

IPCamera Plugin

Rebroadcasting of Streaming
Video in the Form of Titles



*Revision as of
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User's Guide



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Table of Contents

Introduction.....	4
General Information	5
1. Modes of Broadcasting of Streaming Video	
Received by Video Server Over IP Network.....	5
2. Preparation and Control of Broadcasting. General Scheme	6
Installation.....	8
Broadcasting of Streaming Video and Audio in the Form of Titles.....	10
1. General Workflow	10
2. Launch of the SLStreamer Pro Application (Step 1)	11
3. Creation of a Graph From the Input_IP Template (Step 2)	12
4. Graph Nodes Configuration (Step 3)	14
5. Finish of Graph Configuration (Step 4a)	20
6. Saving Graph to File (Step 4b).....	21
7. Creation of a Title Project (Step 6).....	22
8. Configuring and Controlling via the FDO nAir Application (Steps 7, 8).....	24



Introduction

The IPIInput plugin is used to organize broadcasting of streaming audio or video in the form of titles – in «windows» of a desirable size with a main video at the background (PiP – picture in picture). Source of video can be IP cameras/TV programs broadcasted from the main station by net using IP protocol.

➡ **Example:** Broadcasting of streaming video received from IP camera on information-entertaining channel in the form of titles.



The IPIInput plugin is an additional software option to:

- the Forward T product line: Forward TT, Forward TA, ForwardTP/TP2;
- the Forward TS product line: products for inserting commercials into and overlaying titles on a program from MPTS (multiprogram transport stream).



General Information

1. Modes of Broadcasting of Streaming Video Received by Video Server Over IP Network

Broadcasting of streaming video received via IP network is based on one of the products of the Forward T or Forward TS sets. It can be implemented in 2 ways:

- as titles in one or several «windows» of a desirable size with audio/video on the background. In this case the IPCamera title element is used. This way of broadcasting requires the IPCamera plugin. Instruction on customizing and use see in the sections below;
- as a background. In this case IPIInput function is used to control this procedure. Detailed information on software requirements see in [«Rebroadcasting of Streaming Video Delivered on Video Server Over IP Network on a Full Screen. User's Guide.»](#).

Each way has both benefits and limitations (for more information see the table below).

Table 1. Description of modes

Characteristic	Way of broadcasting	
	Titles	Background
Tool for configuring and controlling	IPCamera title element.	Video input in FDO nAir of the IPIInput type.
Possible quantity of broadcasting channels (where you may switch quickly)	Any amount. Limited by PC resources.	6 buttons assigned to video inputs in the FDO nAir application.
Quantity of windows where streaming audio or video are displayed simultaneously	Any amount. Limited by PC resources.	1 full-screen window.
Possibility to configure window size and location	Present.	Absent.
Possibility to broadcast several programs (channels) from one or different IP streams simultaneously	Present.	Absent.
Possibility of switching between channels in one window	Present. Switching is made with several seconds delay. Delay occurs because when a new channel is switched on a corresponding video begins to be received and processed. Receiving and processing take time.	Present. Implemented without a delay because all channels (where switching is planned) are decoded all time (all corresponding schemes work simultaneously).



Characteristic	Way of broadcasting	
	Titles	Background
Use of PC resources working with several channels	Less resource-demanding because only broadcasted on air channels are decoded at the moment.	More resource-demanding because all channels are decoded at the moment. It increases PC load.

2. Preparation and Control of Broadcasting. General Scheme

Procedure and used tools to configure and control streaming audio or video broadcasting depend on a selected way of broadcasting (see the table below).

Common feature in this case is a preliminary step of receiving and processing configuration of streaming video and audio. You need to specify a source and a format of video and audio for broadcasting by indicating a source network address and interface that receives the stream. Also, adjust if necessary parameters of demultiplexing, select program (channel) for broadcasting, etc.

Configuration is implemented in the SLStreamer Pro (SLStreamer Lite) application via graphs created from the IP_Input template.

Note: For more information on the SLStreamer Pro application, see the [«SLStreamer Lite, SLStreamer Pro. Programs for Configuring, Monitoring & Managing Digital Broadcasting Schemes. User's Guide»](#).

Table 2. Configuration and control of broadcasted streaming video and audio

Steps and operations	Way of broadcasting	
	Titles	Background
Preparation		
Configuration of a scheme of video and audio receiving and processing	Prepared in the SLStreamer Pro application by creating and configuring of graph from the IP_Input template.	
Saving of video and audio receiving and processing scheme to an XML file	Prepared in the SLStreamer Pro application via the Save graph command.	Not required.



Steps and operations	Way of broadcasting	
	Titles	Background
Configuring of streaming video and audio receiving and processing schedule	Not required. Receiving and processing of video and audio will be implemented according to the broadcasting schedule in the FDO nAir application.	Prepared in the SLStreamer Pro application by creating tasks schedule.
Configuring of region size and location with streaming video on the screen	Prepared in the FDTitleDesigner application (title projects editor). IPCamera title element is used.	Not required.
Configuring of a correspondance between receiving video and audio and controlling of broadcasting	Prepared in the FDTitleDesigner application. Task is loaded in the IPCamera title element. The task is an XML file with a description of video and audio receiving and processing scheme.	Prepared in the FDO nAir application. Configuration of video input of the IPI nput type.
Control over receiving and processing of streaming video and audio		
	Schemes are automatically launched when tasks are loaded in the IPCamera title elements of the FDO nAir application.	Schemes start/stop when tasks start/stop in the SLStreamer Pro application (made according to the schedule automatically/ manually).
Control over video and audio output on air in the FDO nAir* application		
Displaying of video is on/ off	Commands to control title objects: Title object on Tile object off Title object abort	On: commands to control «passthrough video» – Video input N. Off: any commands of full-screen video starting.
Switching of channels in one window	Command to load a new task for the IPCamera** title object.	Video input N command, where N is index of a necessary input (1–6).

* – use FDO nAir buttons or schedule commands to control.

** – consider that you will need some time to start another channel.



Installation

The IPInput plugin is installed in addition to the basic software.

The setup file is the ForwardTxPlugins_Setup_xx_xx_xx.exe file, where xx_xx_xx denotes software version.

Complete the following steps to install and register the plugin correctly depending on the basic software:

1. For the Forward T product line:
 1. Be sure that ForwardT Software of a current version with all available updates are installed. For more details, see the «[ForwardT Software. Setup. User's Guide](#)».
 2. Install IPOut Option software. For more details, see the «[IPOut, ASIOut: Digital Streaming Options for Forward T Products. User's Guide](#)».
 3. Install IPInput via plugins installer.
 4. Register the IPInput plugin for the corresponding FD300 board.

✓ **Important:** Reboot PC to apply registration.

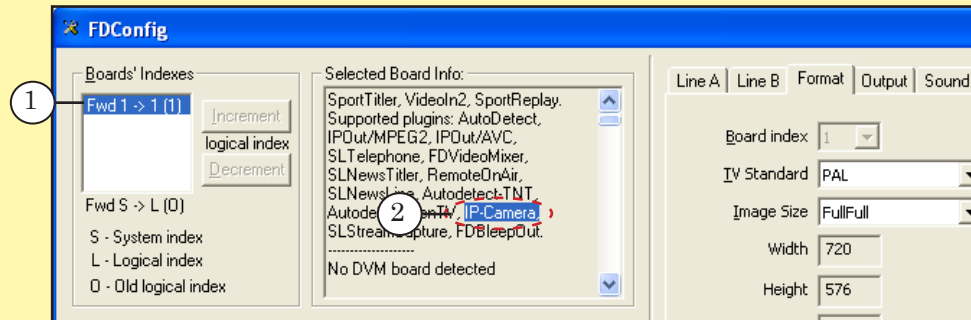
2. For the ForwardTS product line:
 1. Be sure that ForwardTS software of a current version with all available updates are installed. For more details, see the «[ForwardTS Software Setup. User's Guide](#)».
 2. Install IPInput via plugins installer.
 3. Register the IPInput plugin for HASP key and if necessary for the corresponding FD300 board.

✓ **Important:** Reboot PC to apply a registration.

Note: Detailed information on plugins installation and registration see in the «[Plugins Setup. User's Guide](#)». All listed above software components and additional instructions are available at the Download page:
<http://www.softlab-nsk.com/forward/download.html>



Tip: If the FD300 board is used, launch the FDConfiguration application to be sure that the IPInput plugin is registered. Select required board in the list (1). The IP-Camera element must be present in the Supported plugins list of the Selected Board Info window (2).



Functional set of the product is extended when IPInput is installed and registered, i.e. the IPCamera title element will be added to the basic set of FDTitle Designer elements. The element allows configuring and controlling of streaming video and audio playback in the form of titles.



Broadcasting of Streaming Video and Audio in the Form of Titles

1. General Workflow

The section contains information on preparation and control of stream video and audio broadcasting in the form of titles. Steps in details are given below:

1. Launch the SLStreamer Pro application.
2. Create a graph from the Input_IP template.
3. Configure graph nodes sequentially in configuration mode: specify a stream source, configure parameters of stream demultiplexing (if necessary) and select a program for broadcasting.

✓ **Important:** Implement configuration when video and audio is being received on the IP input.

4. Switch configuration mode off and save the graph to the XML file. You may delete the graph after saving.
5. Close the SLStreamer Pro application.

Note: For more information on the SLStreamer Pro application, see the «SLStreamer Lite, SLStreamer Pro. Programs for Configuring, Monitoring & Managing Digital Broadcasting Schemes. User's Guide».

6. Create a title project in the FDTitleDesigner application. Add the IPCamera title element. Specify its size, location on the screen and name. Load the XML file (task) created on step 4 and save the project.

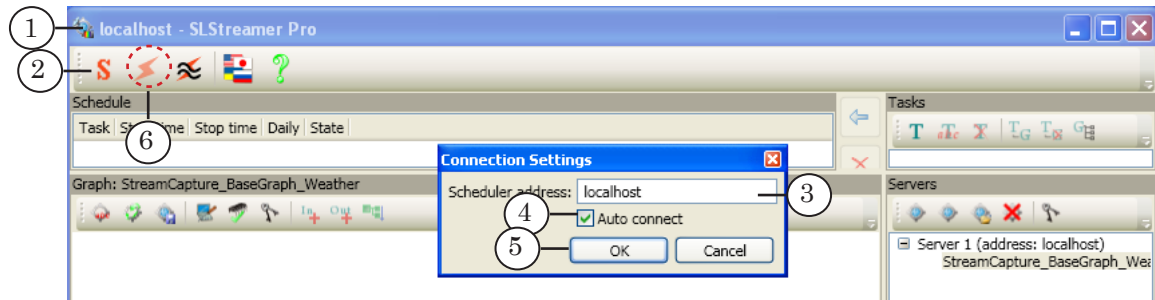
Note: Title project may contain several IPCamera elements with different tasks. Repeat steps 2–4 as many times as it is necessary to create the tasks for every element. Include title elements into different title objects to control each of them separately.

7. Load the title project created on step 6 in the FDO nAir application. Create broadcasting schedule. Include commands to control title objects with the IPCamera title element in the schedule if necessary.
8. Start created schedule in the FDO nAir application. In addition to schedule commands that you may use to control switching on/off of broadcasting and channels switching you may also use buttons for interactive control over title objects.



2. Launch of the SLStreamer Pro Application (Step 1)

1. Launch the SLStreamer Pro application (1) via the Start menu command: Programs > ForwardT Software > IPOutOption > SLStreamer Pro or the program shortcut.
2. Connect to Scheduler if connection is not done automatically:
 1. Click the Connection Settings button (2) on the toolbar.
 2. Specify IP address or hostname (3) where Scheduler is started, local PC in our example.



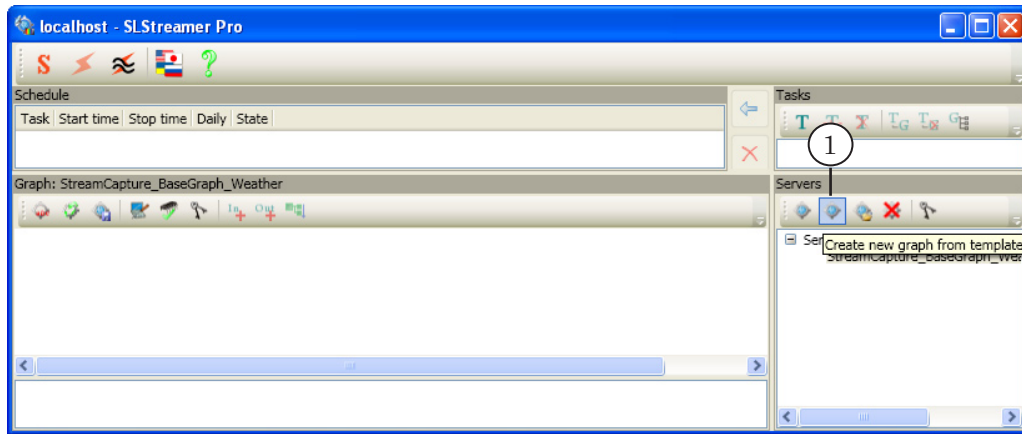
3. Set the Auto connect check mark (4) to connect to the server automatically (during current and all subsequent program sessions).
4. Click OK (5).
5. Click the (6) button to connect to Scheduler manually if automatic connection is not configured.



3. Creation of a Graph From the Input_IP Template (Step 2)

A template is a standard graph pattern. Complete the following steps to create the graph from the Input_IP template:

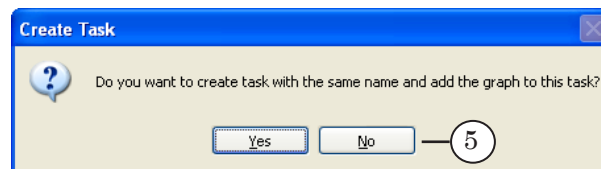
1. Click the Create new graph from template button (1) on the toolbar in the Servers window.



2. Specify graph name in the appeared window (2).
3. Select the Input_IP template (3) in the Template drop-down list.

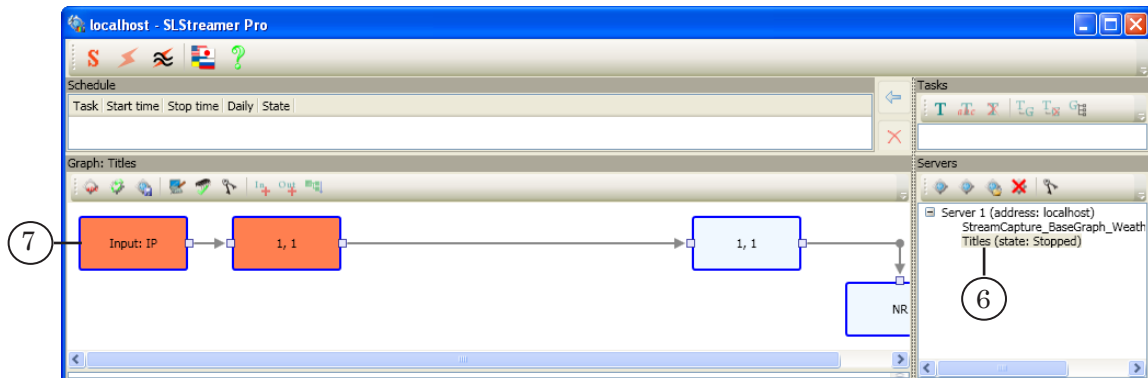


4. Click OK (4).
5. Refuse to create a new task by clicking No (5) in the appeared window.





6. New graph from the selected template is created. Its name will be added to the graphs list (6). The graph itself is displayed in the graph work area (7). Configuration mode will be switched on automatically.



7. Configure graph nodes consequently in configuration mode. Next section contains detailed information on this procedure.

✓ **Important:** Configure graph nodes obligatory.



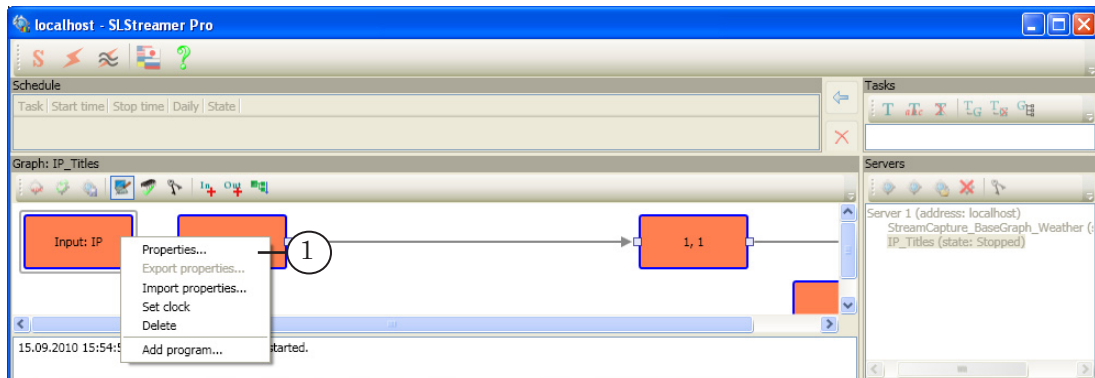
4. Graph Nodes Configuration (Step 3)

Configure nodes in the order they are located in the graph – from left to right. In the most cases node configuration depends on previous node configuration.

4.1. Input Device

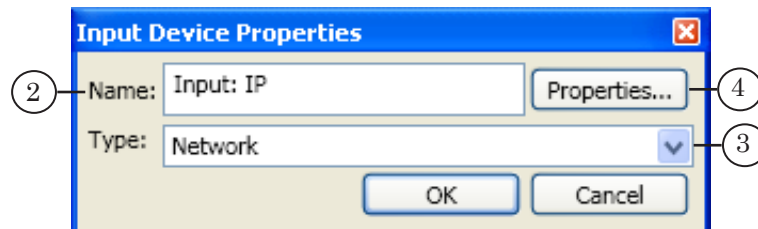
Node of the input device is the first in the order.

1. Open the context menu by right-clicking the node. Select Properties... (1).



Complete the following in the Input Device Properties window:

2. Specify a name of the node (2).
3. Select the Network device type in the drop-down list (3).
4. Click Properties... (4) to configure device parameters.

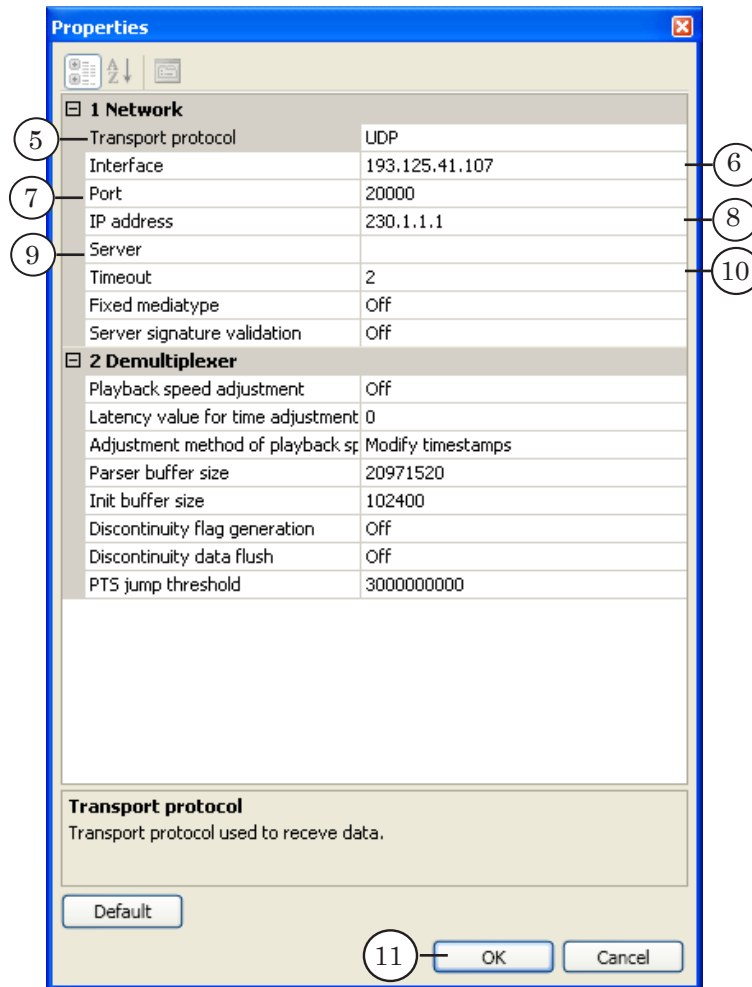


Configure input device parameters in the appeared window:

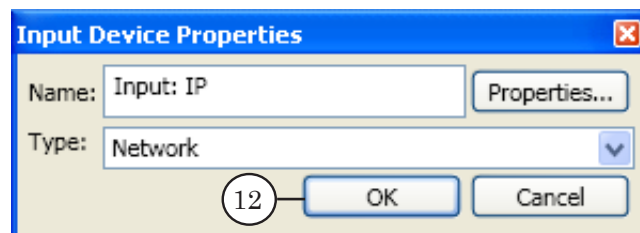
5. Select a transport protocol (5), UDP in our example.
6. Select IP address of receiving network interface in the Interface drop-down list (6).
7. Specify a port number used for receiving of video and audio in the Port field (7).
8. If you have multicast broadcasting specify IP multicast group address in the IP address field (8). In our example it is 234.5.5.5.
9. Specify IP address or hostname of the streaming server in the Server filed (9) if PC that receives the stream is not included in multicast group.



- Specify a timeout (in sec) in the Timeout field (10), 2 sec in our example.



- Remain default values in demultiplexer section.
- Close windows with configurations consequently by clicking OK (11, 12) and to save all modifications.

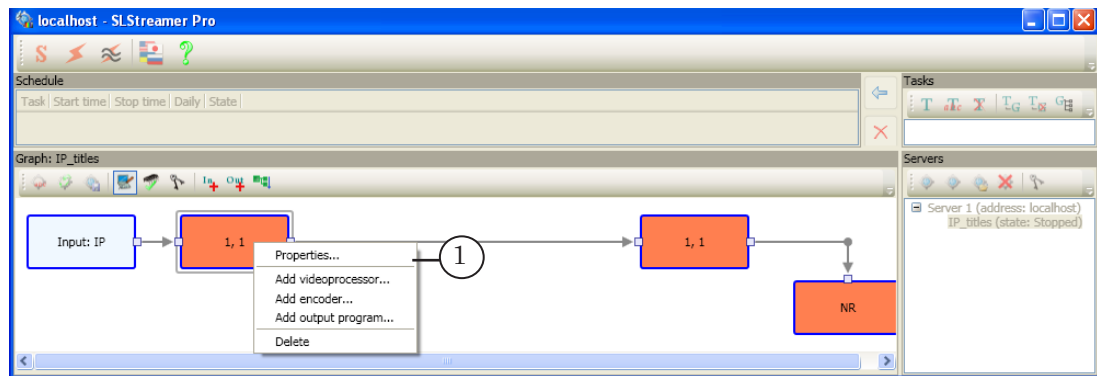




4.2. Input Program

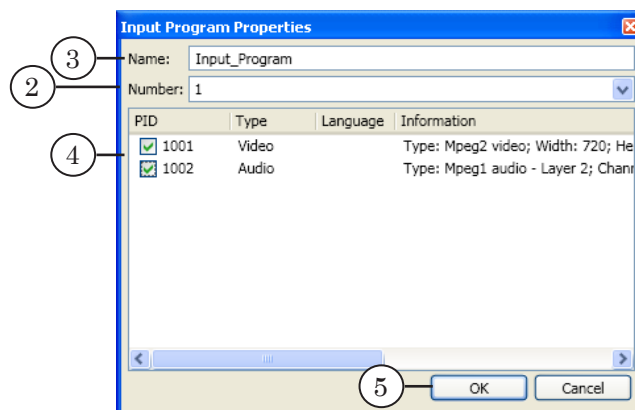
Node of the input program is the second in the order. Configure the node when stream is being received by network adapter and when the Input Device node is configured.

1. Open the context menu by right-clicking the node. Select Properties... (1).



Configure parameters in the Input Program Properties window:

2. Select number of program (2).
3. Specify program name (3).
4. Select audio/video streams in the table (4) by setting corresponding check marks, PID=1001 video and PID=1002 audio streams in our example.



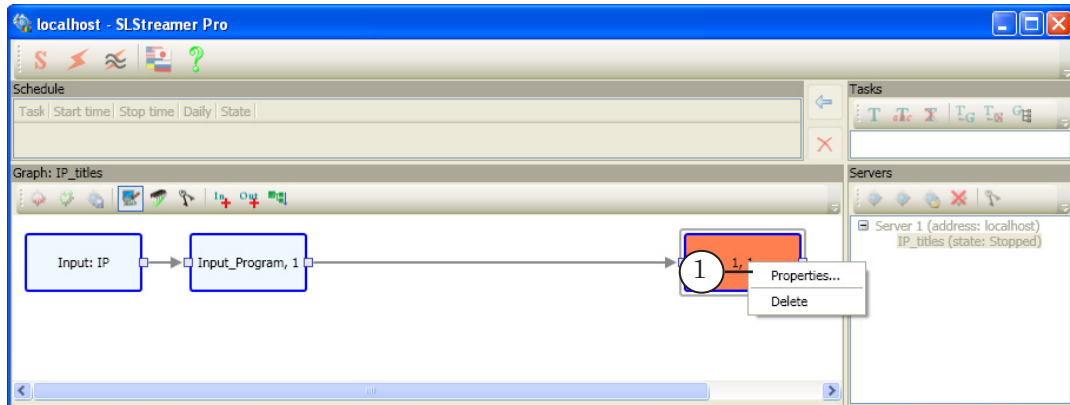
5. Click OK (5) to save properties and close the window.



4.3. Output Program

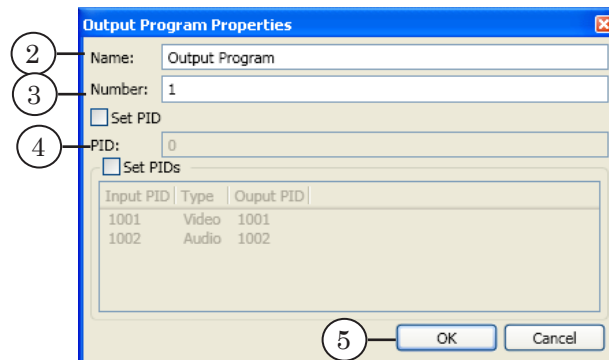
Node of the output program is the third in the order.

1. Open the context menu by right-clicking the node. Select Properties... (1).



Configure parameters in the Output Program Properties window:

2. Specify the program name (2).
3. Specify the program number (3).
4. PIDs in our example are specified automatically (4).
5. Click OK (5) to save properties and close the window.



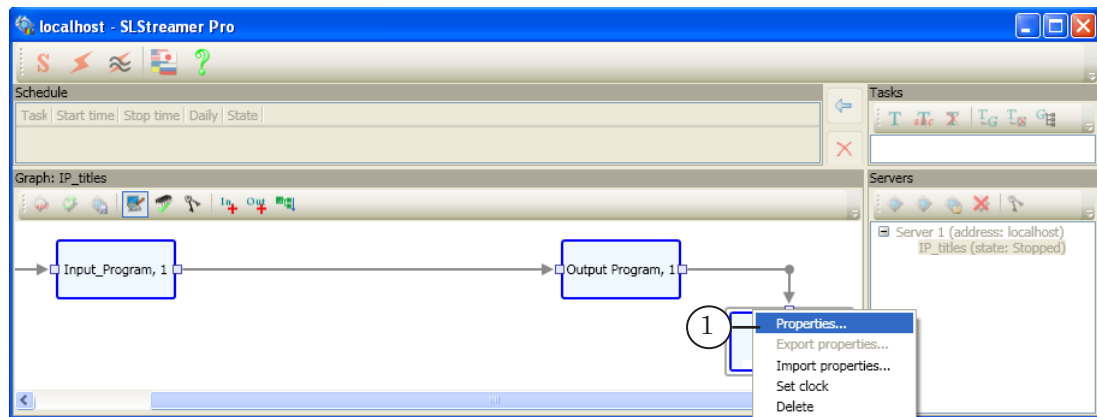


4.4. Output Device

Node of the output device is the fourth in the order.

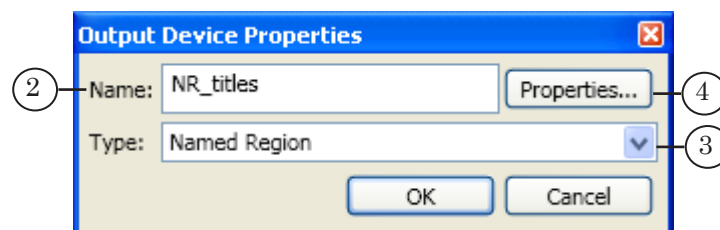
In solution that we customize we use the Named Region virtual device. In this case video and audio are transmitted to named region – a rectangular area of a specified size and location.

1. Open the context menu by right-clicking the node. Select Properties... (1).



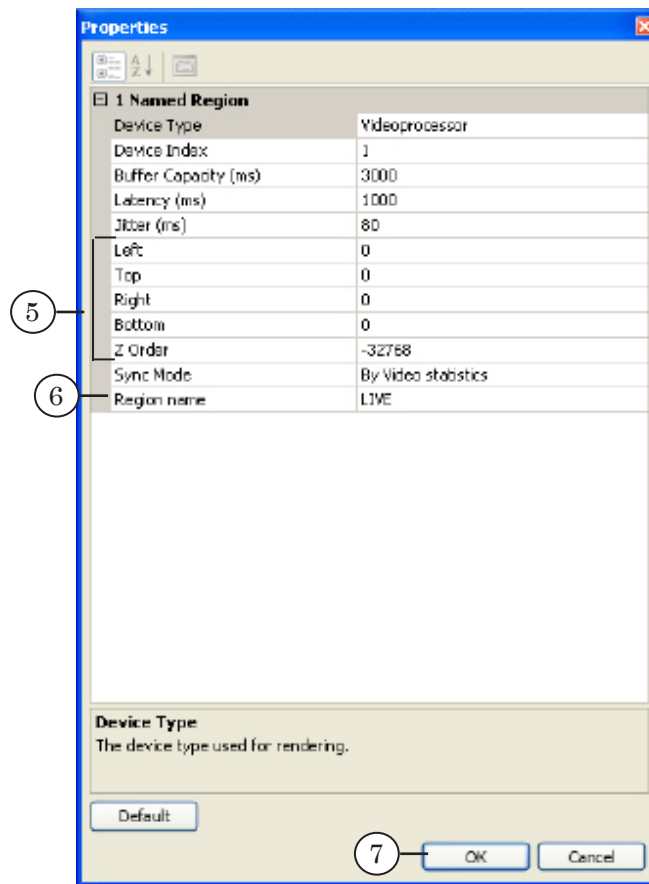
Configure parameters in the Output Device Properties window:

2. Specify the node name (2).
3. Select the Named Region device type in the drop-down list (3).
4. Click Properties... (4).

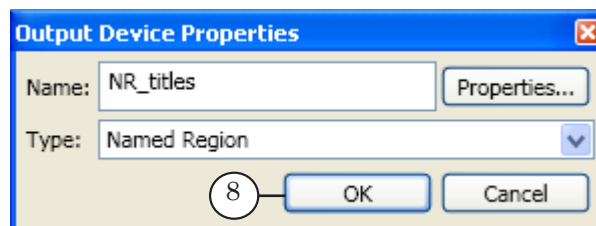




5. Remain default parameters in the Properties window. Region location, Z order (5) and region name (6) will be specified later in the FDTITLEDesigner application.



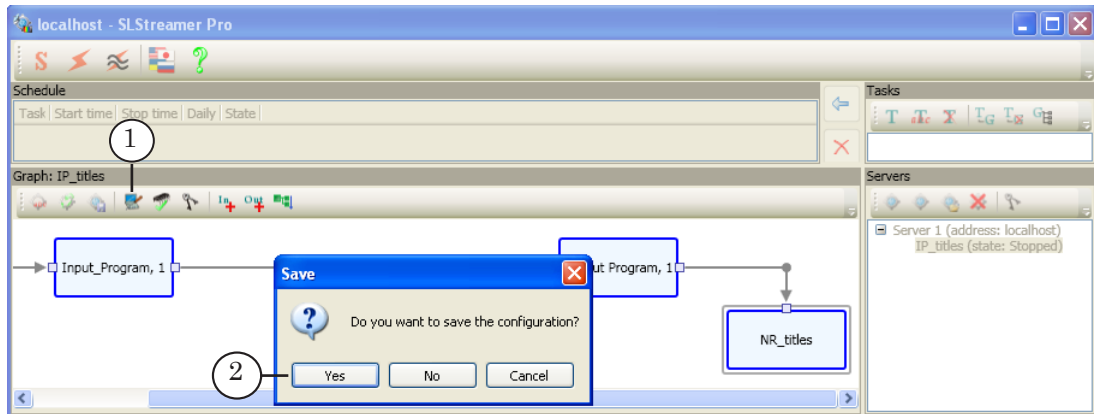
6. Click OK (7, 8) to save properties and close windows.



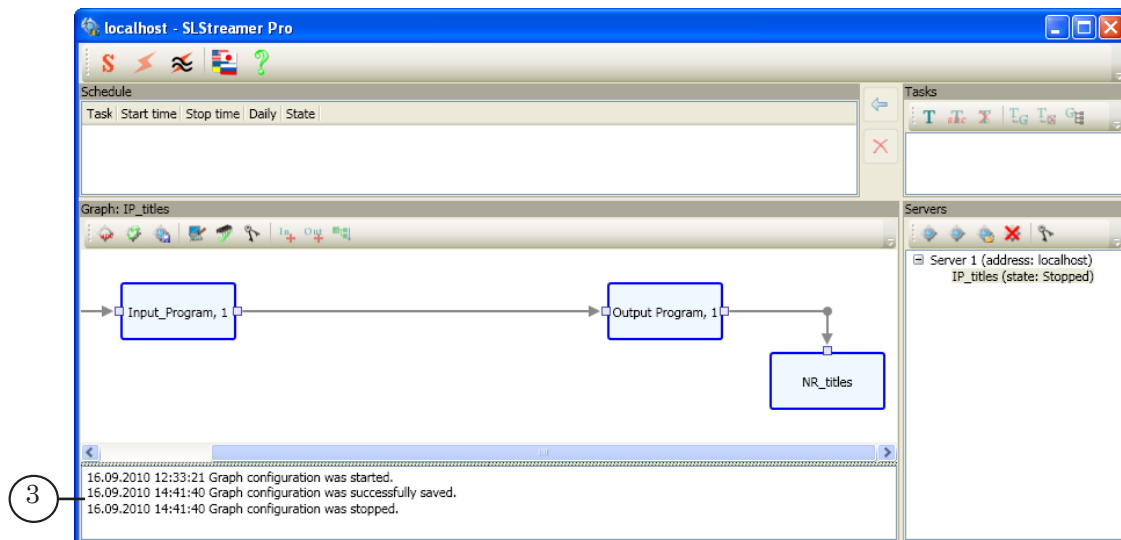


5. Finish of Graph Configuration (Step 4a)

1. Click Finish Graph Configuration (1) to complete graph configuration and to quit configuration mode.
2. Click Yes in the appeared window to save configuration (2).



3. Graph is configured. Corresponding message (3) appears in protocol area.

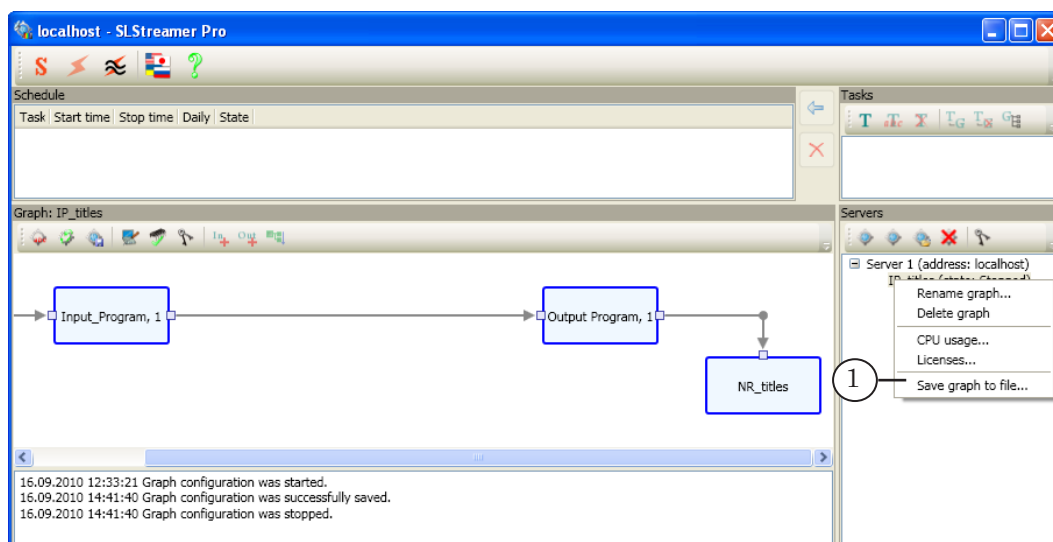




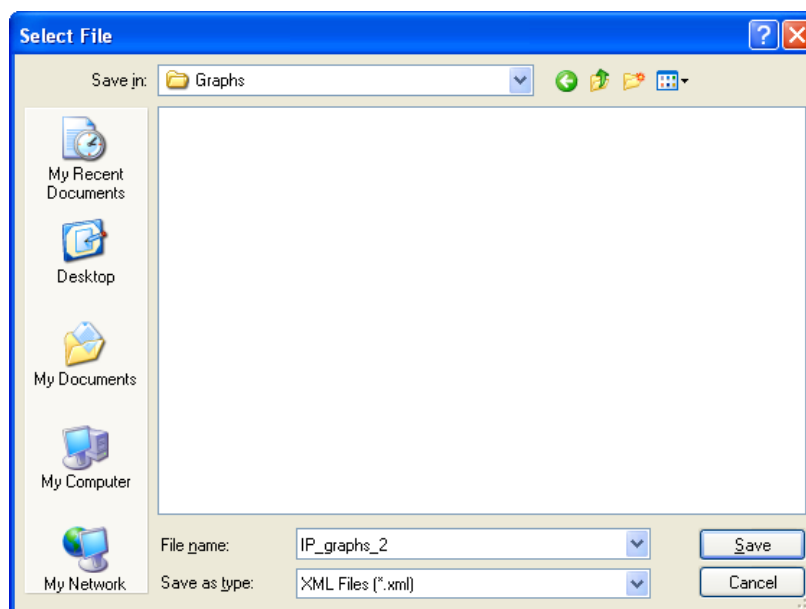
6. Saving Graph to File (Step 4b) and Closing of the SLStreamer Pro Application (Step 5)

Save graph properties to an XML file. The file is the task for the IPCamera title element.

1. Select necessary graph in the Servers window.
2. Open the context menu of graph by right-clicking the graph.
3. Select Save graph to file...(1).



4. Select a folder to save the file. Specify file name and click Save.



Note: You do not need the graph for further work. It can be deleted.

5. Close the SLStreamer Pro application.

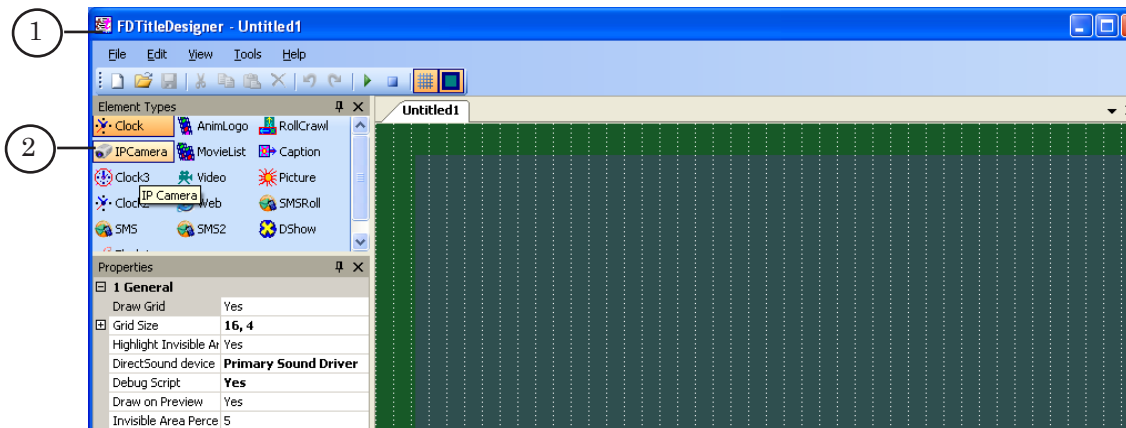


7. Creation of a Title Project (Step 6)

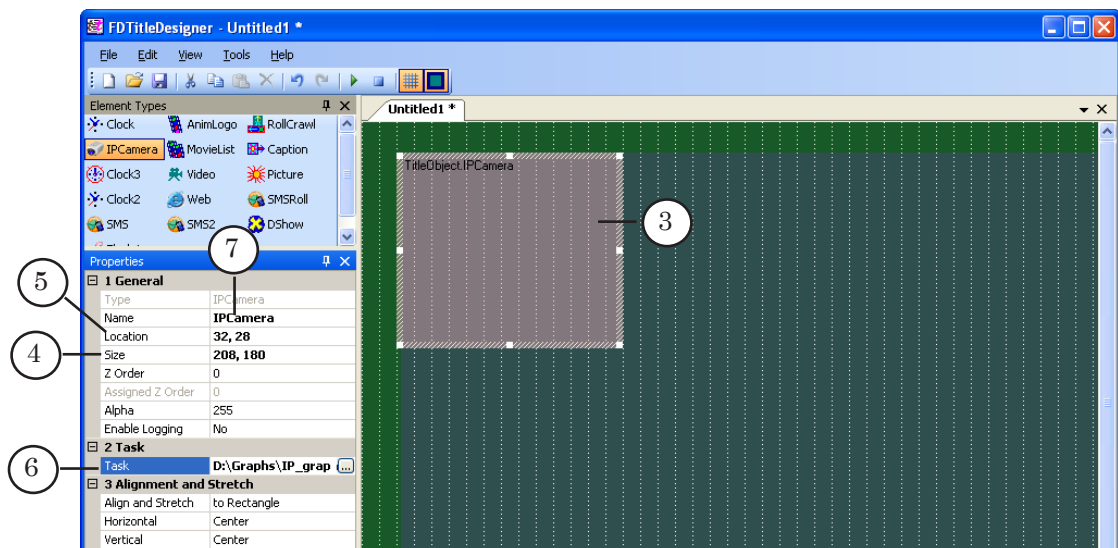
Create a title project with the IPCamera title element.

Use the FDTTitleDesigner application (1) to create, edit and preview the title project. The application can be launched via the Start menu command: All Programs > ForwardT Software > Titles > Title Designer or the program shortcut.

1. Empty title project will be opened when the application is launched. Create a new project if it is necessary.
2. Click the IPCamera button (2) on the Elements Types panel.



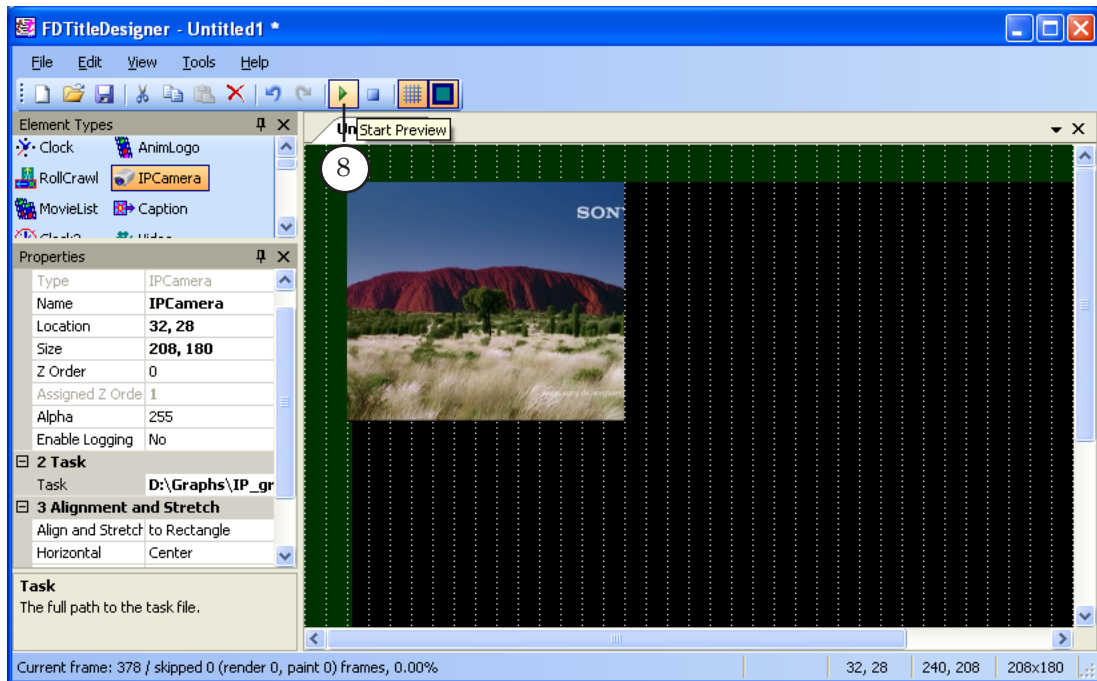
3. Click mouse cursor in project work area and drag it to necessary position to specify element bounds (3).
4. Specify element size (4) and location (5).
5. Specify the XML file created on previous step as the element task (6).



6. Specify title element name (7), IPCamera in our example.



7. Click Start Preview (8) to be sure that input video is correctly displayed in the title element.



Note: Give unique names to title elements and specify unique Z coordinates if several IPCamera elements are added to the project. The FDTITLEDesigner application automatically controls that all project title elements have different names and different Z coordinates.

8. Save the title project and close the FDTITLEDesigner application.



8. Configuring and Controlling via the FDO nAir Application (Steps 7, 8)

Launch the FDO nAir application via the the Start menu command: Programs > ForwardT Software > OnAir

Load the title project with the IPCamera title element created on the previous step.

Turning on/off of channels is implemented in one window:

- automatically according to the schedule via commands to control title objects:
 - Load title object;
 - Title object On (1);
 - Title object Off (2);
 - Abort object task (3);
- via buttons of overlay direct control buttons (4).

Note: Buttons for adding of commands to the schedule are located on file pages that are used for working with title objects and to control them (title objects) (5).



Tip: Remember that graph start takes several seconds. Load corresponding tasks in title objects in advance to display streaming video without a delay.



Useful Links

ForwardT Software set: description, download, documentation, solutions

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

Support

e-mail: forward@softlab.tv

forward@sl.iae.nsk.su

forward@softlab-nsk.com

Forum

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

Documentation for more information:

1. [ForwardT Software Setup. User's Guide.](#)
2. [IPOut, ASIOut: Digital Streaming Options for Forward T Products. User's Guide.](#)
3. [ForwardTS Setup. User's Guide.](#)
4. [Plugins Setup. User's Guide.](#)
5. [SLStreamer Lite, SLStreamer Pro. Programs for Configuring, Monitoring & Managing Digital Broadcasting Schemes. User's Guide.](#)
6. [FDTitle Designer. Title Project Editor. User's Guide.](#)
7. [FDOnAir. Broadcast Automation. User's Guide.](#)
8. [Rebroadcasting of Streaming Video Delivered on Video Server Over IP Network on a Full Screen. User's Guide.](#)

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