EiTV Playout Professional

USER GUIDE

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Contents

Installation of EITV Playout Professional

This section describes how to install EITV Playout Professional. Perform the following steps in order to install the equipment in the rack and connect system cables.

1. Remove the system from package and identify each item (keep all packing material for future transportation needs).

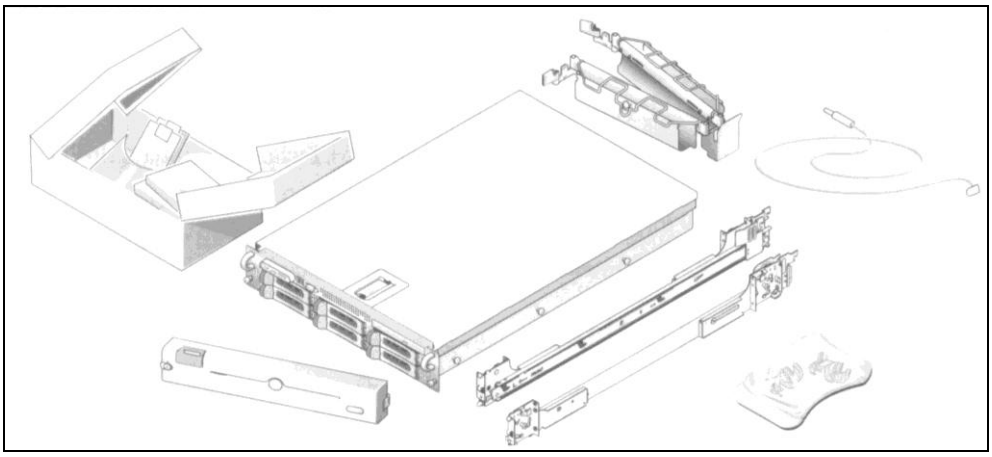


Figure 1 Items on Package

2. Install the rails and then install the system in the rack.

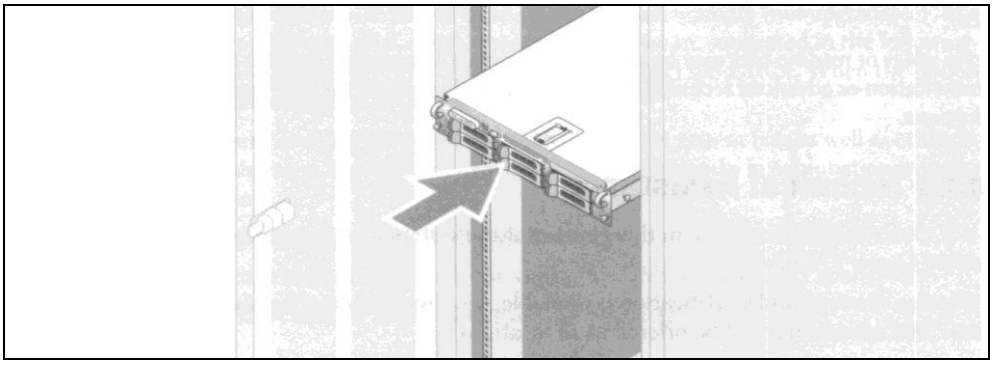


Figure 2 Installation of the Equipment in the Rack

3. Connect keyboard, mouse, and monitor (these are optional connections). The connections on the back of your system have icons indicating which cable has to be plugged in each connector.

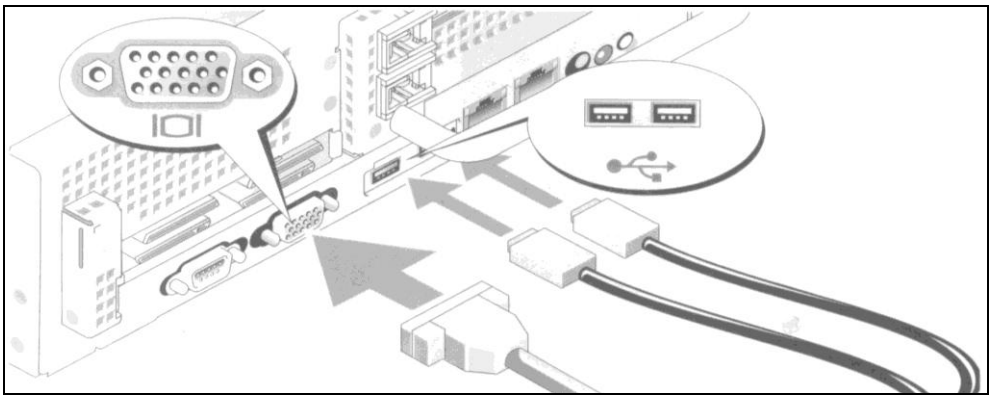


Figure 3 Keyboard, Mouse, and Monitor Connections

4. Connect each power cable to the equipment. Connect the other end of each power cable to a grounded electrical outlet or separated power source like an UPS or PDU.

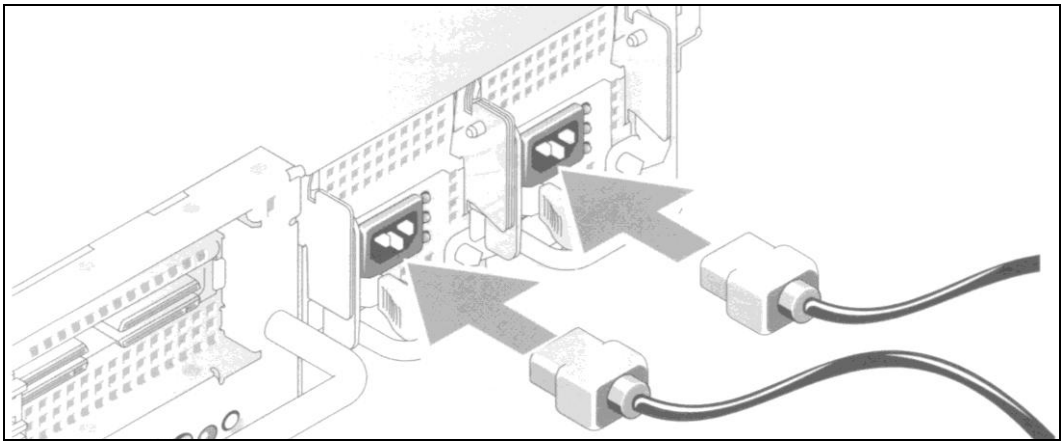


Figure 4 Power Cable Connections

5. Install the power cable retention bracket on the right bend of the power supply handle. Bend the power cable in a loop as shown at the illustration and attach to the bracket's cable clasp. Repeat the procedure with the second power supply cable.

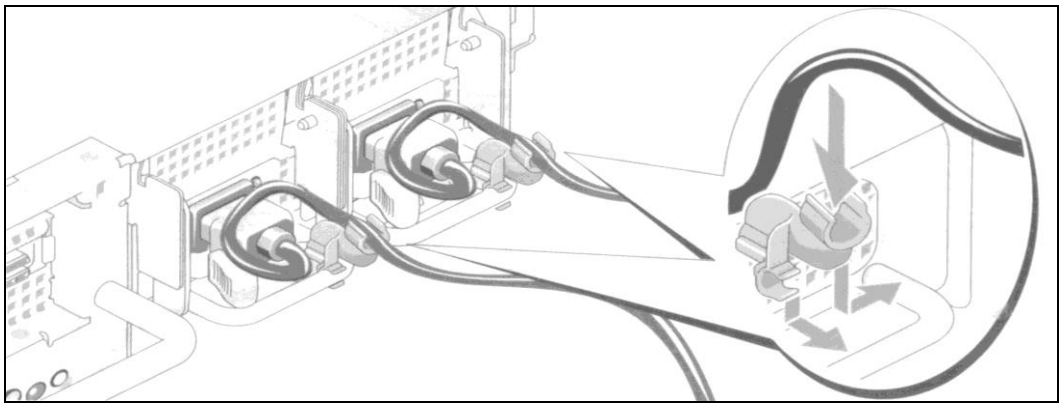


Figure 5 Installation of the Power Supply Retention Bracket

6. Turn on the system and monitor (the monitor is optional). Press the power button on the system and monitor. The power LEDs will light on. Adjust the monitor's control until the displayed image is satisfactory.

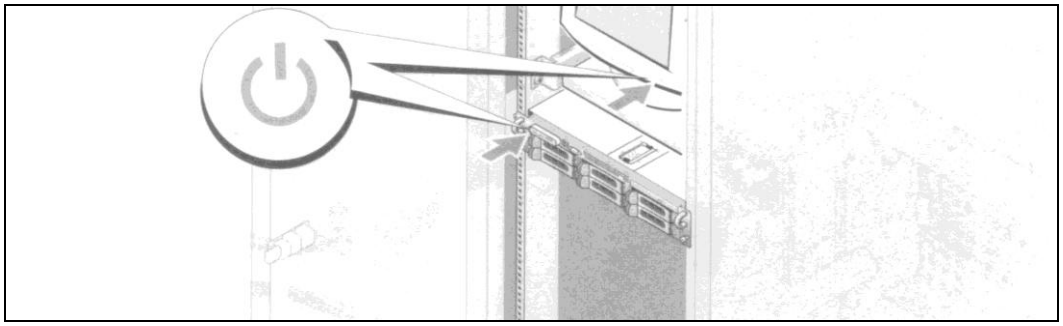


Figure 6 Turning the System On

7. Install the bezel (optional).

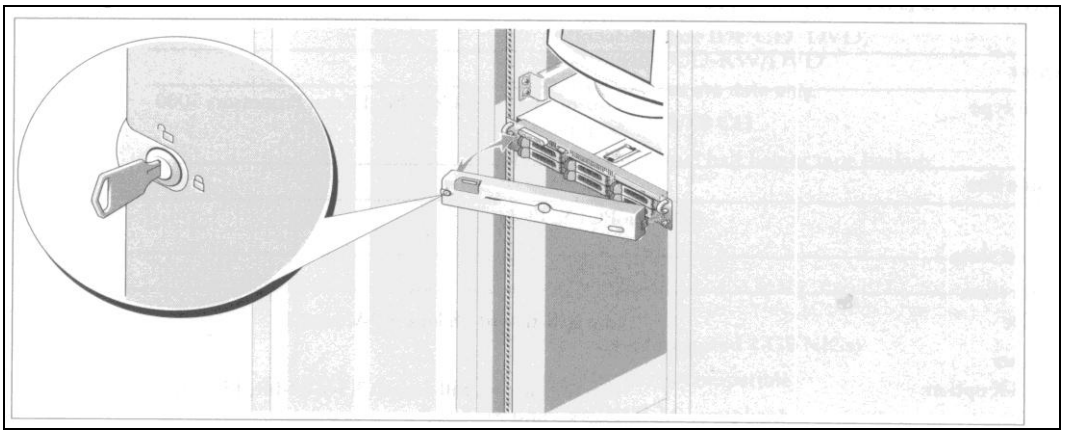


Figure 7 Installing the System Bezel

Introduction to the EITV Playout Professional

The EITV Playout Professional, shown in the **Figure 8** and **Figure 9**, is the high-availability professional equipment intended to the operation at interactive digital TV networks and broadcasters, completely compatible to the SBTVD or ISDB-TB Brazilian Standard.

Figure 8 EITV Playout Professional (Front View)

Figure 9 EITV Playout Professional (Rear View)

The equipment delivers the best cost-effectiveness on market integrating six distinctive functions that, in general, are performed by separated units. The EITV Playout Professional has the following six functions:

Function	Technical Characteristics
SI Server	SI multiplexing and generation as defined by the **ABNT NBR 15603** Brazilian Rule Information generation for tables **PAT, PMT, NIT, CAT, EIT, SDT, TDT, TOT, BIT, CDT, SDTT**, and **AIT** Time zone configuration for auto-adjustment of time based on **UTC** Table configuration that will be generated in the transport stream Configuration of virtual channel number Configuration of service ID Configuration of table repetition rate in milliseconds
EPG Server	EPG multiplexing and generation as defined by the **ABNT NBR 15603** Brazilian Rule Generation of **H-EIT**, **M-EIT**, and **L-EIT** Generation of **EIT** p/f and **EIT** scheduling for electronic programming guide Date, time, duration, title, subtitle, and description information for programs EIT descriptors (short event, parental rating, audio component, digital copy control) Automatic update of EIT tables based on XML file and FTP protocol External clock sync via NTP WEB interface for EPG generation.
EWBS Server	ISDB-T Parte 3 (05/2013) Rules concordance Message and PID Configurable Identification Service Area Code register

Function	Technical Characteristics
Closed Caption Server	**ABTN NBR 15606-1** and **ARIB STD-B24 VOL1 PART 3** Rules concordance Real time generation of overlapped subtitles and characters Closed Caption roll-up and pop-up support Serial signal input (**EIA-608**) from **RS-232** interface Configuration of Closed Caption (CC) output stream **PID** Configuration of CC language Support for multiple stream generation of simultaneous CC (**HD**, **SD**, **1SEG**, multi-language) Generation of **PTS** for A/V stream sync Stream real time output with multiplexed CC via **ASI** interface
Object Carousel Server	Data coding as defined by the **ABNT NBR 15606** Brazilian Rule Generation of **DSM-CC** object carousel **GINGA-J**, **GINGA-NCL**, **GINGA-Bridge**, and **GEM** application support Real time insertion of the object carousel into transport stream Configuration of organization ID and application ID Configuration of auto-start option Data descriptors (association tag, component tag, carousel ID, data broadcast ID) AIT descriptors (application signaling, transport protocol, application descriptor, control code) **GINGA** descriptors (optional flags, document resolution, content ID, default version, language) Configuration of application transmission bitrate Configuration of AIT PIDs and data stream Generation of **DSM-CC** Stream Events Application automatic update based on XML file and FTP protocol Automatic transmission scheduling, application start and stop via XML Automatic Stream Events dispatch scheduling via XML
Multiplexer	Multiplexing of transport stream as defined by the **ABNT NBR 15603** Brazilian Rule Up to 8 independent **ASI** inputs for real time multiplexing Integration of external encoders via **ASI** inputs Automatic multiplexing of **A/V**, **SI**, **EPG**, Closed Caption, and object carousel Filtering of **PIDs** and streams, generation of real time **TS** or **BTS** table and data Input of real time **TS** or **BTS** via **ASI** interface
Re-multiplexing	Transport stream re-multiplexing as defined by the **ABNT NBR 15601** Brazilian Rule Transport stream re-multiplexing organized in hierarchical layers (layers **A**, **B**, **C**) Generation of **IIP** (**ISDB-T Information Packet**) packets Generation of **TMCC** (Transmission and Multiplexing Configuration Control) information Configuration of transmission mode and guard interval Configuration of segments, modulation, code rate, and time interleaving for layers Transmission of **1-SEG** contents for partial receiving Configuration to enable emergency alert flag Automatic ordering for **OFDM** frame construction packets Signal generation for transmission of **HDTV**, **SDTV**, and **Mobile TV** Option for 10MHz external clock reference input for **ASI or SPI** output Real time **BTS** output via **ASI** or **SPI** interface

The **Figure 10** displays a diagram that illustrates the functions performed by EITV Playout Professional on a Digital TV transport and transmission environment with interactive services.

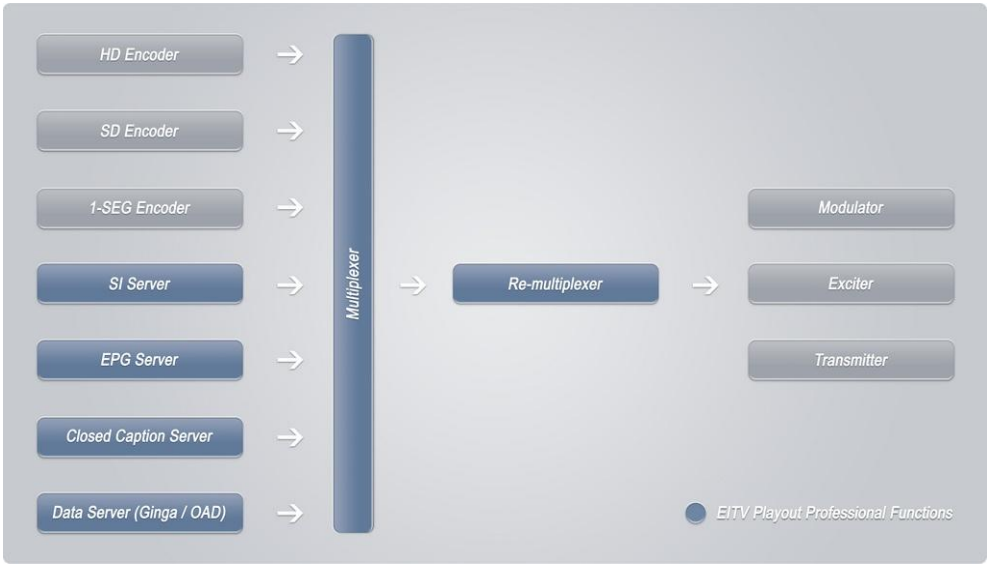


Figure 10 EITV Playout Professional Functions

ASI Port Connections

The standard configuration of EITV Playout Professional deliver an ASI input port and an ASI input/output port. In **Figure 11**, you can see the existing ports in the standard equipment configuration.

Figure 11 Rear Panel Detail Showing the ASI Ports

As you can see on the previous figure, there are two ASI standard ports. The port marked with number **1** is a port that can be configured as input or output (usually used for connection to an encoder or multiplexer). The port number **2**, on the other hand, can be used as output only (usually used for connection to a multiplexer).

By inserting new ASI ports, up to 8 input ports and 2 output ports could be configured.

Serial Port Connection

The serial port on EITV Playout Professional is used as input for connection of a signal with **EIA-608** protocol from line 21 encoders or from analog signal extracted from a decoder (for example TextGrabber®, shown in the **Figure 12** and **Figure 13**).

Figure 12 TextGrabber Frontal View

Figure 13 TextGrabber Rear View

The **RS232-C** port of TextGrabber should be connected to the **RS232-C** port of EITV Playout Professional (shown in the **Figure 14**) via serial cable.

Figure 14 EITV Playout Professional RS232-C Port

In order to EITV Playout Professional receive and correctly interpret the information sent by TextGrabber you must activate the **Field 1** completely. It means the hexadecimal character **0146** (**<Control>AO** in ASCII) that activates the Field 1 releasing all data in this field needs to be sent to TextGrabber for its setup.

When this control character is sent to TextGrabber all LEDs related to the **Field 1** on the front panel of the equipment turn on.

The EITV Playout Professional makes this operation easy using an available button at the **Closed Caption** function named **Enable Field 1**, as you can see in the **Figure 15**. To do this, stop the transmission and then click on **Enable Field 1** button. After this, restart the transmission normally.

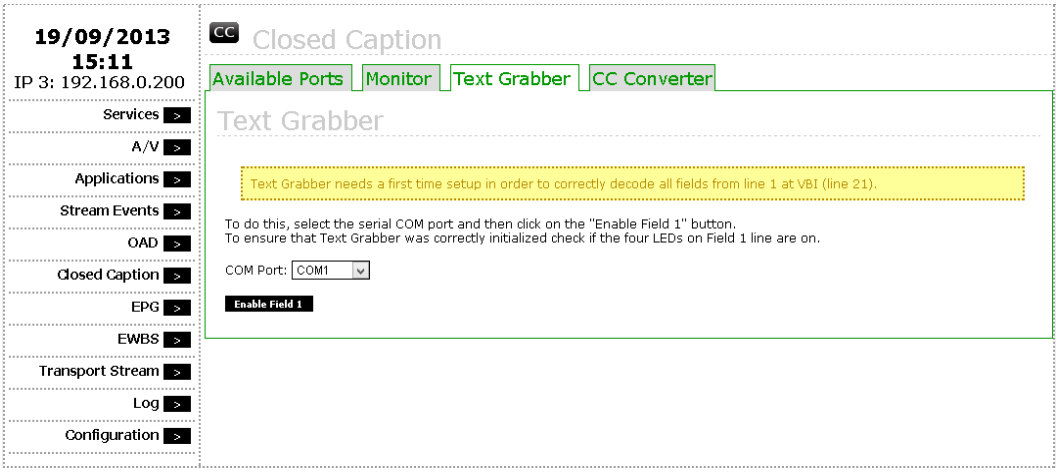


Figure 15 Activating the Field 1 for TextGrabber

Network Port Connection

The EITV Playout Professional has two Ethernet network ports used to connect the equipment to the local area network. But typically only the Port 1 (on the left) is preconfigured for a local area network connection.

Figure 16 Network Ports

System Login

To setup and operate the EITV Playout Professional equipment was developed an user interface that enables remote access through a Web browser (Mozilla Firefox® or Google Chrome®). For the best system performance we suggest the use of Mozilla Firefox browser with the EITV Playout Professional.

The access to the EITV Playout Professional's graphical interface can be done remotely (via a TCP-IP network) or locally (directly at the equipment). To remote access you must use the IP address which the equipment was configured on. Type this address at the Web browser address bar, as shown in the **Figure 17**.

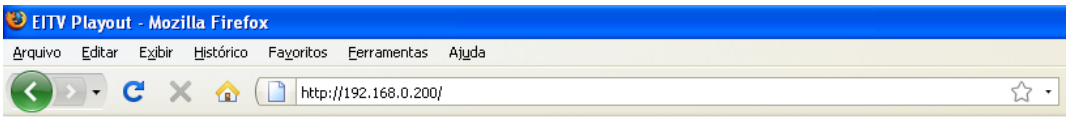


Figure 17 Inserting the Equipment IP Address into Web Browser

By default, the EITV Playout Professional is set for the **IP Address 192.168.0.200** and **Netmask 255.255.255.0**. In order to access the equipment from the network the remote computer must be set for an IP address and Netmask in the same class the network is (it must have an IP address with the same three first numbers of the IP address set to the EITV Playout Professional (**192.168.0.X** for this example) and the same Netmask (**255.255.255.0** for this example)).

Login

The operating access to the EITV Playout Professional is controlled by a password that only registered users can authenticate and gain access to the setup and operating functions. In order to access the system operations, the user needs to login into the system providing a **Login** and **Password**, as shown in the **Figure 18**. To get access, type your user ID in the **Login** field and the password in the **Password** field. Then, click the **OK** button. The default system login ID is **eitv** and the password for this ID is **playout** (both lowercase).

Figure 18 System Login Screen

If the provided information in login screen is valid, the **Main** system page shown in the **Figure 19** appears.

The user cannot have access to the EITV Playout Professional's setup and operating functions without a successfully system login.

Main Page

After a successfully system login the user can access the setup and operating functions for the equipment shown at the **Main** system page, shown in the **Figure 19**.

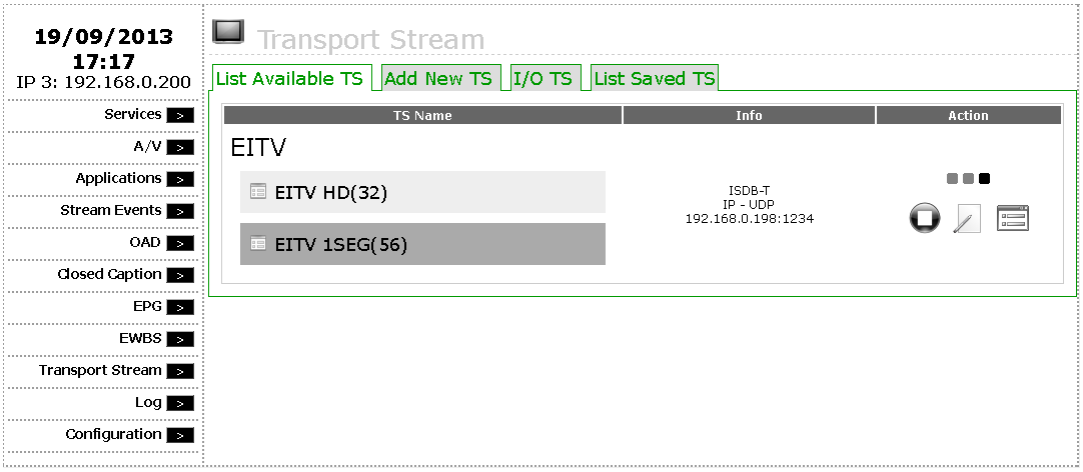


Figure 19 Main System Page

The following pages have the main setup functions for operation of the EITV Playout Professional. By setting these functions the user can control the entire system operation. At the left of this page the user can find the main 10 setup functions for the equipment operation. These functions are presented in the following table with a brief explanation.

Function	Explanation
Services	Opens the **Services** page that displays an initial list of all currently registered services on system.
A/V	Presents the **A/V Configuration** page that displays an initial list of all currently registered audio and video on system.
Carousel	Starts the **Carousel** page where you can see the list of all currently loaded application.
Stream Events	Opens the **Stream Event Object** page that lists all the existing STOs.
OAD	Opens the **OAD (Over the Air Download)** page that lists all the existing OADs.
Closed Caption	Presents the **Closed Caption** page that displays all available ports to the closed caption feature.
EPG	Starts the **EPG (Electronic Programming Guide)** page where the user can create and manage the programming electronic guide.
EWBS	Presents the EWBS **(Emergency Warning Broadcast System)** page to create, edit and transmit alert messages through the broadcast of Digital TV using the interactive capabilities built in receivers.
Transport Stream	Opens the **Transport Stream** page that lists all existing TSs on system.
Log	Presents the **Log** page that displays the system event logs and/or information.
Configuration	Opens the **General Configuration** page that allows the user to perform several system basic configuration.

To access each of the functions, left click the corresponding function link. A new page corresponding to the selected link will open with related options and configurations.

System Logoff

After a successful system login as shown in the previous section, the user can perform **Logoff** or **Shutdown** to exit from the system. Both options are displayed at the top of all pages in the system, as shown in the **Figure 20**.

Figure 20 Logoff and Shutdown Options

Shutdown

To shut the system off correctly (that mean to get out of the system setup graphical interface and turn the equipment off) click the **Shutdown** link, as shown in the **Figure 20**. When you click this link the system displays the **Shutdown EITV Playout** page.

This page displays the **Are you really sure you want to shutdown EITV Playout?** prompt, as shown in the **Figure 21**.

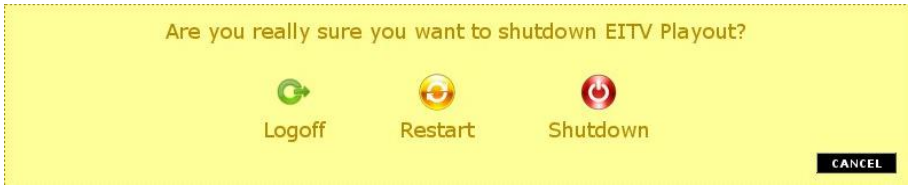


Figure 21 Logging Off from the System

There are three answer alternatives: **Shutdown**, **Reboot**, and **Cancel**. To shut the EITV Playout Professional off, click **Shutdown**. To restart, click **Reboot.** To cancel the shutdown operation, click **Cancel**.

Use this option carrefully because it will turn the equipment completelly off, and all transmission will be finished.

It is important to observe that when the user makes a login the system continues to operate normally. This operation doesn't turn the equipment off.

Configuration

The **Configuration** function allows user to perform a series of system configuration. When the **Configuration** function is selected, the system loads the page displayed in the **Figure 22**.

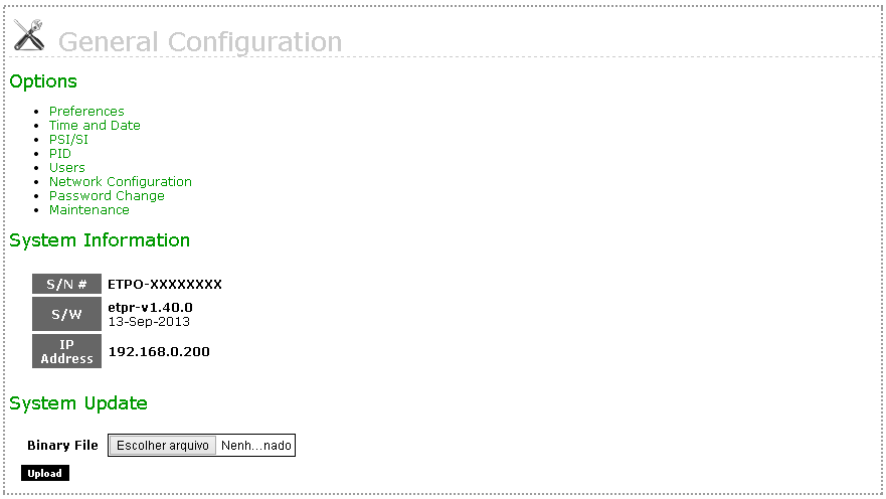


Figure 22 General Configuration Page

The following will describe the existing configuration options at the **Options**, **System Information**, and **System Update** items.

Options

Under the Options item there are the following settings: Preferences, Time and Date, PSI/SI, PID, Users, IP Configuration, and Change Password.

Preferences

As you can see in the **Figure 23**, preferred values can be set for some fields. Following these fields and standard values are presented:

Application		
Field	**Default**	**Details**
Application Scheduling	Disabled	Enable/disable the scheduling of an application program associated with the EPG
Carousel Schedule Control	Service	Sets if the scheduling Carousel will give priority to service or EPG
Organization ID	10	The field stores the default organization ID sent in AIT to each application.
Closed Caption		
Field	**Default**	**Details**
Closed Caption 2 lines	Disabled	Enables / disables the automatic conversion of closed captioning Rollup 2 lines, 3 lines for Rollup.

EPG		
Field	**Default**	**Details**
CSV Carriage Return	Win Mode	Select the correct line breaks depending on your operating system: Windows or Linux.
CSV Delimiter	,	If using EPG automatic method with CSV file input, please select the field delimiter. For example comma (,) or semicolon (;).
EPG Editor Language	Pt-br	Sets the language of the user interface of the EPG editor. Available in Portuguese or English.
EPG Method	EPG Manual	Option that allows choosing how the EPG will be inserted in the transmission. It can be manually in the Services menu or the EPG menu via an XML or CSV file (File Upload) or using the GUI to create the EPG (User Interface)
EPG Time Zone Adjust	0	This value defines the displacement of the Zone to be sent in EIT to match the time zone in TOT sent by the multiplexer. The value must be in seconds, positive or negative. For example -7200 to a negative offset of 2 hours or 3600 for a positive offset of one hour.
H-EIT Schedule Transmission	Enabled	Enable/disable the H-EIT Schedule Table Transmission.
H-EIT Transmission Bitrate	50000	Sets the transmission rate from Table H-EIT
L-EIT Schedule Transmission	Enabled	Enable/disable the L-EIT Schedule Table Transmission.
L-EIT Transmission Bitrate	3008	Sets the L-EIT table transmission rate.
M-EIT Schedule Transmission	Enabled	Enable/disable the M-EIT Schedule Table Transmission.
Start Day	5	This field sets the start time of the EPG
Total EPG days sent	7 days	Allows the EPG sending to a certain number of days when using the EPG User Interface
Modulation		
Field	**Default**	**Details**
Modulation Output Level	-27,5 dBm	Modulation output level to be set in dBm can be configured according to the need for the default values in this field.
Multiplexer		
Field	**Default**	**Details**
AIT Multiplexing	Enabled	Enable/disable the Application Information Table (AIT).
BIT Multiplexing	Enabled	Enable/disable the Broadcaster Information Table (BIT).
CAT Multiplexing	Enabled	Enable/disable the Conditional Access Table.
EIT Multiplexing	Enabled	Enable/disable the Event Information Table (EIT).
NIT Multiplexing	Enabled	Enable/disable the Network Information Table (NIT).
PAT Multiplexing	Enabled	Enable/disable the Program Association Table (PAT).
PMT Multiplexing	Enabled	Enable/disable the Program Map Table (PMT).
SDT Multiplexing	Enabled	Enable/disable the Service Description Table (SDT).
SDTT Multiplexing	Enabled	Enable/disable the Software Download Trigger Table

TMCC Multiplexing	Enabled	Enable/disable the TMCC Re-multiplexing. When this field is selected, the output will be a 204-byte BTS, as defined by the **ARIB STD-B31 5.5** rule. When disabled, the output will be an 188-byte TS, without the 16 control bytes.
TOT Multiplexing	Enabled	Enable/disable the Time Offset Table (TOT).
Output		
Field	**Default**	**Details**
External Clock	Disabled	Enables/disable the external clock of 10 MHz of the DTA-2142 interface
Fix PCR Jitter	Enabled	Enables/disable the automatic correction of the PCR jitter
SFN Information	Disabled	Enable/disable the addition of IIP packets of information from SFN
System		
Field	**Default**	**Details**
Auto Start	Disabled	Enable/disable automatic restart transmission after a system restart.
Remote Transmission Control	Disabled	Enable/disable the initial remote control or of a transmission.

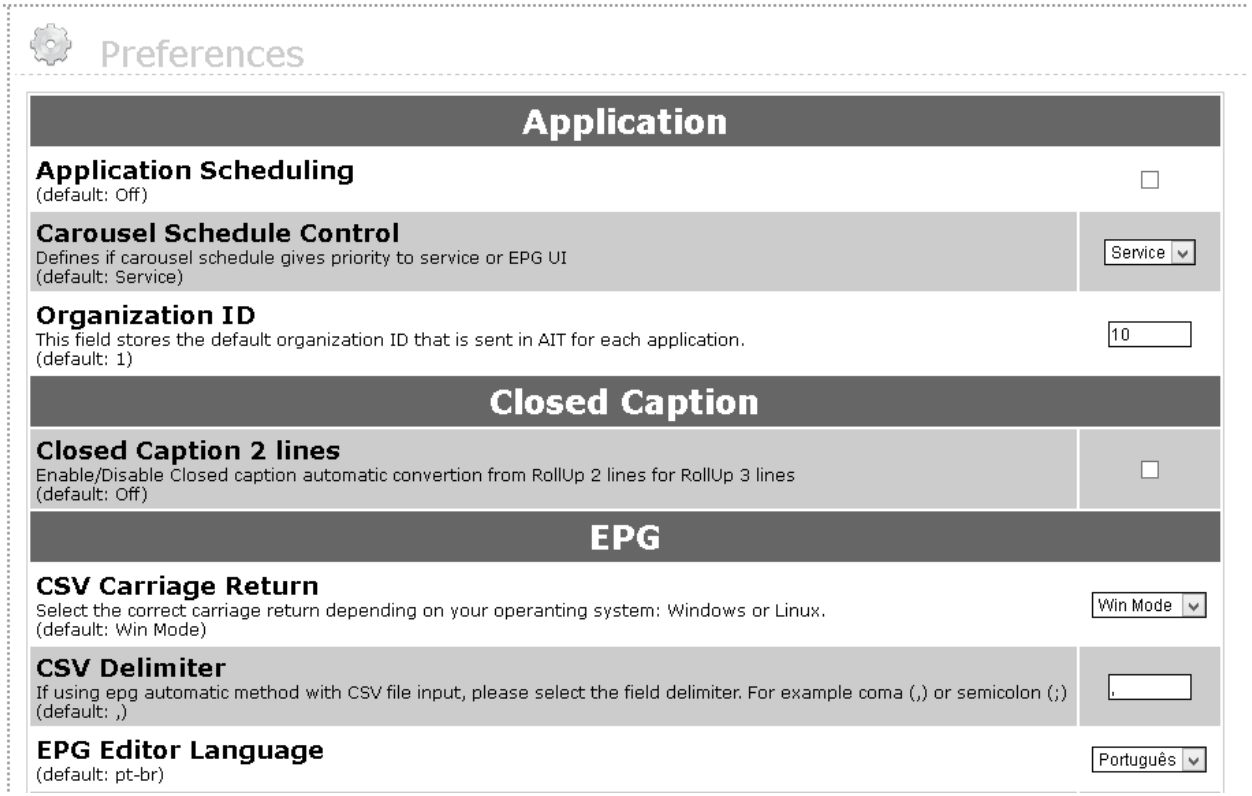
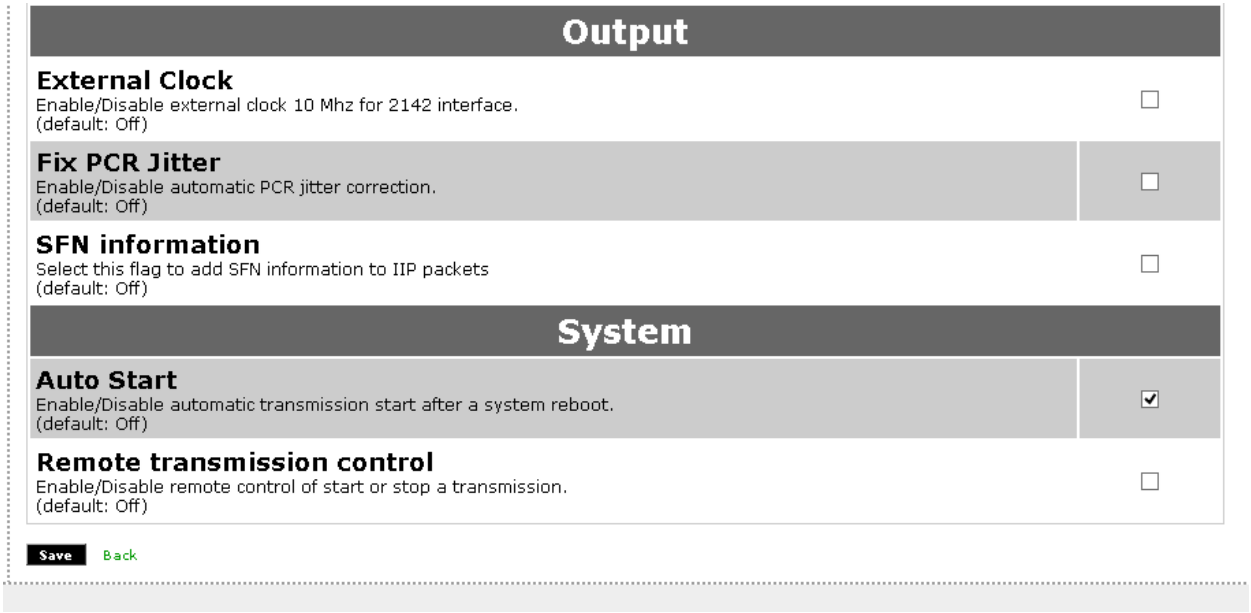


Figure 23 Configuration of Preferences

EPG Method Eletronic Programing Guide (EPG) generation method. (default: Manual EPG)	EPG Editor
EPG Time Zone adjust This field sets the Time Zone offset to be sent in EIT so it matches the timezone in TOT sent by the multiplexer. The value must be in **seconds**, positive or negative. (i.e. -7200 for negative offset of 2 hours or 3600 for one hour positive offset) (default: 0)	0
H-EIT Schedule transmission Enable/Disable H-EIT schedule transmission. (default: On)	☑
H-EIT Transmission Bitrate (default: 50000)	50000
L-EIT Schedule transmission Enable/Disable L-EIT schedule transmission. (default: On)	☑
L-EIT Transmission Bitrate (default: 3008)	3 Kbps
M-EIT Schedule transmission Enable/Disable M-EIT schedule transmission. (default: On)	☑
Start Day This field sets EPG day start hour (default: 5)	05:00
Total EPG days sent When using EPG UI interface you can choose send a limited number of days. (default: 7)	7 days
Modulation	
Modulation Output Level (dBm) (default: -27.5)	-27.5 dBm
Multiplexer	
AIT multiplexing Enable/Disable Application Information Table (AIT) multiplexing (default: On)	☑
BIT multiplexing Enable/Disable Broadcaster Information Table (BIT) multiplexing (default: On)	☑
CAT multiplexing Enable/Disable Conditional Access Table (CAT) multiplexing (default: On)	☑
EIT multiplexing Enable/Disable Event Information Table (EIT) multiplexing (default: On)	☑
NIT multiplexing Enable/Disable Network Information Table (NIT) multiplexing (default: On)	☑
PAT multiplexing Enable/Disable Program Association Table (PAT) multiplexing (default: On)	☑
PMT multiplexing Enable/Disable Program Map Table (PMT) multiplexing (default: On)	☑
SDT multiplexing Enable/Disable Service Description Table (SDT) multiplexing (default: On)	☑
SDTT multiplexing Enable/Disable Software Download Trigger Table (SDTT) multiplexing. (default: On)	☑
TMCC Remultiplexing Enable/Disable TMCC Remultiplexing. When enabled, output will be a 204-byte BTS according to ARIB STD-B31 5.5. Disabling this will cause output to be a 188-byte TS, without the 16 dummy control bytes. (default: On)	☐
TOT multiplexing Enable/Disable Time Offset Table (TOT) multiplexing (default: On)	☑



Time and Date

When the user selects **Time and Date** the system displays the date and time set on EITV Playout Professional, as shown in the **Figure 24**.

In this menu, the user can correct the date and time of the system. The user should be aware that the schedule should always be set to UTC-3. The **region** information and **DST** should be configured in **TOT** tab as shown in **Figure 25.** As an alternative, you can set the time from an **NTP server**, you just put the server address in the corresponding field, select the scheduling (or not) the check box next to it and click **GET**.

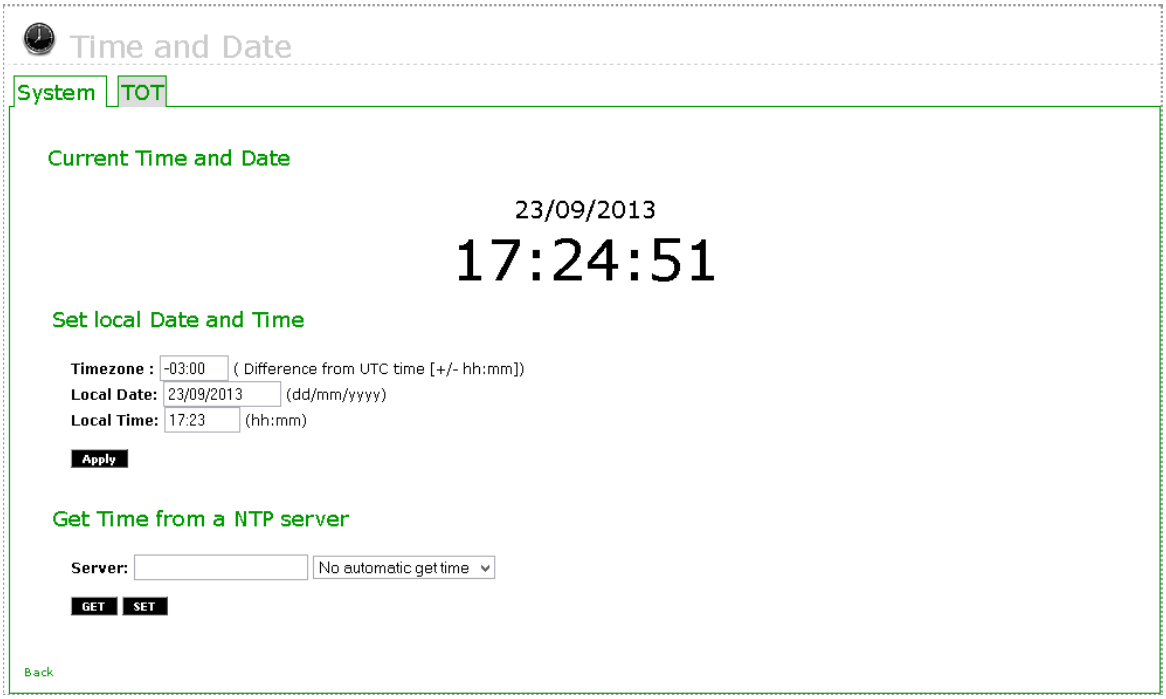


Figure 24 Configuration of Date and Time

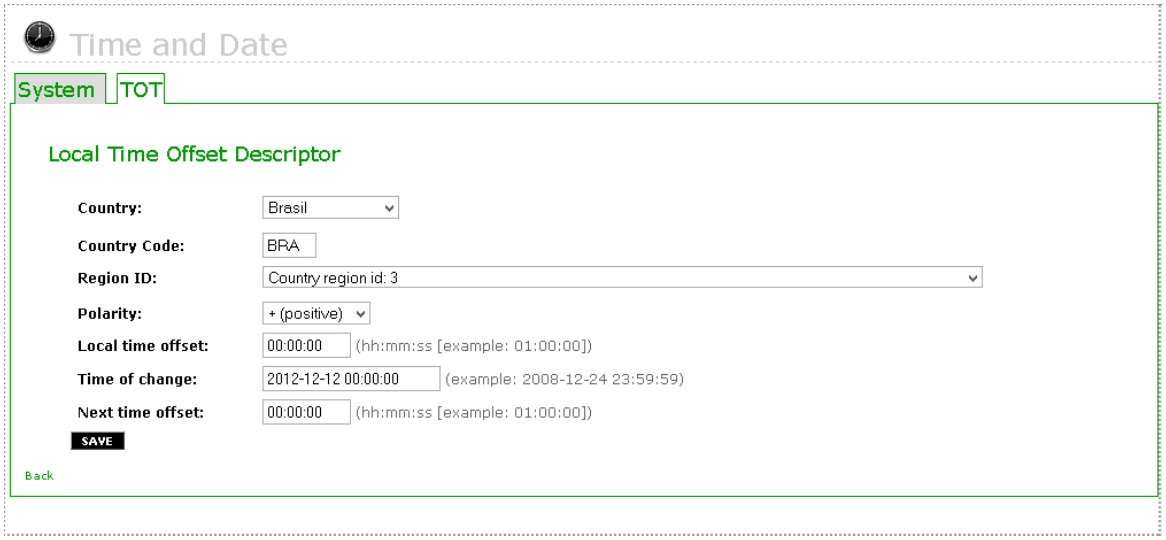


Figure 25 Configuration of the Date and Time Difference Table

As defined by the **ABNT NBR 15603-2** Brazilian Rule, the TOT (Time Offset Table) table is responsible for sending the Brazilian Official Time information, set as UTC-3 (Universal Time Coordinated –3 hours), and send the time zone and daylight saving time information. To do this, is convenient that the local_time_offset descriptor has the time zone information set for the region where the transmission system of the broadcaster is installed on.

PSI/SI

The configuration screen of the **PSI/SI** tables shown in the **Figure 26** enables you to configure the repetition rate (in milliseconds) of the **PAT**, **PMT**, **NIT**, **TDT**, **EIT**, **SDT**, **AIT**, **BIT** , **TOT**, **STE, SDTT, IIP** and **CAT** tables in the transport stream.

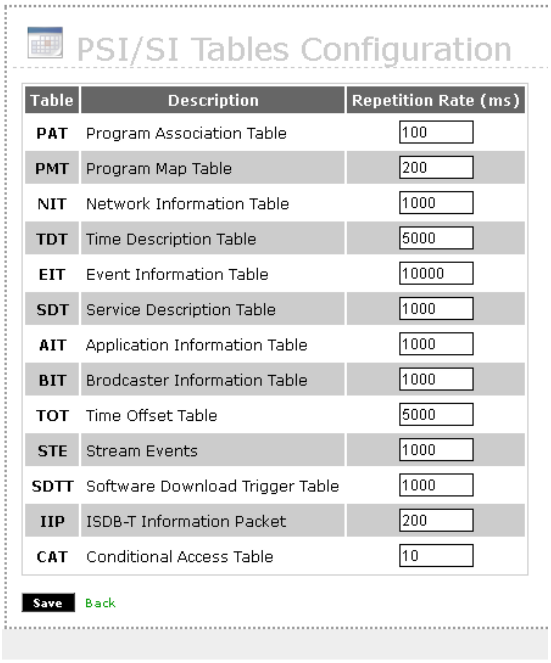


Figure 26 Configuration of PSI/SI

This table stores the timing values of the **PSI/SI** tables that need to follow the technical rule standard of the used digital TV system.

PID Configuration

The **PID Configuration** screen shown in the **Figure 27** enables you to configure **Packet ID** (exclusive packet identifier) of stream TS packets to be generated by the equipment into the multiplexing and re-multiplexing process, including: **Audio Stream**, **Video Stream**, **PCR**, **Generic Elementary Stream**, **Data Stream**, **AIT**, **PMT**, **H-EIT**, **M-EIT**, **L-EIT**, **Stream Events PID, Closed Caption Stream, SDTT, Software Download Data Carousel PID e Data Carousel Component**.

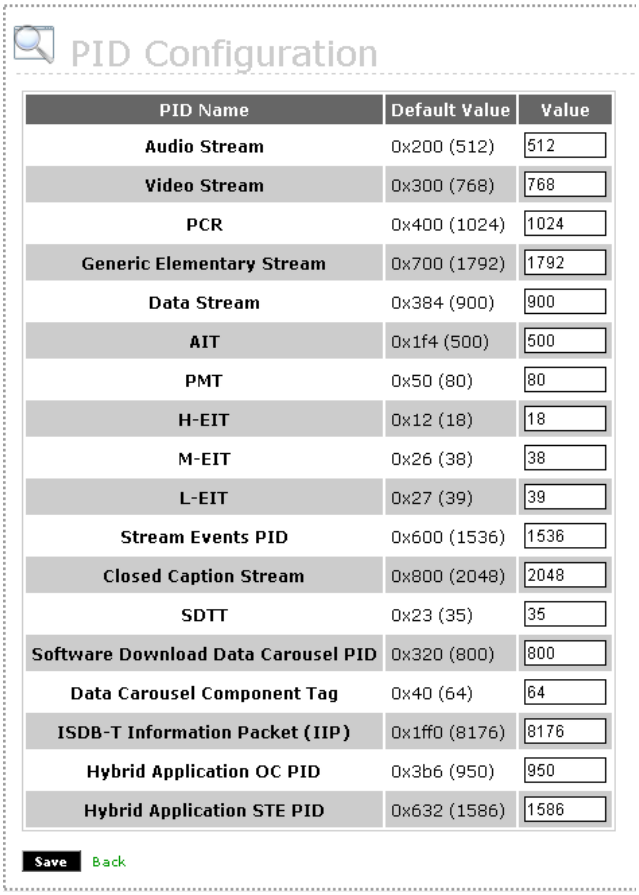


Figure 27 PID Configuration

For the **Audio Stream**, **Video Stream**, **PCR**, **Generic Elementary Stream**, **Data Stream**, **AIT**, **PMT**, **Stream Events PID**, and **Closed Caption Stream** items, the values can be chosen as needed, but the most important is that the value overlap is not allowed.

The **H-EIT**, **M-EIT**, and **L-EIT** fields must have the values completed as defined in the Brazilian Technical Rule.

All values are presented in the **Default Value** column using hexadecimal notation with the matching value in parenthesis. However, all values inserted in fields of **Value** column should be entered in decimal notation.

New User

In the user registration screen shown in the **Figure 28**, new users will be able to access the system are registered. The **eitv** user is already registered and cannot be deleted (see details in **Login** section previously in this guide).

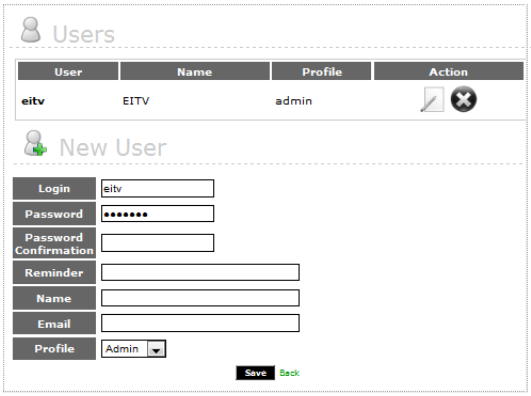


Figure 28 New User Registration Screen

To add a new user, enter the **Login**, **Password**, **Password Confirmation**, **Reminder**, **Name**, and **Email**. After fill in all fields, click the **Save** button to add the new user.

In EITV Playout Professional there are three levels of user profile:

Admin: Has unrestricted access to any menu and system functionality.

User: Has access to all features of the system, except the administration of users, such as adding or removing a user.

EPG UI: Has restricted access to the EPG Graphic User Interface, all others menus are inaccessible.

All created users are displayed in a table on the screen. To edit the information about a particular user, click the **Edit** link under the **Action** column for the user which you want make changes to. You can change the **Name** and **Email** fields. The remaining fields cannot be changed. To confirm the changes, click **Save** to save them. The **Figure 29** shows the user editing screen.

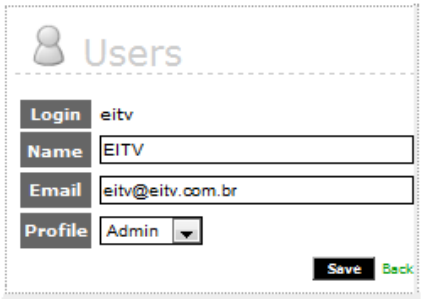


Figure 29 User Editing Screen

To delete a system user, clique the **Edit** link related to the user you want to remove from the system in the users table, and then click the **Remove** button. The user will be deleted from the system.

Take care to perform this action because you will not be able to undo it after the confirmation.

Network Configuration

In the network configuration shown in Figure 32, the user can configure the network interfaces EITV Playout Professional. Each one must be configured in their respective tab (1 Gb, 2 Gb) and can be up to 4 network interfaces. At each interface the user can opt for EITV Playout Professional to connect to the network with automatic settings (DHCP) or static IP, for the latter you need to configure the IP Address (IP Address), Network Mask (Subnet Mask), Gateway parameters Address).

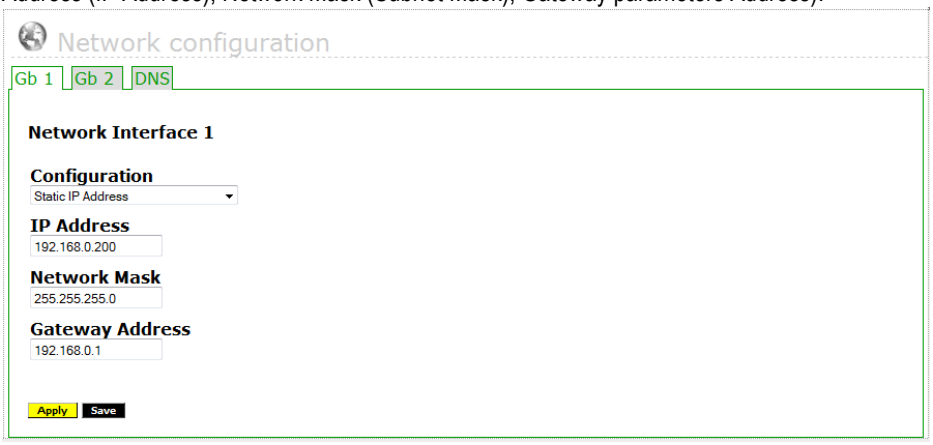


Figure 30 Network Configuration Screen

DNS

On the DNS tab, shown in Figure 33 it is possible to configure the Primary DNS, secondary DNS and Domain.

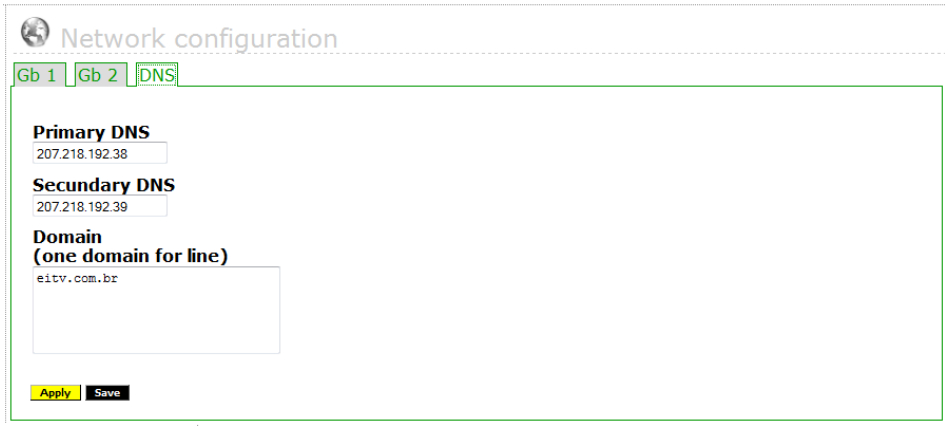


Figure 31 DNS Configuration Screen

When the Save button (save) is pressed, the system checks the consistency of the data and, if everything is correct, a success message is displayed. Otherwise, an error message appears stating the problem.

Whenever a change in IP is performed on this screen, is necessary to click Apply to activate the new settings .

Password Change

The Password Change screen, shown in the **Figure 32**, allows the user to change the password when needed. To do this you need to perform the following steps:

1. Enter the current password in the **Current Password** field.
2. Enter a new password in the **New Password** field.
3. Confirm the new password entering it in the **Password Confirmation** field.
4. Alternately, provide a reminder sentence to the new password in the **New Reminder** field. After fill all the fields, click **OK**.

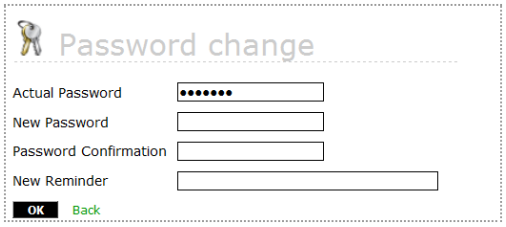


Figure 32 Change Password Screen

Maintenance

The Maintenance screen, shown in **Figure 33**, the user has the options of Backup of the EITV Playout Professional, disk information storage and on the ASI and Modulated existing interfaces.

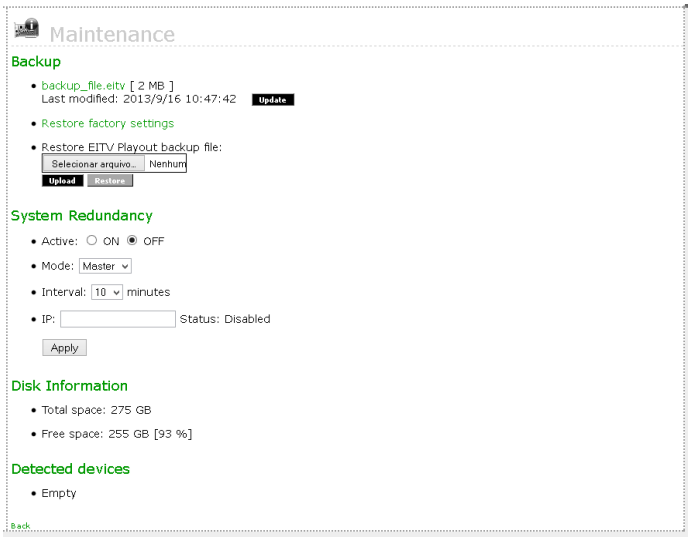


Figure 33 Maintenance Screen

Backup

The user can create a file backup of EITV Playout Professional, by clicking the Update button. This file contains all the settings and files uploaded to the system so that the user can download and save the system information.

The user can retrieve this information by loading the backup file from the EITV Playout Professional (EITV Playout Restore backup file), selecting the file path after this the user must click **Upload** and finally **Restore** to restore the EITV Playout Professional to the point where Backup the file was created.

Another option on this screen is the user can restore the factory settings (Restore factory settings) of the EITV Playout Professional. Selecting this option all settings made by the system will be deleted. It will contain only settings and factory default files.

The backup can only be restored on the same machine or on another machine if both are on the same version of software (in system Information).

It is always recommended to perform a backup after the system update

System Redundancy

To enable redundancy control is necessary to have at least two EITV Playout on the same network, where we will have a Master (main Playout) and Slave (Secondary). Thus each time interval that is set in "Interval" field, the playout Slave is updated with all the information that is applied in Playout Master, including Caption and EPG. Once the settings are been chosen, just use the Apply button to start over.

Disk Information

On this screen the user can also check the Disk Information of the EITV Playout Professional, as the Total Disk Space and Free Space on disk.

Detected devices

In **Detected devices** are listed all the ASI interface communication or existing modulated.

System Information

In the General Configuration screen you can see information about the system under the **System Information** item. The information includes the equipment **S/N#**, software date and version, and **IP Address** in which the equipment is set to. You can see this information in the **Figure 34**.

These fields are for information purpose only and cannot be edited or changed directly by the user.

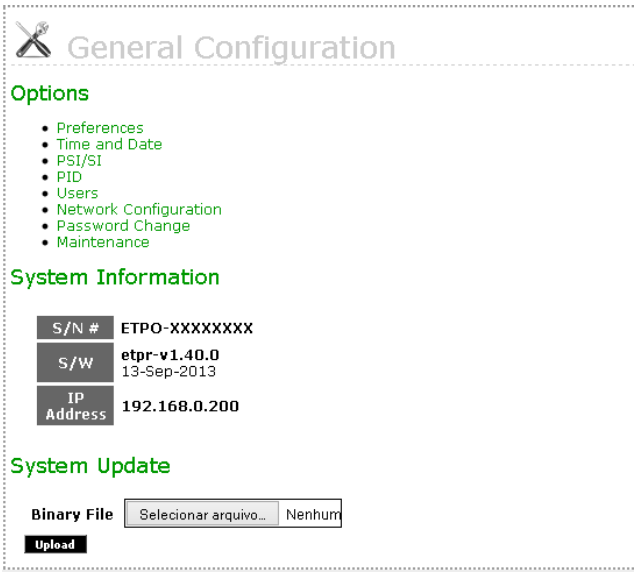


Figure 34 System Information

System Update

The EITV Playout Professional controlling software can be updated using the **System Update** option, as you can see in the **Figure 34**. Always you need, EITV provides you with a binary file named **etpo-update.bin**. This file contains all needed updates. To perform the update, download the file via Web interface and click **Upload**.

If the file is successfully loaded, a message indicating the successfully complete will be displayed. To the system updates contained in the file in effect, the equipment must be restarted.

After equipment restarting is complete, check to see if the software version number shown in the **System Information** item was correctly updated.

Remember to return to the system **Transport Stream** function and restart the transmission.

Services

The services are transmitted channels in the transport stream. For each service the EITV Playout Professional allows the association of audio and video streams, interactive applications in object carousel format, Closed Caption, and programming event information (EPG) to be transmitted into the service.

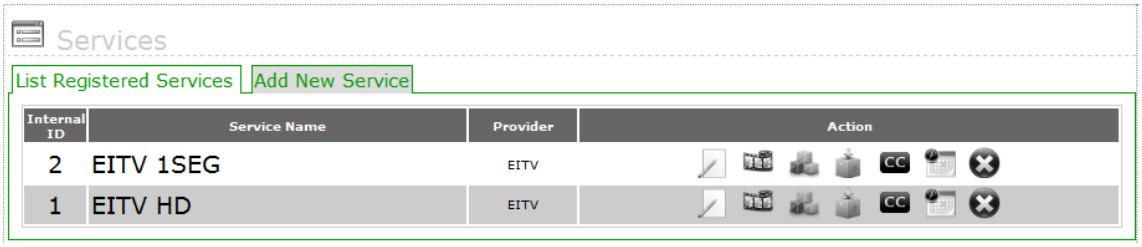


Figure 35 Services

You can add one or more audio and video stream to a given service. To transmit a service, the equipment generates a playlist with all audio and video stream associated to the service and then transmits each service in a looping (when the transmission of the last audio and video stream finishes, the transmission of the first stream is restarted).

Add New Service

To include a service, the user must select the **Add New Service** tab. When you select this tab, the screen shown in the **Figure 36** is displayed. In this screen the information to create a new service is inserted. This information includes: **General and Service.**

General

In General information Name, Provider Service Type should be inserted.

In the **Service Name** field, insert a meaningful name that identifies this service to you and other users that will have access to it. The **Provider Name** file is also an informational field that identifies the creator or responsible for the service that is about to be created.

The default value to the Running Status field is Running. The Service Type field has several options. However, the most used are [0x01] Digital TV service and ([0x02] Digital audio service for HDTV and SDTV, and [0xC0] Data service) for 1SEG.

Finally the user must choose from the following Flags you want to send to the service: Schedule EIT Flag, EIT Present Following Flag, H-EIT, M-EIT and LEIT Flag

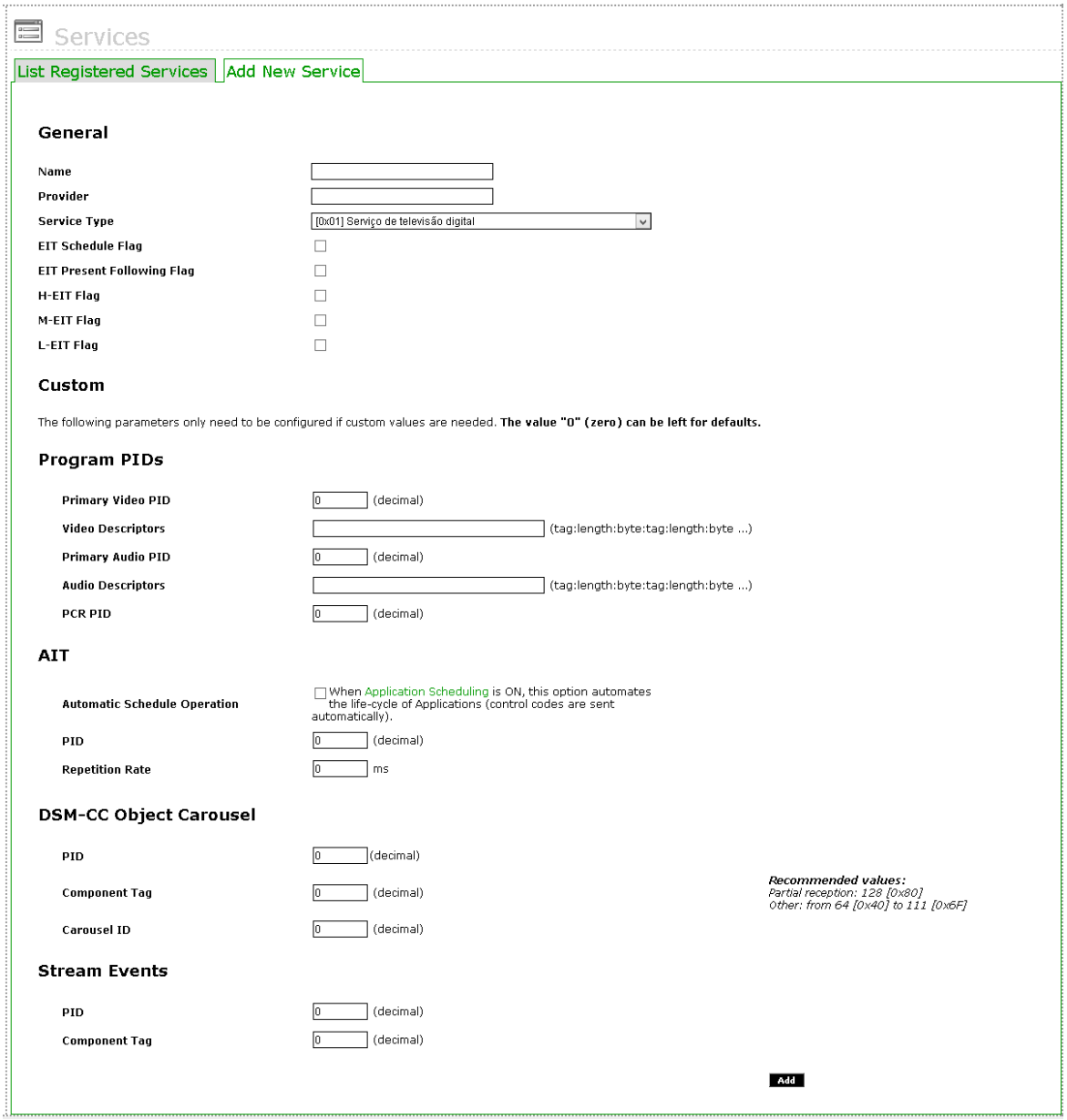


Figure 36 Add New Service or Edit Service Form

Custom

In **Custom**, the parameters should only be modified if the custom values are needed. If the entered value is zero, the system will search for the default values of the EITV Playout Professional defined in the **Configuration`s** menu **PID**.

Can be configured the **PIDs** of **Audio**, **Video** and **PCR**, the **PID** and **Repetition Rate** of the **AIT**, you can also select the option to **Automatic Schedule Operation** that automates the lifecycle applications indicated when scheduling applications is enabled.

Lastly can set the PID, and Carousel Component Tag ID DSM-CC and PID Object Carousel Component and Tag Stream of Events

After inserting all the information and configure click **Add** to create the service. If you do not want to save the information entered. For each service that you want to insert, repeat the procedure described.

Once created a service, in **Registered Services List** tab in the screen **Services** function, shown **Figure 35**, will be displayed the service or existing services and created in the system by users. For each of the services created there is a configuration submenu in **Action** column. This configuration submenu of actions is shown in bellow.

Next following describes in detail the options in the configuration submenu.

Editing a Service

The **Edit** option in the submenu for the **Action** column allows the user to modify all inserted information at the moment the user creates the service. After you have edited the information, you can save the changes clicking in **Save** or you can cancel the editing without save changes clicking **Back**.

Associating an A/V Stream (AV)

The **AV** submenu option allows user to associate an audio and video file, previously registered to the service. Click the **AV** option related to the service which you want to add the A/V stream to in order to display the screen shown in the **Figure 37**. In this screen, the user can choose an A/V stream that will associate the selected service. If user have registered more than one file with the exactly the same parameters (PID and Bitrates), it is possible to associate all the files as a Playlist.

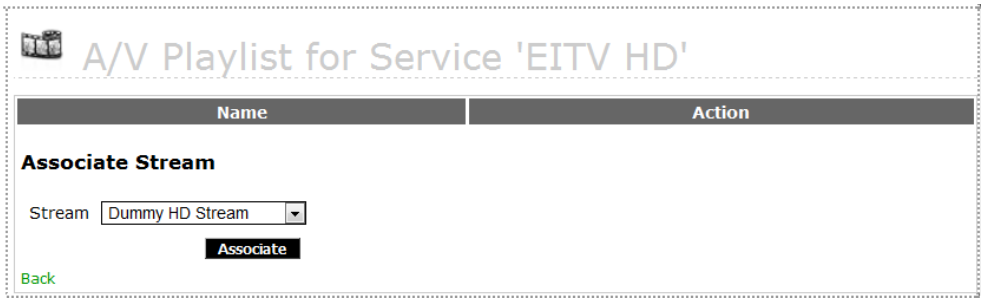


Figure 37 Associating an A/V Stream (AV)

Associating an Application

The **APP** option allows the user to associate an application to a service created by the user. To associate an application, click the **APP** submenu option associated to the wanted service. The displayed screen in the **Figure 38** is shown with the association options of an application, the **Default** mode and the mode **Schedule**.

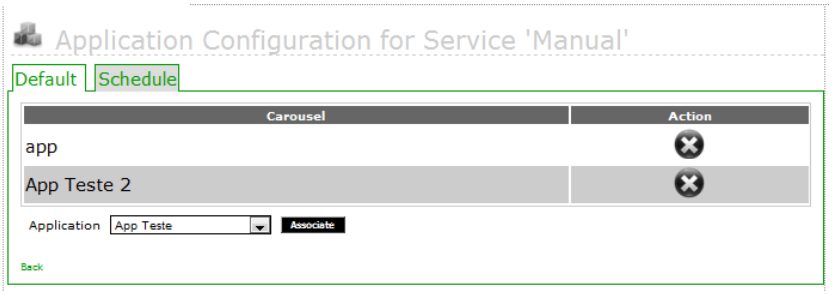
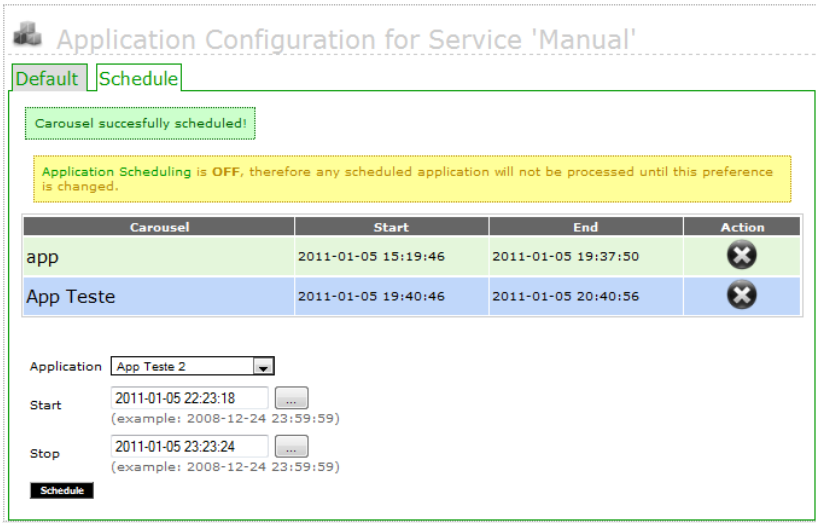


Figure 38 Configuration of the Application

To confirm the application association to the service, click the **Associate** option or click **Back** to cancel the association.

To request an application form from **Schedule** select the application name in the **Application** dropdown field under the column **Carousel** select the date and time **Start** and **Stop** application.



Scheduling Application

To confirm scheduling application, click the Schedule (Schedule) option. A list of scheduled applications appears in the table.

The application to be selected in this option must have been previously inserted in the system (see **Carousel** session in this guide).

The schedules made on this screen will only be processed if the Application Scheduling Preferences of the menu option is enabled

Associating an OAD

The **OAD (Over the Air Download)** option allows user to associate an OAD to a service create by the user. To associate an OAD click the **OAD** option in submenu associated to desired service. In the screen shown in the **Figure 39**, the association option is displayed. Select the OAD name on drop-down list for the **OAD** field at the **Name** column. A list of OADs is displayed at the **OAD Associates to the Services**.

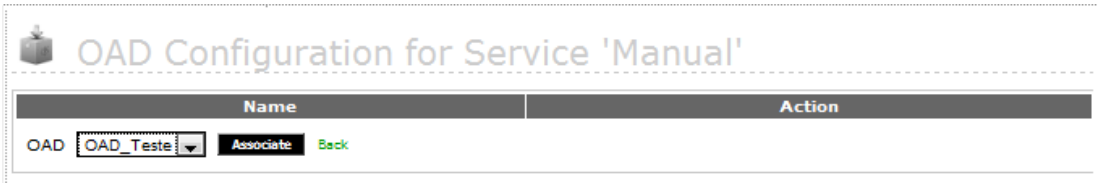


Figure 39 Configuration of the OAD

The OAD to be selected in this option must have been previously entered in the system (see OAD session in this manual).

Association of Closed Caption (CC)

The **CC (Closed Caption)** option allows the user to associate a Closed Caption to a user created service. To associate a Closed Caption, click the **CC** submenu option associated to the service you want. The displayed screen in the **Figure 40** is shown with the association options. Select the Closed Caption in the drop-down list from **Closed Caption** field under the **Name** column. A list of all Closed Caption is presented in the **Closed Caption Associates to the Services** table.

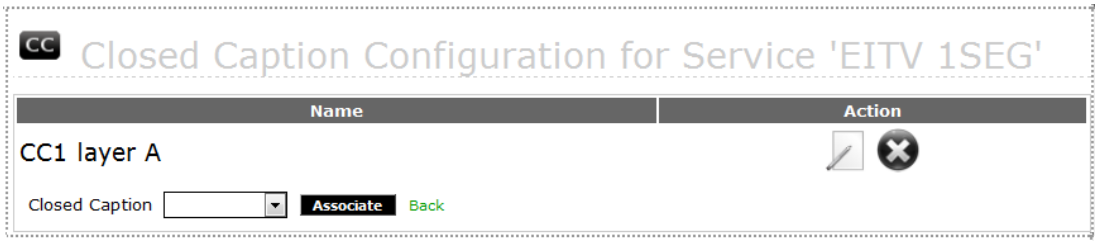


Figure 40 Configuration of the Closed Caption

The application to be associated in this option must have been previously inserted in the system (see **Closed Caption** session in this guide).

Association of EPG (EPG)

The EPG (Electronic Programming Guide) previously included in the system can be associated to a service.

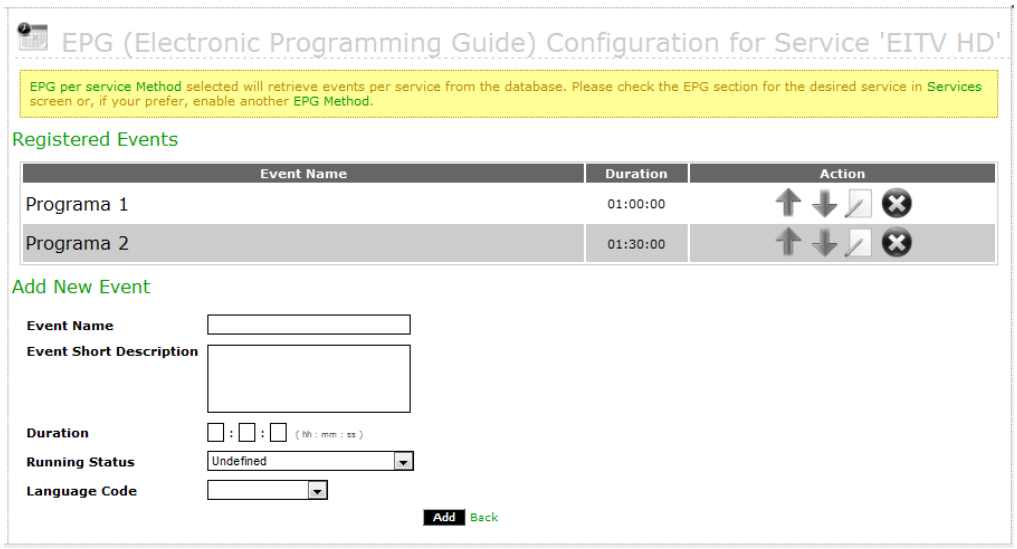


Figure 41 Configuration of the EPG

The registered EPG events in this option will be considered only in case of **EPG Manual** is disabled in the system preferences configuration.

Deleting a Service

All services can be deleted from the list of available registered services in the system. To delete a service, click the existing **Delete** option at the same row for the service you want to definitively delete from the system. When the **Delete** option is selected, the prompt **Really Remove? [Yes] [No]** is shown to you confirm the service deleting. To confirm the delete operation, click the **[Yes]** link and to cancel the delete operation, click the **[No]** link (see the **Figure 42**).

Take care to perform this action because you will not be able to undo it after the confirmation.

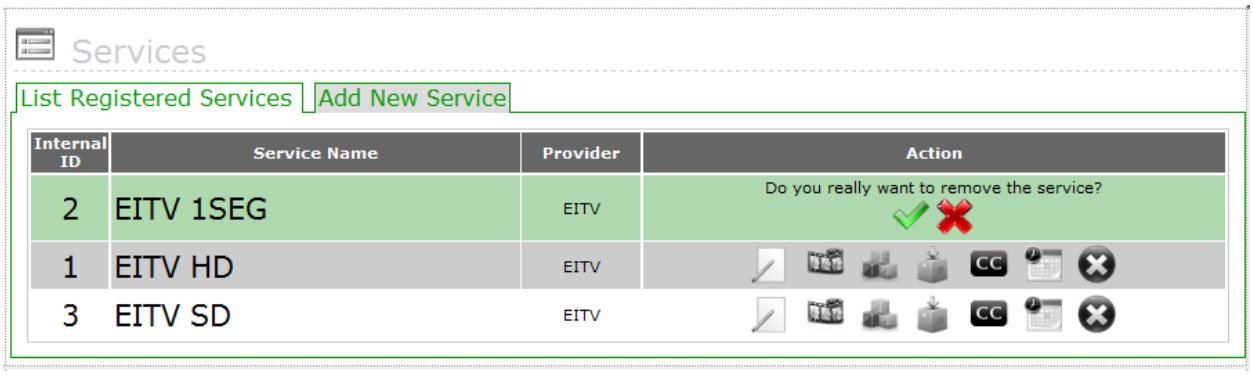


Figure 42 Deleting a Service

A/V

To perform the multiplexing process, the EITV Playout Professional needs audio and video streams packed in TS CBR (Constant Bit Rate) format.

In order to work with HDTV audio and video streams, the user must use a professional encoder with capability for generating stream packed in TS CBR (Constant Bit Rate) format. The stream configuration screen enables the real time stream entry via ASI interface and upload of audio and video streams in TS CBR format, including PID exclusive configuration capability to the PCR Packet, provided by the encoder where TS CBR is generated.

The streams can be inserted in the system in two ways: 188-byte TS Stream or 204-byte TS Stream.

List Registered A/V

The screen shown in the **Figure 43** displays the list of all registered audio/video in the system at the **List Registered A/V** tab.

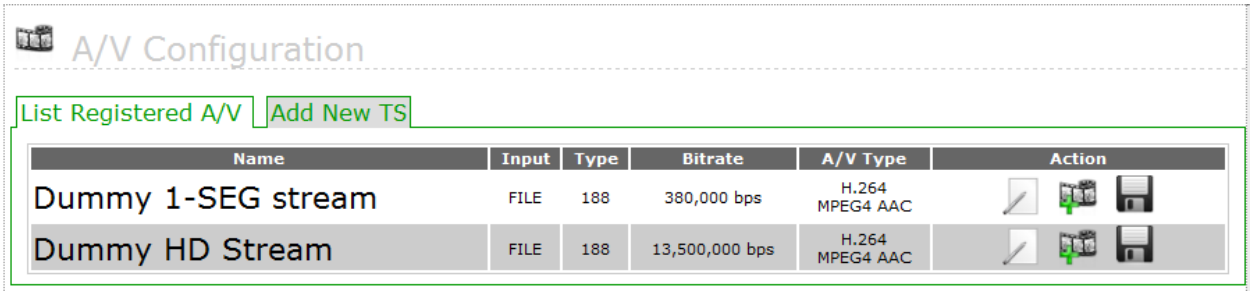


Figure 43 Registered Audio/Video List

For each registered audio/video in the list there is a submenu in the **Action** column with the **Edit**, **Secondary Streams**, and **Delete** options, as you can see in the **Figure 44**.

Figure 44 Submenu of the Registered Audio/Video List

Edit

The **Edit** option in the submenu for the **Action** column allows user to modify all inserted information at the A/V stream creation time by users. After you have edited the information, you can save the changes clicking in **Save** or you can cancel the editing without save changes clicking **Back**.

Secondary Streams

The **Secondary Stream** option in the submenu for the **Action** column allows the user to filter an additional PID in the A/V TS as shown in the **Figure 45**. For example, if the decoder generated TS has a secondary audio PID it can be filtered and multiplexed by the EITV Playout Professional.

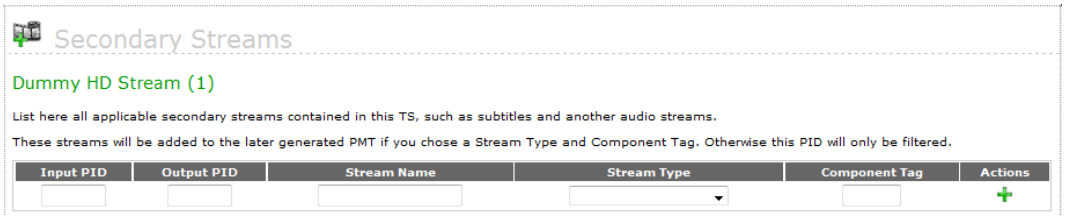


Figure 45 Screen to Add a Secondary Stream

A/V Downloading

All registered audio/video in the system can be downloaded into a local computer. To download an audio/video click the existing **Download** option at the same audio/video line you want to download from system. Following will appear a screen with options to save or open the file.

Deleting an A/V

All audio/video can be deleted from the list of available audio/video registered in the system. To perform an audio/video deleting, click the existing **Delete** option at the same row for the audio/video you want to definitively delete from the system. When the **Delete** option is selected, the prompt **Really Remove? [Yes] [No]** is shown to you confirm the audio/video deleting. To confirm the delete operation, click the **[Yes]** link, and to cancel the delete operation, click the **[No]** link.

Take care to perform this action because you will not be able to undo it after the confirmation.

Add New TS

To insert a 188-byte TS, in the **Add New TS** tab provide a name in the **Name** field and set the **Source**, that can be **File** , **ASI** or **PID**, as shown in the **Figure 46**. If the chosen option is **File**, the **ASI Port Number** field is disabled. On the other hand, if the option **ASI** is chosen, the **File** field is disabled. Finally, if the chosen option is the **IP** selection, the fields **IP interface**, **Port** and **Protocol** are enabled

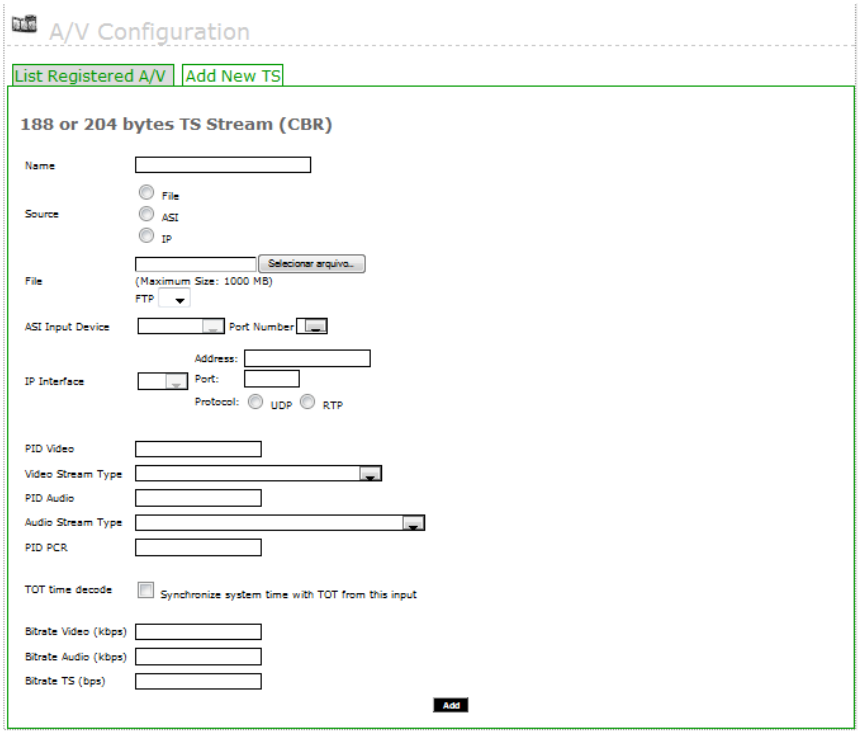


Figure 46 Screen to Add a 188-byte TS (CBR - Constant Bit Rate)

Then you must insert the file or select the ASI port number**,** depending on the chosen Source. Finally, the **Video PID**, **Video Stream Type**, **Audio PID**, **Audio Stream Type**, **PCR**, **Video Bitrate**, **Audio Bitrate**, and **TS Bitrate** information must be inserted. When all fields are completed, click **Add** to add the stream.

The option **TOT Time decode** should be selected if you want the EITV Playout Professional to be synchronized with the TOT TS input.

If you want to insert a TS 188 byte from a byte TS 204, you must enter the PIDs and bitrates of the desired insert the original TS and TS 204 byte file. The equipment performs automatic conversion of TS. In this case the TS Bitrate field must be populated with the value 29 958 294.

Carousel

In the carousel configuration screen shown in the **Figure 47**, the carousel objects (interactive applications) that can be transmitted along services are registered.

To register an application you must provide a ZIP file containing all files needed to run the applications as Java classes (**class**), images (**gif**, **png, jpg),** texts (**txt**), pages (**html**, **xhtml, xml)**, and others. Also is important to indicate the path to the main class of application into the ZIP file.

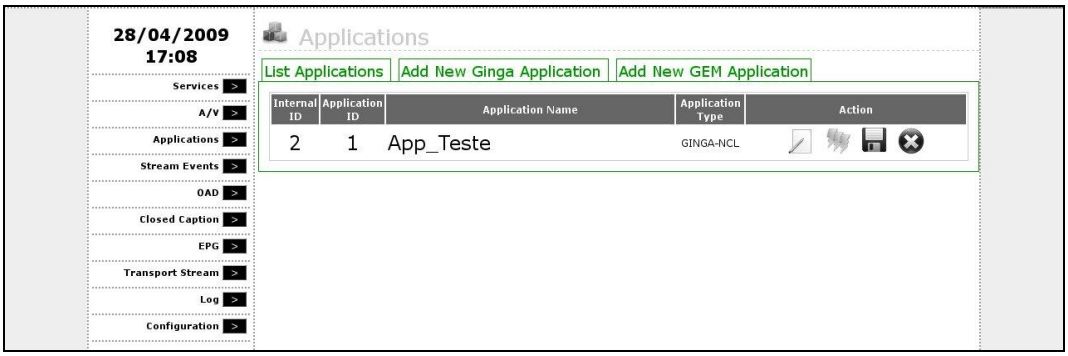


Figure 47 Configuration of the Carousel

The carousel type could be **GINGA** or **GEM.** You can change the information, download interactive application files in ZIP format, and remove a carousel.

The EITV Playout Professional enables that a same application (like a carousel) to be transmitted in several services simultaneously.

Add New GINGA App

To add a new interactive application (carousel), choose the appropriate tab to **GINGA** or **GEM** applications. The **Figure 48** shows the fields to add a **GINGA** application.

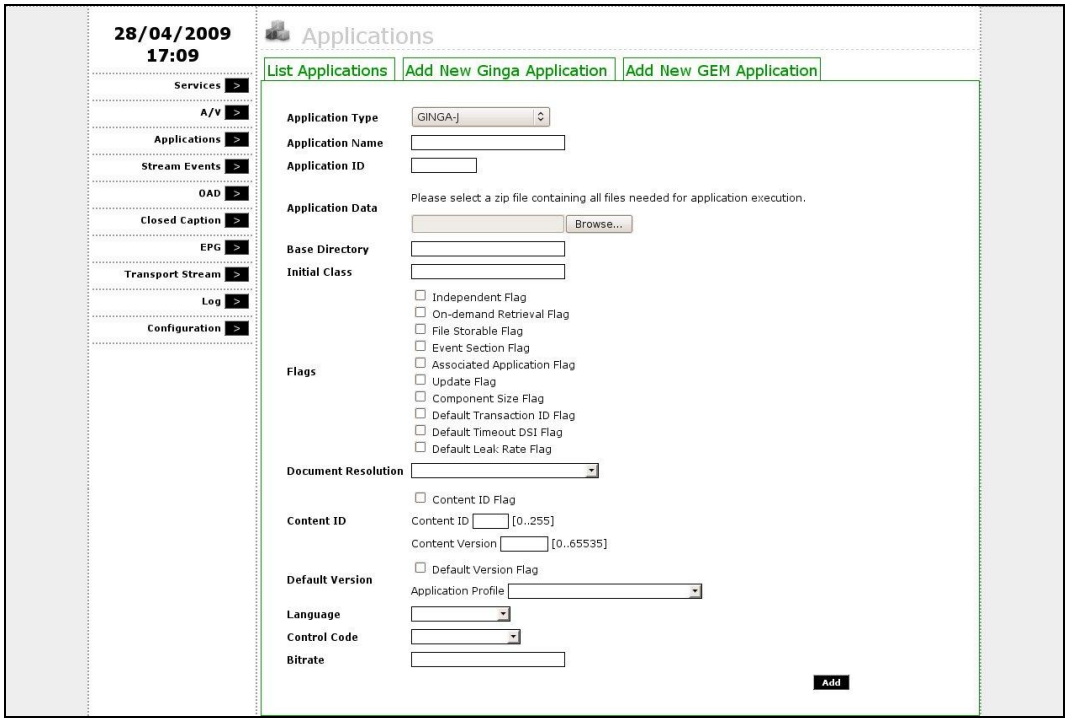


Figure 48 Adding a New GINGA Application

To register a **GINGA** application, first select the **Application Type** that can be **GINGA-J**, **GINGA-NCL**, or **GINGA-Bridge** as defined by Brazilian Rules. After select application type, set the **Application Name**, **Application ID** and add the other information.

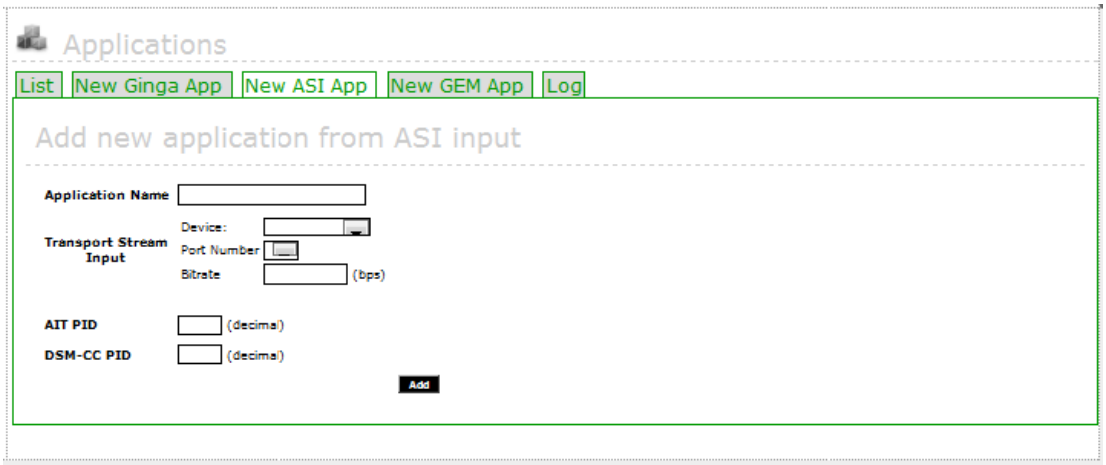
In the **Application Data** field you must select the ZIP format compressed file containing the entire application. The **Base Directory** field must be filled in when the application root directory is in a subdirectory inside the compressed file.

In the **Initial Class** field you must provide the full qualified path in the Java format where the main class is located, for example **br.com.eitv.ClassePrincipal**, without the file extension (**.class**). In case of a **GINGA-NCL** application, you must provide the full qualified path to the **NCL** main file for the application, including the file extension (**.ncl**).

After including all requested information, click **Add** to add the new carousel to the system.

New ASI App

To register an application that will come to Playout via ASI input is necessary to fill in the fields as shown bellow.



Adding a new application GINGA via ASI

In this screen you must complete the **Application Name** field, set the information of the **TS input** , That is, select the **Device**, **Port Number** where to reach the TS and TOTAL **Bitrate** TS. Besides filling the PIDs of **AIT** and **DSM-CC** carousel that should be filtered in the stream.

Add New GEM App

The **Figure 49** shows the fields to add a new interactive application of **GEM** type. The **GEM** interactive application structure is conforming to the **ETSI TS 101 812-DVB GEM** Rule.

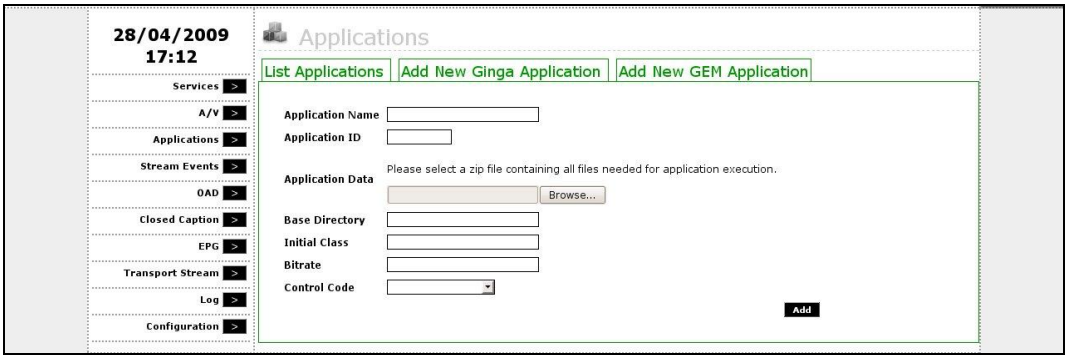


Figure 49 Adding a New GEM Application

To register a **GEM** application, the user must set **Application Name** and **Application ID**. In the same way for adding interactive applications of **GINGA-J**, **GINGA-NCL**, or **GINGA-Bridge** type, you must select a ZIP format compressed file in the **Application Data** field containing the entire application.

The **Base Directory** field must be filled in when the application root directory is in some subdirectory inside the compressed file. In the **Initial Class** field you must provide the full qualified path in the Java format where the main class is located, for example **br.com.eitv.ClassePrincipal**, without the file extension.

After including all requested information, click **Add** to add the new carousel to the system.

Log

This log shows the result of adding the XML file app_management in applications / xml / FTP of the EITV Playout Professional folder. Any change of this file in that folder will result in a message on the screen, as shown in **Figure 50**.

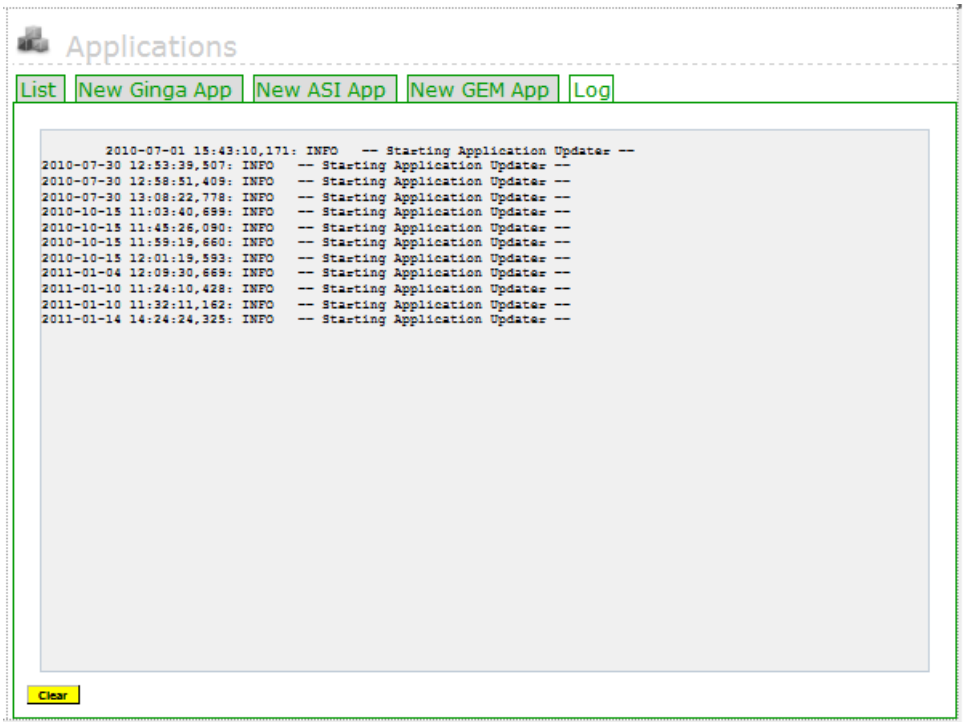


Figure 50 App automation log

Automation of the App

For each carousel in the list there is a submenu in **Action** column with the **Edit**, **STO**, **Download** and **Delete** options, as can be seen in **Figure 51**.

Figure 51 App actions submenu

Editing an Application

To edit an existing application in the displayed list when the **Carousel** option and the **List Carousel** tab are selected, select the **Edit** option in the application submenu list to the application you want to edit. You can edit all application attributes except the **Application Type**.

Associating Stream Event Object

To associate a Stream Event Object to the application you should click **STO** link. Then you must select the Stream Event Object to be associated clicking at the STO Active Field.

Download

The EITV Playout Professional allows the download of an existing application in the Carousel. To do this you must select the **Download** option in the application list submenu.

Deleting an application

To delete an existing application in the displayed list when the **Carousel** option and the **List Carousel** tab are selected, select the **Delete** option in the application submenu list to the application you want to delete.

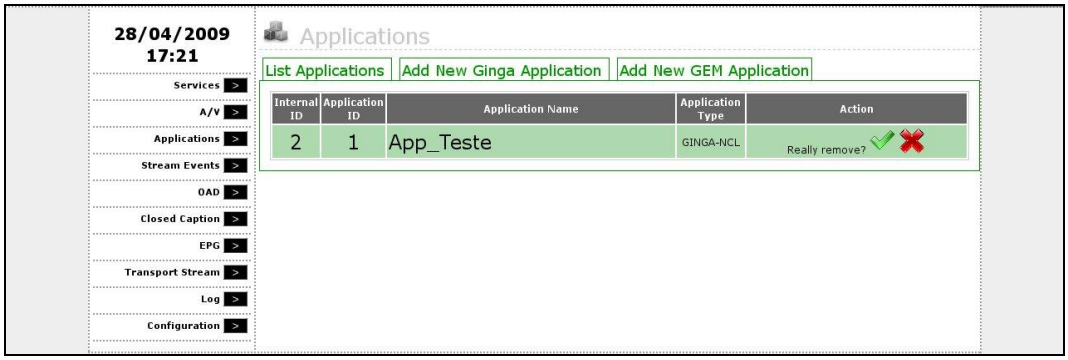


Figure 52 Deleting an Application

The prompt **"Confirm removal?"** will be displayed with **YES** or **NO** option. If you really want to delete, click **YES**. Otherwise, click **NO**.

Take care to perform this action because you will not be able to undo it after the confirmation.

Stream Event

A Stream Event is defined by the transmission of an event message that provides a way to send information messages immediately or scheduled to an application working on a terminal (set-top box). The main use for the Stream Events is the GINGA application synchronization with the audio/video stream.

They can have a small application content, like a text about a quiz or information about the weather.

There are two types of stream events: **Do-it-now** and **NPT** (Scheduled). The difference between both types has no impact over the application.

Adding a Stream Event Object

The first step to add a Stream Event is the creation of a Stream Event Object containing the Stream Events that will be added following. **Figure 53** shows the screen to add a Stream Event Object. At this phase you need to provide the name and description of the Stream Event Object.

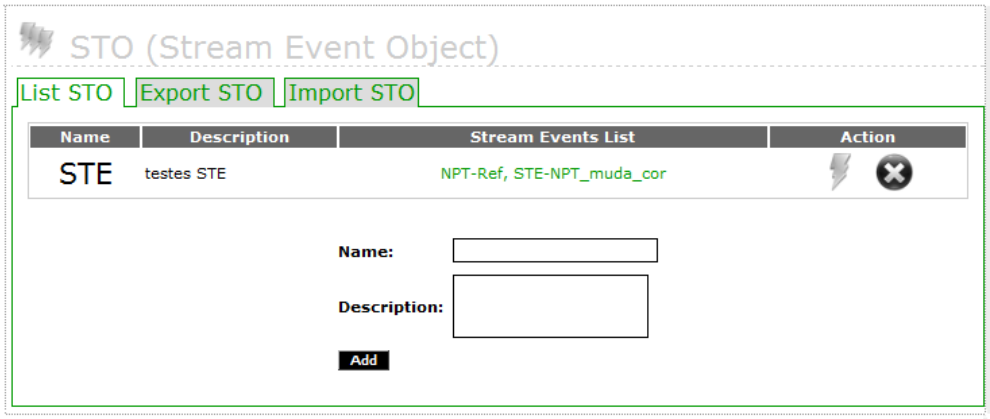


Figure 53 Adding a Stream Event Object

Adding a DIN Stream Event

After adding the Stream Event Object a list of Stream Events is set with the option of add event type DIN or NTP. The **Figure 54** displays the adding of a DIN type event. You must set an identifier to the Stream Event. This identifier follows a standard of two different ID ranges corresponding to both Stream Events types. For NPTs you must use ID in the 32768 – 49151 range, and for DIN Stream Events, use the 1 – 16383 range (decimal format numbers; to add into hexadecimal format you must to make the appropriate conversion). Thereafter should be fill in the **Type**, **Name** and **Private Data Bytes** with the **Tag Command**, the **Sequence Number** and **Command String** fields agreement with the selected **Command Tag**.

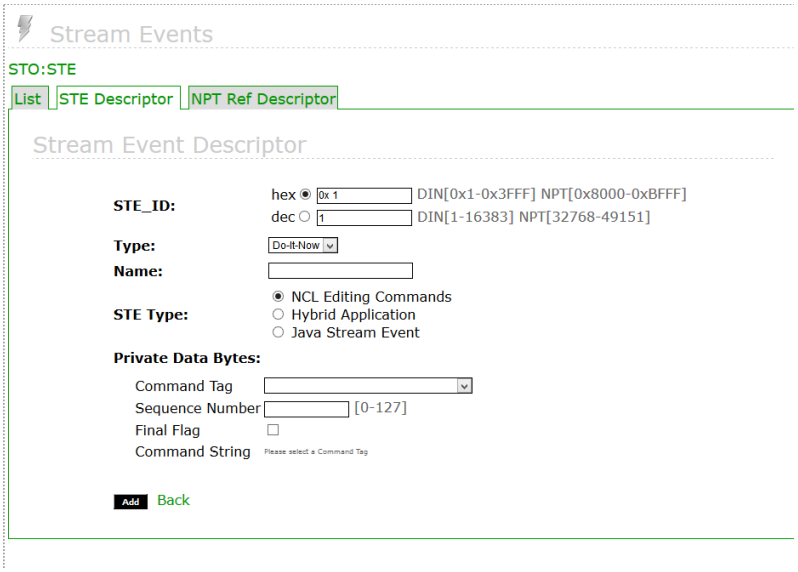


Figure 54 Adding a DIN Stream Event

Adding a NPT Stream Event

The **Figure 55** displays the adding of a NPT type event. The adding of a NPT event follows the same adding standard, where you set the ID, name and event description.

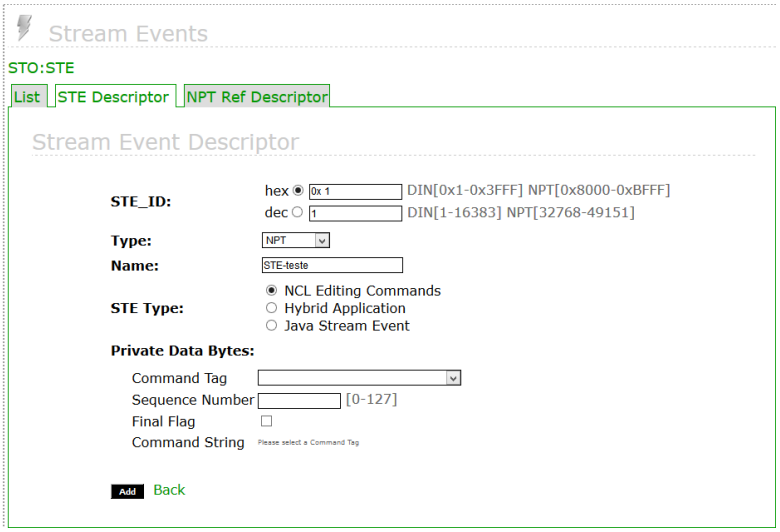


Figure 55 Adding a NPT Stream Event

Adding Java Stream Event

In **Figure 55** above in STE Type you can select between three types of applications available to send Stream Events: NCL editing commands and private data for Ginga-Java applications. According to the type of event, the Private Data Bytes field will be displayed in a different way to suit the need of the information to be sent down, or even show a free text field for entering the information to be sent (mainly in kind Ginga-Java).

Adding Time to NPT Stream Event

To add a NPT type event you need to specify the time to activate it (that can be specified in Ticks or Secs) as shown in the **Erro! Fonte de referência não encontrada.**..

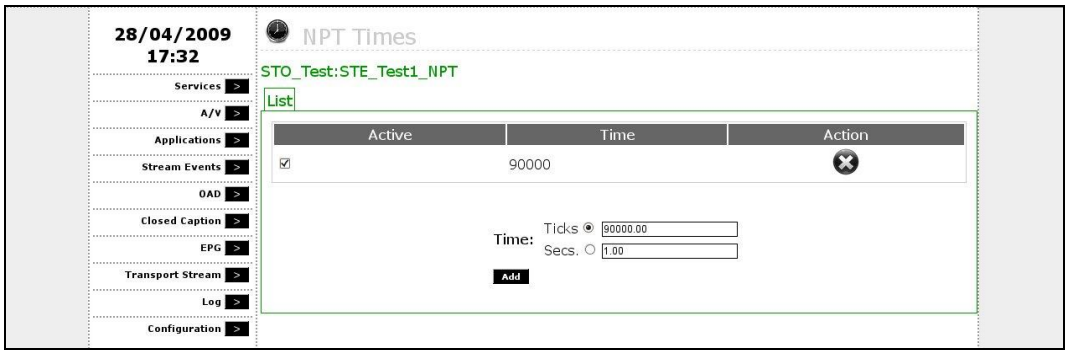


Figure 56 Adding Time to NPT Stream Event

Adding a descriptor time reference to stream events NPT

To add a descriptor time reference to stream events like the NPT, just add the information below. For more information you can check the ABNT NBR 15606-3 in item 13.2.2 NPT reference descriptor.

Exporting a STO

You can perform an exportation of a XML file with backup of Stream Event Object settings as shown in the **Figure 57**.

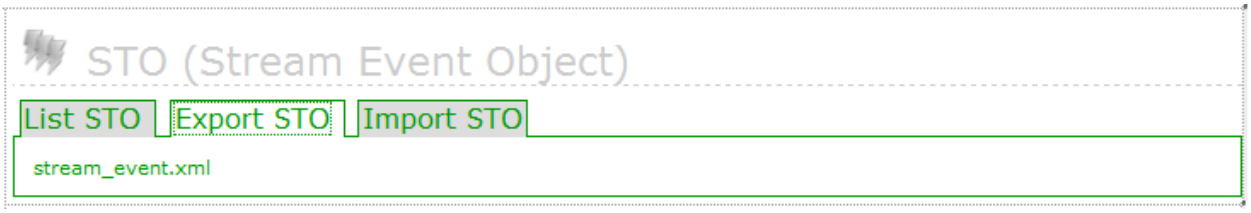


Figure 57 Exporting a STO

Importing a STO

The EITV Playout Professional enables you to add and update the GINGA application and associated Stream Event Objects to these applications through importing a **XML** file. This operation is presented in the **Figure 58**.

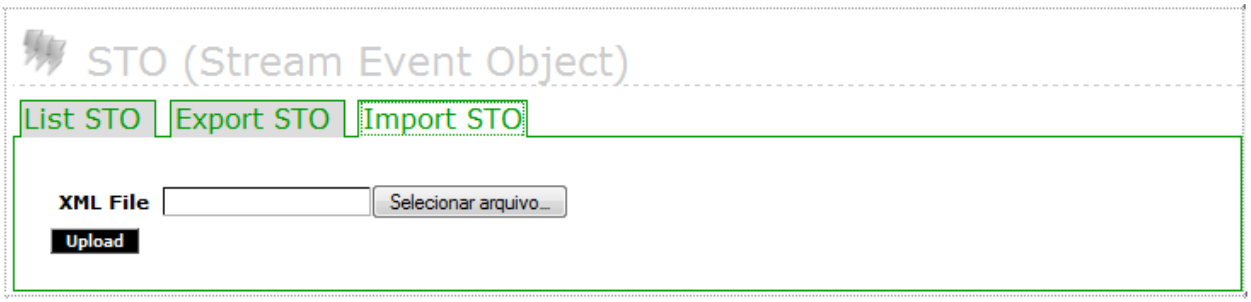


Figure 58 Importing a STO

Following is a **XML** file example to be used:

Code	Comments
<?xml version="1.0" encoding="ISO-8859-1" ?> <stream_events> <object name="**stream_events**"> <event name="**Event1**" type="**din**"></event> <event name="**Event2**" type="**din**"></event> <event name="**Event3**" type="**din**"></event> <event name="**Event4**" type="**npt**"> <fire time="**90000**"/> </event> <event name="**Event5**" type="**npt**"> <fire time="**450000**"/> </event> </object> </stream_events>	The XML tags for this file represent the following: object (defines a Stream Event Object, with the name set by the name attribute), event (defines a Stream Event, with the name set by name attribute, and type set by type). Two types of Stream Events are supported by EITV Playout Professional: din or npt. If the Stream Event is NPT, you need the fire tag, With the time attribute, that set the time which the event should start.

The Stream Events Object importing performs the adding only for new objects. If the contained object in the XML file has the same name of another object already existing in EITV Playout Professional, the import will not be successfully finished.

OAD (Over the Air Download)

EITV Playout Professional provides the functions to generate tables related to the set top boxes updating over the air (OAD – Over the Air Download). Data carousel and downloading scheduling table are generated, named as SDTT (Software Download Trigger Table).

The equipment provides 3 different ways to implement this function: inserting only the binary file to STB updating (in this case EITV Playout Professional creates the SDTT and data carousel), inserting a TS containing data carousel only, and inserting a full TS created by the manufacturer (in this case the equipment filters PIDs from data carousel and SDTT). The first two options are detailed in the **Add New OAD** sub-section, and the explanation for the last option can be located in **Add New TS** sub-section.

Adding a new OAD

To add a new OAD, access the **Add New OAD** tab, provide a name for the OAD and the information related to the manufacturer (**Maker ID**), STB model (**Model ID**), group identifier (**Group ID**), as shown in the **Figure 59**.

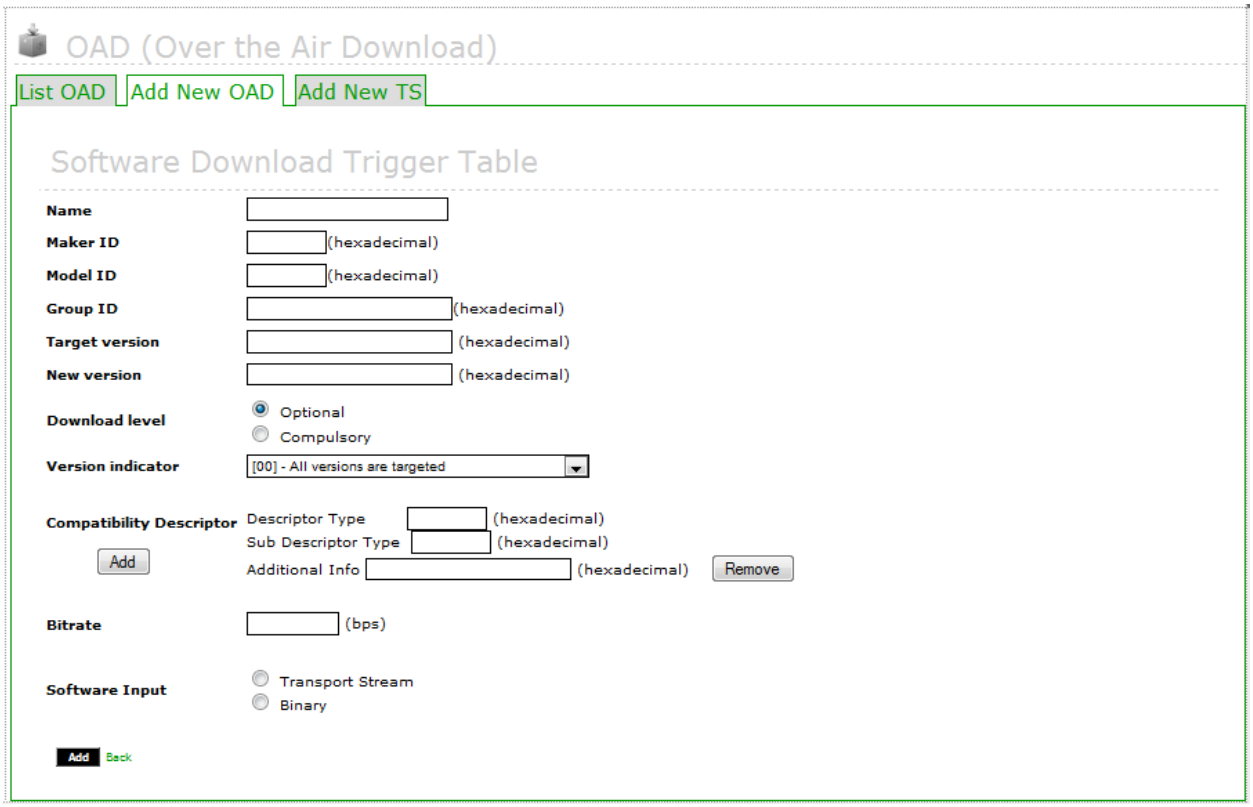


Figure 59 Adding a new OAD

Additionally, you need to provide software version information: equipment version to be updated (**Target version**), new version equipment assume after update (**New Version**), updating scope (**Version Indicator**). You need to indicate download is optional or must be done (**Download level**) and the bitrate data will be sent by carousel (**Bitrate**).

Then, choose the way file will inserted in EITV Playout Professional for post-processing, that could be via binary file or TS with data carousel. If binary file is selected, you must insert the download identifier (**Download ID**) and choose the binary file, as you can see in the **Figure 60**.

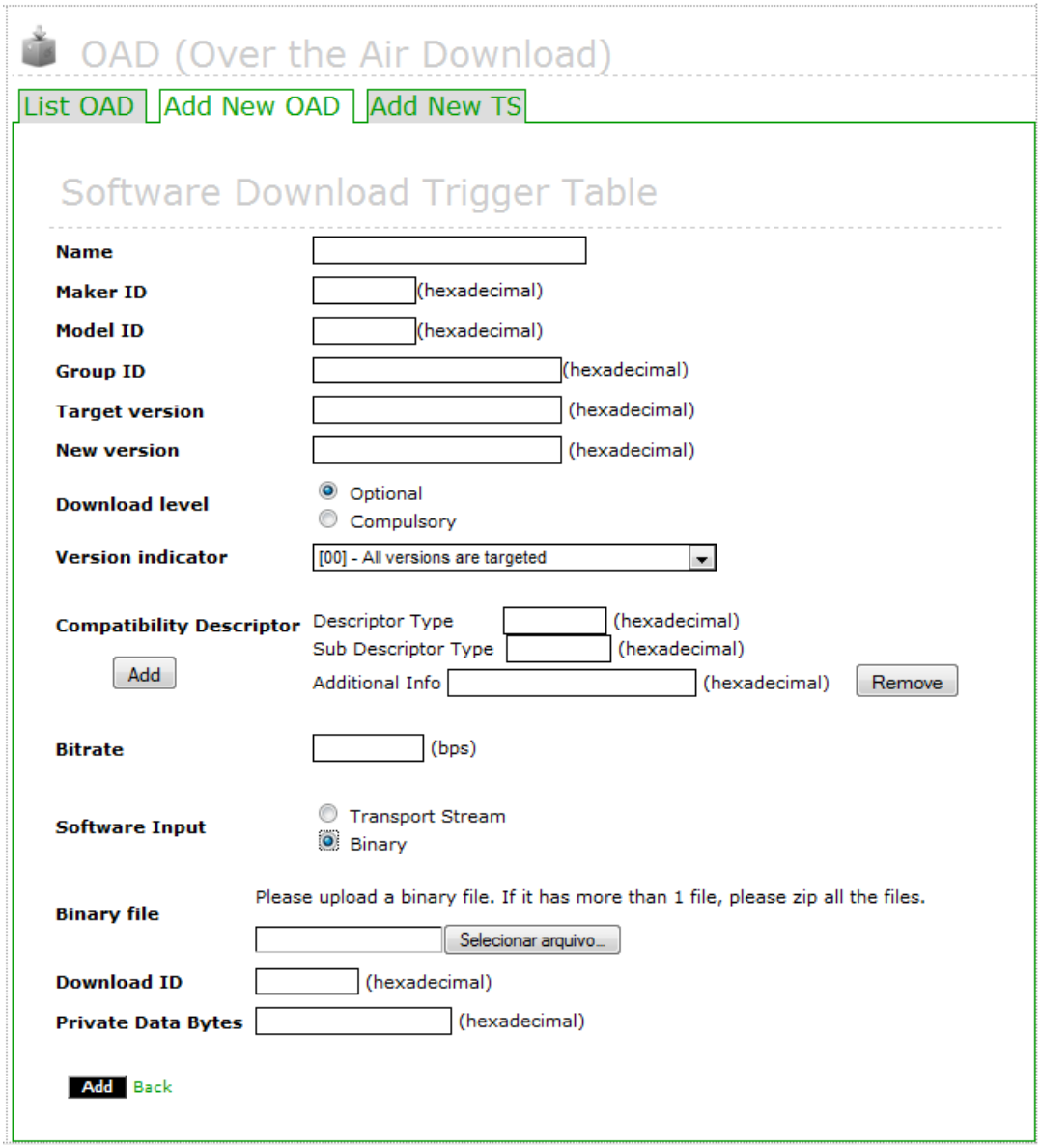


Figure 60 Selection binary file

If TS with data carousel option is selected, you must to pass the carousel generation information in order to the correct SDTT filling: **Data Carousel PID**, **Component Size**, **Download ID**, **Time Out Value DII**, **Component Tag** e **Private Data Byte**, as shown in the **Figure 61**.

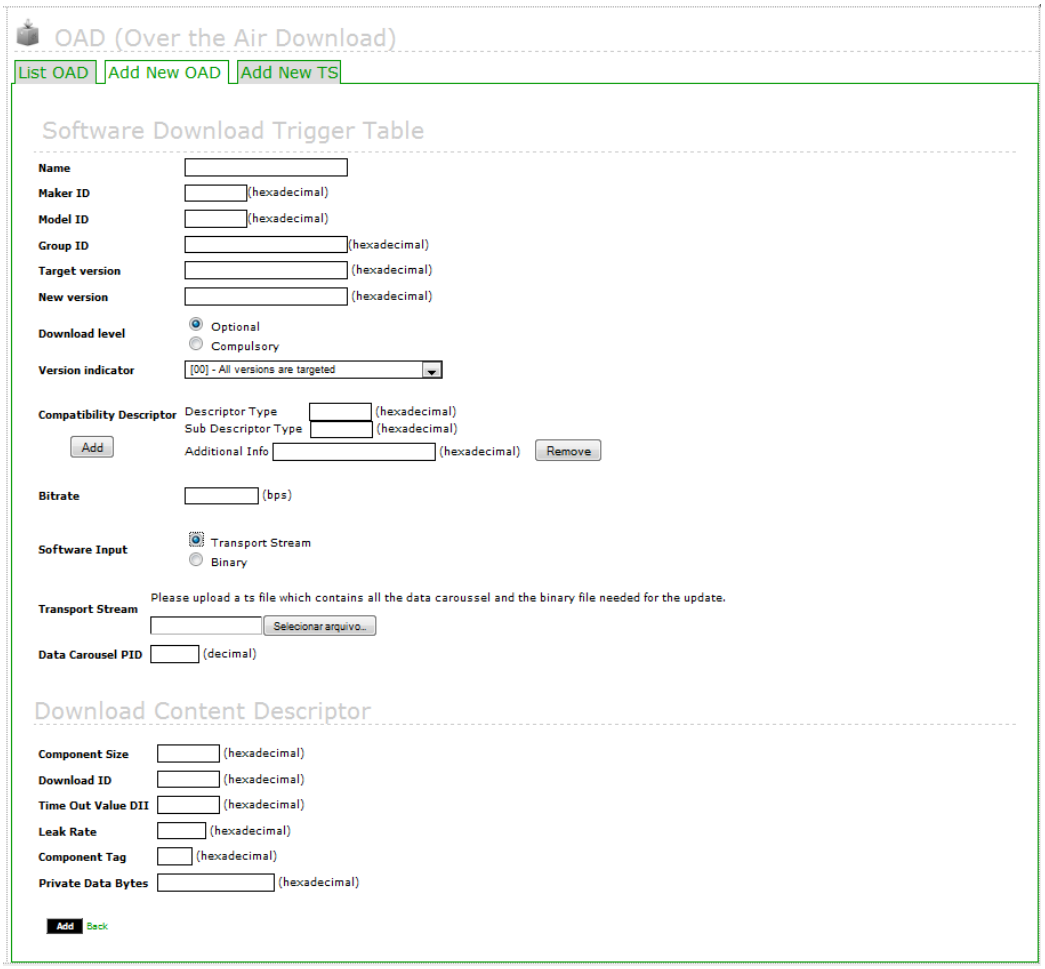


Figure 61 Download content description

Add New TS

The third option provided by the equipment to OAD is inserting the TS containing the data carousel and ready SDTT, in which the equipment filters PIDs from carousel and SDTT, and allows associating the OAD to a service. In this case, you must insert **Data Carousel PID** and **SDTT PID**, and indicate the **Data Carousel Bitrate** and **Component Tag**, as shown in the **Figure 62**. The equipment uses the information to properly configure the PMT to be generated by the EITV Playout Professional.

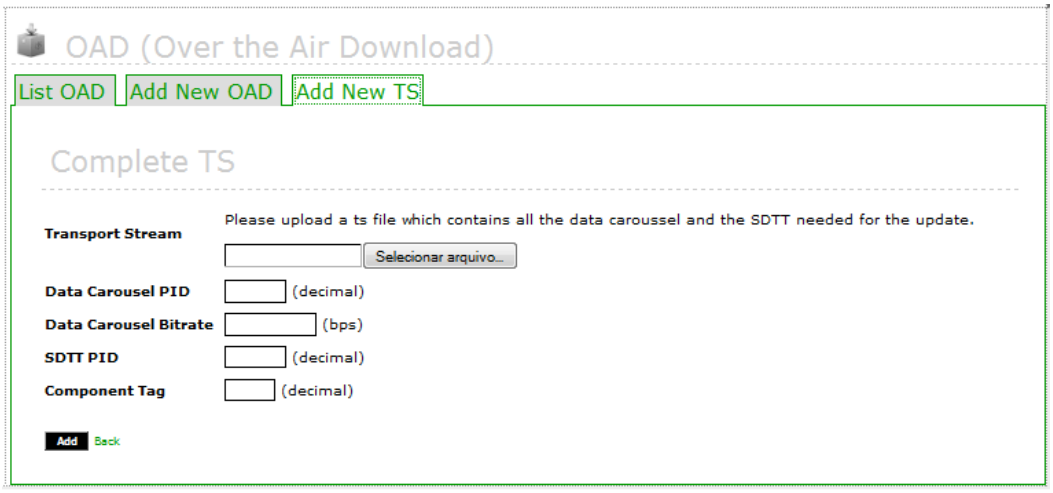


Figure 62 New TS configuration information

Closed Caption

The **Closed Caption** function is used to add subtitles to the transmitted stream. You can use the following **Closed Caption** schemes presented below in 3 possible options. The Option 1 for the Closed Caption generation engine, shown in the **Figure 63**, the H-264 stream from encoder output is used as reference only to generate Closed Caption PTS and MUX continues receiving the H-264 stream directly from encoder.

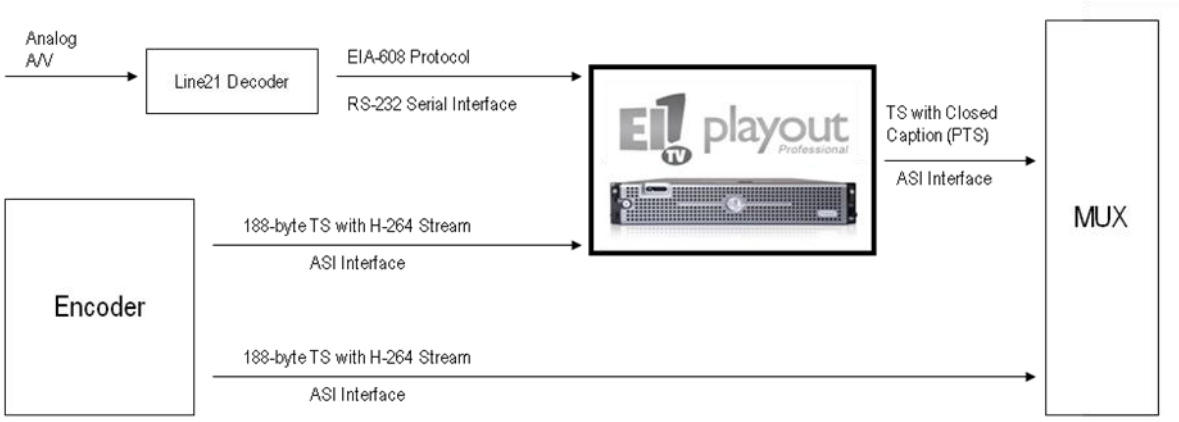


Figure 63 Option 1 for the Closed Caption Generation Engine

The Option 2, shown in the **Figure 64**, an ASI output from MUX provides the H-264 stream used as reference to generate PTS Closed Caption. In this way, the MUX can continue extracting the H-264 stream directly from encoder.

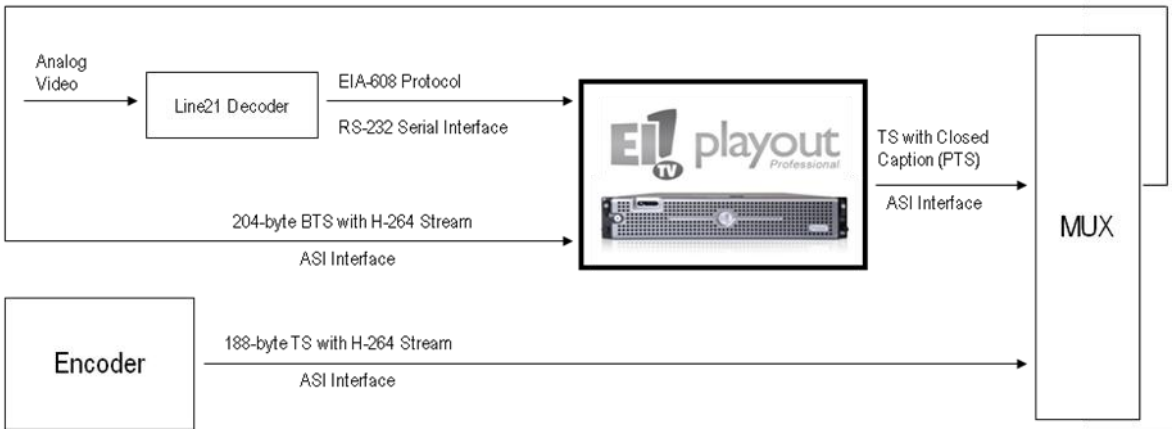


Figure 64 Option 2 for the Closed Caption Generation Engine

In the Option 3, shown in the **Figure 65**, the EITV Playout Professional is used as multiplexer and uses the H-264 stream input from encoder as reference to generate the Closed Caption PTS.

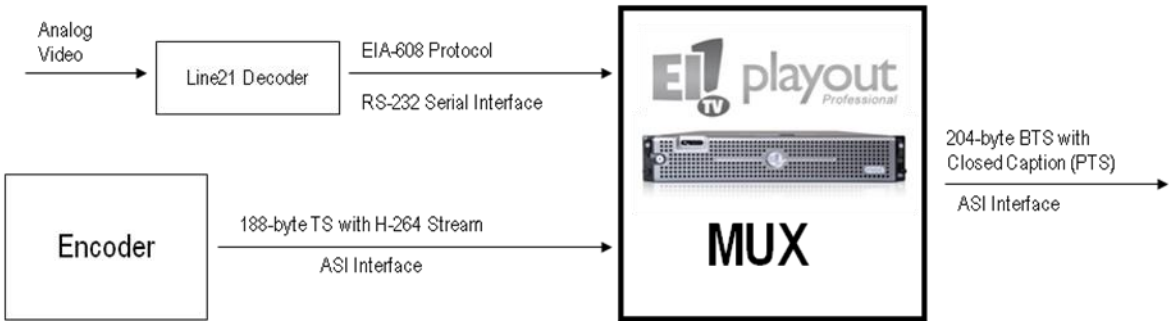


Figure 65 Option 3 for the Closed Caption Generation Engine

Closed Caption List

List all Available Ports to Closed Caption generation as shown in the **Figure 66**.

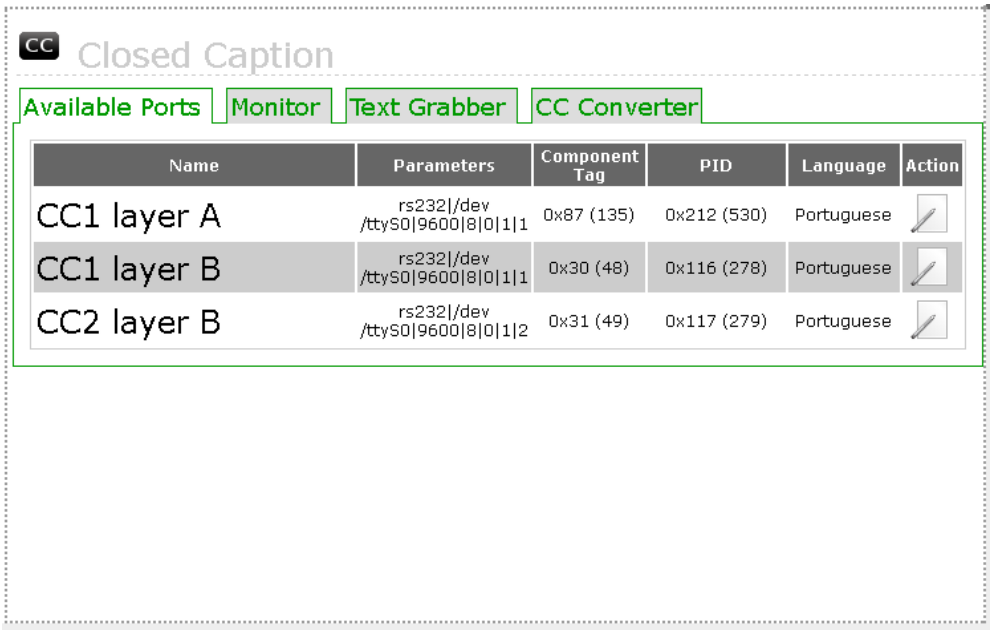


Figure 66 List of Closed Caption Ports Available

Closed Caption Edit

You can edit, modify and save the settings related to the available Closed Caption ports in the **Available Ports** list under the **Closed Caption** option. To do this, click the **Edit** option under **Action** column of the table shown in the **Figure 66**.

The settings must be made depending on decoder equipment you intend to use for the application. To use Text Grabber, for instance, just the Baud Rate settings should be changed against the screen shown in the **Figure 67**.

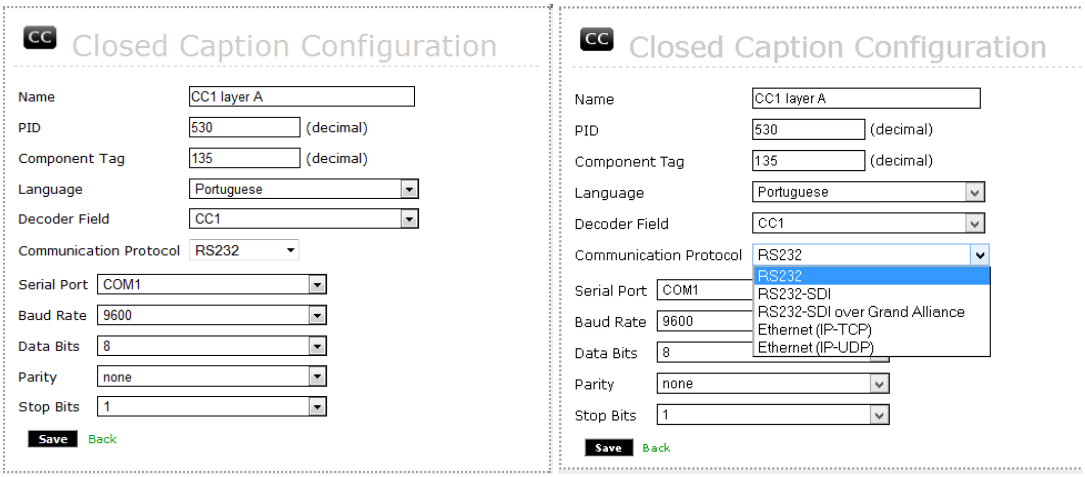


Figure 67 Configuration of a Closed Caption Port

After finish the Closed Caption port setting editing, click **Save** to save the changes, or click **Back** to cancel the changes.

Code	Comments
RS232	Used for data communication with Text Graber
RS232-SDI	Communication with the Wohler HDCC Encoder (Protocol 608)
RS232-SDI Over Grand Alliance	Protocol 608 encapsulated with the Grand Alliance
Ethernet (IP-TCP)	Protocol 608 Pure, encapsulated in IP-TCP
Ethernet (IP-UDP)	Protocol 608 Pure, encapsulated in IP-UDP

Monitor

In the monitor tab, the user can monitor the Caption being transmitted by EITV Playout Professional as shown in **Figure 68.**

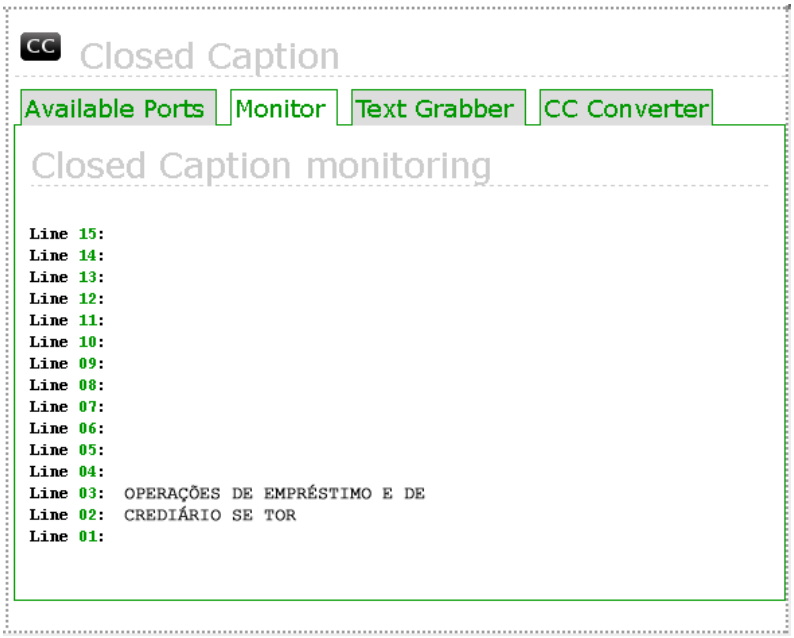


Figure 68 Closed Caption Monitoring Tab

Automatic EPG

Where you need the integration to systems responsible for the programming grid, you can use the XML or UCV files standard to feed the EPG for the EITV Playout Professional. The XML file is read each 15 seconds, searching for the current programming and the following one associated to the EITV Playout Professional based on the system date and time setting. If you choose to CSV, the equipment performs the conversion of the uploaded file and the converted file can be viewed on **Current XML File** tab

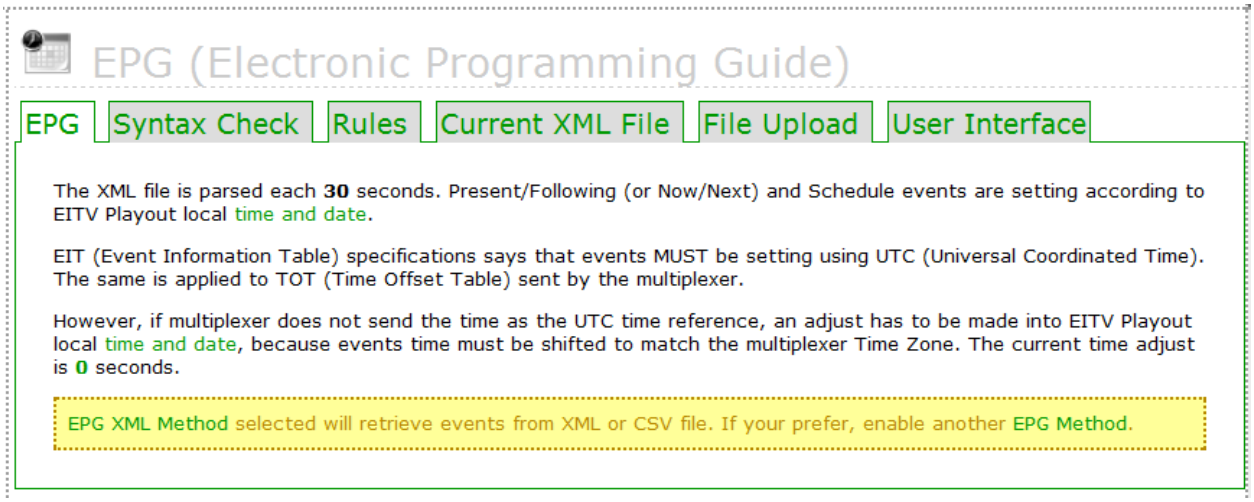


Figure 69 Electronic Programming Guide

Load the XML file using the **FTP, USB** or **HTTP** protocol **(**CSV file scan only be loaded by using the protocol HTTP or being loaded in the **Graphic Interface of EPG**), observing the system settings. To use the EITV Playout Professional automatic EPG engine, the **XML/CSV** option should be enabled in the system preference settings (**Configuration > Preferences > EPG XML Method** field).

Syntax Check

The system tests the XML document and issue a valid confirmation message. This message is displayed as shown in the **Figure 70**. If there are validation errors, the system will show a corresponding error message.

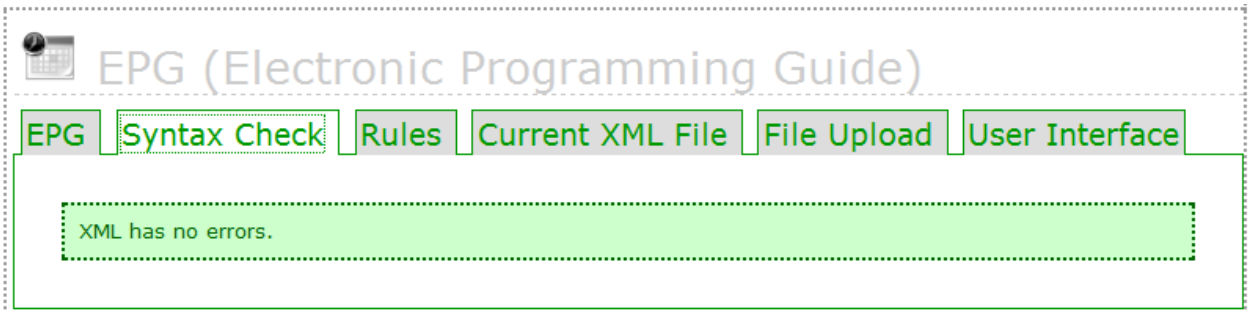


Figure 70 Validation Confirmation Message for the XML File

The syntax check for the XML file is performed after the XML file loading in the **XML/CSV File Upload tab**. If any files are loaded and the **Syntax Check** tab is selected, the check will be performed in the default sample file and always will result in a successful check. If the uploaded file is a CSV, automatic conversion to an XML file and the converted file is held is verified.

Rules

In this User's Guide you can see a list of characters not allowed in the file provided in XML format it and indicates, for each character, the string you alternatively should use.

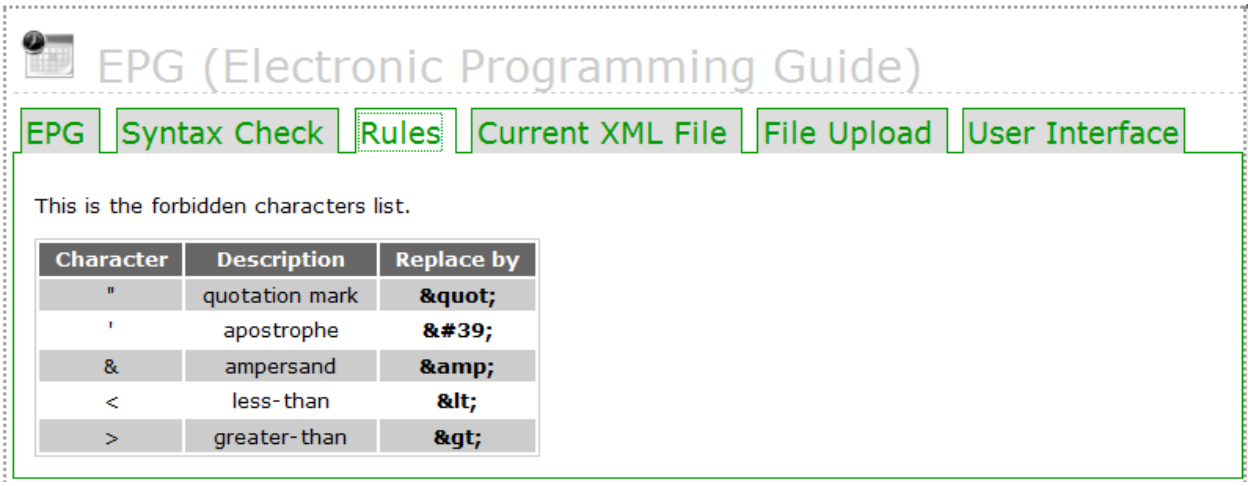


Figure 71 List of Characters Not Allowed in the XML File

The use of a not allowed character in the XML file will cause the syntax checker to generate an error message after the check.

Current XML

The **Current XML** tab shows the current XML file loaded in to the system.

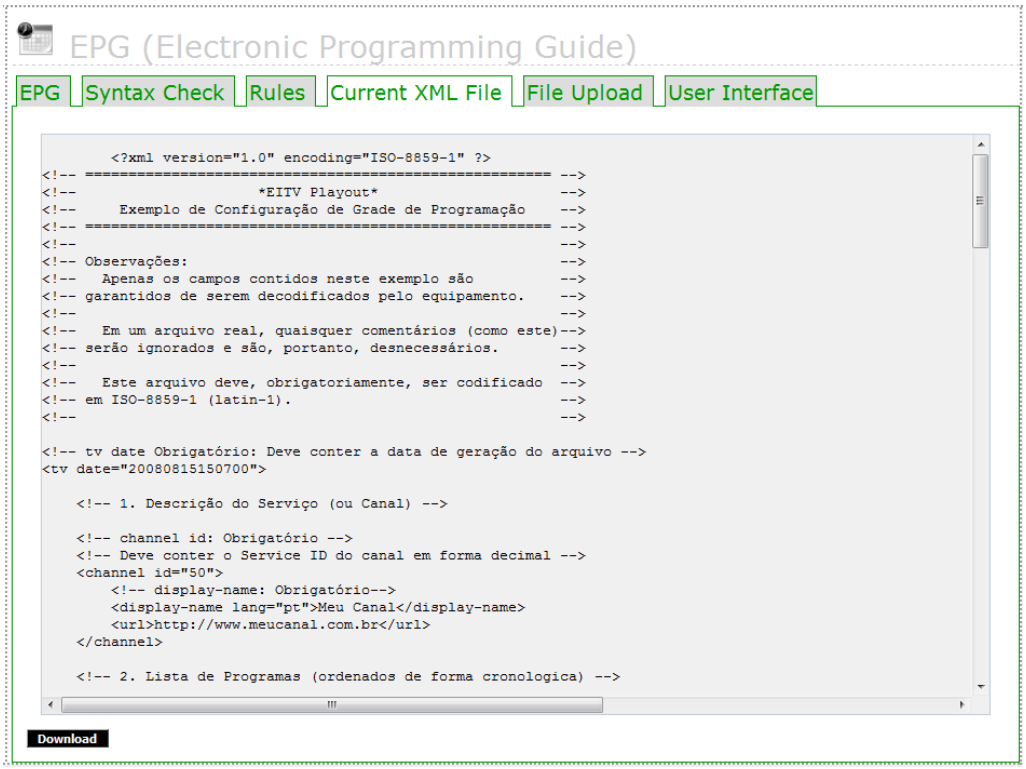


Figure 72 XML File Loaded in to the System (just for view)

XML File Upload

Using this option you can load a new file in XML format for the EPG. In the **XML File Upload** tab you can check the information under the **FTP** or **HTTP** connection, that are the two ways of loading the XML file in to the system.

For loading via FTP, the **Host**, **Port**, and **User** information is available in the screen shown in the **Figure 73**. This information must be used by a **FTP** client program for a connection to the EITV Playout Professional. Once connected, you must copy the XML file to the FTP root directory in a file named events.xml.

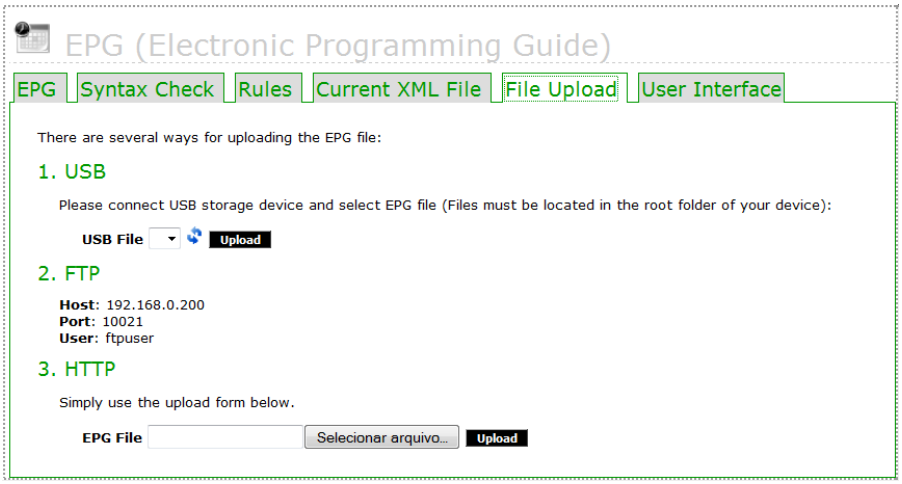


Figure 73 Loading Information for the XML File, via FTP or HTTP

If you choose to load the file via HTTP, click **File** and select the location where the XML file is found. Then, click **Upload**. The XML file must follow the standard described below:

Code	Comments
<?xml version="1.0" encoding="ISO-8859-1" ?> <tv date="20080815150700">	tv date (required) (date of file generation)
<channel id="**50**">	channel id (required) (channel identifier in decimal format)
<display-name lang="**pt**">**Meu Canal**</display-name>	display-name (required) (channel name to be displayed)
<url>**http://www.mychannel.com.br**</url> </channel>	url (optional) (Channel URL)
<programme id="**1357**" start="**200808151000**" stop="**200808152200**" channel="**50**">	Programming list (chronologically ordered) start (required) (programming start date and time in the AAAAMMDDHHMM format), channel (required) (channel ID) and id (optional) (programming ID designated by broadcaster)
<title lang="**pt**">**Show**</title>	title (required) Program title (96 characters maximum length)
<desc lang="pt">**Noinoi noinoinoino ioin oni oni oin oinoinoinoinoin. Ioin oinoi noin oin nooin oin oin oin oin oinoin oin oinoin oino ino ino.**</desc>	desc (optional) Program description (250 characters maximum length - <title>)

<length units="**minutes**">**240**</length>	length (required only in case of non-existence of the attribute "stop" in this "programme") (program length)
<audio component_type="**0x03**" stream_type="**0x03**" quality_indicator="**01**" sampling_rate="**111**">	Audio descriptors (required) component_type (audio component type and coding) stream_type (audio stream type) quality_indicator (audio quality indicator) sampling_rate (audio sampling rate)

Code	Comments
<lang>**por**</lang> </audio>	lang (required) (audio language)
<component stream_content="**0x01**" component_type="**0x02**" component_tag="**0x03**">	Identifies the component stream type and can be used to provide a textual description of the elementary stream
<desc>**Elementary stream description**</desc> </component>	desc (required) (description of the stream)
<rating system="**SBTVD**">	rating (required) (program indicative classification)
<value>**18VD**</value> </rating>	value (required) (value follows the [I][C] format, when [I] means age and [C] means contents)
<category lang="**pt**">**0x00**</category>	category (required) (gender descriptor in the content descriptor) (as defined by ABNT NBR 15603-2 Rule Annex C)
<subtitles type="**closedcaption**">	subtitles (optional) (used as Closed Caption signaling)
<lang>**por**</lang> <lang>**eng**</lang> </subtitles>	The main language is required and must be the first one, supporting up to 8 (eight) languages, depending on closed caption sent credits (optional) (description of the program casting)
<credits> <director>**John Smith**</director> <producer>**Peter Old**</producer> <actor>**Actor 1**</actor> <actor>**Actor 2**</actor> <actor>**Actor 3**</actor> <actor>**Actor 4**</actor> <desc>**Noinoinoin oinoinoin oinoin oinoi noin oin oino inoi noin oin**</desc> </credits>	credits (optional) (complete description of the program which could contain casting description, program summary or synopsis, without character limitation)
<url>**http://www.programadeauditorio.com.br**</url>	url (optional) (electronic address to the program)

Code	Comments
<copyright copy_control_type="3" digital_recording_control_data="0" APS_control_data="0">	copyright (optional) (digital copy control, the attributes must follow the current ABNT NBR 15603-2 Table D.2, D.3, and D.5 specification)
<availability image_constraint_token="1" retention_mode="1" retention_state="0" encryption_mode="1" /> </copyright>	availability (optional) (content availability)
<series id="23" repeat_label="0" program_pattern="0" expire_date="200808141700" episode_number="1" last_episode_number="52">	series (optional) (description of the series) Attributes as defined by the ABNT 15603-2 Brazilian Technical Rule, Table 71 on page 82: ID (exclusive series ID set by the broadcaster) repeat_label (program ID label, defined by the broadcaster) program_pattern (program repetition pattern) expire_date (date in AAAAMMDDHHMM format) episode_number (episode number) last_episode_number (last episode number)
<name>**Nome da Série**</name> </series>	name (series name)
<group type="1">	group (description of the event group)

Code	Comments
<event id="254" service_id="50000" />	event id (event identifier) service_id (service identifier, must be the same ID value used in the program number field for PMT)
<event id="123" service_id="50000" /> <event id="567" service_id="50000" /> <event id="254" service_id="50000" original_network_id="5678" transport_stream_id="1234" />	original_network _id (original network identifier, must be the same original_network_id of the related event)
<event id="789" service_id="50000" original_network_id="5543" transport_stream_id="4312" />	transport_stream_id (transport stream identifier of the transport stream, must be same transport_stream_id of the related event)
</group> </programme> </tv>	

When you use a CSV file, the files must contain 68 columns each one representing a field from a programming guide descriptor. Following are the attributes coded by the equipment and they must to follow the same order presented here in the file:

"Event ID";"Audio number";"Copy control number";"Data contents number";

"Broadcast starting date";"Broadcast starting time";"Duration";"Program title";"Program content";
"Free CA mode";"video Component tag";"Stream_content + video component type";"Vido text";"
audio component tag 1";"Steam content + audio component type 1";"audio multilingual flag 1";
"audio main component flag 1";"audio quality indicator 1";"audio sampling rate 1";
"main language code 1";"secondary language code 1";"audio text1 1";"audio text2 1";
"audio stream type 1";"content_nibble_level_1 + content_nibble_level_2";"user_nibble";
"degital recording control data all";"APS control all";"maximum bit rate all";
"digital copy control type all";"digital copy component tag 1";"digital recording control data 1";
"APS control 1";"maximum bit rate 1";"digital copy control type 1";"digital copy component tag 2";
"digital recording control data 2";"APS control 2";"maximum bit rate 2";"digital copy control type 2";
"data Component ID1";"entry component1";"selector byte1";"component ref1";"data contents text1";
"group type";"Common service id";"Common event id";"series id";"repear label";"program pattern";
"expire data";"episode number";"last episode number";"series name char";
"extended_item_descriptor_char";"extended_item_char";"Country Code";"rating";
"Image constration token";"Retention mode";"Retention state";"Encryption mode";
"linkage transport stream id";"linkage original network id";"linkage service id";"linkage type";"any"

The first line in CSV must contain the name of descriptor attributes (listed above and in the same order). The remaining lines represent the existing programming in the EPG, where the specified value in each column in this line represents the column attribute (defined at the first line of the file).

You can use different characters to separate values in the file. This configuration is present in the **Configuration → Preferences → CSV Delimiter** menu. If the chosen character is used in the text for any field, you must put the character between double quotes (“).

EPG User Interface

The **User Interface** of the EPG, shown in Figure 80, allows you to create, edit, save and monitor the program guide that is being displayed on the service. The registered EPG **UI** that is transmitted if the **EPG Editor is** selected in **Configuration → Preferences → EPG Method.**

On the top screen is shown EIT preset / following in the **Now** and **Next f**ield. The screen shows two main fields, and EDIT ON AIR, the EDIT field the user viewing the programming he is currently editing and **ON AIR** field programming being transmitted. To make the edited programming pass to be displayed, simply click the APPLY button on the side menu interface.

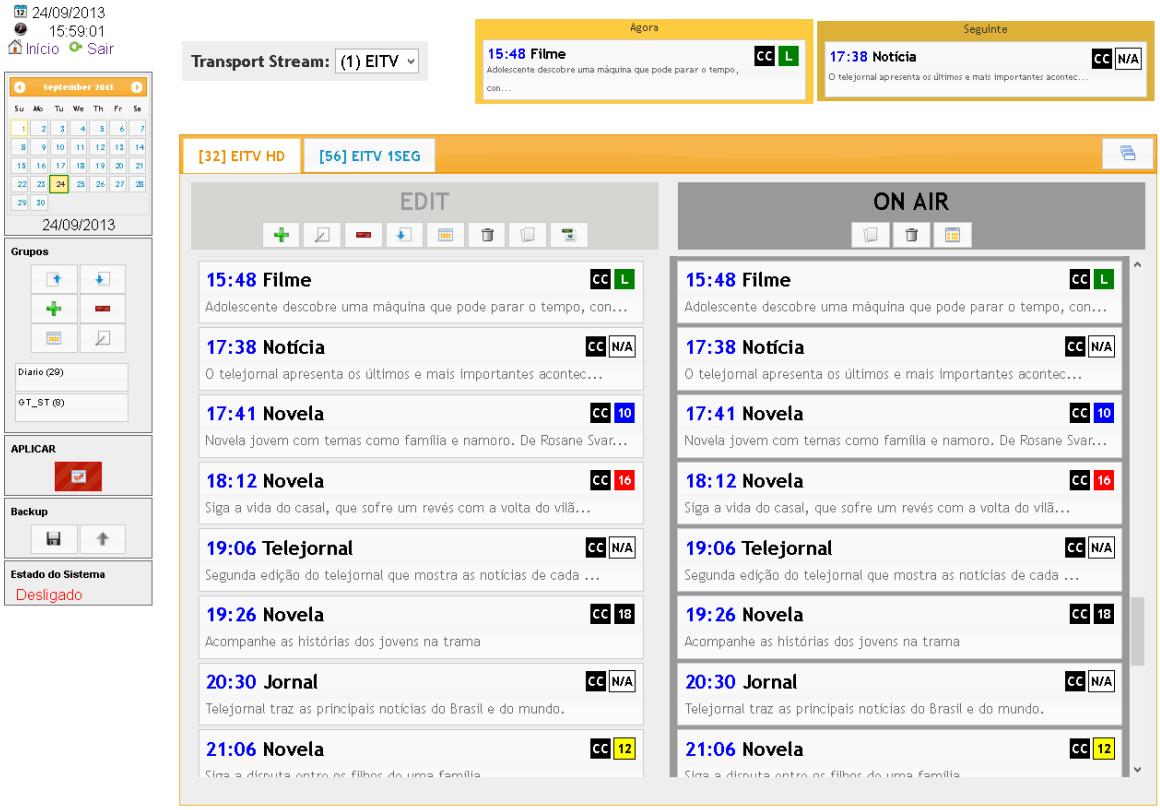


Figure 74 EPG Graphic Interface

Interface Basic Information

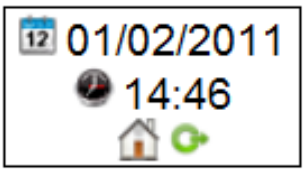


Figure 75 Basic information

In the upper left corner of the screen, shown in **Figure 75** you can see the date and time registered in the **EITV Playout Professional**, is based on that date and time the EPG is transmitted. Buttons to return to the **EITV Playout Professional** homepage and to perform off the system are also in this region

EDIT

In the **EDIT** menu, shown in **Figure 76** allows some actions like add, edit or delete an event, import an XML/CSV for editing area, save a set of events as a group and delete all events in **edition (EDIT).**

Figure 76 Edit Menu

To add an event the user must click on the button in the **Edit** menu. By clicking the button the screen in Figure 76is displayed. On the **Basic** tab the user must fill to be entered the **Time**, **Title**, **Description**, select the **Rating System** and **Content** of the event.

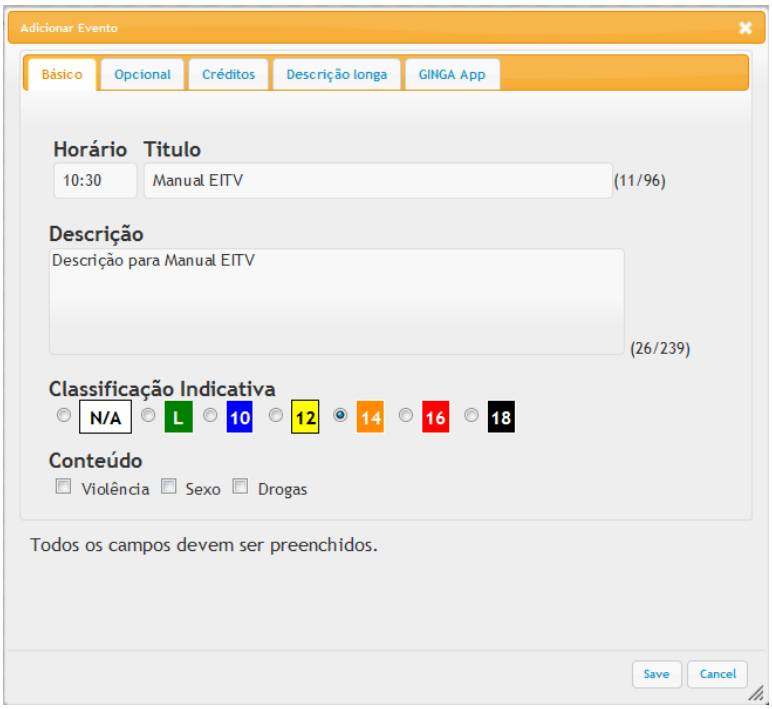


Figure 77 Add or Edit Basic Event Information

In the Optional tab, **Figure 78**, can define the category and sub-category of the event, and enable the information that there is Closed Caption and Copyright in the event.

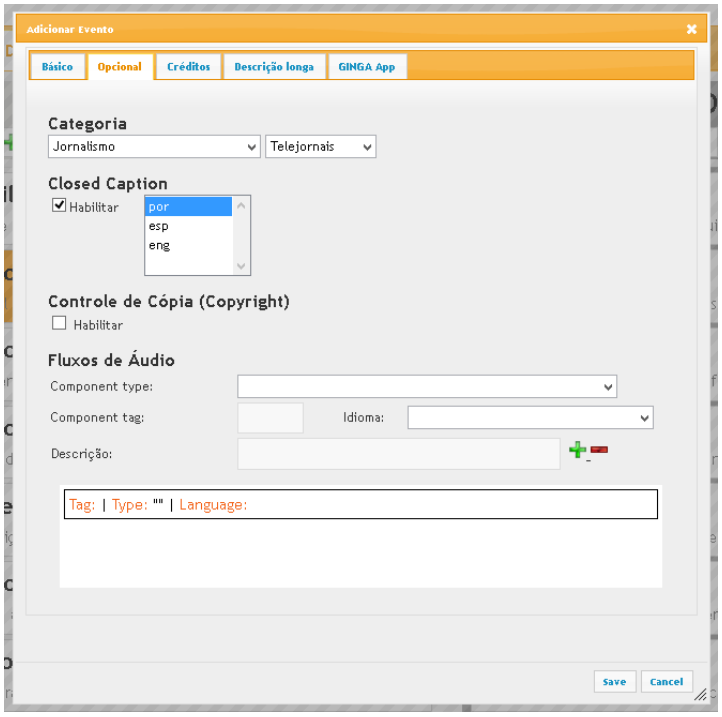


Figure 78 EPG Graphic User Interface

In **Figure 78** above, you can add values to identify whether the event will have one or more audio options (such as audio description, audio or in another language). Moreover, it is possible to tell the EPG if the content has control of Copyright.

The **Figure 79** shows the Credits tab, where the credit information of the event can be inserted or removed.

Figure 79 EPG GUI

The long description tab, **Figure 80**, allows you to enter a more detailed description of the event being inserted.

Figure 80 EPG GUI

Figure 81 shows the **Ginga App** tab where you can schedule an application registered in the EITV Playout Professional to be transmitted during the event inserted.

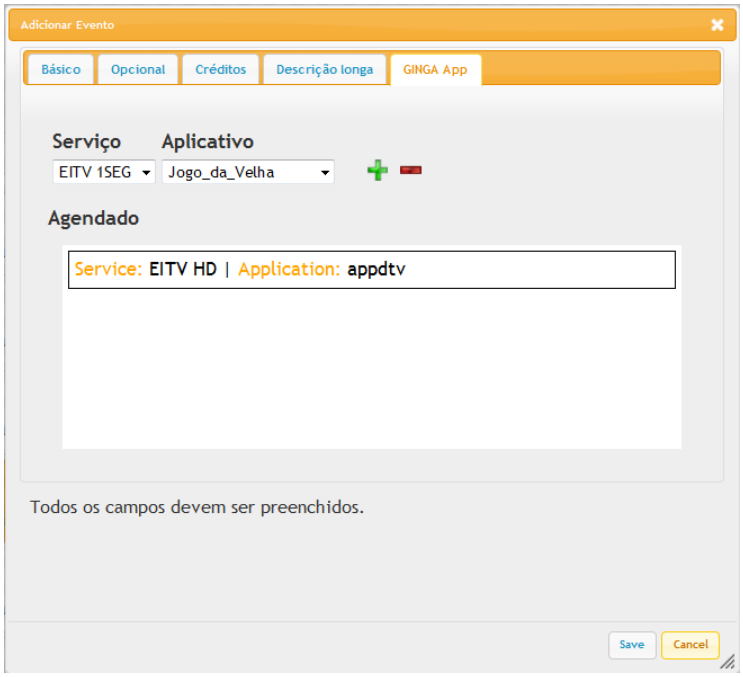


Figure 81 EPG GUI

To save the event, just click on **Save** button. If you want to cancel the creation of the event click in **Cancel.**

The scheduling of applications need to be enabled in **Configuration → Preferences → Application Scheduling** and it is necessary to pay attention to possible scheduling conflicts with pre-scheduled applications via XML or via scheduling of applications in Services (**Figure 42**).

If there is conflict in the start time of an event, the event will be inserted last in red letters indicating the conflict. If programming is applied, the duplicate event (in red) will be ignored and will not be transmitted

To edit an event, you just select and click or double-click on the desired event. The same screens adding an event will be available and just click the **Save** button to save your changes or the **Cancel** button to withdraw.

To remove one or more events just select the desired event and click on the button. A confirmation screen will appear asking "Do you really want to delete all selected events?" Click **Remove** to confirm or **Cancel** to cancel the removal.

The button allows you to import an XML / CSV containing EPG information for the editing area.

To create group just select the events you want to be part of the new group and click on , enter the desired name for the group and save. This process will group the events in the respective time so that they can be inserted at a time later.

The button deletes all information contained in the edit (**EDIT**) every day, but the information being transmitted (**ON AIR**) is not changed. After clicking this button, a confirmation window will appear, just click on the Clear button to confirm the removal of information.

There is the possibility to export the events on file in XML format via the button .

ON AIR

The **ON AIR** menu, shown in **Figure 82** allows copying all the events that are being transmitted (ON AIR) to the edit field (EDIT) by clicking the button . The button clears all events being transmitted (ON AIR). Lastly the button generates and makes available for download a report in CSV format with the time information of start and end of the program, the event title and description of the event.

Figure 82 EPG GUI

Menu Lateral

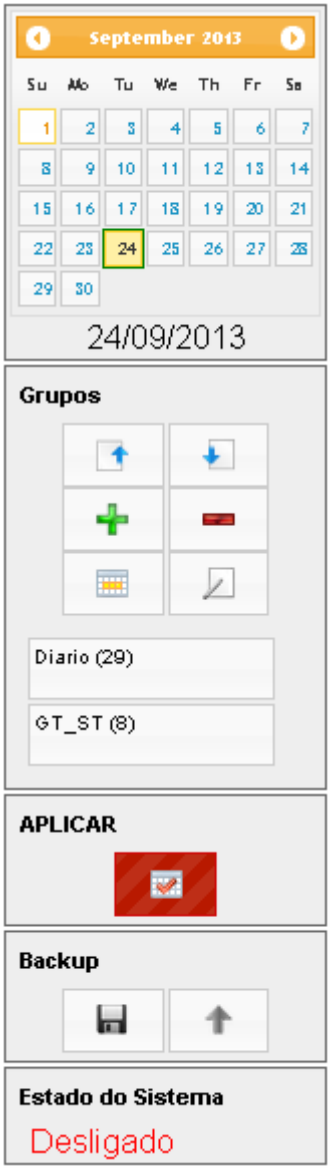


Figure 83 EPG GUI

On the side of the screen is the menu shown in **Figure 89**.

The first field of this menu shows a calendar where you can scroll through the days to view and edit the Programming Guide. This calendar allows you to quickly view **RED** the days that the edited EPG, is **different** from that applied to be transmitted and **GREEN** which days the EPG edited and applied to be transmitted are **consistent**.

In the **Groups** tab you can see the created groups, add them to the EPG with the + button or remove the Group of the list by clicking the button −. To edit the Group information, just click on that a window appears within the browser, with all the events associated with the group, and hence the possible editing details of these events, as previously described.

The **Apply** button makes the EPG that is in **EDIT** field be transmitted. Once this button is pressed the EPG that appears in the **EDIT** appears in the field **ON AIR**

The Field **Backup** has in the right (represented by a floppy) the **Download Backup** button that opens a window to download a copy of all registered Programming Guide. The file to be saved is called **epg.eitv** that can be renamed maintaining **.eitv** extension

The **Reset** button allows you to upload a file in the **.eitv** format in the EITV Playout Professional that will contain a backup file of the graphical user EPG interface.

The last block (System Status) serves to inform the signal (transmission) is active or not.

EWBS

EWBS (Emergency Warning Broadcast System) is a system developed to alert the population in case an emergency like earthquakes, tsunamis, river flood. EITV Playout Professional is prepared to generate a signal that can be received in EWBS ready receivers.

Enabling Signal Transmission

The EWBS operation on EITV Playout Professional is simple. To enable or disable the transmission just click on the check box Enable shown in **Figure 84**. It is necessary to choose some Area Codes that identify the geographical area where is desired to warning the population.

It is possible to describe the emergency sending a message similar to Closed Caption, using the interface available in EITV Playout Professional. Also, users can configure the EWBS using two flags:

Start / End Flag: field that shall correspond to start signal and end signal of EWBS operation. When this flag is set to "On", shall mean that EWBS was started or it is being in operation. When it is set to "Off", shall mean that EWBS was ended;

Signal Level Flag: field that shall correspond to emergency alarm signal specified by responsible agencies. When set to "Off", shall mean that emergency alarm signal is the first type of start signal. When set to "On", the alarm signal shall be the second type of start signal.

The last item that is necessary to configure is to choose what service will contain the message, and what PID will carry this information.

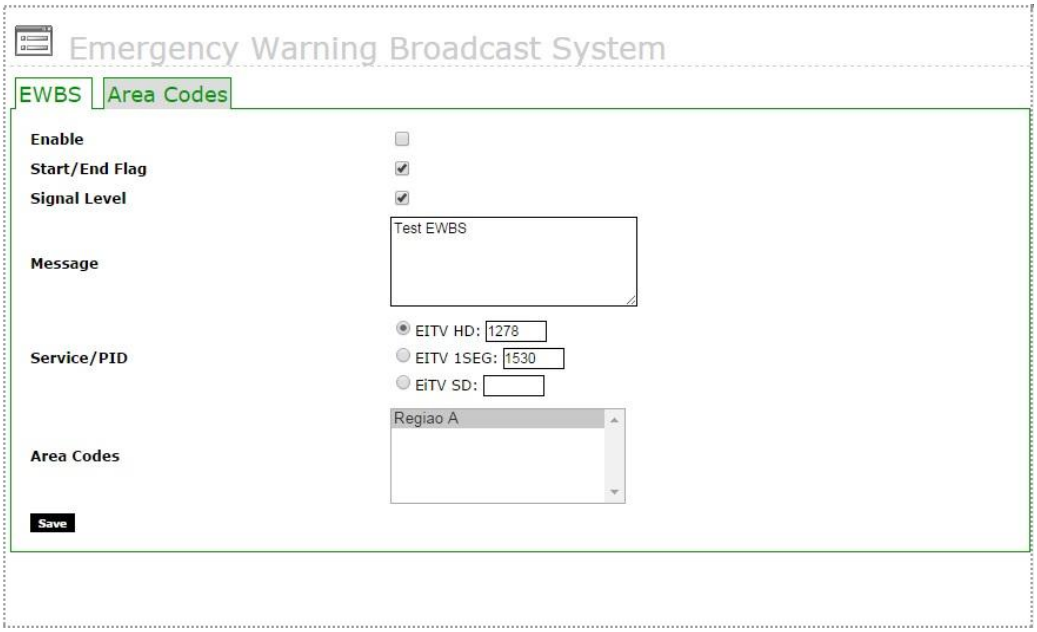


Figure 84 EWBS configuration

Adding Area Codes

Through EWBS menu is possible to define which Area Codes will be target of the EWBS message. Figure 86 exhibits the interface where it can be added all the Area Codes that user can send the EWBS signal.

It is necessary complete the area code determinate by the regulatory agency and the name of the area. Once the list of Area Codes is filled, all items from the list will be available for EWBS signalization.

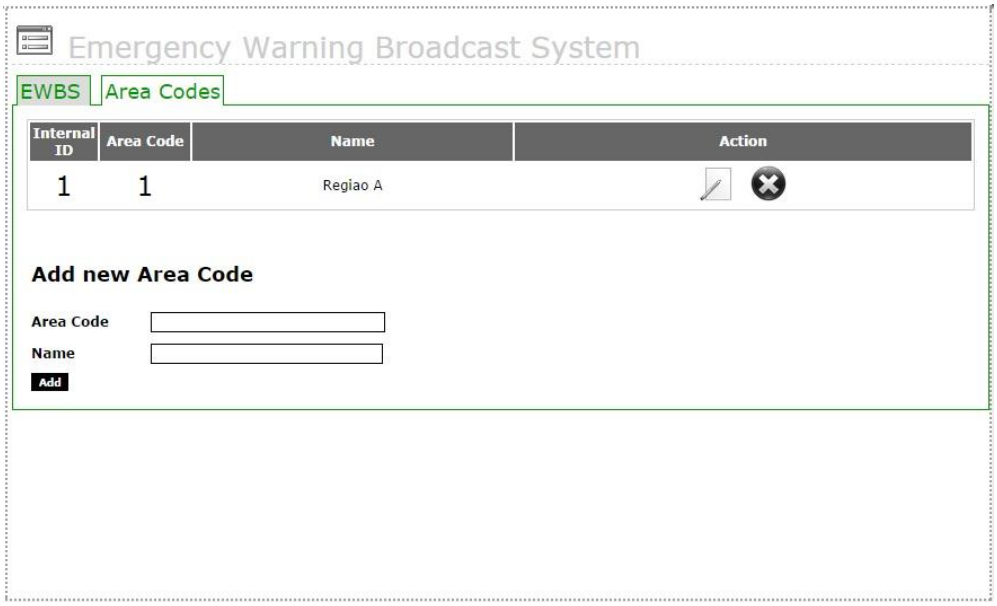


Figure 85 EWBS Area Codes definition

Transport Stream

Adding the Transport Stream

To add a new, TS (Transport Stream) you need to name the TS and click **Add** as shown in the figure below.

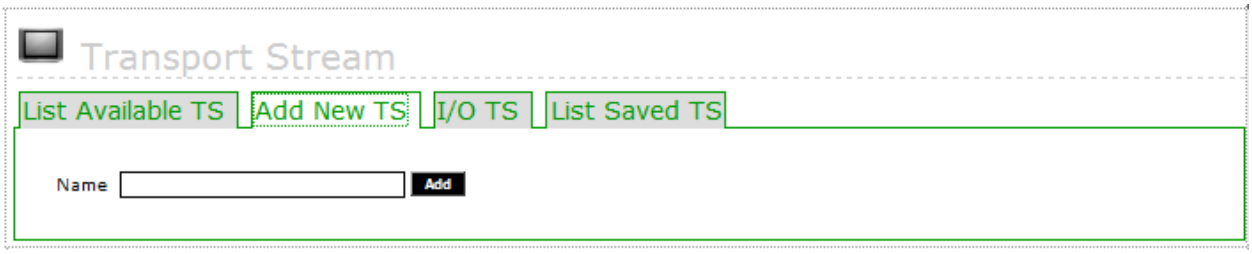


Figure 86 Adding a TS

After adding the new TS, the same is displayed in the **Available Transport Stream**.

Below the adding function of a new **Transport Stream (TS)** are displayed the **Saved TS Files** that are the Transport Stream files saved in to the equipment's hard disk. For this list you can Download the file, perform the transmission to an ASI output (**Play ASI**) or remove (**Remove**) the TS file stored in the EITV Playout Professional.

Configuration of the Transport Stream

The Transport Stream setup screen displayed in the figure below is used to setup the services that will be transmitted in the transport stream to be generated, as well the hierarchical layer where each service will be transmitted.

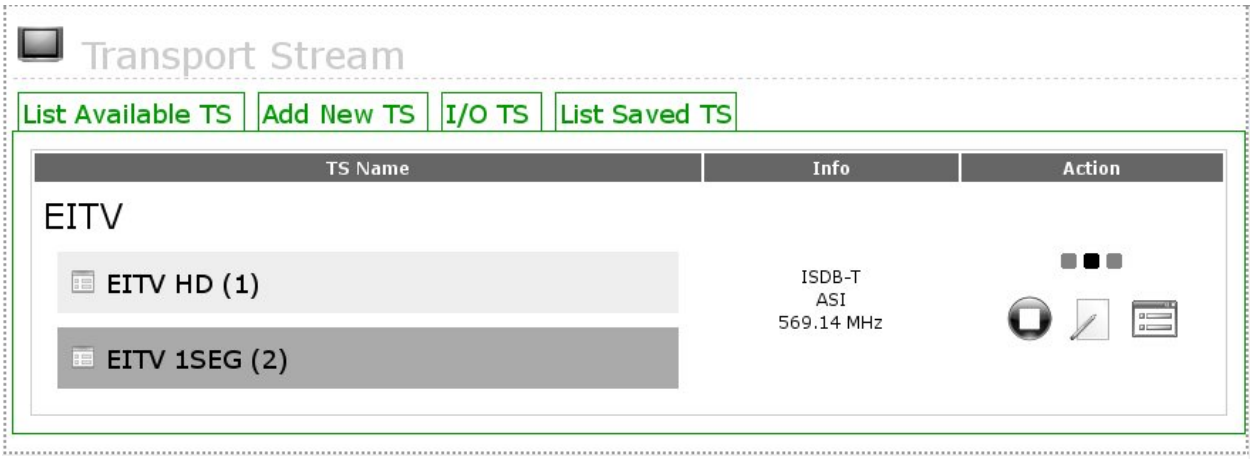


Figure 87 TS Configuration Screen

You can set and store several transport streams in the equipment. However, only one transport stream can be transmitted each time. In this screen you can activate the transport stream transmission through an ASI/SPI output or to a hard disk file.

Starting the Transport Stream Transmission

As you can see in the **Figure 88**, the **Start** link must be used to start the transmission as the previously set configuration to the Transport Stream.

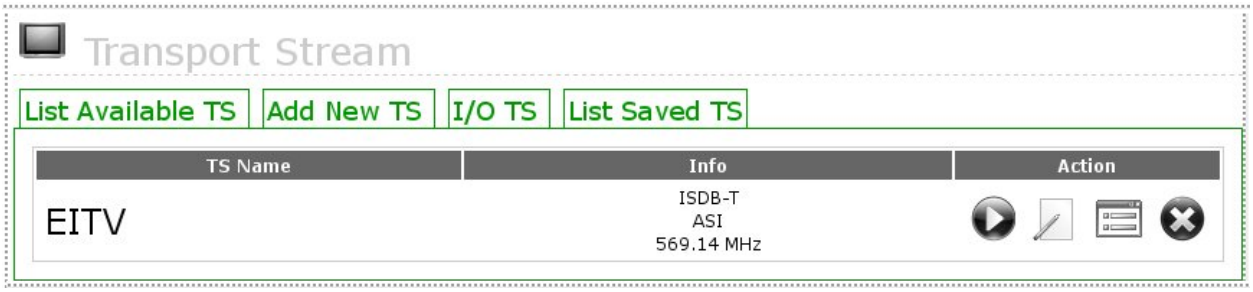


Figure 88 Starting the Transmission of a TS

In the example of **Figure 88** the system is set to transmit in the ISDB-T standard and will be transmitted to an ASI output.

Editing the Transport Stream Settings

You can also change TS (Transport Stream) name. To do this click **Edit** to display the screen shown in the **Figure 89**:

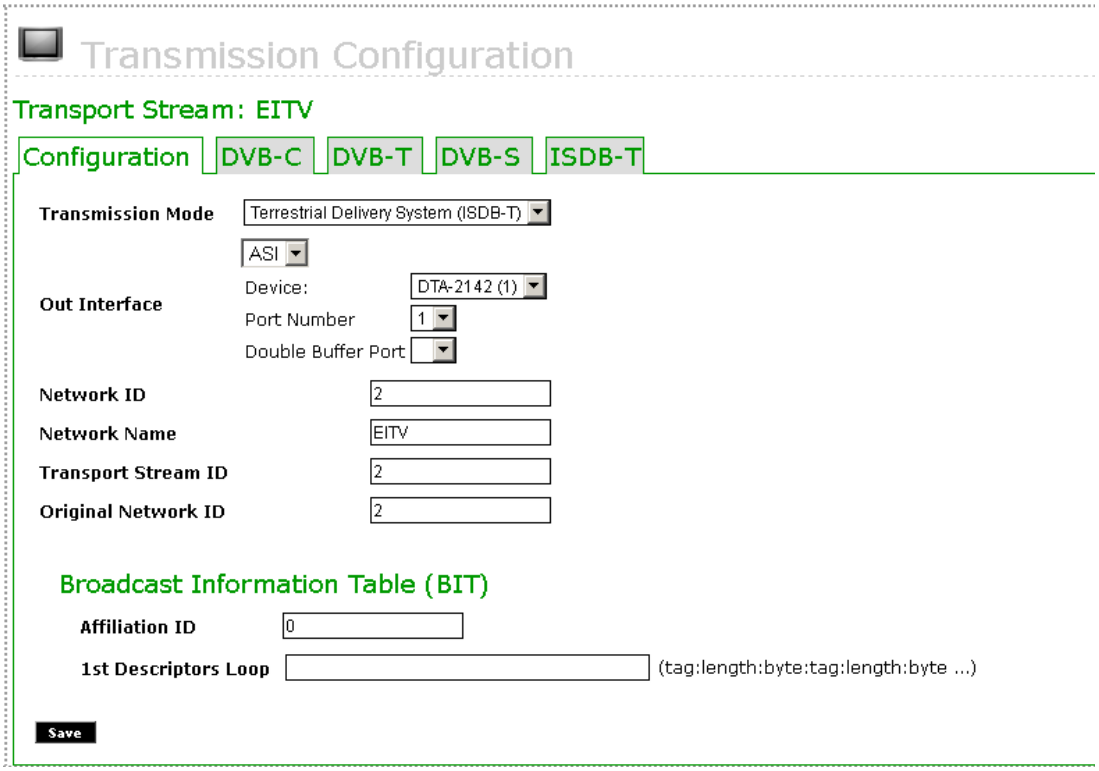


Figure 89 Editing the TS Settings

Other possible change that can be made from screen shown in the **Figure 89** is the change in the DVB-C, DVB-T, DVB-S, ISDB-T modulation. To perform the configuration of the DVB-C parameter, click the **DVB-C** link to show the screen that appears in **Figure 90**.

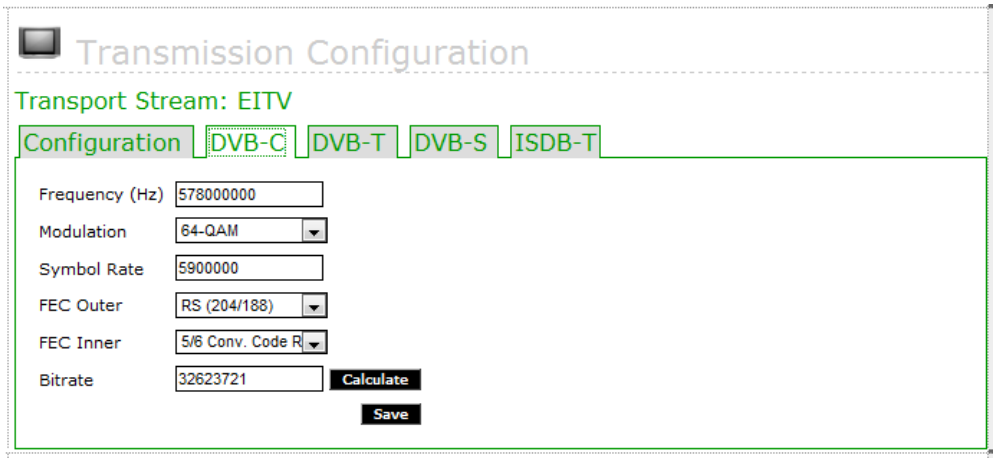


Figure 90 Configuration of the DVB-C Modulation

To perform the configuration of the DVB-T modulation, click the **DVB-T** link to show the screen that appears in **Figure 91**.

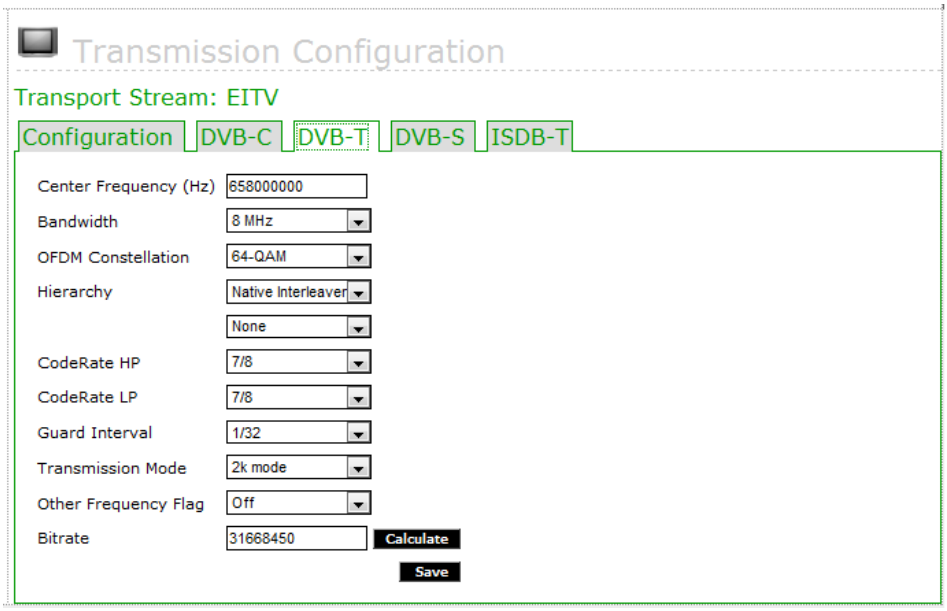


Figure 91 Configuration of the DVB-T Modulation

To perform the configuration of the DVB-S modulation, click the **DVB-S** link to show the screen that appears in **Figure 92**.

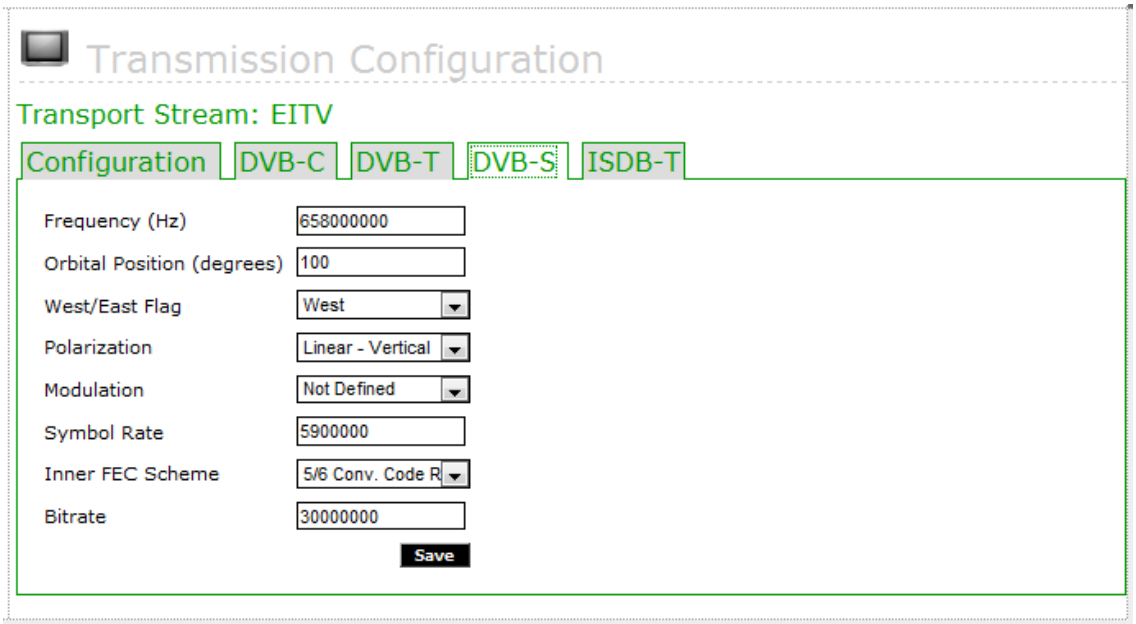


Figure 92 Configuration of the DVB-S Modulation

To perform the configuration of the ISDB-T modulation, click the **ISDB-T** link to show the screen that appears in **Figure 93**.

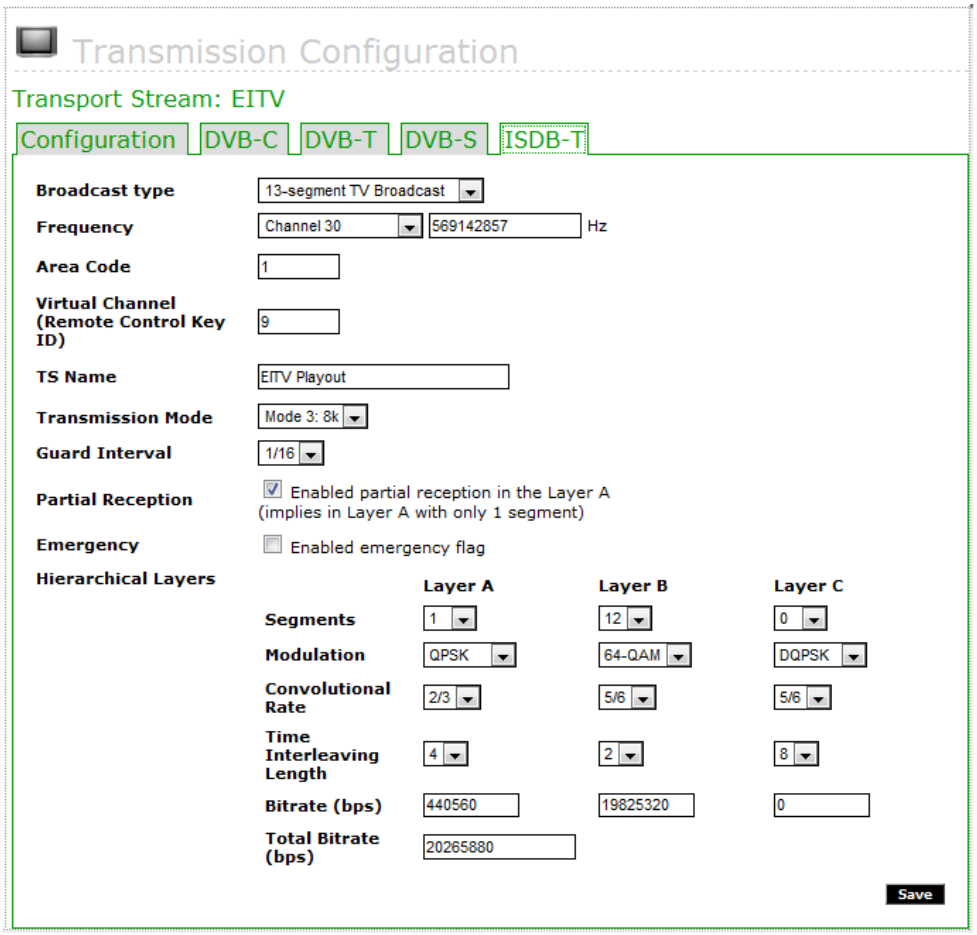


Figure 93 Configuration of the ISDB-T Modulation

Associating Service to the Transport Stream

Clicking the **Service** link shown in the Transport Stream interface will display the following screen to set the **Services Layers**. In this screen you can associate the services (Channels) to the appropriate TS (Transport Stream) Layers for transmission in the ISDB-T system.

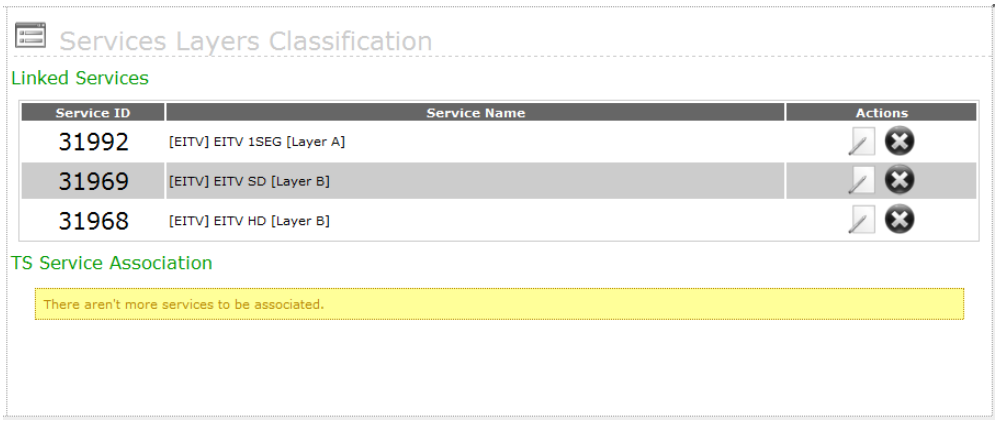


Figure 94 Associating of Services to the TS

Using this screen you can associate a service to the TS selecting the service in **Service** field, including its ID in the **Service ID** field and determining the layer in the **Layer** field options. All fields are required however the value for **Layer** field is necessary only for transmission in ISDB-T standard (Brazilian standard).

You can also edit a service clicking the **Edit Service** link, changing the values and then clicking **Save**. To remove a TS (Transport Stream), clique the **Delete** link shown in the **Figure 94**. The prompt "**Confirm removal?**" will be displayed with the **YES** or **NO** options. If you want do really delete, click **YES**. Otherwise, click **NO**.

I/O TS

The EITV Playout Professional provides input and output for Transport Streams in 4 different ways: as a file as input and as output modulated, as a file as input and as output via ASI, ASI and as input or as modulated output file. These operating modes are described in detail below.

Input File – Output Modulator

In this configuration is possible to use as an input except in a TS EITV Playout Professional via FTP or previously saved by the device. If the file has been uploaded via FTP, it is necessary that the same holds packets of 204 bytes in size, because in this mode the machine does not add the 16 bytes of TMCC related to modulation.

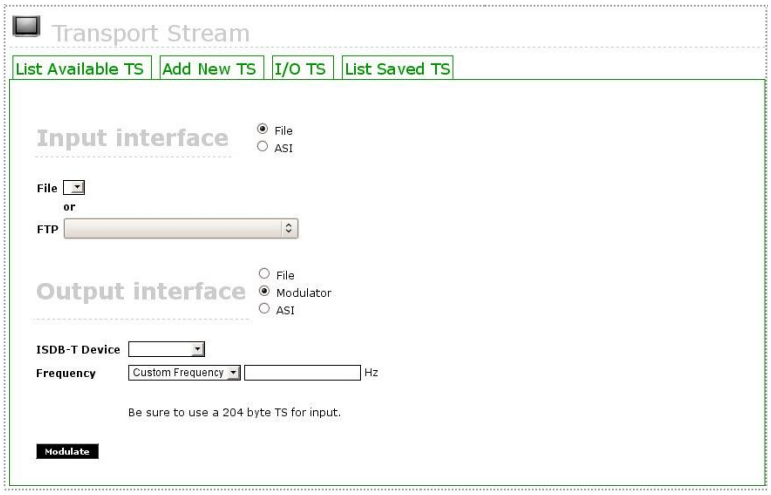


Figure 95 Editable parameters for file input and output by the modulator.

The editable input parameters in this option are **File** or **FTP.** Editable parameters for output (output) are: **ISDB-T Device** which is the device that will modulate the TS (default DTA-115 (1)) and Frequency in Hertz which is the desired **frequency** for modulation, as shown in **Figure 95**.

Input File – Output ASI

The first option is use a file as input and the ASI as output. In this case, the user can define **ASI Device**, **Port Number**, **Bitrate (bps)** and **TS Size** that is the TS packet size (188- or 204-byte), as shown in the **Figure 96**.

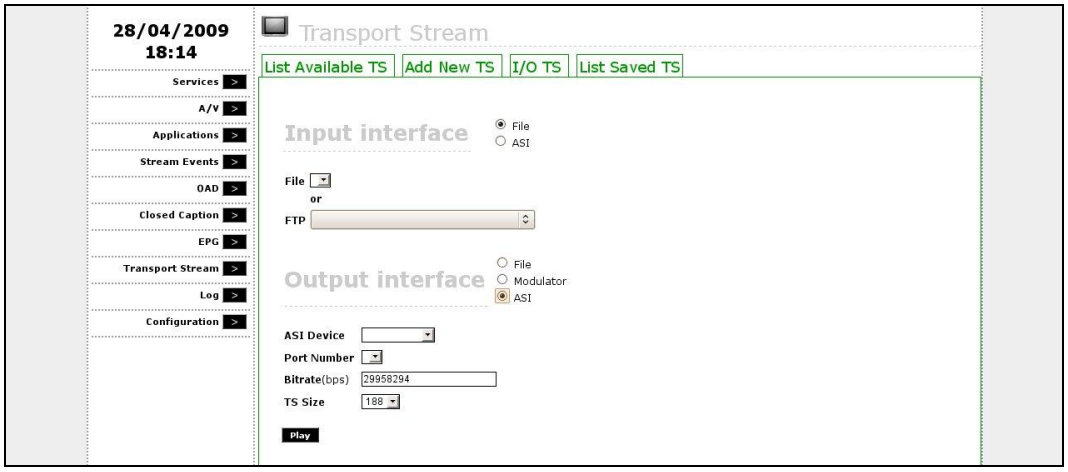


Figure 96 Editable parameters with input via file and output via ASI

Input ASI – Output Modulator

If you use an ASI port as input, it can define the parameters **Device ASI**, **Port Number**, **Bitrate** and **TS Size** , which is the size of the packages TS (188 or 204 bytes), as shown in **Figure 97**.

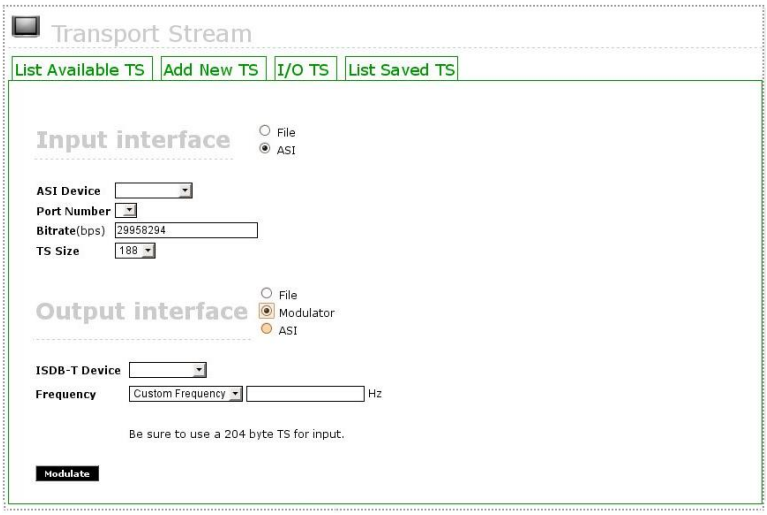


Figure 97 editable parameters via the ASI input and output by the modulator

The same way as in the input option by file when the ASI interface is used, packets must necessarily be 204 bytes because in this mode, the equipment does not create the 16 bytes required for TMCC modulation. Thus, this option selectable parameters for the output interface are **ISDB-T Device** and **Frequency** in Hertz required for modulation, as can also be seen in **Figure 97**.

Input ASI – Output File

The last configuration option available for I/O is using the ASI as input and a file as output. In this configuration option the parameters you can configure for the input are: **ASI Device**, **Port Number**, **Bitrate (bps)** and **TS Size**, that is the TS packet size (188- or 204-byte), as shown in the **Figure 98**.

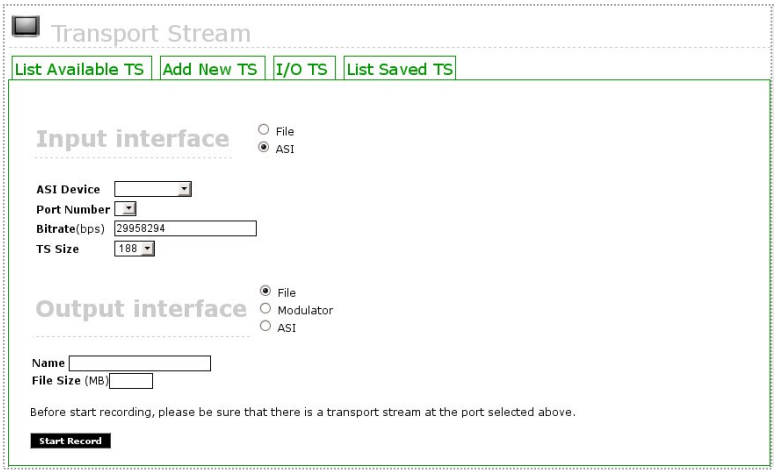


Figure 98 Editable parameters with input via ASI and output via file

The parameters you can set for the output via file are: **Name** and **File Size (MB)**.

Log

In this option you have access to the interface to view equipment generated logs in case of problem provided by equipment configuration errors or by wrong handling by the user.

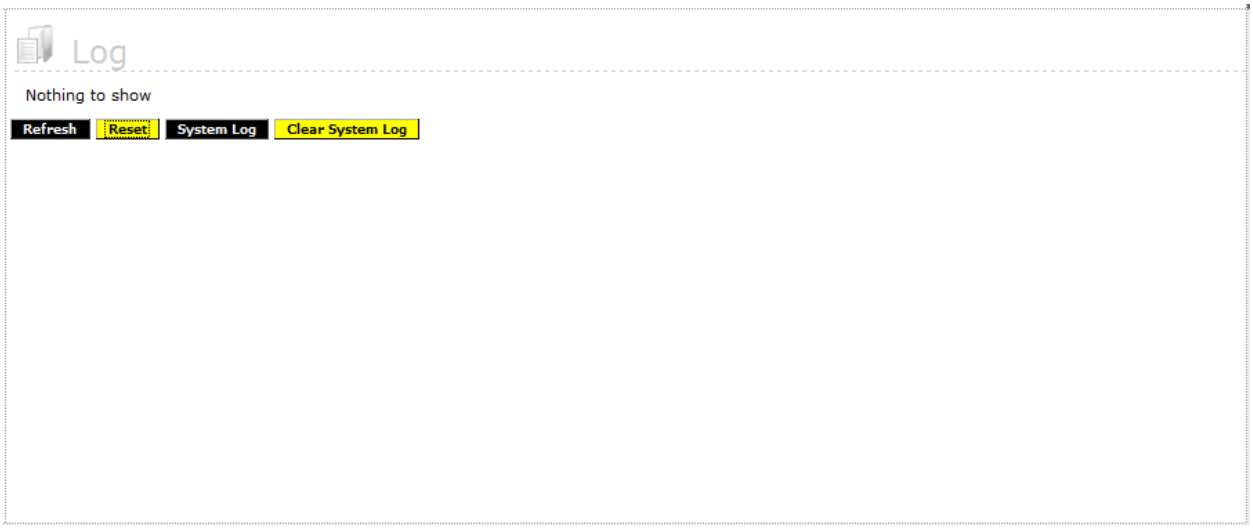


Figure 99 Viewing of the Equipment Logs

Technical Characteristics

Following is presented the specification for the main hardware components for EITV Playout Professional.

Modulator ISDB-T

Characteristic	Details
Transmission System	ARIB STD-B31 (ISDB-T)
Bandwidth	5 / 6 / 7 / 8 MHz
RF connector	Connector F of 75Ω (2 connectors)
RF Output Frequency	400 to862 MHz ±1 ppm
RF step size	100 KHz
SN ratio of RF	44 dB typical @ 474 MHz
Transmission Mode	2k, 4k, 8k
RF Output Level	-30 ± 2 dBm
Spurious Suppression	> 50 dB (d2: 20 dB)
Base Noise	-102 dBm
Phase Noise	< -85 dBc @ 10 KHz
Return Loss	> 20 dB
Parameters Transmission	Hierarchical layers: TV (up to 3 layers) Mode: MODE 1, MODE 2, MODE 3 Guard Interval: 1/4, 1/8, 1/16, 1/32 Modulation modes: DPSK, QPSK, 16QAM, 64QAM Rate Encoding: 1/2, 2/3, 3/4, 5/6, 7/8 Constant Interleave Time: 0 to 4 Number of segments: TV (13, arbitrary configuration of the layers) Partial Reception: Configurable

Modulator DVB-T (COFDM)

Characteristic	Details
Transmission System	EM 300 744 (DVB-T)
Bandwidth	5 / 6 / 7 / 8 MHz
Modulation Modes	QPSK, 16/64 QAM
RF connector	Connector F of 75Ω (2 connectors)
Output Frequency RF	400 to 862 MHz ±1 ppm
Step size of RF	100 KHz
SN ratio of RF	44 dB typical @ 474 MHz
Transmission Mode	2k, 4k, 8k
Guard Interval	1/32, 1/16, 1/8 e ¼
Rate Code	1/2, 2/3, 3/4, 5/6, 7/8

Characteristic	Details
RF Output Level	-30 ± 2 dBm
Spurious Suppression	> 50 dB (d2: 20 dB)
Base Noise	-102 dBm
Phase Noise	< -85 dBc @10 KHz
Return Loss	> 20 dB

Modulator DVB-C (QAM-A/C)

Characteristic	Details
Transmission System	ITU-T J.83 A/C – EM 300 429 (DVB-C)
Modulation Modes	4/16/32/64/128/256 QAM
Symbol Rate	5,0 to 7,1
Accuracy Rate Symbol	< ± 25 ppm
Resolution of Symbol Rate	< 12 mBd
RF connector	Connector F of 75Ω (2 connectors)
Frequency Range of RF	400 to 862 MHz
Accuracy Frequency of RF	< ± 1 ppm
Output Level	-25 ± 1 dBm
Spurious Suppression	> 50 dB (d2: 20 dB)
Return Loss	> 20 dB

Modulator DVB-S (QPSK)

Characteristic	Details
Transmission System	ETS 300 421 (DVB-S)
Rate Convolution	1/2, 2/3, 3/4, 4/5, 5/6, 6/7, 7/8
Symbol Rate	0,088 to 45
Accuracy Rate Symbol	< ± 25 ppm
Resolution of Symbol Rate	< 50 mBd
RF connector	Connector F of75Ω (2 connectors)
Frequency Range of RF	950 a 2.150 MHz
Accuracy Frequency RF	< ± 1 ppm
Output Level	-30 ± 3 dBm
Spurious Suppression	> 50 dB (d2: 25 dB)
Return Loss	> 15 dB

ASI Output Interface

Characteristic	Details
Physical Layer	DVB-ASI (Coax)
DVB-ASI Connector	75Ω BNC Connector (2 connectors)
Transmission Rate	0-150Mbps
Transmission Rate Resolution	< 1bps
Transmission Rate Stability	< ± 10ppm
On/Off Burst Mode	Yes
Maximum Jitter	70ns p-p
Package Size	188- or 204-bytes

ASI/SDI Input Interface

Characteristic	Details
Digital Video Channels	4 (standalone)
DVB/ASI	Compatible to the EN50083 Standard
SDI	Compatible to the SMPTE-259M Standard
DVB-ASI Connectors	75Ω F-Connector (4 connectors)
Transmission Rate	0-214Mbps
10-bit SDI	Full Stream@270Mbit/s
Input Return Loss	> 17dB
Error Free Cable Length	300 meters maximum
Package Size	188- or 204-bytes

General Specification

Characteristic	Details
Processor	2,33 GHz Intel Xeon E5410 Quad-Core with 2x6MB Cache
Memory	2GB FBD (Fully Buffered DIMM), 667MHz (4x512MB)
Hard Disks	2 250GB Serial ATA2 hot-plug 7200 rpm units
Backplane	Up to 6 3.5" rigid disks
Array Controller	SAS 3Gb/s integrated for up to 6 disks
Disk Array	With 256MB of ECC cache memory with battery (PERC6/i)
Network Interfaces	2 10/100/1000 UTP on-board interfaces
Front Panel (Bezel)	Riser with 2 slots PCI-x and 1 slot PCI-e
Power Supply	750W redundant with Universal automatic adjust for 110/220VCA, with two power cords
CD/DVD Drive	24x CDRW/DVD
Keyboard	USB

Characteristic	Details
Cooling (fan)	Hot-plug redundant
Memory	ECC Spare Row SDDC - Single Device Data Correction PERC6/i board with battery-powered cache Cluster support with high-availability failover DRAC 5/i
Tape Unit	Internal tape device support
Chassis	Tool-less
Cluster Support	Yes
ROMB (express)	Battery-powered
Enclosure	2U with rails to standard 19" rack Depth: 29.31" (74.4cm) Width: 17.5" (44.43 cm) Height: 3.4" (8.64 cm) (with Bezel)
Enclosure Weight	50.71 lbs (23Kg) for full configuration
Optical Mouse	310-9638, 2 buttons
Warranty	3-year warranty with on-site service for the next business day Advanced hardware support Advanced software support

Glossary

Term	Explanation
Closed Caption	Characters displayed in the screen that corresponds to the talking in the context of the current transmitted program and/or to the sound and displayed effects description.
EPG	Acronym to **E**lectronic **P**rogramming **G**uide.
PDU	Acronym to **P**ower **D**istribution **U**nit.
UPS	Acronym to **U**ninterrupted **P**ower **S**upply.
PID	Acronym to **P**rocess **ID**entification.
Playlist	List of the audio-visual content to be executed by a specific application.
PSI/SI	Acronym to **P**rogram **S**pecific **I**nformation / **S**ervice **I**nformation.
HDTV	Acronym to **H**igh **D**efinition **T**ele**V**ision.
SDTV	Acronym to **S**tandard Definition **T**ele**V**ision.
STO	Acronym to **ST**ream Event **O**bject.
STE	Acronym to **ST**ream **E**vent.
Stream	Flow of a specific content.
SBTVD	Brazilian Digital Television System
ISDB	Acronym to Integrated Services Digital Broadcasting that is the given name to the Japanese Digital TV Standard.
DVB	Acronym to Digital Video Broadcasting that is the given name to the European Digital TV Standard. Is subdivided in DVB-C (to cable transmissions), DVB-S (to transmission via satellite), and DVB-T (to terrestrial transmission via broadcasting)
ARIB	Acronym to **A**ssociation of **R**adio **I**ndustries and **B**usinesses that is the consortium responsible to the middleware development to the Japanese Digital Television System.
COFDM	Acronym to Coded Orthogonal Frequency Division Multiplexing that represents a modulation method based on Frequency Division Multiplexing associated to the channel decoding (Error Correction Method).
QAM	Acronym to Quadrature Amplitude Modulation.
QPSK	Acronym to Quadrature Phase Shift Keying that represents a modulation method with Phase Shift of Signal Carrier Frequency.
1-SEG	Segment that transmits the audio, video and data to the mobile devices.
Mobile TV	Mobile portable device that can receive the television signal.
PAT	Acronym to Program Association Table.
PMT	Acronym to Program Map Table.
NIT	Acronym to Network Information Table.
EIT	Acronym to Event Information Table.
SDT	Acronym to Service Descriptor Table.
TDT	Acronym to Time and Date Table
TOT	Acronym to Time Offset Table
BIT	Acronym to Broadcasting Information Table.
SDTT	Acronym to Software Download Trigger Table
AIT	Acronym to Application Information Table.