



VIDEO COMPRESSION GURU

Elecard CodecWorks v.4.4

User Guide

User Guide Notices

Elecard CodecWorks v.4.4 User Guide

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1. Introduction

1.1 Preface

Elecard CodecWorks is a professional software solution for real-time encoding and transcoding into MPEG-2/AVC with up to 16K resolution supporting multiscreen encoding and HLS adaptive streaming technologies.

CodecWorks has passed through comprehensive testing. It ensures high performance and continuous content delivery suitable for projects of any scale and complexity.

1.2 Using This Guide

This Guide allows the user to find information on basic functions and operation principles of Elecard CodecWorks software solution. The Guide describes installation and configuration rules for Elecard CodecWorks.

1.3 System Requirements

System requirements depend on several factors:

- type of task (encoding, transcoding, multiplexing etc.);
- input and output format and resolution;
- the need for signal processing (change of frame size, deinterlacing, frame conversion etc.);
- number of channels to be processed.

The minimal system requirements recommended for proper operation of Elecard CodecWorks:

CPU encoding
<ul style="list-style-type: none">• CPU (Intel® 4/5/6/7 generation, Xeon)• 8 GB RAM (two-channels mode is required)• Any video card• Linux (CentOS 7.2-7.4)

1.4 Activating Elecard CodecWorks

There are two ways to activate Elecard CodecWorks described below:

- HWkey License.

Unique identifying code is compiled based on target PC hardware configuration with the help of a special utility, and CodecWorks build is tied to this code. To receive the utility, contact Elecard Technical Support Team or your project coordinator.

- HASP License.

Elecard mails a HASP key which has a unique code and should be plugged into a PC where CodecWorks is going to be used.

1.5 Licensing and Technical Support

Elecard CodecWorks is available as a demo version or a registered product.

By installing, copying, or otherwise using the SOFTWARE PRODUCT or any UPDATES, you agree to be bound by the terms of the "Elecard" End-User License Agreement ("EULA"). This EULA is a legal agreement between you (either an individual or a single entity) and Elecard for the "Elecard" software product(s) accompanying this EULA, which include(s) computer software and may include "online" or electronic documentation, associated media, and printed materials ("SOFTWARE PRODUCT").

For sales and licensing information, contact the Elecard Sales Department: sales@elecard.com

For technical support, contact Elecard Technical Support Team at: tsup@elecard.com

2. Describing CodecWorks

2.1 Installing CodecWorks

1. For installation run the script:

```
chmod +x ./elecard_cw_install.sh  
./elecard_cw_install.sh
```

2. Software is installed to: /usr/local/bin/elecard/CodecWorks.

The created schemas are saved at: /etc/elecard/CodecWorks.

Before CodecWorks is installed, the following should be taken into consideration:

- CPU performance is of crucial importance for real time encoding process. Take it into account, when you choose hardware for the encoding server.
- The disk selected for program installation should have enough free space for saving of the system log (for highly detailed logs) and memory dump files (if the application fails or abnormally closes).
- To manage encoding server via SNMP protocol, the corresponding service must be installed in the system¹.

2.2 Uninstalling CodecWorks

To uninstall Elecard CodecWorks execute the command below:

```
/usr/local/bin/elecard/CodecWorks/elecard_cw_uninstall.sh.
```

2.3 Running CodecWorks

To start the server in terminal, execute the command:

```
/usr/local/bin/elecard/CodecWorks/cwWatcher.sh
```

To start the server in a background mode, execute the command:

```
/usr/local/bin/elecard/CodecWorks/cwWatcher.sh /start
```

To start Manager, execute the command:

```
/usr/local/bin/elecard/CodecWorks/cwManager.sh
```

To stop the server, execute the command:

```
/usr/local/bin/elecard/CodecWorks/cwWatcher.sh /stop
```

To start/stop/restart the server or to check the service status, execute the commands:

```
service elecard-codecworks-service {start|stop|status|restart}.
```

Note: To create and manage the encoding schemas, use the local Manager, or Web-interface, or the Manager installed on Windows OS or Linux OS and located in the same network.

2.4 Specifications

Elecard CodecWorks supports the following formats and protocols:

¹See the *Management via SNMP* section.

- MPEG-2 Transport Stream
- MPEG-2 Video Stream
- AVC/H.264 Video Stream
- RTSP Input
- HLS
- UDP/RTP

2.5 Features

Elecard CodecWorks implements the following functionality and modules:

- Adaptive streaming support via HLS;
- Encoding schemes configurator;
- GUI and web-interface for centralized control over several encoding servers;
- Mechanism for quick back up in N+M Mode;
- Redundancy mode and immediate automatic changeover to a redundant source in case pre-defined errors occur;
- SPTS monitoring functions enabling to spot CC errors;
- Error notifications via e-mail or SNMP protocol;
- Logo insertion on video image

2.6 Quick Start

Elecard CodecWorks can be started as a Windows system service or as a console application².

To manage and control encoding servers, use the **Elecard CodecWorks Manager** program.

When the Manager is started, it detects locally started CodecWorks server and displays the server information. If the server is not detected, select the **Local server** → **Settings** command and set the network interface IP address and the multicast address (if it is required) values that are consistent with the Manager settings.

If the Manager program is started on another computer, adjust the automatic detection of remote encoding servers using the **Preferences** command of the **Application** menu. The *Multicast IP* value (must be matched with the corresponding setting of the encoding server), and the network interface address used for management must be specified. If the address is set to *127.0.0.1* value, the automatic detection is available only for local (started on the same computer) encoding node.

To simplify management for group of servers, set the same *Multicast IP* and *Multicast Port* values for all servers of the group (however, make them unique for each group). In this case the Manager displays only servers from the specified group.

Alternatively to automatic detection of a new server, the encoding server can be added manually. Click the **Add server** button and type the *Multicast IP* and *Multicast Port* values for the selected server.

If the **Local Server** → **Start Elecard CodecWorks (console)** is selected, the **Elecard CodecWorks Watcher** console is started. It starts the **Elecard CodecWorks Dispatcher** program automatically. The dispatcher activates encoding consoles according to the initial configuration. If the **Local Server** → **Start Elecard CodecWorks (console)** is selected, no other windows are opened.

Each encoding console performs an individual task (with the only one Pipeline) and may be started or stopped separately from the other tasks. The task details can be viewed in the encoding schema.

²The console work mode is recommended on the first workspace adjustment stage because it is more visually informative. For the well-tuned system, the system service mode is more convenient.

The encoding servers and launched consoles are managed via shortcut menus. The shortcut menu appears when the user right-clicks a selected GUI element.

To stop the Elecard CodecWorks server operation, select the **Deactivate** command from the shortcut menu. The **Restart** command forces the CodecWorks server to restart. The server computer is not restarted or turned off.

To select or change the encoding schema, select the **Change schema** command. The **Schema list** window is displayed. The typical task is a new schema creation (see the *Schema Configurator* section). You can create several schemas with different settings and use them later without any additional configuration. Select a schema from the opened list and press the **OK** button.

To start or stop the encoding process, click the **Start** or **Stop** commands, respectively. To restart the encoding console, click **Restart**.

The **Statistics** window is used for monitoring the console encoding process. To open the window, select the **Statistics** command. The **Statistics** window indicates the encoding schema parameters. Furthermore, the Manager window displays status, name of the selected schema, start date/time and utilized system resources for each console.

The **Parameters** command opens the list of component parameters that can be changed. In the schemas created with the Schema Configurator, the components are grouped into separate tabs. To apply changes, press the **OK**³ button, to discard – the **Cancel** button. Double-click the selected console to open the Parameter window. Use the Schema Editor to configure encoding process more precisely. To enter the Schema Editor, click the required console and press the hot keys combination: Ctrl+Shift+e.

2.7 Program Structure and Module Description

Only one encoding server can be installed per one operational system.

- **Encoding console** – a program that builds and starts the encoding schema, receives and processes control commands from the Manager (using the CodecWorks Dispatcher program), and controls license limitations. Each server allows starting of several consoles (depending on the number of purchased licenses).
- **Dispatcher** – a program (console or system service at user's discretion) that supervises the dispatcher work of encoding consoles, starts and reboots the consoles, provides “external communications”, gathers the server capacity statistics. Each server allows starting only one dispatcher.
- **Watcher service** – a program (console or system service at user's discretion) that supervises the dispatcher work and reboots it in case of failure. The watcher service, dispatcher and encoding consoles can be started as system services or as console applications at user's discretion.
- **CodecWorks Manager** – a program with graphical user interface (GUI), that manages work of encoding consoles, adjusts and starts encoding schemas depending on the user's actions, and gathers statistics. One Manager can manage several servers.
- **CodecWorks Manager (console)** – a console application that provides command line management of encoding servers.
- **Encoding schema** – an XML document that contains full information about Pipeline structure and its settings. Usually the schema is intended for encoding of the specific input stream on the particular server.

³New values for some parameters cannot be applied without stopping the encoding process. If the value is not applied, the corresponding error message appears.

- **Schema configurator** – a program that is intended for the encoding schema creation using the complete set of component sections. Each component section represents structure and parameters of an encoding graph part that performs certain function (stream receiving, decoding, encoding, etc.). Templates can be used for schema preparation as well.

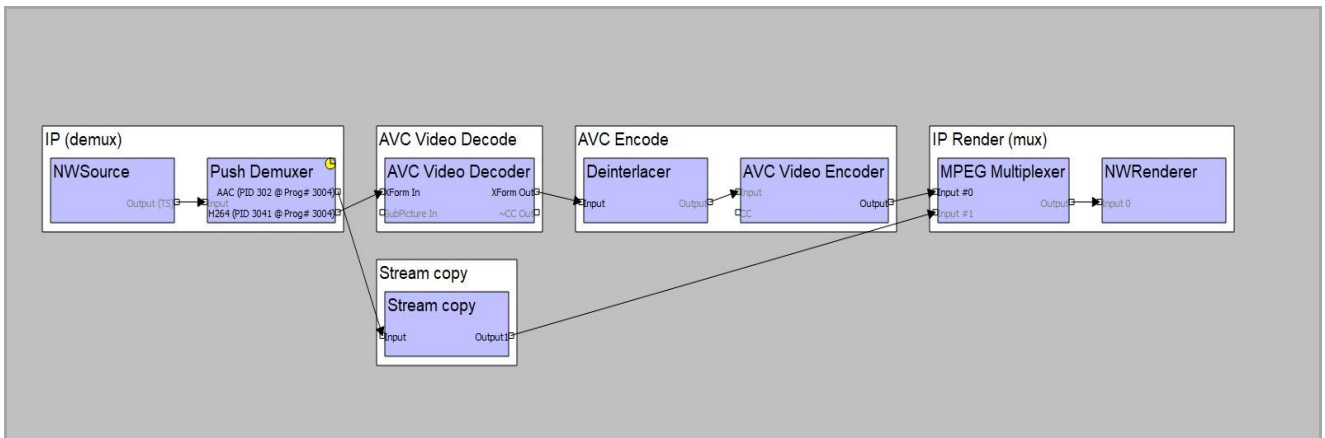


Figure 1. Schema Configurator – Component Sections

- **Template** – an XML document intended for a new encoding schema creation. The document consists of a limited set of component sections. The component section set defines the sort of encoding tasks that are performed with the template. It is recommended to set up a template if nonstandard complicated schema is built. Templates are prepared by Elecard.

2.8 CodecWorks Manager

The CodecWorks Manager main window contains a list of available servers and launched encoding consoles. Activity status, statistics, start time, CPU usage (%), and used RAM (Mb) are displayed for each server and console. Besides, the selected encoding schemas are displayed for the consoles.

Node	Activity	Schema	Parameters	Statistics	Started	CPU (%)	RAM (Mb)
DESKTOP-4CTJPA4 (10.10.30.221)	Active				2017-08-09 11:1...	9	3817 free
Console 1	Active Stopped	test	1920x1080 25 fps 1 CBR, AVC TS IP (demux) --> UDP	0 fps 0 kbps 0 frame		0	13
Console 2	Active Stopped	Elecard_test	1920x1080 25 fps 1 CBR, AVC TS IP (demux) --> UDP	0 fps 0 kbps 0 frame		0	13
Console 3	Active Running	Elecard_HIS_streaming	IP (demux) --> Null		2017-08-09 11:2...	3	135
Console 4	Active Stopped	3	1920x1080 25 fps 1 CBR, AVC TS IP (demux) --> UDP	0 fps 0 kbps 0 frame		0	13
Console 5	Active Stopped	3	1920x1088 25 fps 1 CBR, AVC TS IP (demux) --> UDP	0 fps 0 kbps 0 frame		0	13

Figure 2. CodecWorks Manager – Main Window

If CodecWorks Manager is started on the encoding server (local), then there is no need to adjust the Manager anyhow. Otherwise it may be required to open the **Preferences** dialog from the **Application** menu and set the **Multicast address** value for receiving announcements. The value should match with the corresponding setting of the CodecWorks server⁴. In some cases, it is required to specify the **Network interface** value used for the Manager communication with encoding servers.

⁴To manage a group of servers, set the same *Multicast IP* and *Multicast Port* values for all nodes. In this case the Manager automatically detects all servers from the group and performs centralized monitoring and management.

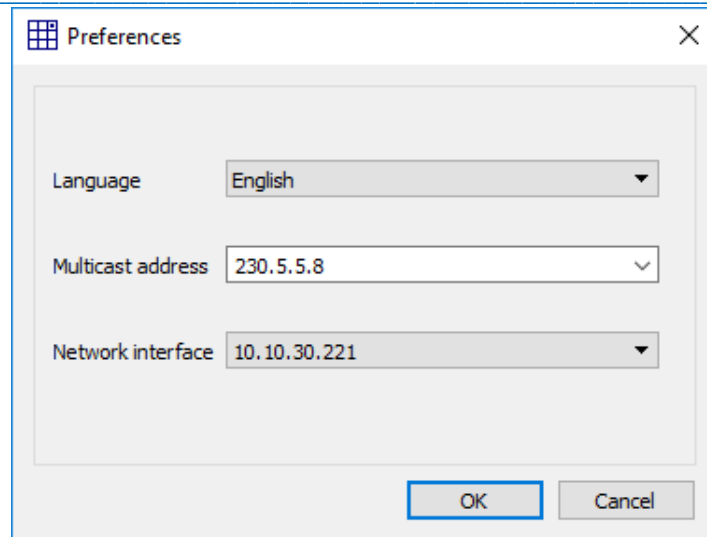


Figure 3. CodecWorks Manager – Preferences

The **Preferences** dialog box allows selecting the user interface language.

Right-click the encoding server or console to open its shortcut menu which provides main commands for the servers and consoles management.

2.8.1 Encoding Server Management

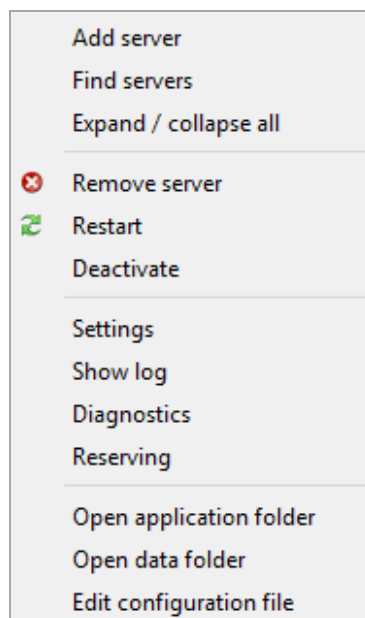


Figure 4. Encoding Server Management – Shortcut Menu

The **Find servers** command opened from the shortcut menu starts detection of the CodecWorks servers compatible with the announcements sent to the network multicast group that is specified in the Manager settings.

The **Add server** command opens the dialog box for manual addition of a new CodecWorks server.

The **Restart** command forces the CodecWorks server restart, and the **Deactivate** command turns off the encoding server. The server computer is not restarted or turned off.

The **Remove server** command removes the selected server from the server list.

The **Settings** command opens the **Server settings** dialog box for the encoding server.

The **Open application folder** command opens File explorer in the installed Elecard CodecWorks folder.

The **Open data folder** command – opens File explorer in the folder with configuration files, encoding schemas, logs, application events and samples.

The **Edit configuration file** command opens a configuration file for editing.

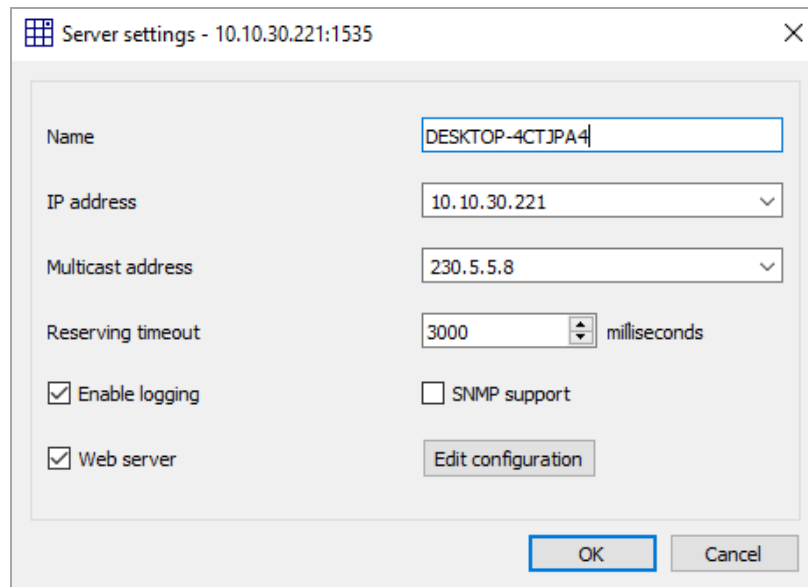


Figure 5. Server Settings Dialog Box

The dialog box allows adjusting the server name, specifying IP-address to send multicast announcements for CodecWorks Managers, and IP-address of the used network interface.

The **Reserving Timeout** parameter specifies the time interval (in seconds) for starting of backup encoders, if the encoding server response is not received.

The **Enable logging** option enables recording of system messages into the encoding server log.

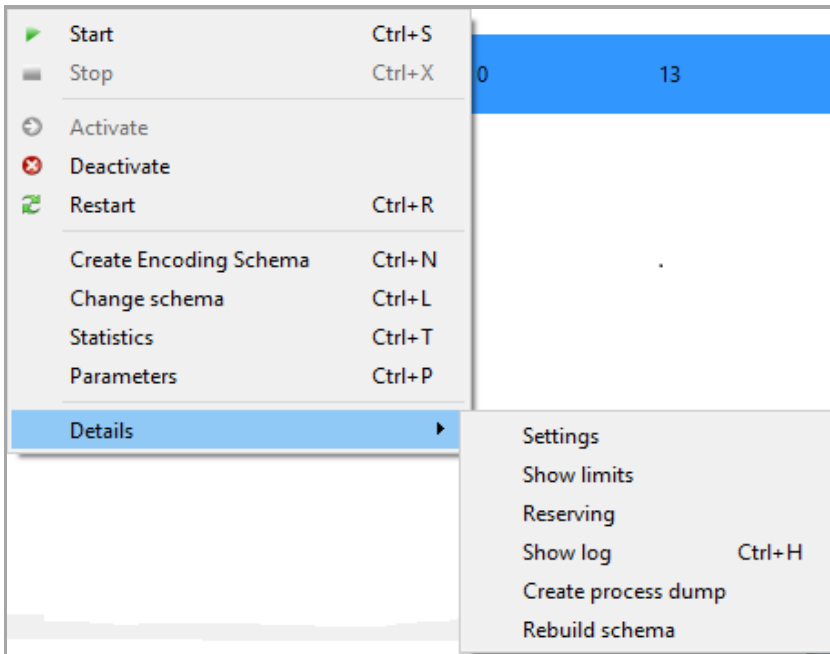
The **SNMP support** enables the SNMP management (if the SNMP protocol is not used, disable it to save the system resources).

The **Web server** option enables automatic start of nginx that is used for HLS streaming and Web-pages. The **Open configuration file** command opens the nginx configuration file where configuration parameters can be adjusted.

If the Manager and the CodecWorks server are installed on the same computer, the local server settings are available from the Manager shortcut menu (right-click in the Manager window), even if the server is turned off. The server can be started as console or service via the Manager as well. The **Show log** command opens the selected server system log for preview.

The **Diagnostics** command reports detailed information about the CodecWorks server configuration. This report should be sent to Elecard Technical Support Team if any issue occurs. From the window shortcut menu select the **Save to file...** command.

2.8.2 Encoding Console Management



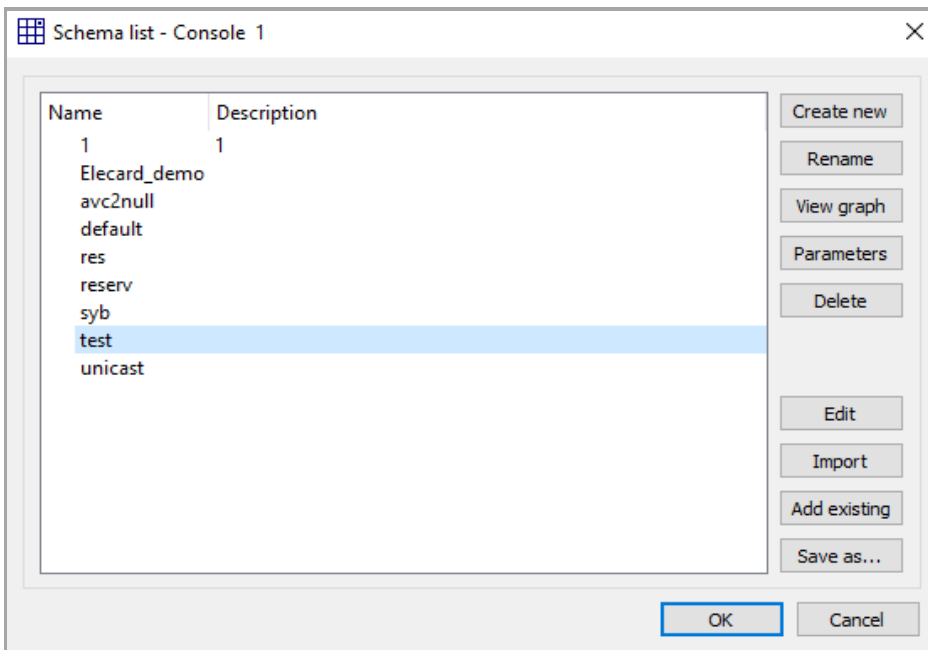
Encoding Console – Shortcut Menu

To start or stop the encoding process, click the **Start** or **Stop** command, respectively.

The **Activate** command activates the encoding console. If the console is not used, it can be deactivated with the **Deactivate** command.

The console can be restarted with the **Restart** command whether it is in the *Start* or *Stop* state. The restarted console returns to the pre-restart state (encoding or pending).

The **Change schema** command displays the list of available encoding schemas. The **Schema list** dialog box allows you to add, save, rename or delete encoding schemas.



Schema list

To apply the selected schema, press the **OK** button.

To create a new schema, press the **Create new** button. The configurator window allows setting up a schema according to project requirements. For details see the *Schema Configurator* section. When the

schema adjustment is completed, specify the schema name and brief description.

The **Rename** button allows editing the schema name and its description.

The **View graph** button visualizes the filter graph that corresponds to the selected encoding schema. Settings adjusted in this mode will not be saved.

The **Parameters** button displays the list of schema components and the component parameter values. The information is read-only. Tool tips on the parameter names display the parameter identifiers. The identifiers can be used, if the encoding process is managed via console or SNMP.

To remove the selected schema from the list, press the **Delete** button. If the schema is used in an encoding process, it cannot be removed.

If an encoding schema was prepared with configurator, the **Edit** button opens the schema for editing in the configurator program.

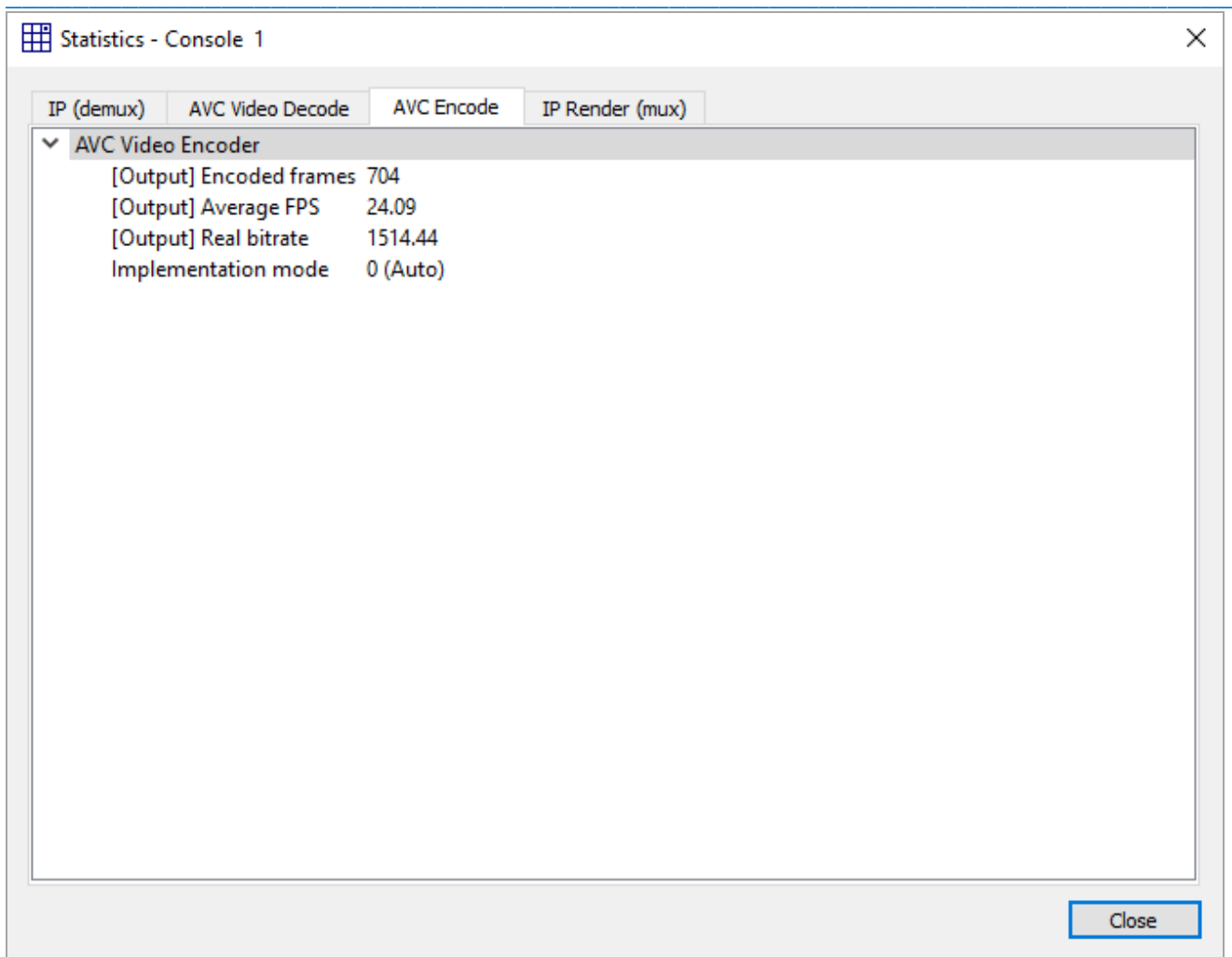
To add a new schema, press the **Add existing** button, the dialog box for a schema file selection will open. The selected schema validation is performed before the schema addition. The schema is added to the schema list, if validation is successfully completed. The schema is considered to be valid, if all used components are present (contained in the *Components* folder or registered in the system), their parameters are adjusted according to the current system environment, and the task execution is not restricted with the console license limitation. Some schema parameters related to the system environment (network interface IP-address, etc.) will be cleared, when the console is started. The new parameter values must be set.

There is one more way for an encoding schema loading – import from another CodecWorks server. The **Import** button opens the dialog box where the server IP-address should be specified. Select the required schema from the list of consoles operating on the server. In all other respects, import is similar to the **Add existing** option.

Note: Usually, if a schema uses a specified multiplexed input stream (not raw video), this schema cannot be used for another input stream encoding. So, the **Add existing** and **Import** options are used quite seldom.

The **Save as...** button saves the selected schema to a file.

The **Statistics** command displays the tree-type list of read-only parameters that are intended for control of the encoding schema operation. You can increase the number of the monitored statistical parameters by pressing Ctrl+Shift+E and opening the schema editor. Double left-click the selected parameter with the required component, and it will be available in the **Statistics** window.



Statistics Window

The **Parameters** command displays the tree-type list of the schema editable parameters. You can increase the number of monitored statistical parameters by pressing Ctrl+Shift+E and opening the schema editor. Double left-click the selected parameter with the required component to make it available in the **Statistics** window.

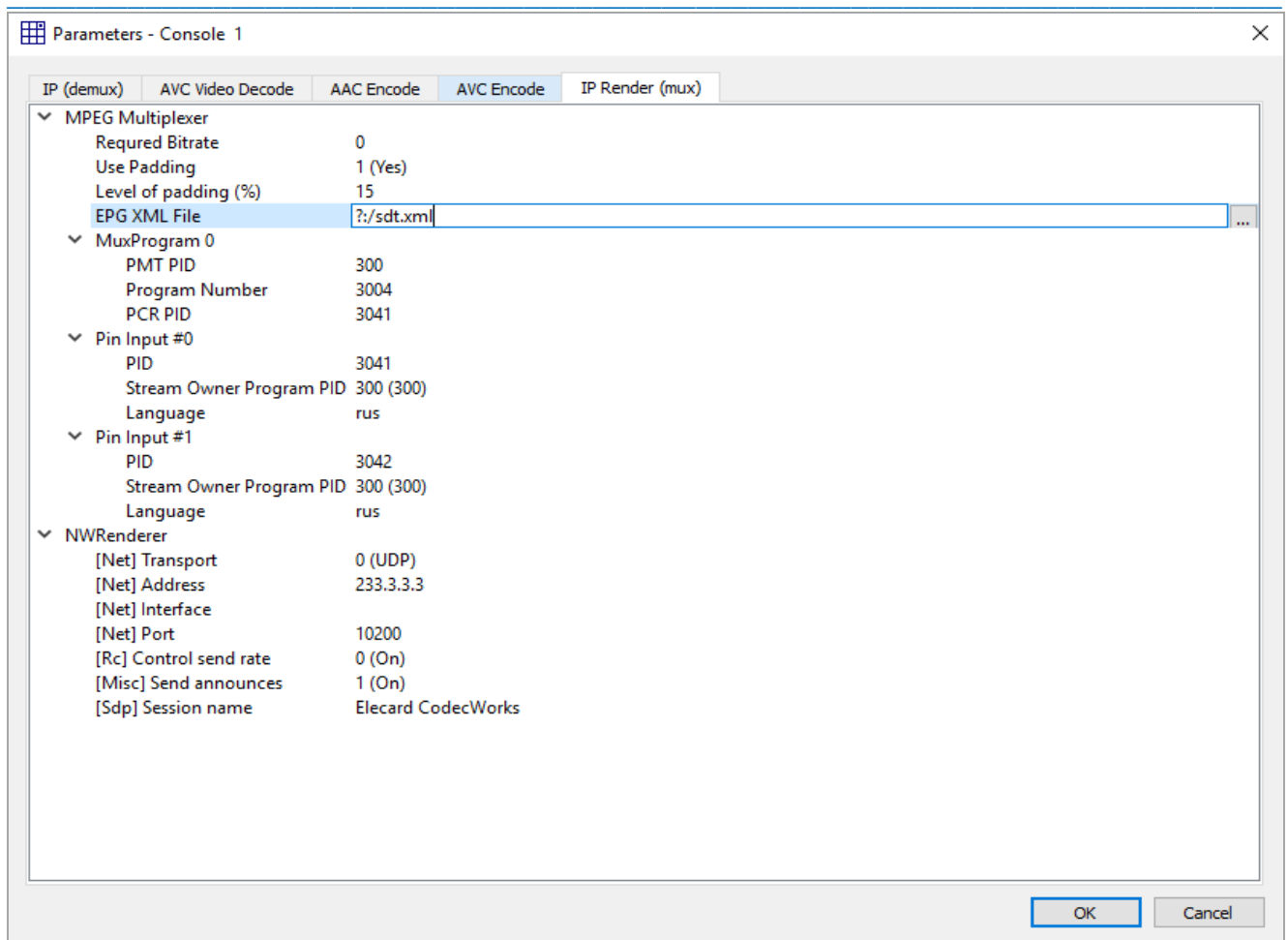


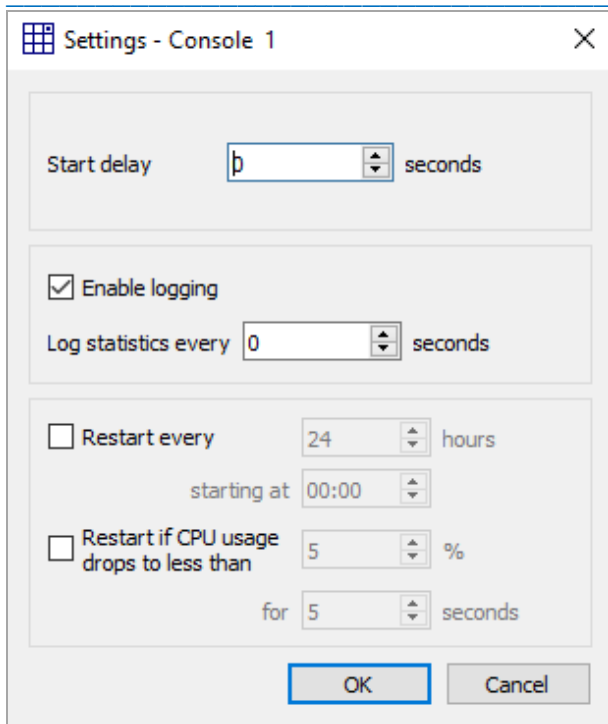
Figure 6. Parameters Window

To edit a parameter value, click the parameter. To save changes, press the **OK** button, to discard – the **Cancel** button.

Depending on the used schema template, components in the **Statistics** and **Parameters** windows can be grouped into separate tabs.

The **Parameters** window tab names are editable. Right-click the tab and select the **Rename** command. It is useful, if the prepared schema contains several sections with the same name.

The **Details** → **Settings** command opens the console **Settings** dialog box.



Console Settings Dialog Box

The **Start** delay option allows you to set delay time (in seconds) between the CodecWorks server start and the console start (if required⁵).

The **Enable logging** option enables logging of the console system messages. If this option is selected, time interval for the statistics logging must be specified.

In some cases automatic restart of the encoding console is needed (at regular intervals or at low level of CPU utilization). Select the required option and set the corresponding parameter values to restart the encoding console.

The **Details** → **Show limits** menu command displays the license limitation list for the selected console (depends on the purchased license).

To adjust the reserving settings, select the **Details** → **Reserving...** command (see the *Reserving* section).

The **Details** → **Show log** command opens the console system log for preview.

The **Save to file** shortcut menu command allows you to save the console system log to a text file. To preview the log previous records, select the **Show previous logs** command.

Some commands are available for simultaneous execution in several consoles. Press and hold down the CTRL (or SHIFT) key and select necessary consoles. Open the shortcut menu and click one of available commands. For instance, you can simultaneously start or stop encoding in the selected consoles.

2.9 Schema Configurator

The encoding schema configurator is intended to facilitate the schema creation or graph building process (i.e. corresponding Pipeline).

⁵ For instance, if A console sends data and B console receives the data. Both consoles work on the same server. Simultaneous start of A and B consoles may produce unpredictable results. In that case, it is recommended to start the B console with delay.

To open the configurator, click the **Create new** button in the **Schema list** dialog box.

Select the source type and adjust the source parameters in the **Input settings** tab. Different sources can have different parameters. The mandatory parameters are red highlighted.

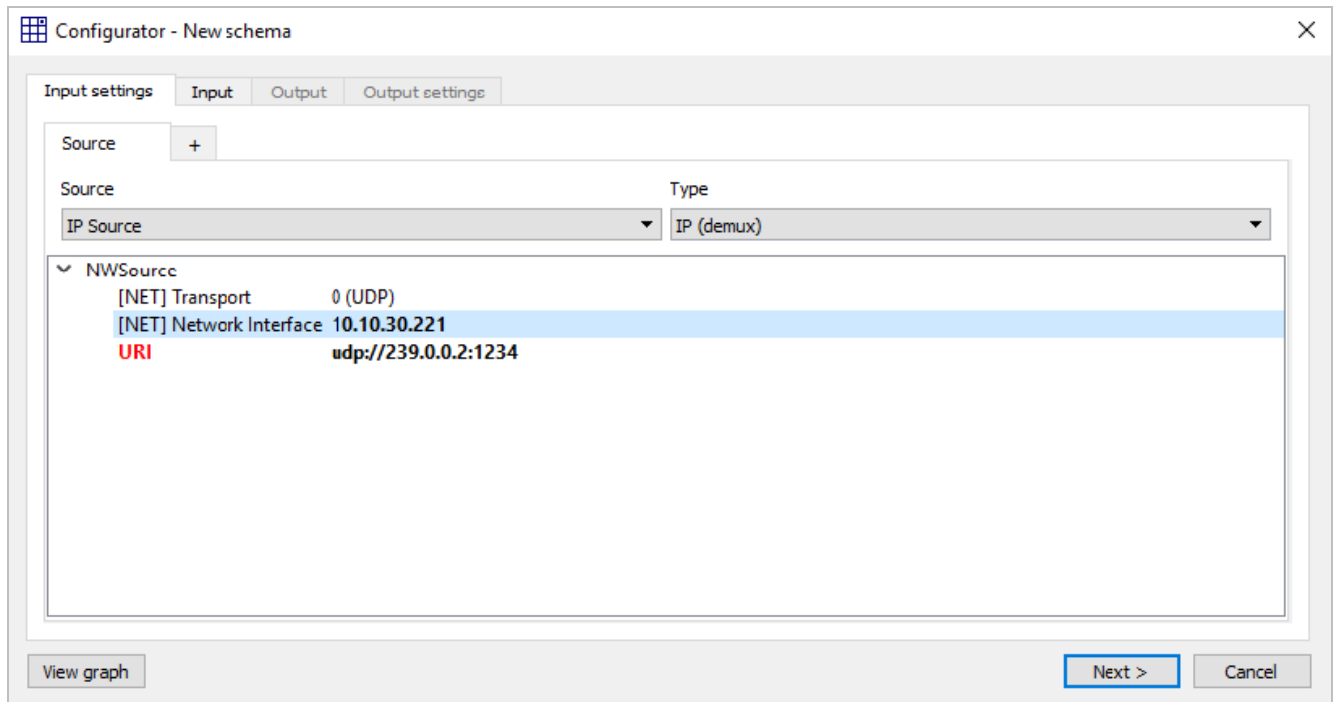


Figure 7. Schema Configurator – Input Settings

The broadcast stream parameters should be set (address, port, etc.) when selecting a template with IP source.

Several input sources can be added. To add a new source, select the + tab.

After adjusting the input stream parameters, click the **Input** tab.

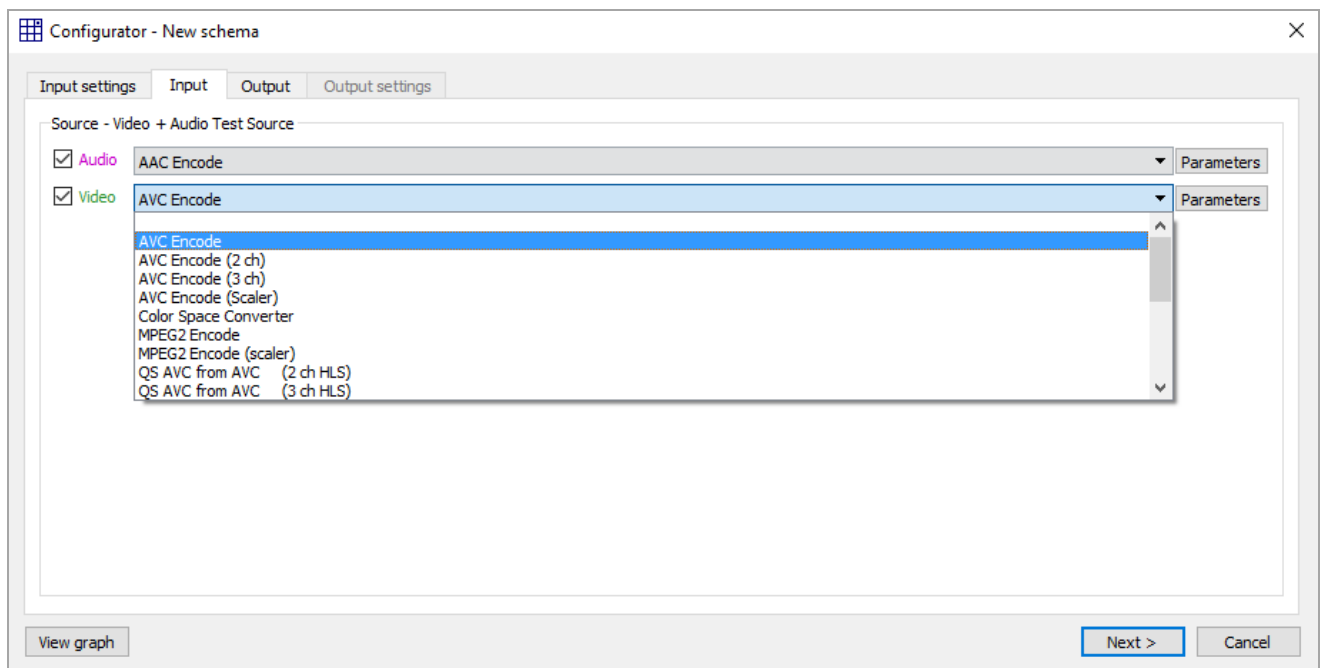


Figure 8. Schema Configurator – Input

If the source parameters are set properly, the elementary stream list is displayed on the **Input** tab. The transformation section (encoding profile) must be selected for each required stream using the

corresponding profile list.

If several sources are selected in the **Input Settings** tab, the elementary streams will be grouped according to their source.

To refresh the elementary stream list, press the **F5** key.

To preview or edit parameters of an encoding profile, click the **Parameters** button to the right of the profile selection box.

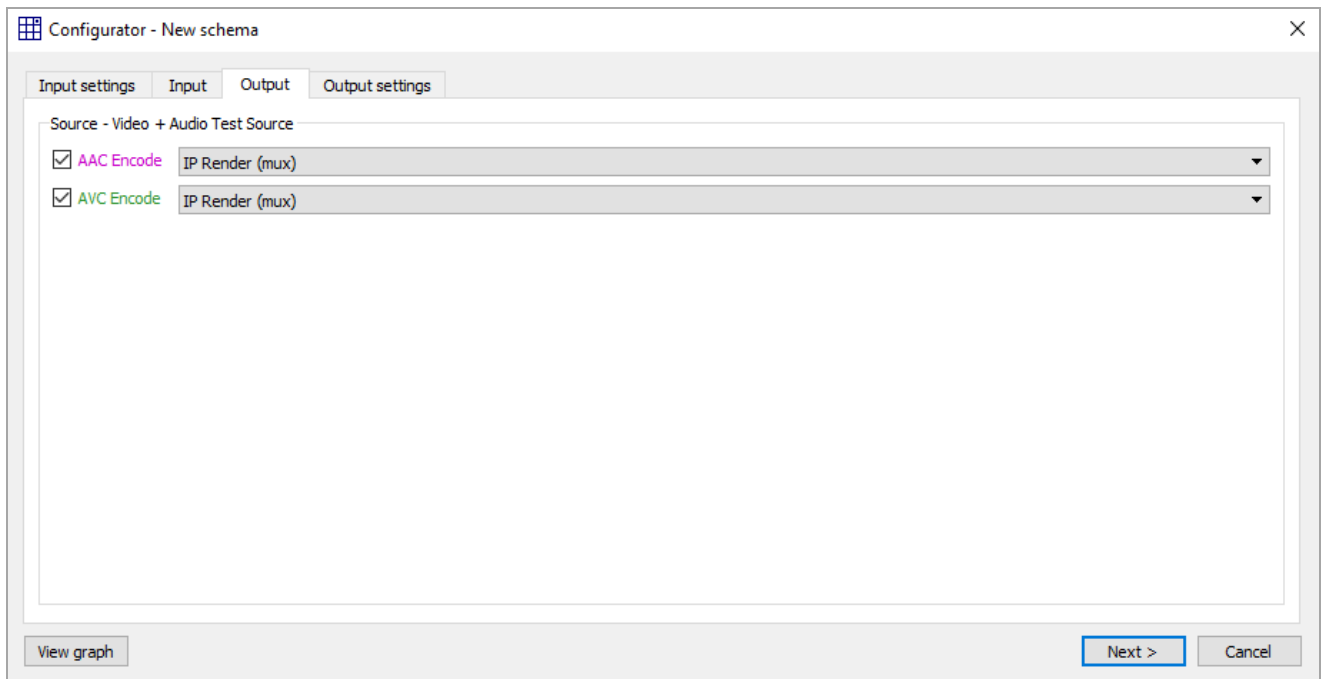


Figure 9. Schema Configurator – Output

On the **Output** tab select the output component for each encoded stream. This is the schema section that is responsible for the output stream generation.

If you need to send an encoded stream to several output devices of the same type (for instance, to create several single-program transport streams), select the required output device (for instance IP Render) for an elementary stream, right-click list box, click the **Increase output number...** command, and specify the required number. These actions enable selection of additional input devices in the list.

The **Output settings** tab allows you to adjust the output parameters.

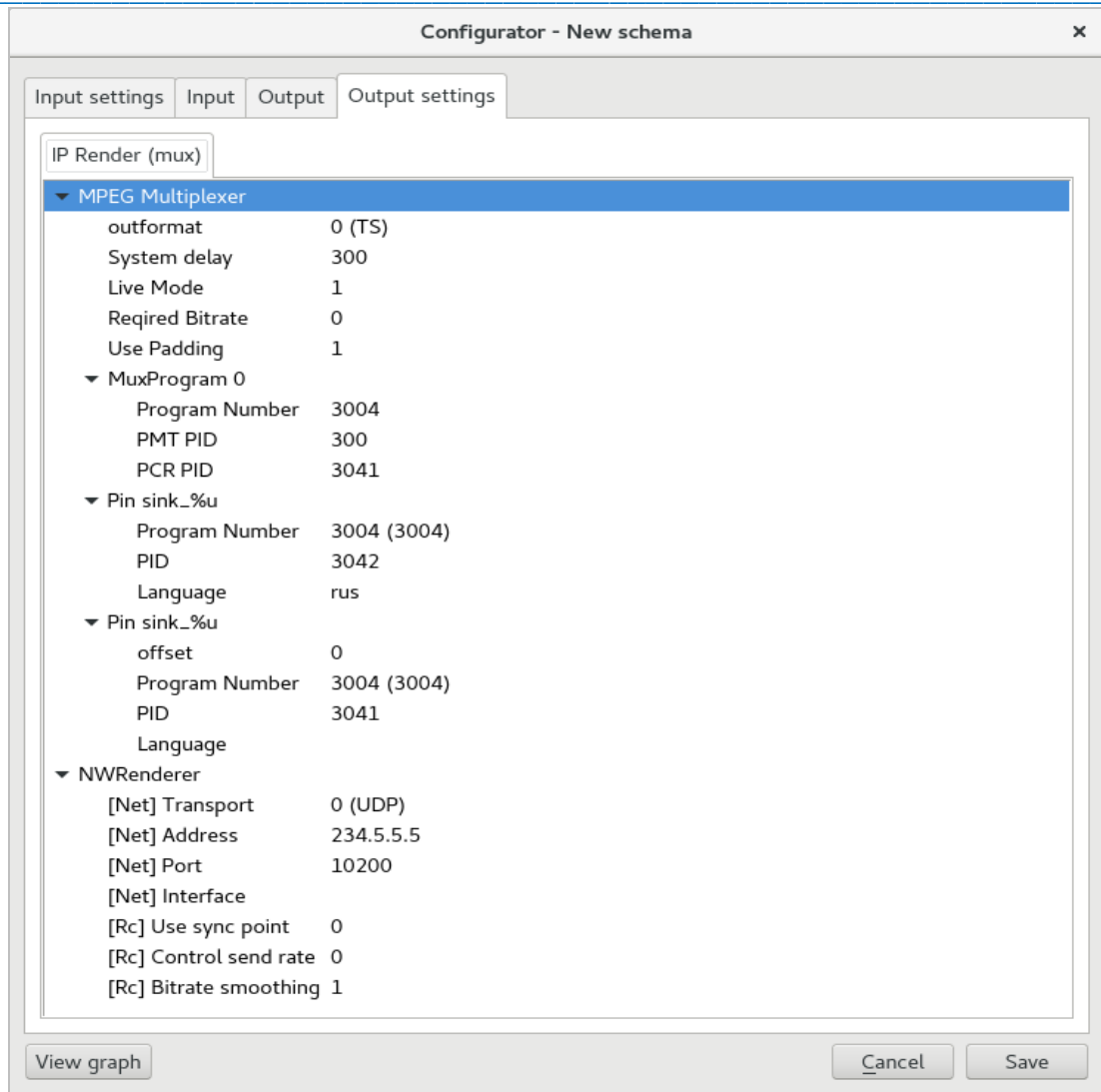


Figure 10. Schema Configurator – Output Settings

The **View graph** button displays the built graph structure at every step. To preview or edit component parameters, right-click the component. Read-only parameters are displayed with italic font. If a parameter is displayed with gray font, it will not be presented in the **Parameters** window (**Statistics** window for read-only parameters) on the encoding console. To change a parameter visibility mode, double-click the parameter name⁶.

When the adjustment is completed, click the **Save** button and specify the schema name and short description. After that the created schema appears in the list of schemas available for the selected console.

2.10 Reserving

There are two reserving modes used in Elecard CodecWorks:

- Server reserving
- Source reserving

⁶ The default parameter values are optimized for performance and quality in most cases. The default visibility mode provides access to the base set of encoding parameters. Advanced users can expand the list of visible parameters.

Both reserving modes ensure integrity of the CodecWorks encoding systems. The encoding console can be used as a reserve for one or several servers.

The **Reserving** button in the console **Settings** window opens the **Reserving** dialog box that displays the list of reserved nodes (identified by IP-address) and the reserve encoding schemas.

2.10.1 Server Reserving

A reserve server is monitoring the CodecWorks server proper operation by sending special signals to it and receiving timely responses. If a response is not received from the CodecWorks server dispatcher during the specified period of time, the reserve server starts encoding channels which have been previously set and are controlled by the server.

One reserve server can backup several CodecWorks encoding servers (N+1 mode). Several reserve servers can backup as many CodecWorks servers as required (N+M mode).

The **Reserving** button in the console **Settings** window opens the **Reserving** dialog box that displays the list of reserved nodes (identified by IP-address) and the reserve encoding schemas, which should be started automatically if connection with the server is lost.

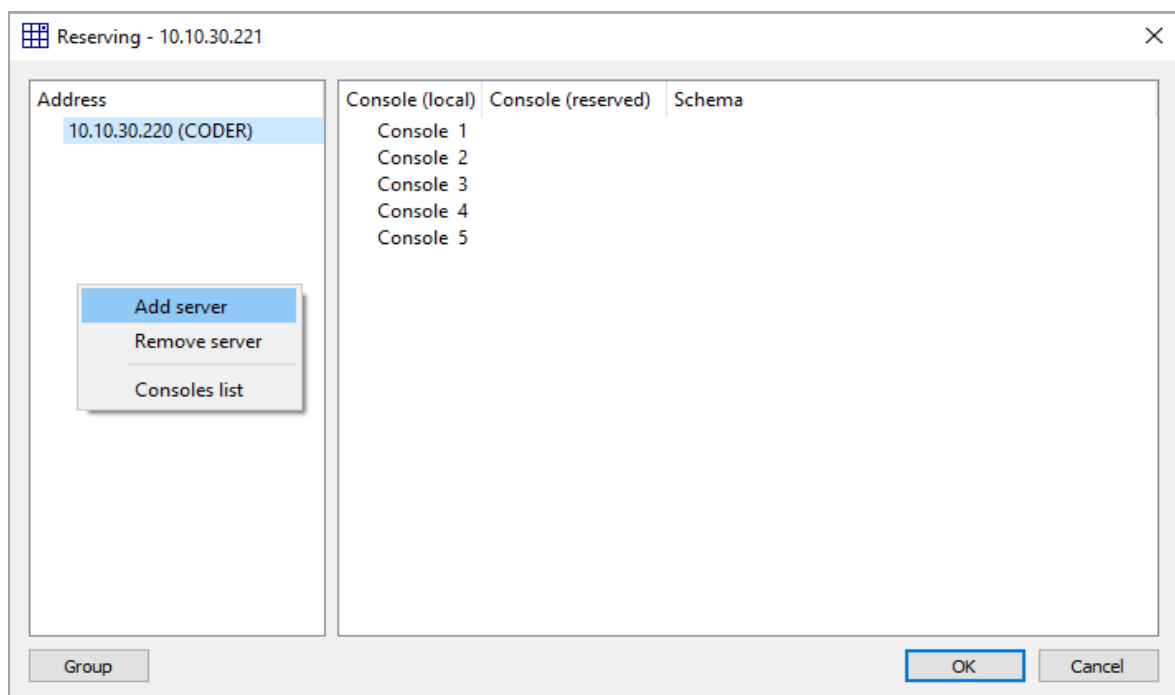


Figure 1. Reserving Dialog Box

The reserve encoding consoles must be started, if connection with the CodecWorks server is lost, which means that the reserve server dispatcher does not receive any response from the CodecWorks server dispatcher.

If several consoles work on the server, the same number of reserve consoles must be started after the server failure. In this case, it is necessary to add a record and specify encoding schema for each console that must be reserved. The same *Host* (dispatched node IP-address) and *Port* values must be specified for all reserve consoles.

2.10.2 Source Reserving

Each channel of the encoding server can be configured for using reserve sources of the original signal. The reserve sources are connected with the encoding schema, and if the main signal is lost or a failure occurs (CC errors in MPEGTS, video and audio signals are missing).

Such a reserving mode can be used even if additional reserve signal sources are available.

Note: Special encoding schema is configured for this reserving mode exactly. Configuration of the encoding schema should only be performed by Elecard’s certified engineers.

To configure the encoding schema by yourselves, follow the steps below:

Set a main source for an encoding signal when creating a schema. Press the Add (+) tab and set a reserving source. To add other reserving sources, repeat this procedure.

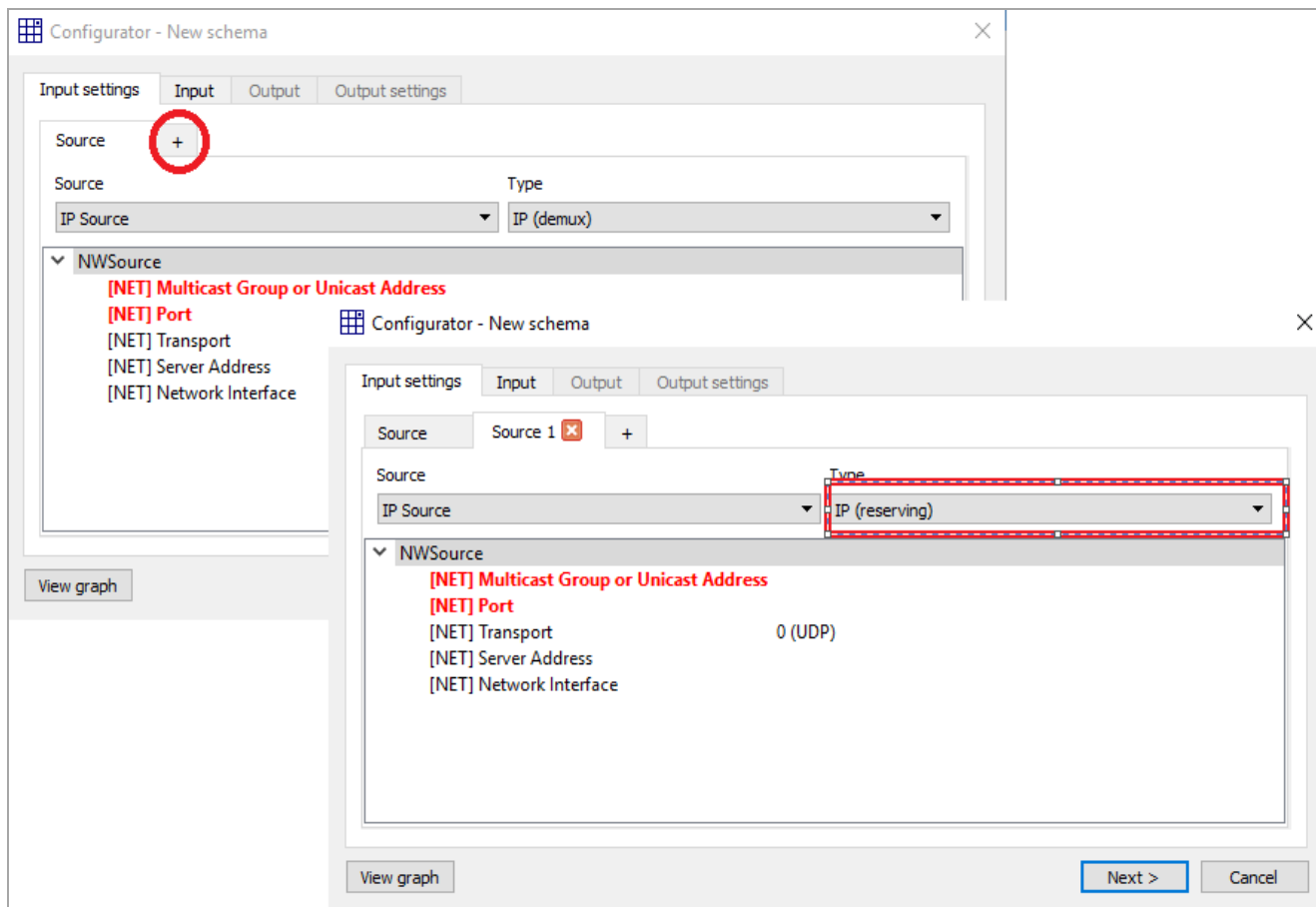


Figure 2. Source reserving

After the required reserving sources are added, continue to set up the encoding console as described in Section 2.5.

2.11 Web Interface Management

The list of encoding consoles and servers that are available for management is contained on the **CodecWorks Manager Web-page** as well as in the **Local Manager**. Status, statistics, CPU load (%) and RAM load (Mb) are displayed on each console for each server. The selected encoding schema is also displayed on the console.

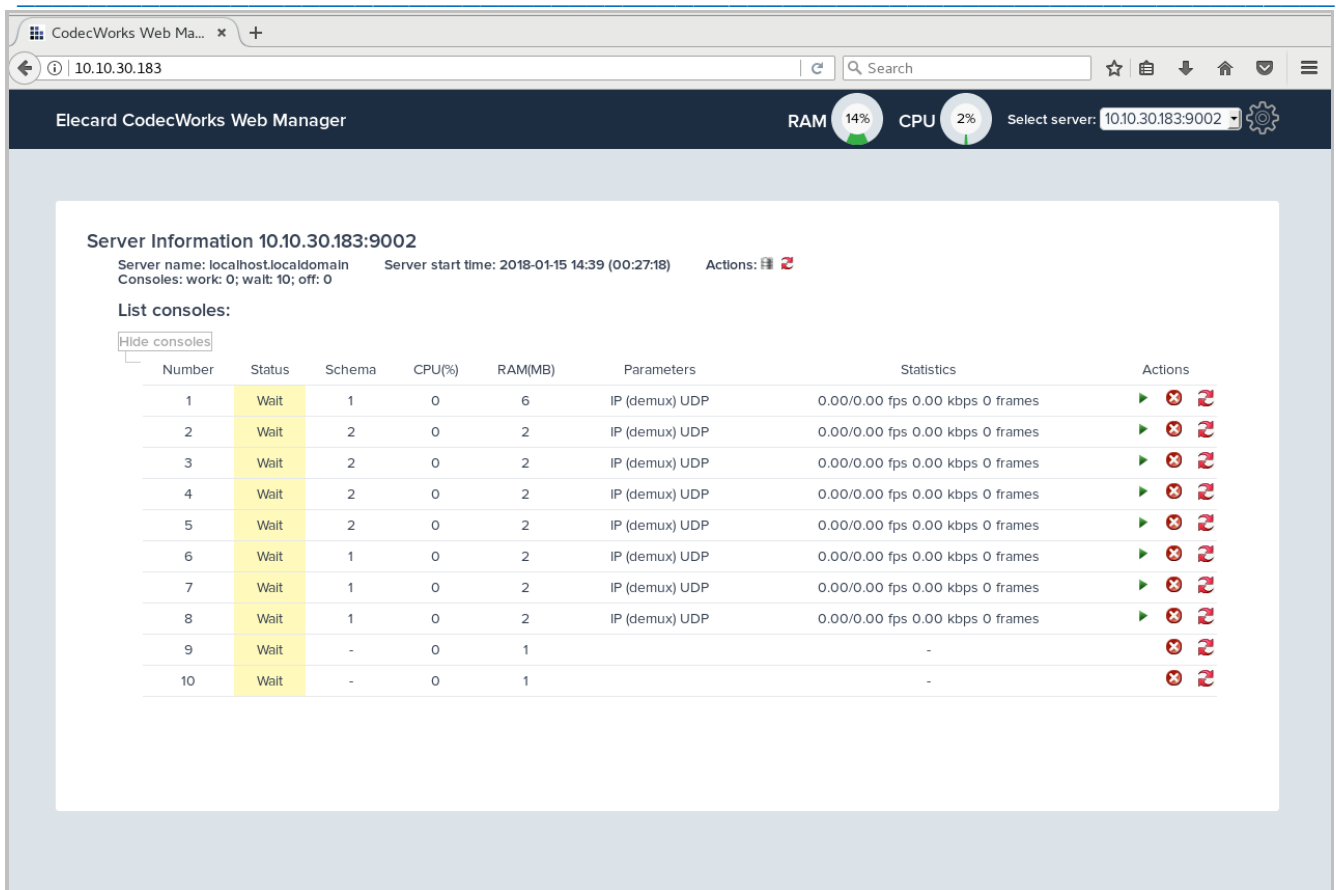


Figure 3. Web-page

To create an encoding schema via Web, **Select a console -> Create a schema -> Add a source**, select the **Source type** and specify its **Parameters**.

Network Interface – xxx.xxx.xxx.xxx

URI – udp://xxx.xxx.xxx.xxx:port

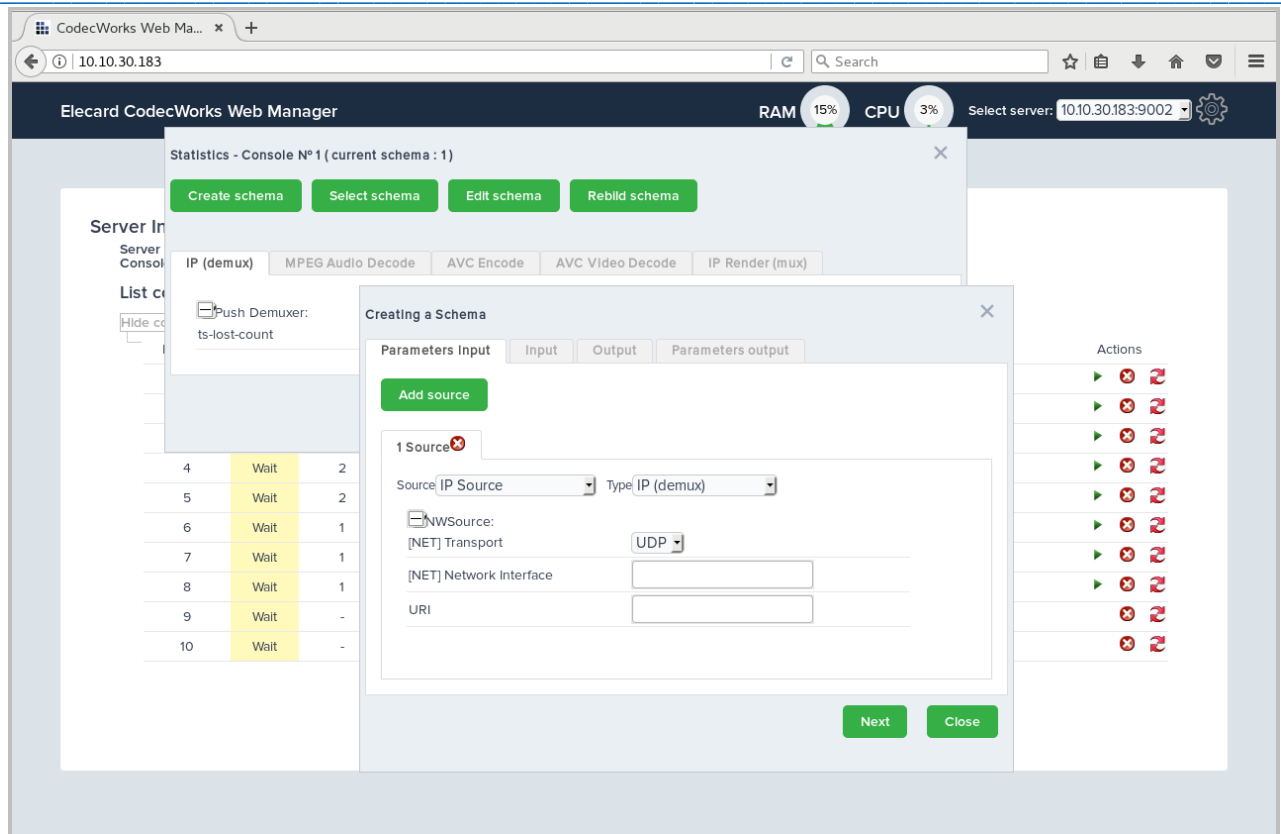


Figure 4. Creating a schema via the Web-page

Select codecs for audio and video streams.

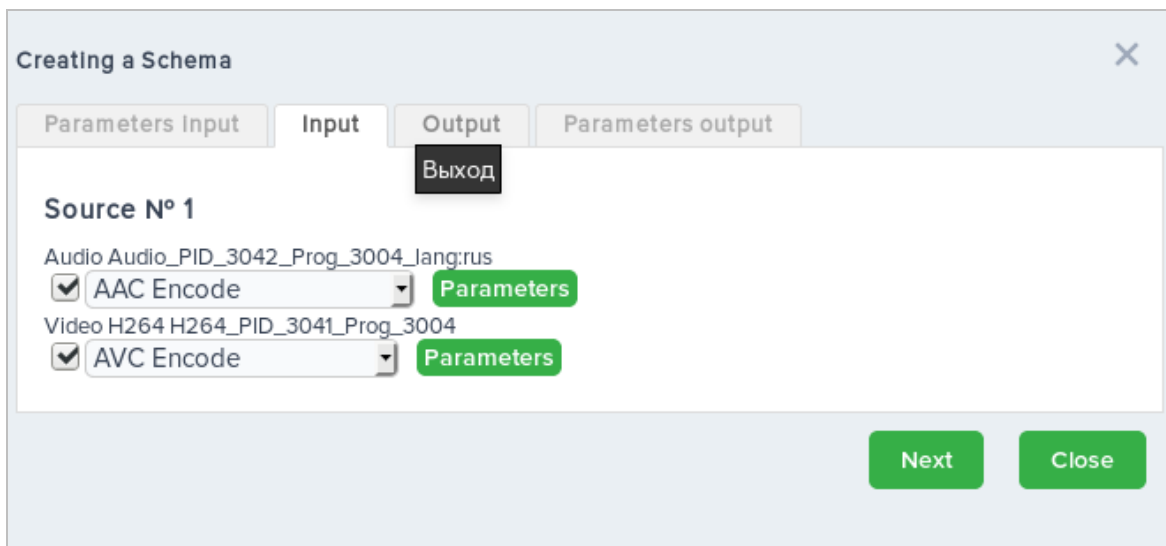


Figure 5. Creating a schema via the Web-page – Selecting codecs

Select the type of output stream.



Figure 6. Creating a schema via the Web-page – Selecting output

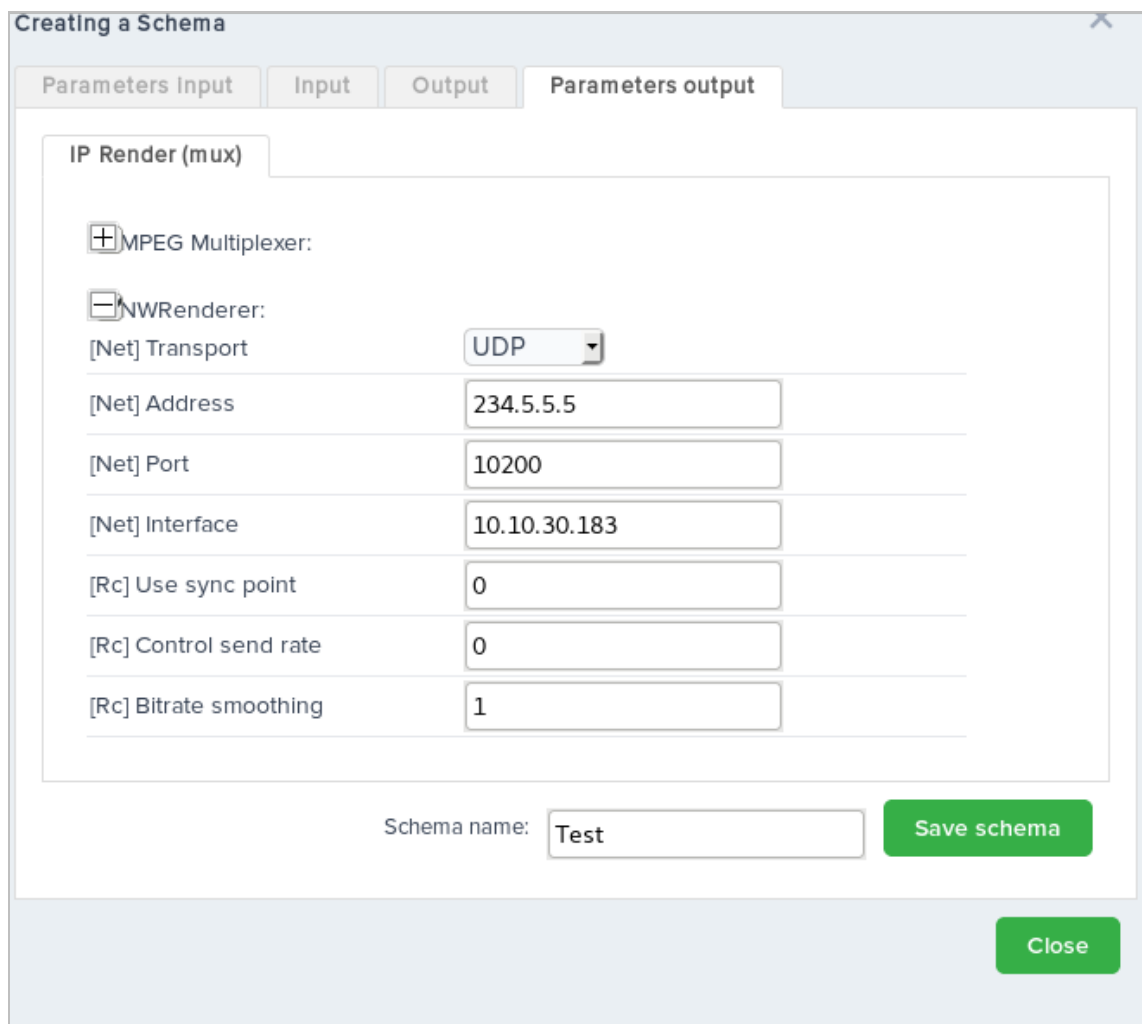


Figure 7. Creating a schema via the Web-page – Naming

Specify the parameters for the output stream and **name** the schema.

After the encoding schema has been created, start it by clicking the **Start Encoding** button.

2.12 Configuring Nginx

Nginx can be used for HLS streaming and CodecWorks Manager Web-page as a web-server.

Install **nginx** in the system: `yum install nginx`.

Edit the configuration file: `etc/Nginx/nginx.conf`.

The following changes should be performed in `nginx.conf`: replace the old **server** tag `{ }` with the one required by the task or use both tags. Change the path to receive HLS play lists saved by CodecWorks and broadcasting ports for HLS and Web-pages.

Configuring Elecard CodecWorks Web Manager:

```
server {
    access_log off;
    add_header Cache-Control no-cache;
    add_header 'Access-Control-Allow-Origin' '*';
    listen      80 default_server;
    listen      [::]:80 default_server;
    server_name _;
    root        /usr/local/bin/elecard/CodecWorks/WebClient/;
```

Load configuration files for the default server block.

```
include /etc/nginx/default.d/*.conf;

location / {
}

error_page 404 /404.html;
    location = /40x.html {
}

error_page 500 502 503 504 /50x.html;
    location = /50x.html {
}
}
```

See an example of Web-page link: `Localhost:80`.

Configuring Web-Server for HLS Streaming:

```
server {
    access_log off;
    add_header Cache-Control no-cache;
    add_header 'Access-Control-Allow-Origin' '*';
    listen      8080;
    listen      [::]:8080;
    server_name _;
    root        /mnt/hls/;
```

Load configuration files for the default server block.

```
include /etc/nginx/default.d/*.conf;

location / {
}

error_page 404 /404.html;
    location = /40x.html {
}
}
```

```
        error_page 500 502 503 504 /50x.html;
        location = /50x.html {
    }
}
```

See an example of a link for HLS streaming: <http://localhost:8080/StreamName.m3u8>.

2.13 Windows Command Line Management

The console application *cwManagerConsole.exe* is included into the Elecard CodecWorks package. The application allows command line management of the encoding server. For instance, it may be useful in any batch-mode processing.

If the application is started, the command line parameter information is displayed:

Usage:

```
cwManagerConsole.exe command_name [parameters] [/host ip_address:port]
[/console console_number]
cwManagerConsole.exe /diagnostics [/host ip_address:port]
cwManagerConsole.exe /help
cwManagerConsole.exe /help commands
```

If you click the */help* parameter, the same information is printed.

To get information about available commands, start the application via */help commands* options. The following commands list is printed:

```
---Information commands---
```

```
ListConsoles
GetLog
GetPerfInfo
ListLoadedLibs
GetLimits
GetState
ListSchemas
GetGraphName
GetGraphSource
GetGraphStatistics
GetGraphParameters
GetGraphParameter <parameter_number>
```

```
---Control commands---
```

```
Activate
Deactivate
Restart
ClearLog
Start
Stop
SetGraph <graph_name>
SetGraphFromFile <local_file_name>
AddGraph <local_file_name>
```

SetGraphParameter <parameter_number> <new_value>

Information commands

This list contains commands that provide information about the encoding server and started processes.

- **ListConsoles**

Prints the list of encoding consoles that are available on the CodecWorks server with the specified address (*/host* option). The loaded encoding schema name and state (0 – wait, 1 – pause, 2 – encoding) is printed for each console.

Example:

```
cwManagerConsole.exe ListConsoles /host 192.168.1.45:1535
```

- **GetLog**

Prints the current system log of encoding server (or console, if the */console* option is specified)

Examples:

```
cwManagerConsole.exe GetLog /host 192.168.1.45:1535
```

```
cwManagerConsole.exe GetLog /console 2 /host 192.168.1.45:1535
```

- **GetPerfInfo**

Prints information about the CPU utilization and available system main memory, if only the */host* option is specified. If the */console* option is specified too, the CPU and memory information for the specific console is printed.

Examples:

```
cwManagerConsole.exe GetPerfInfo /host 192.168.1.45:1535
```

```
cwManagerConsole.exe GetPerfInfo /console 2 /host 192.168.1.45:1535
```

- **ListLoadedLibs**

Prints the list of DLLs (names and versions) loaded by the server.

Example:

```
cwManagerConsole.exe ListLoadedLibs /host 192.168.1.45:1535
```

- **GetLimits**

Prints the license limitation list for the selected console.

Example:

```
cwManagerConsole.exe GetLimits /console 2 /host 192.168.1.45:1535
```

- **GetState**

Prints the current state of the specified console (0 – wait, 1 – pause, 2 – encoding).

Example:

```
cwManagerConsole.exe GetState /console 2 /host 192.168.1.45:1535
```

- **ListSchemas**

Prints the list of encoding schemas that are available for the specified console.

Example:

```
cwManagerConsole.exe ListSchemas /console 2 /host 192.168.1.45:1535
```

- **GetGraphName**

Prints the name of the current encoding schema for the specified console.

Example:

```
cwManagerConsole.exe GetGraphName /console 2 /host 192.168.1.45:1535
```

- **GetGraphSource**

Prints the source XML code of the current encoding schema for the specified console.

Example:

```
cwManagerConsole.exe GetGraphSource /console 2 /host 192.168.1.45:1535
```

- **GetGraphStatistics**

Prints the read-only parameter list (names and values) of the current encoding schema for the specified console.

Example:

```
cwManagerConsole.exe GetGraphStatistics /console 2 /host 192.168.1.45:1535
```

- **GetGraphParameters**

Prints the editable parameter list (names, values, and identifiers) of the current encoding schema for the specified console. The parameter identifier is used in the *GetGraphParameter* and *SetGraphParameter* commands.

Example:

```
cwManagerConsole.exe GetGraphParameters /console 2 /host 192.168.1.45:1535
```

- **GetGraphParameter <parameter_number>**

Prints the value of the encoding schema parameter (specified with *parameter_number*).

Example:

```
cwManagerConsole.exe GetGraphParameter 45 /console 2 /host 192.168.1.45:1535
```

Control commands

This list contains commands that provide the encoding server management.

- **Activate**

Activates the specified console.

Example:

```
cwManagerConsole.exe Activate /console 2 /host 192.168.1.45:1535
```

- **Deactivate**

Deactivates the specified console.

Example:

```
cwManagerConsole.exe Deactivate /console 2 /host 192.168.1.45:1535
```

- **Restart**

Restarts the CodecWorks service (or console, if the */console* option is specified).

Example:

```
cwManagerConsole.exe Restart /host 192.168.1.45:1535
```

```
cwManagerConsole.exe Restart /console 2 /host 192.168.1.45:1535
```

- **ClearLog**

Clears the system log of the CodecWorks server (or console, if the */console* option is specified).

Example:

```
cwManagerConsole.exe ClearLog /host 192.168.1.45:1535
```

```
cwManagerConsole.exe ClearLog /console 2 /host 192.168.1.45:1535
```

- **Start**

Starts encoding process in the specified console.

Example:

```
cwManagerConsole.exe Start /console 2 /host 192.168.1.45:1535
```

- **Stop**

Stops encoding process in the specified console.

Example:

```
cwManagerConsole.exe Stop /console 2 /host 192.168.1.45:1535
```

- **SetGraph** <graph_name>

Loads the specified XML-schema into the console. Only schemas presented in the Schema list window are available for the loading.

Example:

```
cwManagerConsole.exe SetGraph "my schema" /console 2 /host 192.168.1.45:1535
```

- **SetGraphFromFile** <local_file_name>

Loads XML-schema from the specified file into the console.

Example:

```
cwManagerConsole.exe SetGraphFromFile "C:\my schema.xml" /console 2 /host 192.168.1.45:1535
```

- **AddGraph** <local_file_name>

Adds XML-schema from the specified file into the console.

Example:

```
cwManagerConsole.exe AddGraph "C:\my schema.xml" /console 2 /host 192.168.1.45:1535
```

- **SetGraphParameter** <parameter_number> <new_value>

Sets a new value for the encoding schema parameter.

Note: Some parameters cannot be changed without terminating the encoding process.

Example:

```
cwManagerConsole.exe SetGraphParameter 45 1500000 /console 2 /host. 192.168.1.45:1535
```

Note: If the required /console option is skipped, the command is executed for the first console (number 1).

If the console Manager is started with the /diagnostics option, the detailed configuration information (diagnostic log) will be printed for the CodecWorks server.

Example:

```
cwManagerConsole.exe /diagnostics /host 192.168.1.45:1535 > diag.txt
```

2.14 Management via HTTP Protocol

The dispatcher processes HTTP-POST requests to manage encoding servers.

Example of an HTTP-POST request:

```
<?xml version="1.0" encoding="UTF-8" ?>
<XMLConfig console="2">
  <GetValue Name="SchemaParameter">
    <Parameter>162</Parameter>
  </GetValue>
  <SetValue Name="SchemaParameter">
    <Parameter><p>45</p><p>1500000</p></Parameter>
  </SetValue>
  ....
  ....
</XMLConfig>
```

Simultaneous call of several commands is possible. Report is formed for each command. In case of error, the *<Fault>* tag is used instead of the *<RetVal>* tag. The following illustrates the HTTP-OK message body:

```
<XMLConfig console="2">
  <GetValue Name="SchemaParameter">
    <RetVal>[8] [NET] Server Address=10.10.30.214</RetVal>
  </GetValue>
  <SetValue Name="SchemaParameter">
    <Fault>No input signal detected</Fault>
  </SetValue>
  ....
  ....
</XMLConfig>
```

For the HTTP management details, contact Elecard Technical Support Team at: tsup@elecard.com.
