service and in case of dealing with Forward TS software SLGraph services also) restarting appears automatically. Restarting is necessary for activating of new configuration.

Click OK to restart the service.

✓ **Important:** First close all programs that use the board to restart the service.

4. In case of clicking OK the window is closed and the service is restarted automatically.

✓ **Important:** New configuration becomes active after board service restarting.

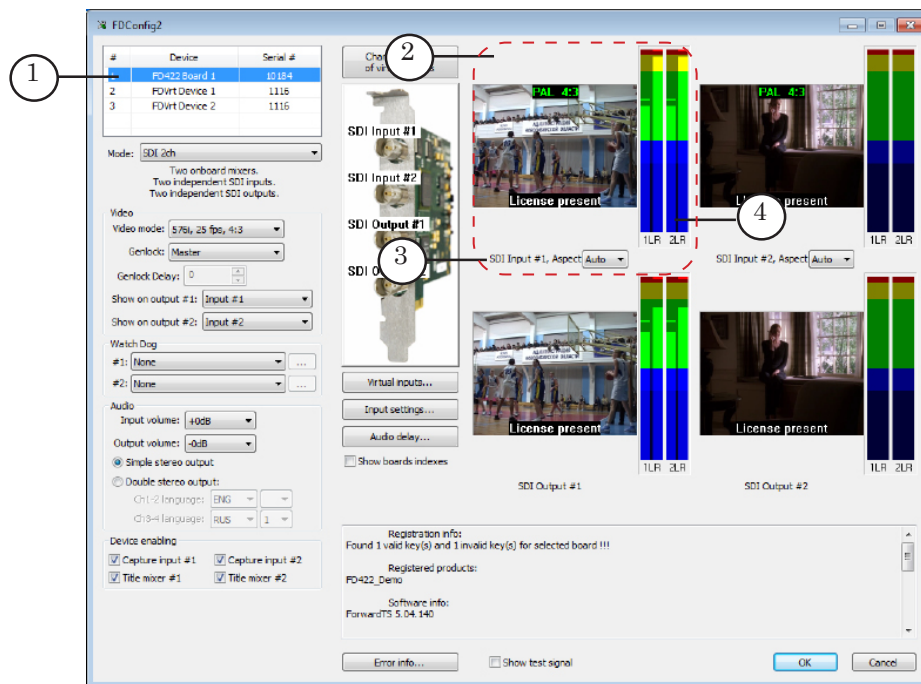
Note: Note that if you change device configuration in FDConfig2 program then all programs that use the board must be adjusted to new parameters. For example, you must specify then again a corresponding video device in FDO nAir or create a new graph.



5. Control Over Audio and Video Data on Board Inputs/Outputs

There are 4 groups of elements for controlling video and audio data on board inputs and outputs in FDConfig2 program main window if the FD422 board is selected in the table (1). One group (2) is used to control a content of one of SDI signals and has a window to preview video and 2 audio meters. Name of the group is indicated in the general group caption (3).

Preview windows display signal content and some additional information (for example, information on licenses).



Audio meters display by different colors current volume level in right and left channels of stereopair (index of stereopair is indicated in a capture (4)).

To see the value that corresponds any point of audio level scale click this point. The value is displayed till the button is released.



6. Specificities of VideoInputN Command Configuring in FDO nAir

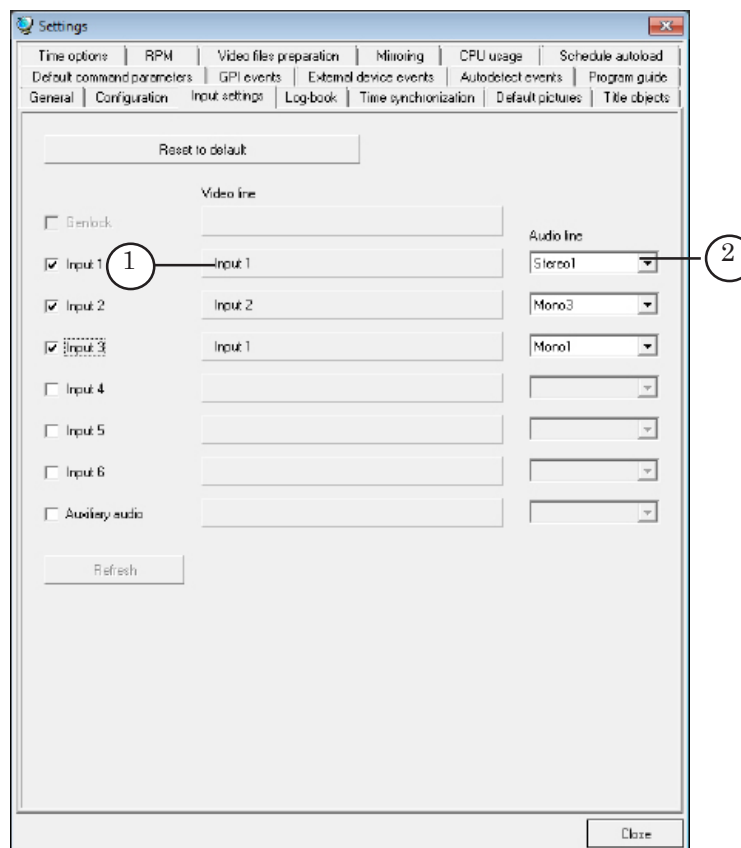
You should configure commands of control over a passthrough video (VideoInput 1 – VideoInput 6) after video device based on FD422 board is specified on the Settings > Configuration tab in FDO nAir.

To do this pass to the Settings > Input settings tab and specify source of audio and video data.

The following marks are used in lists opened by clicking of the buttons from the Video line group (1):

- Input 1 – input line 1 (video track from SDI signal from Input # 1 connector);
- Input 2 – input line 2.

Take into account that you can specify audio and video only from the same SDI signal for one Video input command. Each list of the Audio line group (2) provides with audio lines only from that signal to which specified video track corresponds.

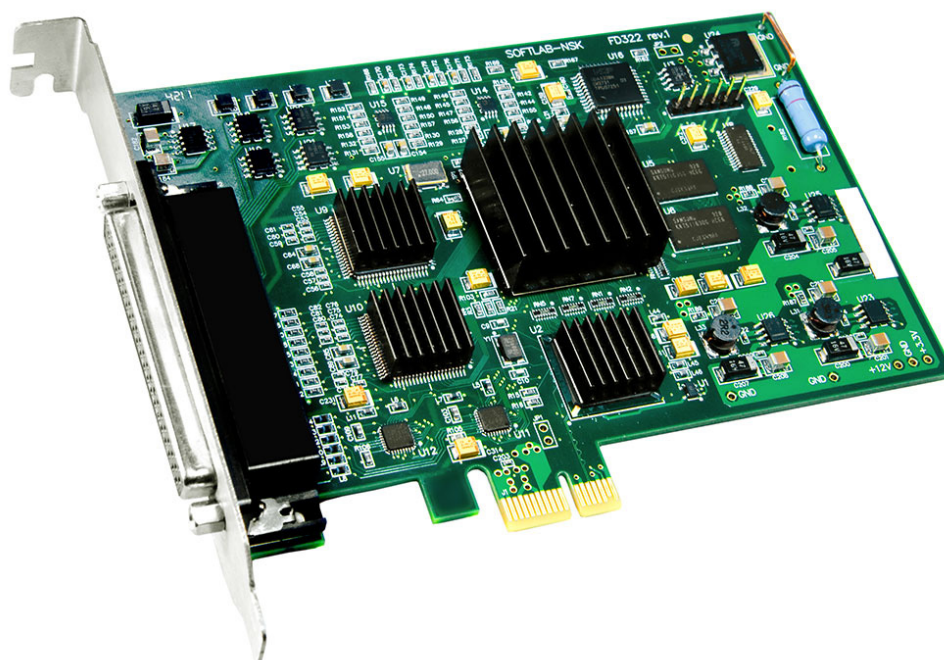


FD322

1. Features and Specifications

The FD322 board (see the picture below) is a hardware component of products used for organization of TV broadcasting in analog format.

Note: To work with SDI/ASI signals the FD422/FD842 boards are used.



The FD322 board is plugged into PCI Express slot of mother board of your PC. Special commutation cable (supplied with the board) or break-out box (purchased additionally) is used for commutating of the board with external equipment. More information on this issue you can find in the «FD322 Board. Solutions for Analog TV Broadcasting» guide.

Drivers of FD322 board are included into products set and installed at installing of software automatically.

✓ **Important:** The board must be installed in PC before installation of the software (otherwise drivers won't be installed).



The FD322 board works with signal in the CVBS, Y/C (S-video), YUV, RGB formats. If you have the board with a corresponding license you can organize up to 2 independent channels of broadcasting as the board has 2 input and 2 output lines.

Necessary mode of working is configured in FDConfig2 program included into a standard software set.

Table 1. The FD322 Board Specifications

Parameters	Specification
Bus	PCI Express 1x
Video	
Formats of video data	PAL, PAL+, SECAM (input only): 720x576, 25 frames/sec, 4:3/16:9 NTSC: 720x480, 29.97 frames/sec
Internal video data processing	YUV 4:2:2 or YUV with 4:2:2:4 transparency, 8-bit per component
Video inputs	Two independent video channels with a possibility of plugging: <ul style="list-style-type: none">• up to 9 composite sources;• up to 4 S-Video sources;• up to 3 YUV sources;• up to 2 RGB sources. Two channels of time-based correction (TBC).
Video outputs	Two outputs. Modes of working: <ul style="list-style-type: none">• the same signal on both outputs;• two independent signals;• fill + key (for dealing with external mixer). Possible combinations of signals for each output: <ul style="list-style-type: none">• Y/C + CVBS;• YUV;• RGB.
Genlock	Genlock of video output to one of the inputs
Audio	
Audio inputs	4 mono or 2 stereo channels
Audio outputs	4 mono or 2 stereo channels
Audio data format	Uncompressed (PCM), 16 bits, 48 kHz
Delay	Customized delay of sound for each input channel
Genlock	Genlock of sound to the main video signal
Volume level	Volume levels: <ul style="list-style-type: none">• 0 dBV non-balanced RCA (cable);• +4 dBu balanced XLR (break-out box).



2. Modes of Working

Selection of a corresponding mode of working and activating of functions in the limits of this mode denotes FD322 board functionality.

Table 2. Modes

Mode	Product	Comments
Output 1ch	Forward TA (Analog)/ Forward TP (Analog)	Two input and two output lines and mixer are active on the board. Content on outputs is duplicated (see note 1 below). The mode is recommended, for example, for the following solutions: <ul style="list-style-type: none">– broadcasting of one channel with switching between different sources in FDO nAir (commands of a passthrough video broadcasting – VideoInput N);– insertion of advertisement into a passthrough signal;– broadcasting of the first channel of a signal delayed via FDTimeShift.
Output 2ch	Forward TA (Analog, 2 channels)/ Forward TP (Analog, 2 channels)	One board functions as two independent devices. There is mixer and one input and one output line on each of them. Content on outputs is different as the lines are independent. This configuration provides with a possibility of launching two FDO nAir instances on one board in mode of a server background, i.e. to organize two independent broadcasting channels. The mode is recommended, for example, for the following solutions: <ul style="list-style-type: none">– two broadcasting channels, with a possibility of switching between different sources in FDO nAir for one channel (commands of a passthrough video broadcasting – VideoInputN);– insertion of advertisement into two channels of a passthrough video.



Mode	Product	Comments
Fill + Key	Forward TT (Analog)	<p>Two input and two output lines are on the board. Mixer is switched off. There is Fill signal on Output 1 line and Key on Output 2. The mode is used to organize solutions for laying of titles over a passthrough video signal.</p> <p>In this case functions of server are limited only by creation of titles and control over their output on external mixer (on air). Mixing is implemented via external mixer, control over broadcasting of a passthrough video is implemented within server limits.</p> <p>To solve other tasks capturing of audiovideo data from board inputs can be implemented additionally (FDCapture program).</p>

- Note:
- 1 – There is a possibility to send a signal from output #1 on air and from output # 2 to control monitor for viewing as both outputs receive a signal with the same content.
 - 2 – Creation, customizing, launch and stop of graphs are implemented in SLStreamer Pro or SLStreamer Lite included into Forward TS software set.

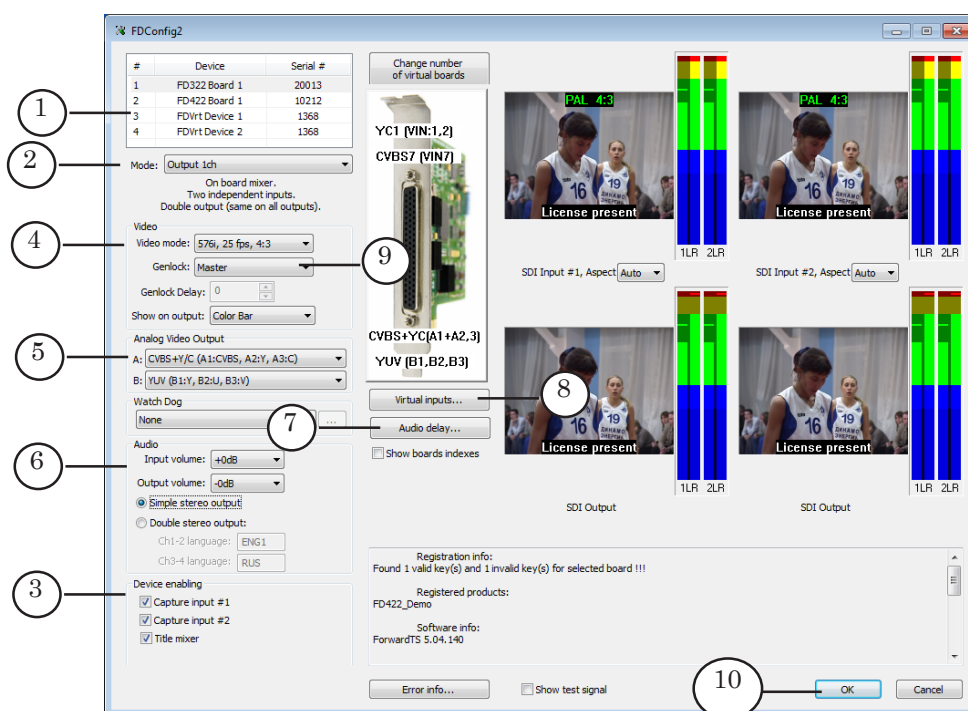


3. Board Configuration

The picture below presents main program window if FD322 board is selected in the table of devices.

The picture below also presents a general workflow of FD322 board customizing. Detailed description of each step of configuring you can find in the «FD322 Board. Solutions for Analog TV Broadcasting» guide.

The following sections provide with some information on FD322 board customizing.



Note that it is very important to follow the given workflow as a set of FDConfig2 control elements and possible parameters values on further steps depend on value specified on the previous step.



4. The Device Enabling Group of Elements in FDConfig2

The table below describes check boxes that are elements of the Device enabling group located in the FDConfig2 main program window used in case of the FD322 board customizing. As set and designations of elements in the group depend on selected mode then the list is given for each mode independently.

Table 3. The Device Enabling Group of Elements

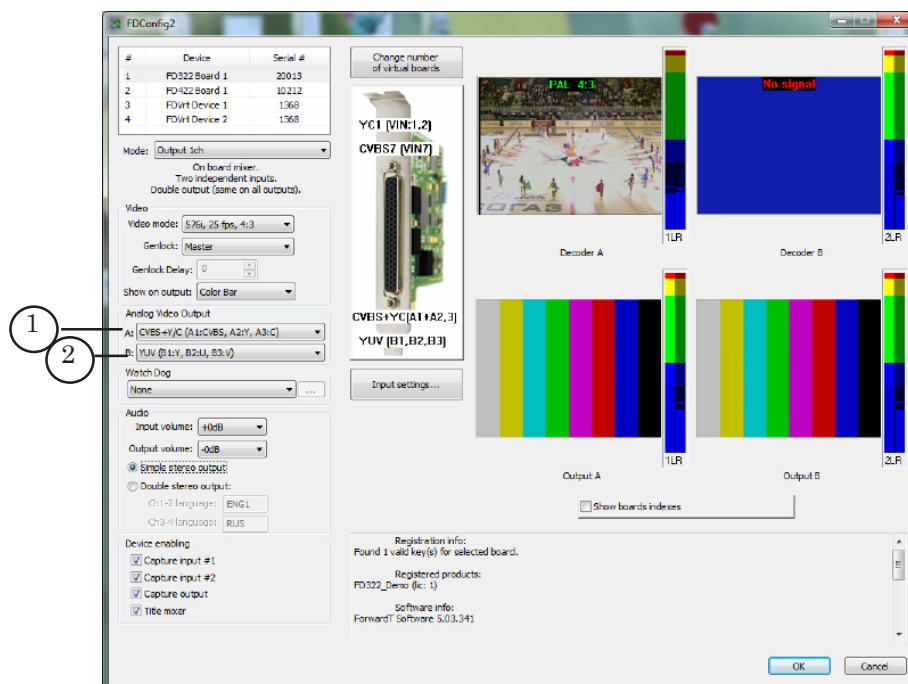
Mode	Designation	Comments: where is used/with what purpose, function, etc.
Output 1ch	Capture Input 1	Enabling capturing of audio and video data from Input 1 line. Can be used in: 1. FDCapture program – capturing and recording of audio and video data into AVI files. 2. SLStreamCapture program – capturing and recording of stream data in WMV format. 3. FDReplayCapture/FDPostPlayCapture – input of audio and video data into storages. 4. Video2 title element – playback of video and audio data from specified line in window with a fullscreen video background (PiP). If the function is off then playback/viewing/capturing of data from Input1 line is impossible.
	Capture Input 2	The same for Input 2 line.
	Title Mixer	Enabling using board mixer. Is needed for programs that playback video on board output, for example, FDO nAir. If the function is off the program does not work.
Output 2ch	Capture Input # 1; Capture Input # 2.	See comments for the Output 1ch mode.
	Mixer # 1	Enabling using board mixer for programs that playback video data on FD322 board output #1, for example, FDO nAir that is customized for working with FD322 Board 1 Output 1 video device. If mixer is off then FDO nAir does not work in such configuration.
	Mixer # 2	The same for Output2 line.
Fill + Key	Capture Input # 1; Capture Input # 2.	See comments for the Output 1ch mode.



5. Configuring of Board Output

1. Selection of Video Encoders

Encoders of video signal for output lines of FD322 board are specified according to the settings specified in the main program window of FDConfig2: Output 1 line corresponds the list A (1) of the Analog Video Output group of elements, Output 2 line corresponds the list B (2). Devices are specified according to the name of commutation lines.

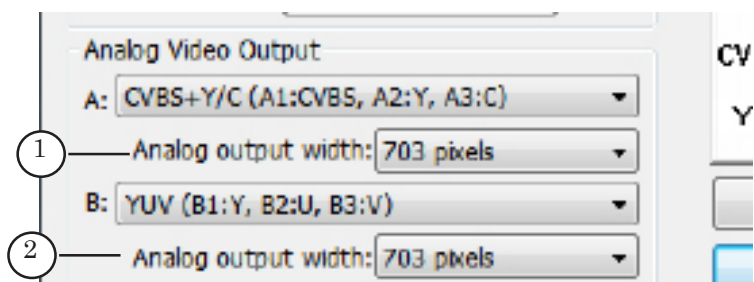


2. Analog Output Width

Analog output width of an image in signal on FD322 board output is 720 pixels (according to internal processing standards). The value is more than width of an active part of line in analog signal that is a base at working on analog devices. As a result the image overlaps fields that are necessary for service purposes. Overlapping leads to some image defects such as, for example, incorrect colors transmission, etc.

For devices of a digital standard such size of a visible part is not an obstacle.

The FDConfig2 program provides with a possibility of configuring visible part of image in output signal on each line. For this there are Analog Output Width drop-down lists (1, 2) in the Analog Video Output group of elements.



Possible values:

- 703 pixels value is used for compatibility with an old analog equipment. The image here is filled by black color on its edges (it is not scaled);
- 720 pixels value is an initial size after its processing. It is better to work with this value if receivers of a signal work in an analog standard.

3. Audio Output Mode of Working

Up to four audio monochannels can be processed on FD322 board output.

Rules for use of audio lines depend on a current mode of board working:

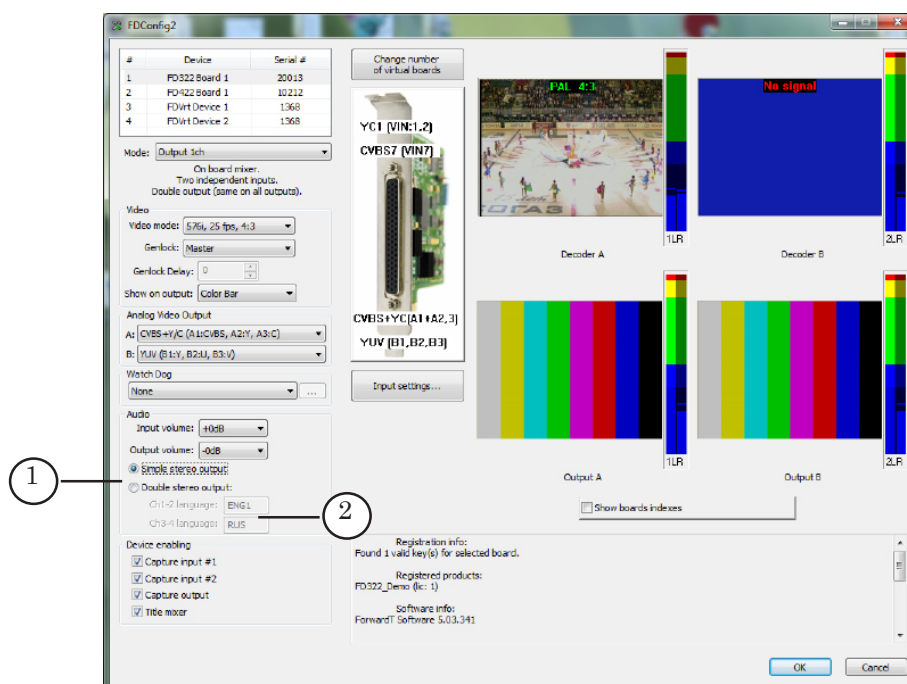
1. In a double channel mode (Output 2 ch) stereopair #1 (channels 1,2) corresponds to the first broadcasting channel (FD322 Board N Output 1), stereopair @2 (channels 3,4) correspond to the second channel (FD322 Board N Output 2).
2. In a mono channel modes (Output 1 ch and Fill+Key) there is a possibility of activating 2 independent stereopairs for one video channel. It allows broadcasting video with 2 simultaneous tracks.

Work with the Audio group of elements to configure mode of audio output working:

1. Specify mode of audio output (1):
 - Simple stereo output – one audio line. In this case a content of the first line is duplicated on the second output stereopair;
 - Double stereo output – two stereo lines. In this case output stereopairs work as independent lines.
2. If the Double stereo output mode is specified then customize a correspondence between serial numbers of stereopairs on board output and languages identifiers.

Specify identifier for each stereopair using the drop-down lists (1).

Identifiers are letter or letter and number designation (standardly) of audio line.



Correspondence among channels and lines of commutation cable:

- 1, 2 channels (stereopair #1) – commutation lines AOUT 1L and AOUT 1R;
- 3, 4 channels (stereopair #2) – commutation lines AOUT 2L and AOUT 2R.

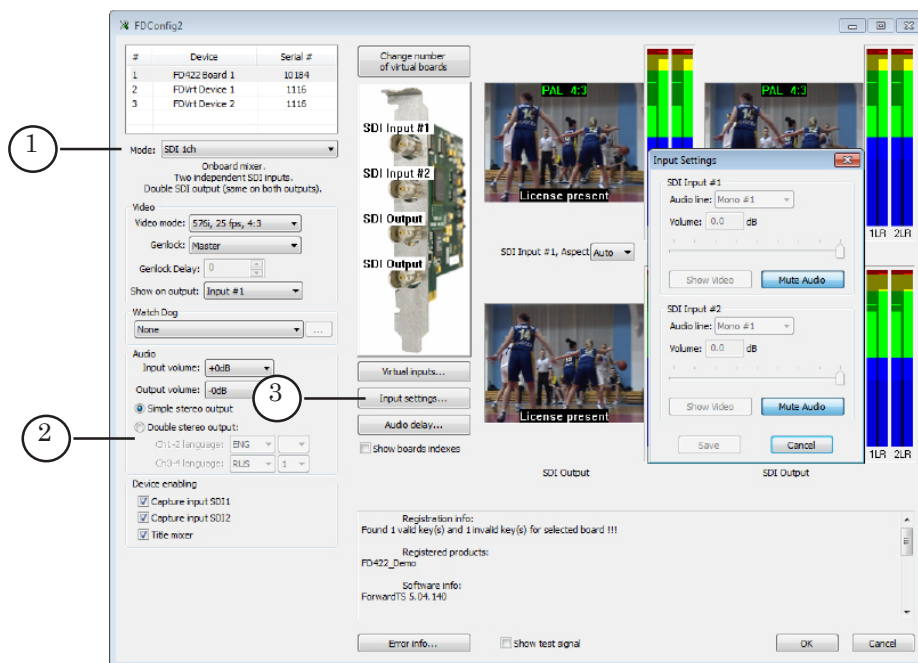
6. Configuring of Board Output

The Input Settings window is used to specify a source of video for input lines Input 1 and Input 2 and sources of sound that correspond to input lines.

Note: Up to 9 sources of video signal and up to 4 sources of audio signal can be plugged to FD322 board simultaneously: 4 monochannels or 2 stereopairs.

You should customize input lines only when mode of board working (1) and mode of audio output mode (2) are specified. Lines customizing presets a set of variants in lists of audio tracks in settings window.

Click the Input Settings window (3) to open the window for customizing.

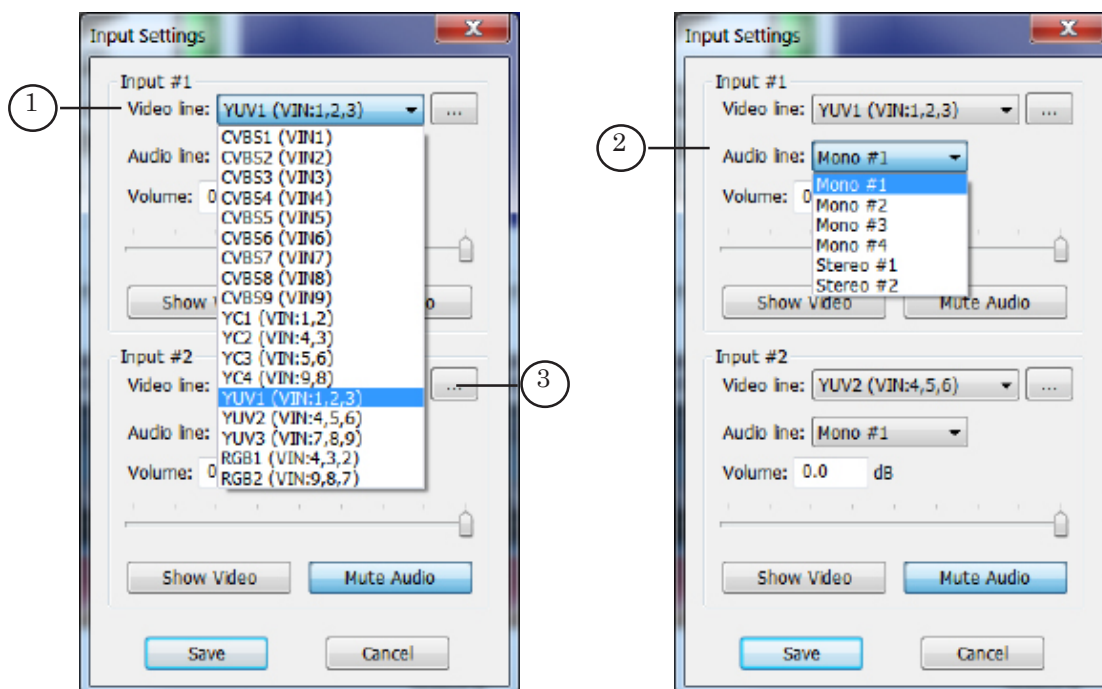


Note: Implemented in this window configuration is actual till the command of switching of a passthrough video in FDO nAir is activated (the VideoInput 1 – VideoInput 6) as other audio lines that correspond to video lines can be specified.

There are two equal groups of elements in the Input Settings window: Input #1 that is used for customizing of Input 1 line and Input 2 necessary for for customizing of Input 2 line.

The VideoInput drop-down lists (1) are used to specify a source of video for corresponding lines and have the same list of values that are at the same time possible variants of plugging of video signal to the board.

Name of variants contain the following information: type of signal, index of variant, name of used commutation lines (in brackets). For example, CVBS1 (VIn1) is CVBS source of signal plugged by VIn1 break-out box (more details on commutation rules you can find in the «FD322 Board. Solutions for Analog TV Broadcasting» user's guide).

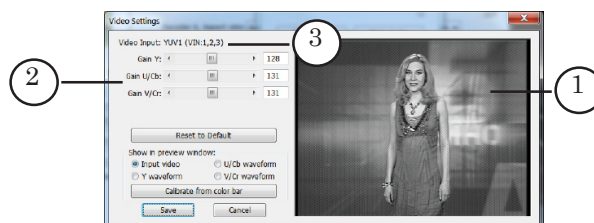


The Audio line lists (2) are necessary to select sound sources for corresponding lines and have a list with variants of plugging of audio signal sources to board:

- Mono #1 indicates on source plugged via AIn1L commutation line;
- Mono #2 – AIn1R;
- Mono #3 – AIn2L;
- Mono #4 – AIn2R;
- Stereo #1 – stereopair of AIn1L and AIn1R lines;
- Stereo #2 – AIn2L and AIn2R;
- Quadro (present only in monochannel modes) – two stereopairs of AIn1L and AIn1R, AIn2L and AIn2R lines.

The (3) buttons are used for opening of the window to configure parameters of image in signal on a corresponding line – VideoInput Parameters.

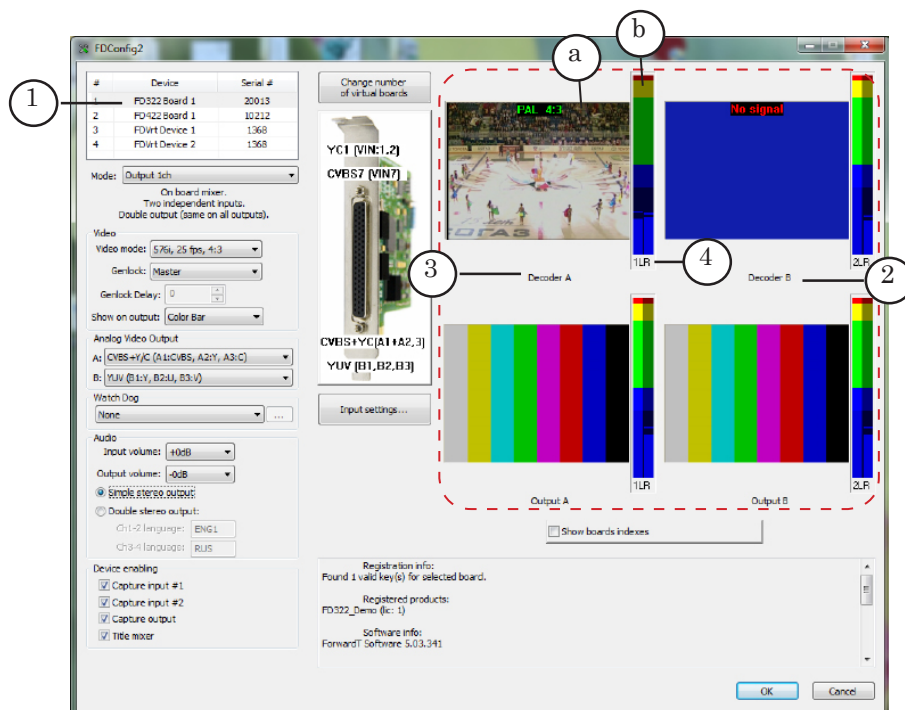
The VideoInput Parameters window has the following elements: preview window (1) for displaying of a current image in signal and sliders (2) used for customizing of color, saturation and image contrast. Specified parameters are active for source that is plugged via specified line (3) till they are not changed in this window.





7. Control Over Audio and Video Data on Boards

There are four groups of elements in FDConfig2 window for control audio and video data on input and output lines (2) if FD322 board is specified in the table (1): windows for previewing of video (a) and graphic indicators (b).



Each input and output line has one window for video previewing. The windows display current content of signal on lines and some additional information, for example, on audio meter licences. Name of controlled line is indicated under the window (3).

There is one for each stereopair of input and output audio channels. Index of stereopair is located under the indicator (4). The index corresponds to index of pair of commutation lines.



8. Specificities of Use of Input Lines for Synchronization

Mode of synchronization influences a workflow of FD322 input lines use:

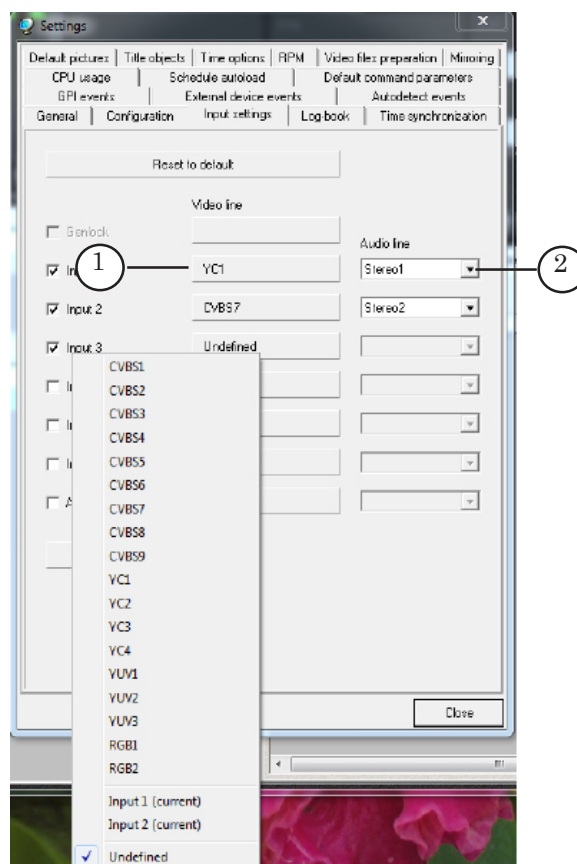
1. If synchronization via board is on (Master) then board input lines are not assigned to specified in FDConfig2 sources strictly. At further working both input lines can be activated for broadcasting of video received from other sources.
2. If synchronization via external source is on (Input #1/Input #2) then specified board input line is assigned to specified in FDConfig2 sources strictly.

9. Specificities of Use of Input Lines in FDO nAir

1. Customizing of VideoInput N Commands. General Information

Specify video device based on FD322 board in the Settings > Configuration window in FDO nAir. Then customize commands of control over broadcasting of a passthrough video – Input 1 – Input 6.

For this pass to the Settings > Input Settings tab and specify sources of audio and video data for the commands. Use drop-down lists of the Input line group (1) to specify video data sources, for video data – use the Audio line group (2).





The list of video lines may contain the following items:

- variants of plugging of video sources to the FD322 board, for example, CVBS1, YC1, YUV2, etc. The items are used to specify necessary source clearly. Each name contains the following data: type of signal on line and index of variant (more information on variants and rules of commutation you can find in the «FD322 Board. Solutions for Analog TV Broadcasting» user's guide).

If video sources are specified in this way then FDOAir program activates input board lines in turn automatically at executing of VideoInput N commands;

- Input 1 and/or Input 2 – names of lines Input 1 and Input 2 correspondingly. If this variant for VideoInput N is specified then source specified in FDConfig2 program is activated;
- Input 1 (current) and/or Input 2 (current) – current settings for Input 1 and Input 2 lines correspondingly. In this variant you will work with a source that is used at the moment of VideoInput N command activation. Depending on a working process the source can coincide with a source specified in FDConfig2 or with the source specified in FDOAir automatically.

The Audio line lists (2) are used for selecting of sources of audio data. The lists provide with variants of plugging of audio sources to the FD322 board:

- Mono1 indicates a source plugged via AIn1L commutation line;
- Mono2 – AIn1R;
- Mono3 – AIn2L;
- Mono4 – AIn2R;
- Stereo1 – stereopair on AIn1L and AIn1R lines;
- Stereo2 – AIn2L and AIn2R;
- Quadro – two stereopairs on AIn1L and AIn1R, AIn2L and AIn2R lines.

At switching of passthrough video a workflow of working of FDOAir with input lines depends on specified current board mode and on mode of synchronization – via board or via external source. The following sections provide with information on working for each of the modes.



2. Output 1 ch Mode

If video sources for VideoInputN commands are specified clearly (according to commutation variant) then at execution of the commands FDO nAir activates input board lines (Input 1, Input 2) automatically:

1. If synchronization via board (Master) is on then both lines can be used in turn. In this case one source is changed by another one smoothly.

Note: Be attentive in this case when working with capture lines in other programs, for example, FDCapture because Input 1/Input 2 lines settings specified in FDConfig2 can be changed at FDO nAir working.

2. If synchronization via external source (Input1/Input2) is on then at switching to another source of data some distortions occur. It happens because line specified for synchronization is assigned to specified in FDConfig2 source strictly. When switching is implemented only one line is used – the line that is not used for synchronization.

To avoid distortion it is recommended to implement switching via a splash screen or use a smooth switching (crossfade).

3. Output 2 ch Mode

Each line in this mode is assigned to one broadcasting channel strictly:

- Input 1 is assigned to channel that is broadcasted via FD322 Board N Output 1 video device;
- Input 2 is assigned to channel that is broadcasted via FD322 Board N Output 2 video device.

Take into account the following items while customizing VideoInput N commands:

1. If synchronization via board (Master) in FDConfig2 is on then sources of video can be specified clearly (according to the name of commutation variant) or according to the name of input line assigned to channel: Input 1 or Input 2.

At switching of a passthrough video some distortions may occur because only one line is used. To avoid distortion it is recommended to implement switching via a splash screen or use a smooth switching (crossfade).

2. If synchronization via external source (Input 1) is on then for VideoInput N commands:



-
- you can select only one line Input 1 in FDO nAir that works on FD322 Board N Output 1. Switching to a passthrough video is impossible;
 - you can select Input 2 line or variant of commutation in FDO nAir that works on FD322 Board N Output 2. Switching to a passthrough video from different sources is possible. Some distortion may occur.
3. If synchronization via external source (Input 2) in FDConfig2 is on then for VideoInputN commands you can specify:
- in FDO nAir on FD322 Board N Output 1 – Input 1 line or commutation variant. Switching to a passthrough video from different sources is possible. Some distortion may occur;
 - in FDO nAir on FD322 Board N Output 2 – Input 2 line only. Switching to a passthrough video is impossible.

4. Fill+Key Mode

VideoInput N commands are not used in this mode.



Virtual Board

1. Description

Virtual board is a program module that processes audio and video data, for example, playback of video or overlaying of a fullscreen video by titles. Virtual board can transmit one video channel and up to three audio stereo channels on one output.

Virtual boards are used in solutions based on products developed by SoftLab-NSK where usual board is either absent or it is used only for input/output of audio and video data, for example, at broadcasting of own channel in IP network.

In programs (for example, for capturing including products of other companies) virtual boards are available (if you have a corresponding licence) and used as usual board.

Note: In earlier developed software versions special Video processor module was used for processing of audio and video data without usual board. Virtual board and Video processor have similar functional specificities but the general principle of their working is different.

Currently it is recommended to use virtual boards.

Several virtual boards can function in the system simultaneously.

Virtual board has the FDVrt Device N name, where N is a serial index.

You need a license for working with a virtual board. Quantity of virtual boards is limited by licences of a corresponding type.

Virtual board becomes active in the system after user activates and configures it via FDConfig2 program. Corresponding program modules start each time after PC start automatically after activation of board (after launching of FDExt Service). No additional actions is required. Virtual board is active till user switches it off in FDConfig2 program.

The board supports processing of video in any arbitrary format – height, width, frame rate, aspect ratio, etc. Format is specified at customizing of board parameters in FDConfig2.

It is possible to capture output of one virtual board in several programs simultaneously.

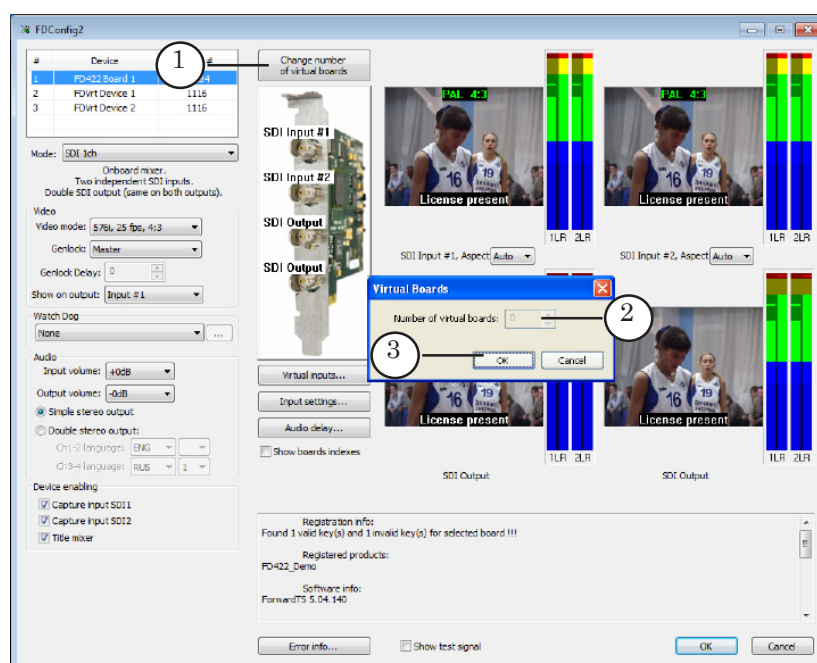
FDPreview Program is used to preview audio and video data from virtual boards outputs on PC monitor.



2. Switching Virtual Boards On/Off

1. Click the Change number of virtual boards button (1) in the FDConfig2 main program window to add/remove virtual boards.
2. Specify quantity of boards in the appeared window (2). Then click OK (3).

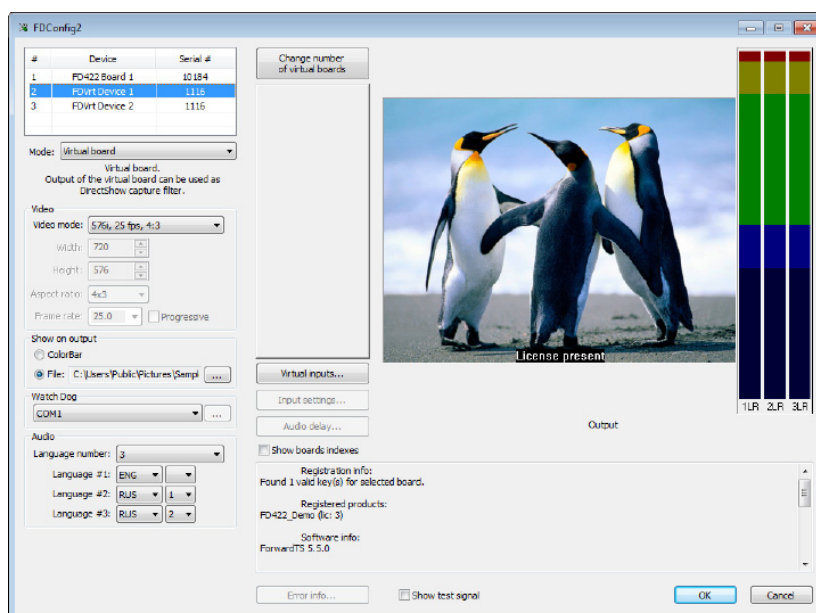
Important: Remember that you need licences for working with virtual boards. Quantity of active virtual boards is limited by a quantity of corresponding licences.



3. Service message appears. Click OK to restart the service automatically.

Important: Restart FDExt Service to activate new settings.

4. After restarting of FDExt Service the FDConfig2 program opens again automatically.

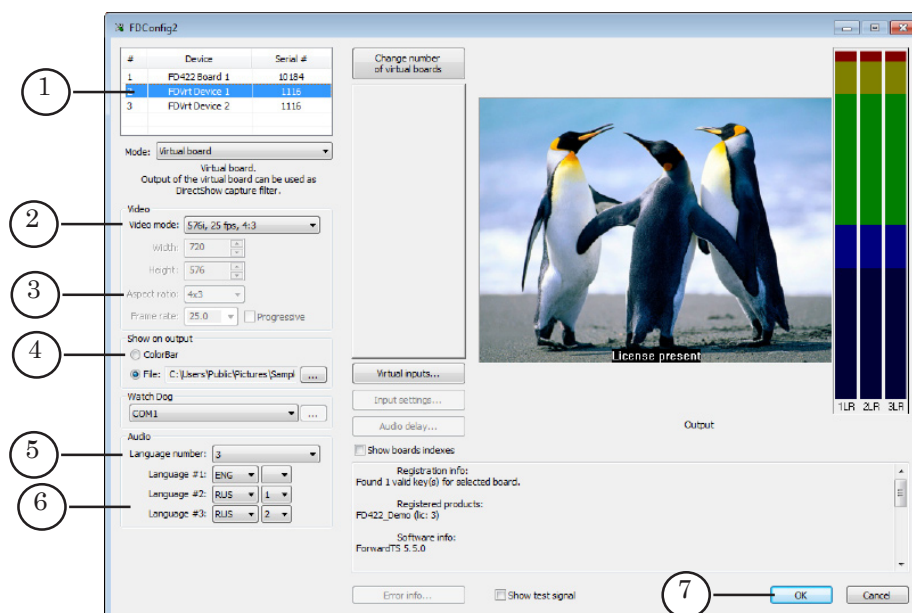


5. If new virtual board is added customize its working parameters (see the further section).
6. If quantity of boards is decreased then boards with the highest serial indices from the general list (the latest ones) are switched off.

3. Customizing of Virtual Boards

Complete the following to customize working parameters of virtual board:

1. Select virtual board in the general list (1).
2. Select necessary video format in the Video mode drop-down list (2). The list includes a list of standard variants. If this item is specified then you can customize the elements (3).
3. Specify what picture should be output by default in the Show on output group of elements (4) via radio buttons. Specify name of graphic file if necessary.
4. Specify mode of board audio output working in the Audio group of elements, i.e. quantity of audio lines (5). If more than one track is specified then customize correspondence among stereopairs indices and languages via drop-down lists (6).



5. Click OK (7) to close the window with applying of new settings.

6. Restart PC.

Restarting of PC is necessary in order DirectShow filters for configured virtual board become visible and available for using in the SLStreamer Pro/SLStreamer Lite (Forward TS software).

Note: Designation of DirectShow filters for virtual board with N index:

- video output – FDVrt Device N Output Video Capture;
- audio output stereopair #1 – FDVrt Device N Output Stereo 1 Capture;
- audio output stereopair #2 – FDVrt Device N Output Stereo 2 Capture;
- audio output stereopair #3 – FDVrt Device N Output Stereo 3 Capture.

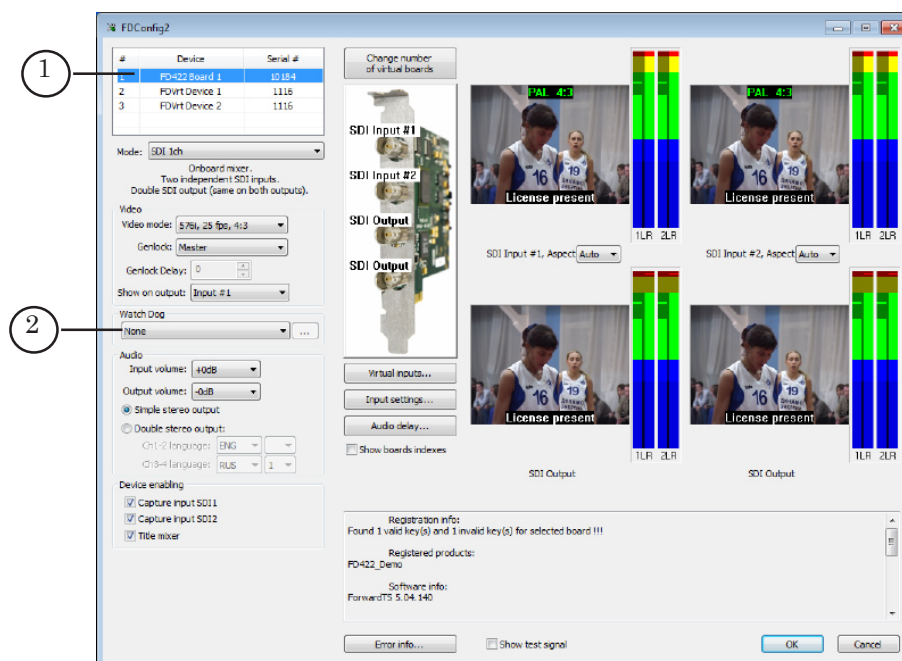


Customizing of WatchDog Function

General Information

Configure the WatchDog function to organize reserving of broadcasting server. Configure the function after final customizing of board.

Firstly specify board that is used in configured FDO nAir program instance that controls over broadcasting via the list (1). Then customize device that will be used in a scheme of reserving via elements of the Watch Dog group (2).



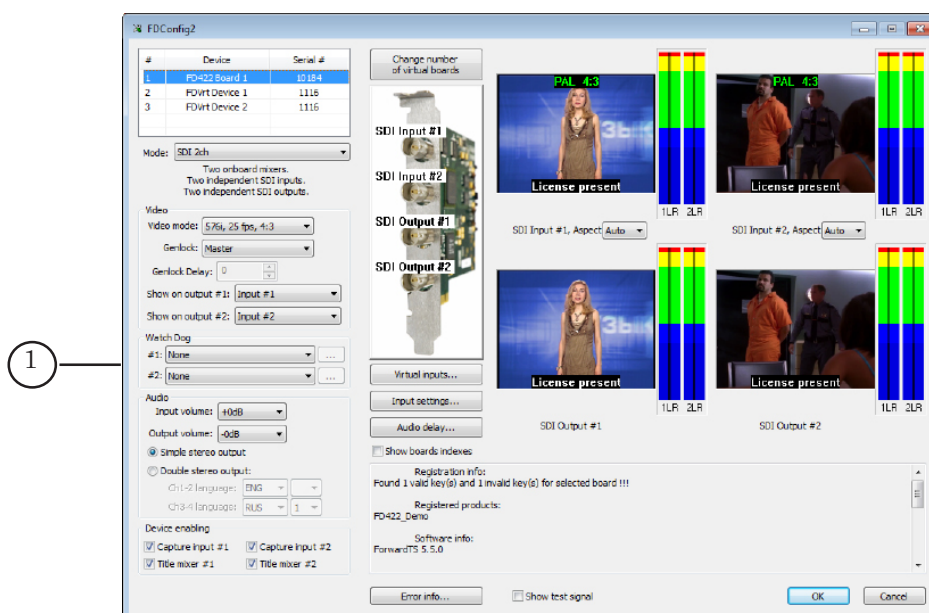


Specificities of Customizing For a Double Channel Solution

Scheme of reserving is customized for each of the channels independently.

If you specify board mode that allows working with 2 independent broadcasting channels (for example, for the FD422 board – the SDI 2ch or ASI in/out mode) then there are 2 drop-down lists (2) in the Watch Dog group of elements:

- #1 drop-down list is used to specify the WatchDog Box device necessary for reserving of the first broadcasting channel (it monitors functionality of FDO nAir that works with the FD422 (FD322) Board N Output 1 device);
- #2 drop-down list is used for the second channel (it monitors functionality of FDO nAir that works with the FD422 (FD322) Board N Output 2 device).



Customizing of Internal Function of Board

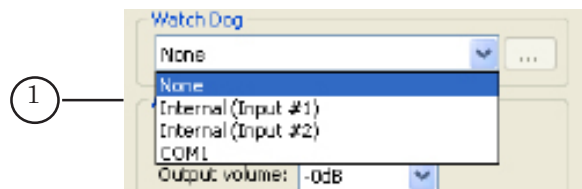
Integrated WatchDog function for the FD322/FD422 boards allows monitoring current state of broadcasting program (FDO nAir or FDTimeShift) and switching to reserve scheme (switching to a passthrough video from specified board input) in case of a failure automatically.

For the FD422 board the WatchDog integrated function is available only at working in the SDI 1ch or SDI + ASI output mode, for the FD322 board – only in the Output 1 ch mode.

Specify one of the variants from the Watch Dog drop-down list (1) to activate the function:



- Internal (Input #1) – in case of a failure passthrough video from source plugged to Input 1 line is broadcasted (for FD422 – to board slot Input #1, for FD322 – current for the line);
- Internal (Input #2) – video from Input 2 line.



Customizing of External Device (For FD322, FD422/FD842 Boards in SDI Mode)

The Forward WatchDog Box device is used in solutions that deal with analog signal (the FD300/FD322 boards) or with SDI signal (the FD422/FD842 boards).

The Forward WatchDog Box device is used in complex with external reserving commutator. The device is plugged to broadcasting server via USB port, to commutator – via RS232/ GPI interface.

The device monitors current state of OS, board, broadcasting program (FDOnAir or FDTIMEShift). In case of a server failure it transmits a signal to commutator to switch to a reserve scheme: to passthrough video or reserve broadcasting server (more information on reserve schemes you can find in the «Forward WatchDog Box. Device for Monitoring...» user's guide).

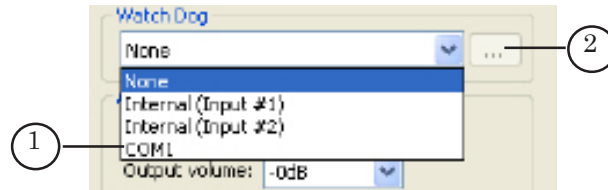
Complete the following in FDConfig2 program window if external Forward WatchDog Box block is used in reserve scheme:

Note: First you must install WatchDog Box drivers on server and plug all devices according to reserve scheme including plugging WatchDog Box to USB PC port.

1. Select identifier of device in the Watch Dog drop-down list(1). Designations in the list can have the following appearance depending on version of used WatchDog Box device:
 - COMn (or USB Serial Port (COMn)), where n is an index assigned automatically at plugging of WatchDog Box to server;



- USB_SLWDxxxx, where xxxx is a serial number of device.
2. Click the button (2) located near the list and configure device working parameters in the appeared window.





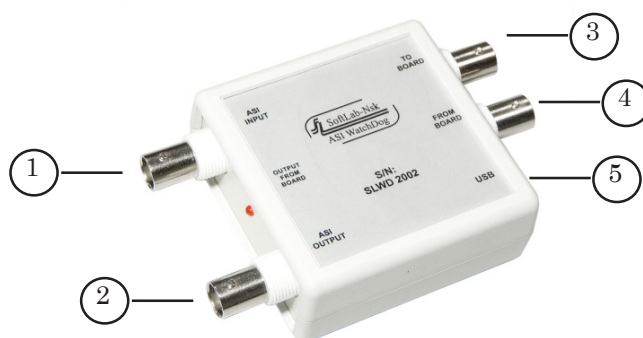
Specificities of Customizing at Working With FD422 Board in ASI Mode

At working in ASI mode the FD422 board is a device only for input–output of a signal. The FDO nAir program works with the Virtual Board device.

In this case the ASI WatchDog Box device is used for reserving. The device monitors current state of OS, board, broadcasting program (FDO nAir or FDT imeShift). In case of a failure it broadcasts input ASI passthrough signal.

Such scheme does not require additional reserve commutator because the device itself functions as ASI signals commutator.

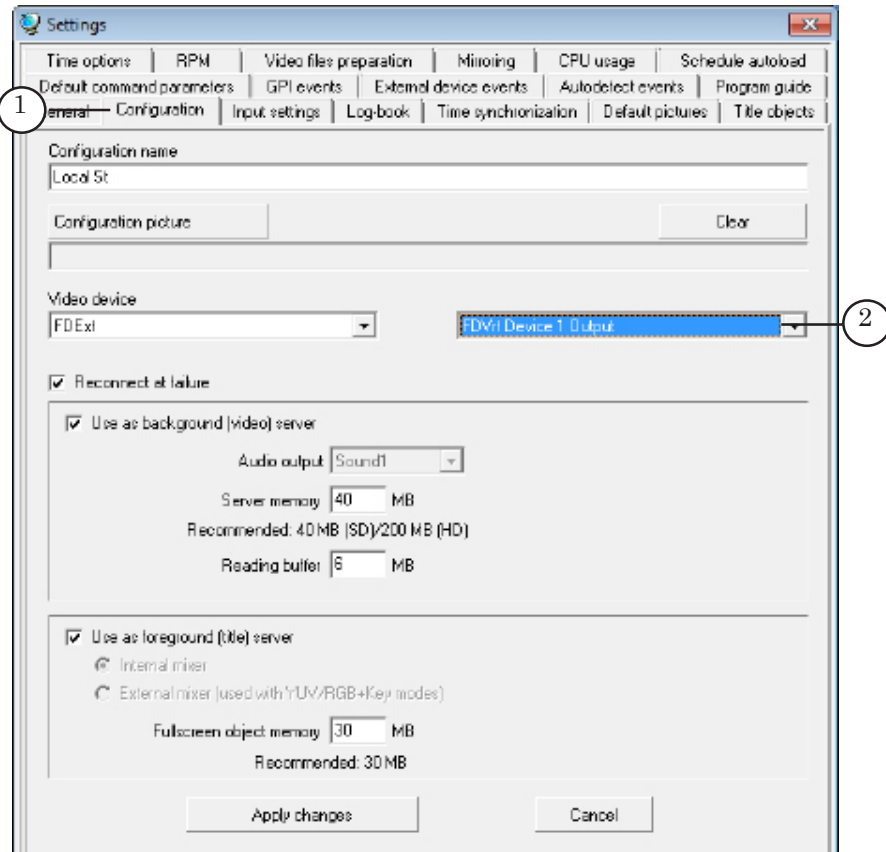
The Forward ASI WatchDog Box block has four BNC connectors via which you can plug to the following devices: source (1), ASI signals receiver (2), ASI input (3) and ASI output (4) for input–output of FD422 board. USB interface (5) is used to exchange by control signals with a broadcasting server.



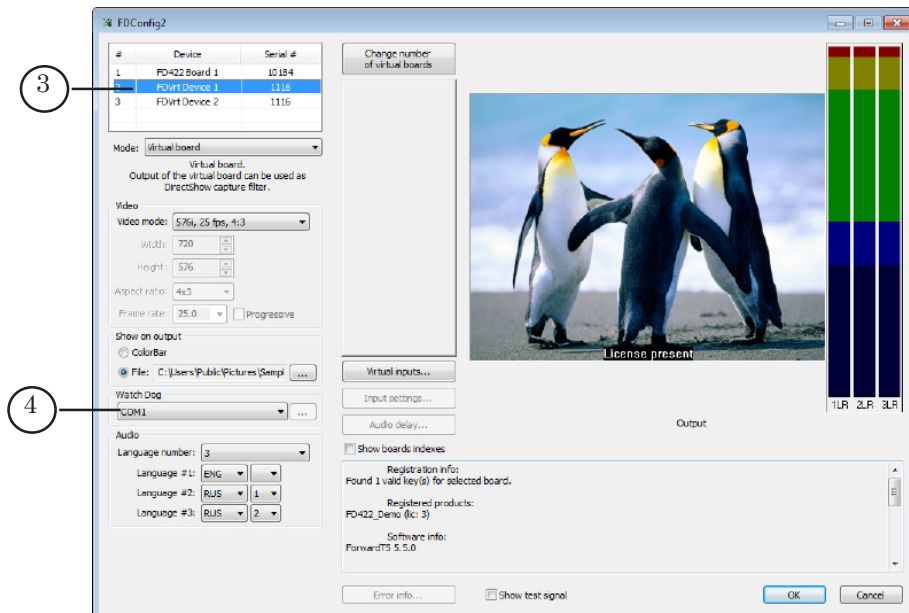
Signals from source on board input (from 1 to 3) and from board output to receiver (from 4 to 2) are usually pass. In case of a failure signal is switched from source to receiver (from 1 to 2) in FDO nAir.

To implement this reserve scheme customize FDConfig2 for working with WatchDog by specifying virtual board that is used for broadcasting in FDO nAir complete the following:

1. Open the Configuration tab (1) in the Settings window. Check name of virtual board (2).



2. Select board with this name (3) in FDConfig2 window. Then select device in the Watch Dog drop-down list (4).





Useful Links

ForwardT Software set: description, download, documentation, solutions

<http://www.softlab-nsk.com/forward/index.html>

Support

e-mail: forward@sl.iae.nsk.su

forward@softlab-nsk.com

forward@softlab.tv

Forum

<http://www.softlab-nsk.com/forum> (currently available in Russian only)

Additional Documentation

- [1. ForwardT Software Setup. User's Guide.](#)
- [2. Forward WatchDog Box. Device for Monitoring of Hardware – Software Systems Based on FD300 Board. Setup Guide.](#)
- [3. FD322 Board. Solutions for Analog TV Broadcasting. User's Guide.](#)
- [4. SLStreamer Lite, SLStreamer Pro. Programs for Customizing, Monitoring and Control Over Work of Digital Broadcasting. User's Guide.](#)
- [5. FDPreview. Program for Previewing of Audio and Video Data on Board Input/Output. User's Guide.](#)
- [6. Insertion of User Content Into Passthrough Signal \(1 Broadcasting Channel, SDI Signal\).](#)

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