TRIAX


# User guide

## IP output module

| Model | Item no. |
|---|---|
| **IP output module** | **492072** |


| Version | 891080B | 01 - 2014 | EN |
|---|---|---|---|


triax.com

# Contents

## Disposal

Within in the European Union this label indicates that the product cannot be disposed of with the general household waste. Neither the headend nor the input and output modules can be disposed of with the general household waste.

For proper treatment and recycling of old products, please take them to designated collection points in accordance with your national legislation.

## Box contents

Item No. 492072 - IP output module
Item No. 492074 - Auxiliary board
Item No. 492086 - SFP transceiver RJ45 - copper -

## Licenses

IP output licenses need to be purchased from Triax to be able to distribute IP services through the TDX headend system.

Required licence numbers:

Item No. - 418040 TDX IPTV out 12 service start
Item No. - 418041 TDX IPTV OUT 12 service
Item No. - 418042 TDX IPTV OUT 4 service Start
Item No. - 418043 TDX IPTV OUT 4 service
Item No. - 418045 TDX IPTV IN 12 Services Start
Item No. - 418046 TDX IPTV IN 12 Services
Item No. - 418047 TDX IPTV IN 4 Services Start
Item No. - 418048 TDX IPTV IN 4 Services

Licences are activated using Licence handling in the Administration window. See the user guide of the TDX Headend Unit for more **information**.

## IP output module

The IP output module is an output module for transmission of digital video, audio and miscellaneous data, encapsulated within one or more MPEG2/ DVB single program transport streams.

The TDX headend system provides the following functionality when the IP output modules have been installed:

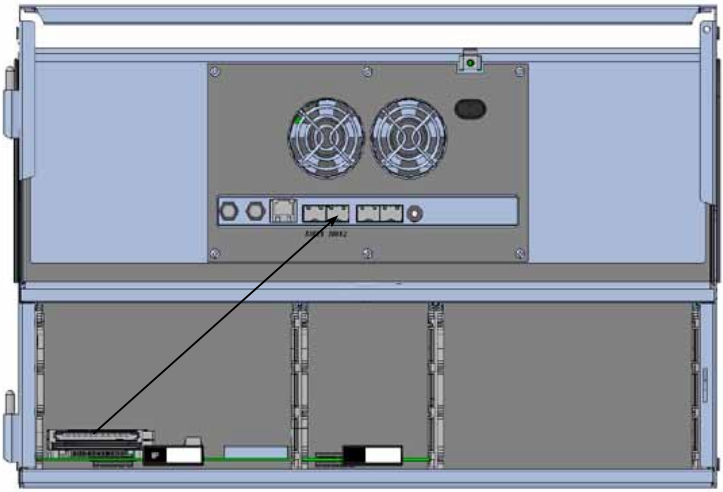
- IP multicast streaming (UDP streaming)
- RTP option
- IGMP version 2
- SPTS including SDT, PAT, PMT, CAT
- Packet ratio of 3-7 TS packet per IP packet - ratio 3-7:1
- Max. BW 700 Mbits/s output per IP output module
- 96 services on each IP output module/AUX socket
- Possible to change service ID (SID)
- Possible to select from IP via Link

# Installation overview

## Module positioning

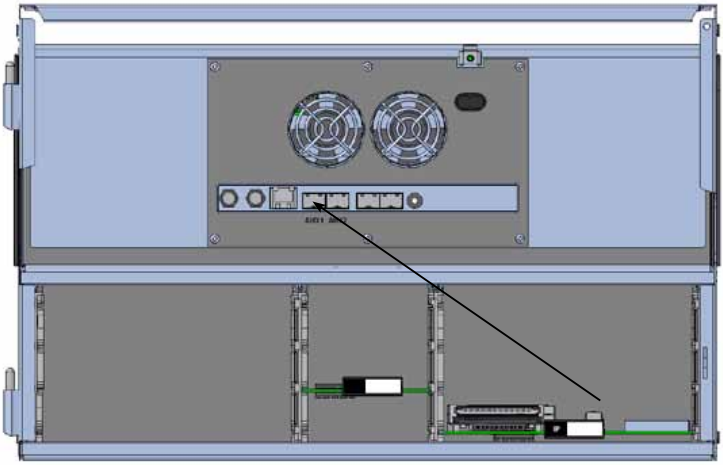
A maximum of two IP output modules, and associated auxiliary boards and SFP transceivers can be installed in a TDX headend. Dedicated positions in the TDX headend are used.

### IP output module placed in slot 3



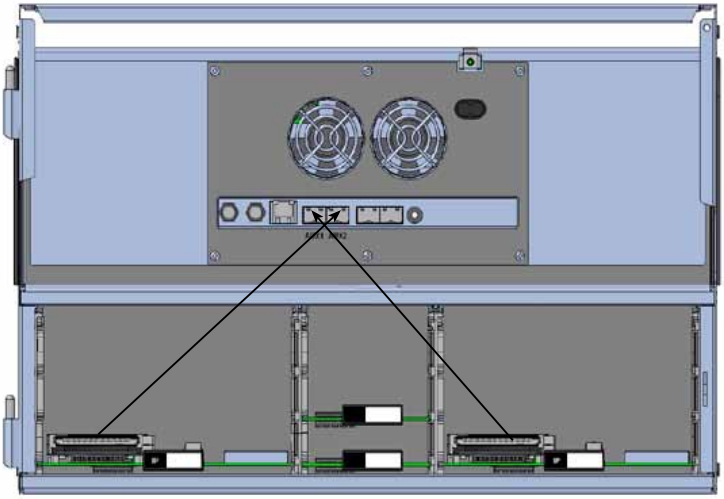
IP module in slot 3, auxiliary board in slot 2, SFP in AUX socket 2.

### IP output module placed in slot 6



IP module in slot 6, auxiliary board in slot 1, SFP in AUX socket 1.

**IP output modules placed in slots 3 and 6**



IP module in slot 3, auxiliary board in slot 2, SFP in AUX socket 2.
IP module in slot 6, auxiliary board in slot 1, SFP in AUX socket 1.

## Labels

Labels are located on the IP output module and the Auxiliary board.
Information relating to configuration of the module can be written on these labels if desired.

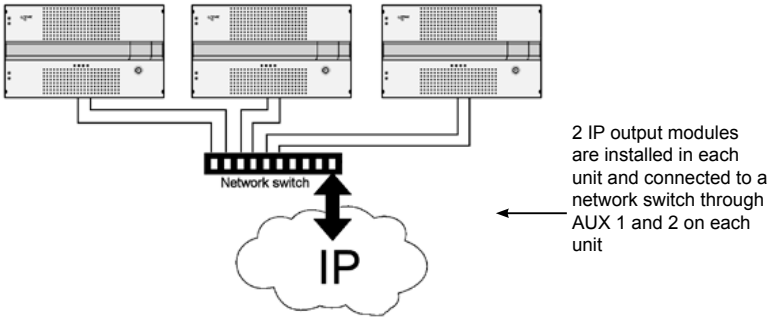
# Installation overview

## Network hardware configuration

The TDX headend system must be connected to a Gigabit network switch to receive and deliver IP services.

The network switch must support IGMP version 2, and contain an adequate number of ports to connect to all the Link sockets on the main and, if relevant, subunits.

- Multiple TDX headends can also be used to deliver a greater number of
- IP services .
- Each IP output module on each TDX output headend must be connected to the Gigabyte network switch, via the associated AUX 1 and/or AUX 2 RJ45/fibre optic transceivers.
- Cat 5e shielded or better network cables must be used.




## Optional hardware

A fibre-optic transceiver can be used instead of an RJ45 SFP transceiver. This is especially relevant for pre-existing optical installations, or for installations with high levels of interference and/or total cable lengths exceeding 100m.

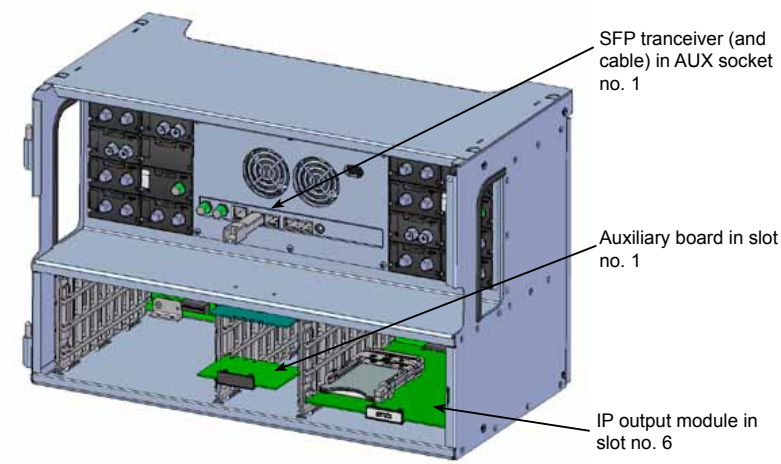
The fibre-optic transceiver must be ordered seperatly.
Item No. 492087 - SFP Fiber 850nm EOLS-8512-MXX (500m)
Item No. 492088 - SFP Fiber 1310nm EOLS-1324-02XX (2km)

## Software version

TDX software version 1.16.1.x or later is required.

## Hardware installation

A maximum of two IP output modules can be installed in a TDX headend.
**Note:**
Hot swapping can be used when inserting modules into or removing modules from the TDX system, i.e. there is no need to power off the unit.




**IP output module**

1. Insert the IP output module into either slot no. 3 or slot no. 6 in the lower section of the headend unit.

**Auxiliary board**

2. Insert the Auxiliary board as per the following:
   Use Auxiliary board in slot no. 2 if the IP output module is in slot no. 3
   Use Auxiliary board in slot no. 1 if the IP output module is in slot no.

**SFP transceiver**

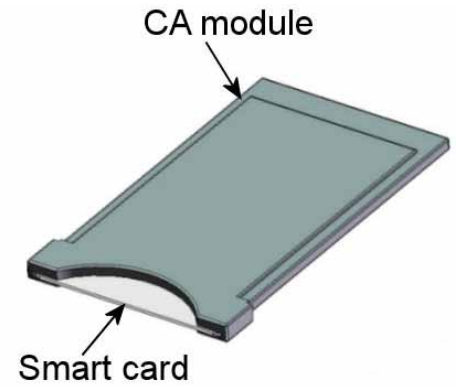
3. Insert the SFP transceiver in the correct AUX socket relating to slot position where the IP output module is located:
   IP output module in slot no. 6 - SFP transceiver in AUX ocket 1
   IP output module in slot no. 3 - SFP transceiver in AUX socket 2

# Hardware installation

## Installing CAM/ Smart card

Two Conditional Access modules (CA) can be inserted into each IP output module.

Each CA module can descramble one or more services. The services that can be provided is dependant on the provider of the CA module and smart card.

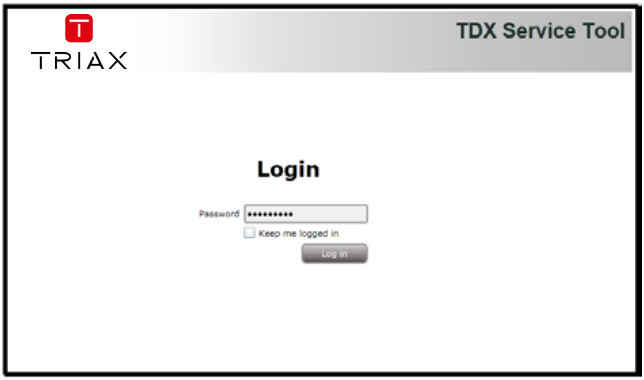



1. Insert the smart card into the CA module.
2. Insert the CA module into the IP output module.

**Note** Either (or both) CA position(s) in the IP output module can be used.

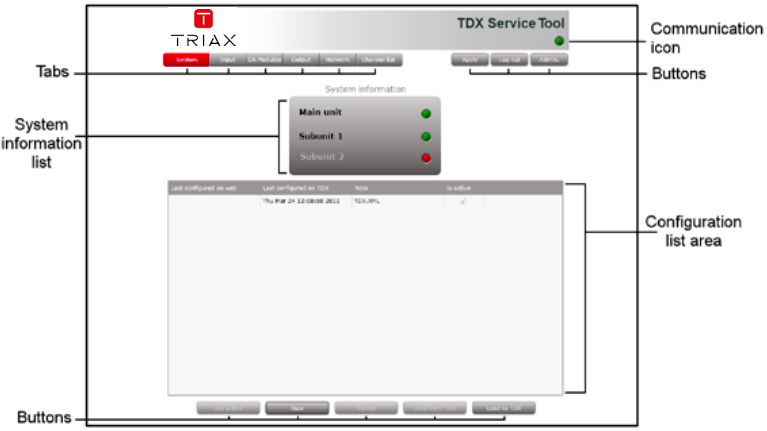
## Logging in

The **TDX Service Tool Login** window is displayed when the TDX Service Tool from the TDX headend system is loaded onto a PC.




1. Enter the password
2. Press the **Log in** button

The **System** window is displayed.




**Note**

Software version 1.16.1.x or later is required for the IP output module.

The software version of each module is displayed in the **Status information** area on the **Configuration** window.

Further information can be viewed using the System Information list area.

## Applying changes of-configuration changes

All changes made within the TDX Service Tool need to be saved to the SD memory card located inside the headend unit.

This is done by:

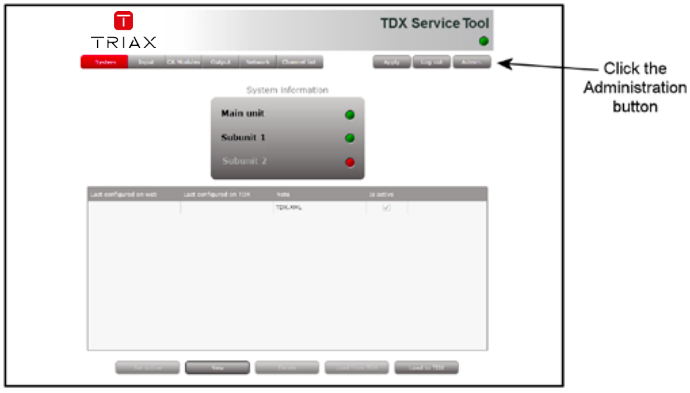
1. Making the required changes in the individual TDX Service Tool windows.
2. Pressing the **Submit** button on the TDX Service Tool where the configuration changes have been made.
3. Pressing the **Apply** button upper right-hand corner of the TDX Service Tool window. The **Apply** button is coloured 'Red' if there are configuration changes waiting to be saved to the SD memory card. 'Uncoloured' indicates that all submitted changes have been applied.

It is not neccessary to press the **Apply** button after each configuration action or use of the **Submit** button. The Apply button must, however, be pressed to save the configuration action(s) to the SD card.

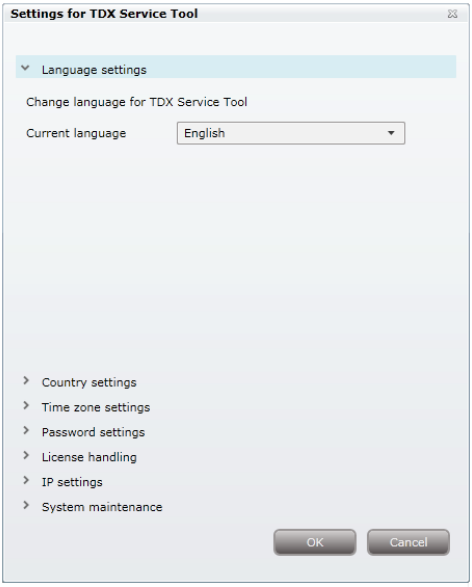
**WARNING - All unsaved changes will be lost in case of a power cut**

## Administration window

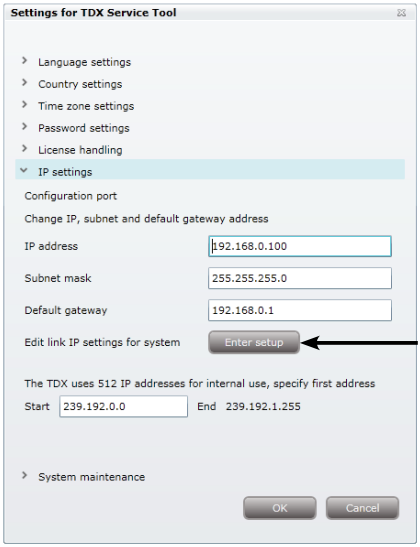
The IP address and subnet mask for each AUX socket used on the headend system need to be configured.




1. Click the **Admin**. button to open the **Administration** window.

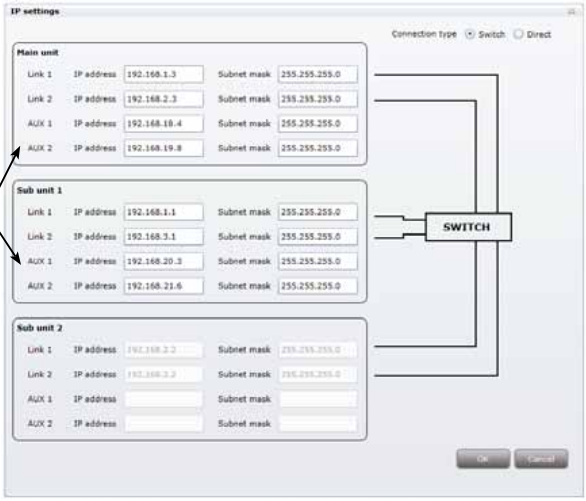



2. Expand the **IP settings** area.

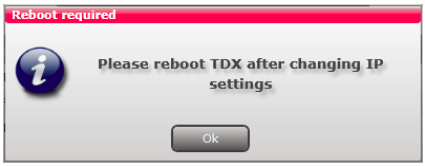



3. Press the **Enter** setup button.

Enter addresses in the AUX fields and subnet masks that are used in the headend system



4. Enter the required addresses in the **AUX** and **Subnet mask** fields
5. Press the **OK** button to return to the **Administration** window.
6. Press the **OK** button at the bottom of the **Administration** window to return to the **System**




7. Press the **Reboot** button in the **System maintenance** area or switch off the power to make the changes effective.

**Important** The TDX headend system must be rebooted if changes have been made to one or more IP addresses.

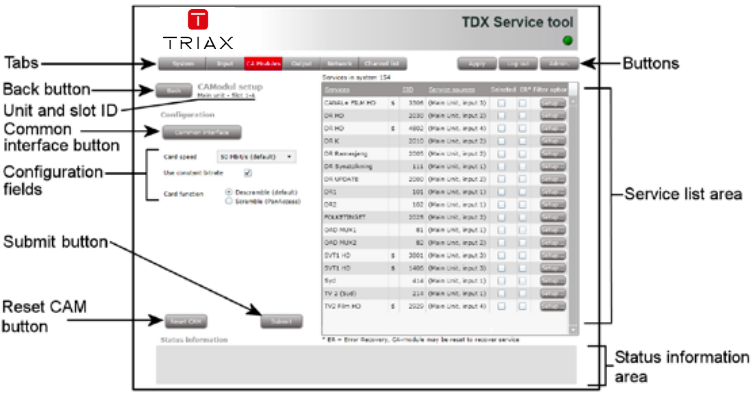
## Configuring CA Modules

1. Select the **CA Modules** window in the TDX Service Tool.


The **CA Modules** window in a new configuration initially only displays the number and type of the CA modules that have been inserted in the headend(s).

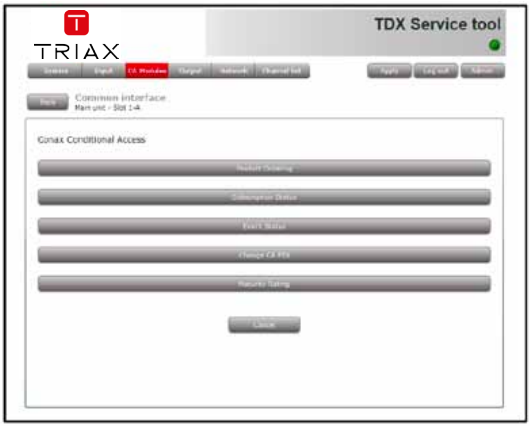
2. Press the **Setup** button relating to the CA module to be configured. Default values are initially displayed for the CA module and the service list area is empty.

## Viewing smart card information




**Common interface button**

1. Press the **Common interface** button on the **CA Modules** window. to view information on the smart card inserted in the CA module.




The type of information provided by the smart card depends on the card type and manufacturer.
Refer to the user documentation provided with the CA module/smart card for more information.

2. Press **Cancel** to return to the **CA Modul setup** window.

## Setting smart card parameters

3. Set the required smart card parameters in the following fields:

**Use constant bitrate**

- Deselct the check box if a variable bitrate is to be used. The **Use constant bitrate** check box is selected by default.

**Card function**

The **Card function** radio buttons determine whether CA module scrambling functionality is to be used.

- Select the **Descramble** (default) button to descramble services.
- Select the **Scramble (PanAccess)** button to scramble services using the PanAccess Scrambler.

**Service list**

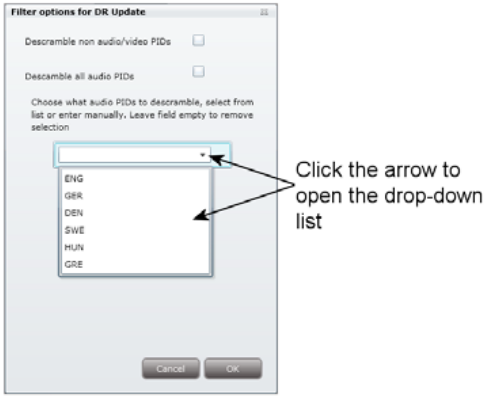
- Select the check box relating to the service(s) to be descrambled. (Scrambled services are indicated with '$'. )
- Press the **Setup** button associated with the service.

The **Filter options** window for the service is displayed.

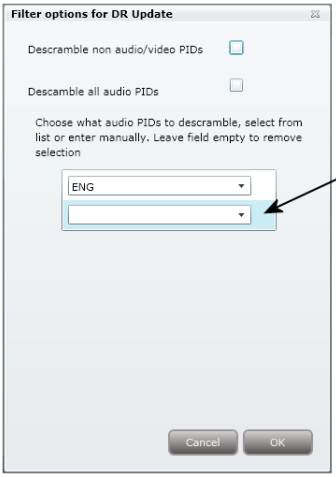

- Select the **Descramble non audio/video PIDs (Packet Identifier)** check box to descramble elementary streams other than audio or video elementary streams.


The **Descramble all audio PIDs** checkbox is selected by default.

- Deselect the **Descramble all audio PIDs** check box to select which audio PIDs are to be descrambled.




- Open the displayed language drop-down list.
- Select the audio PID to be descrambled.

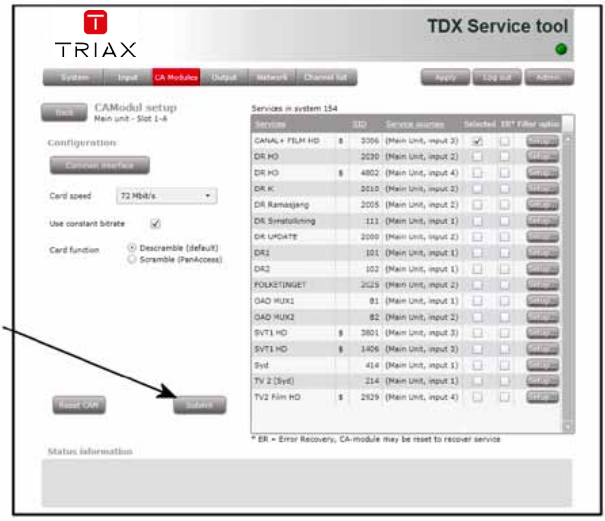



Having selected which audio PID language you want to descramble, a second field appears

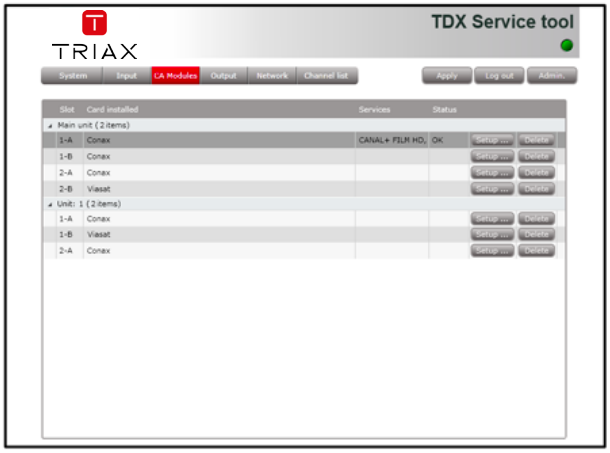
An additional language drop-down list is displayed.

- Select an additional audio PID to be descrambled if desired.
- Enter the three letter language string for an audio PID to be descrambled if it is not present in the drop-down list.
- Press **OK** when the required audio PIDs have been selected.
- Press **OK** to return to the **Configuration** window.

**Note** There is no limit to the number of audio PIDs that can be specified.




4. Press the **Submit** button.



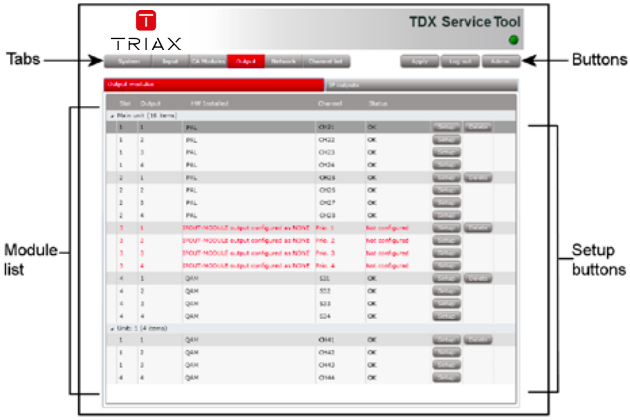

5 Press the **Apply** button if all configuration actions are completed.

# TDX Service Tool

## Output window

Click the Output tab in the TDX Service Tool to display the Output window.

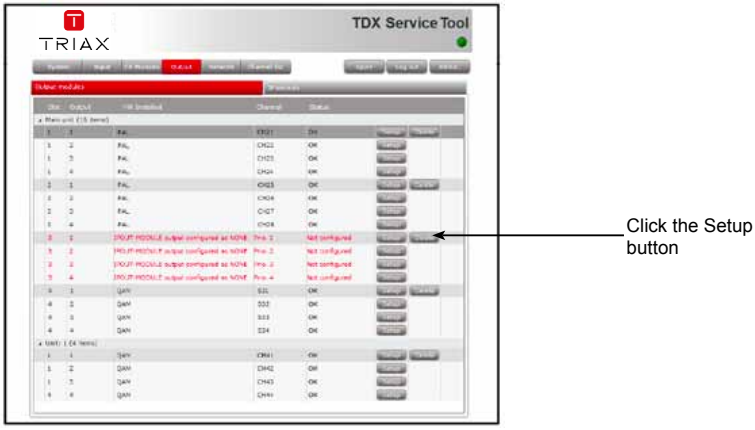
You can only install two IP output modules in each TDX headend unit. You have to install them in slot no. 3 and/or 6 in the output section of each unit.




According to the illustration above, an IP output module has been installed in slot no. 3 in the main unit.

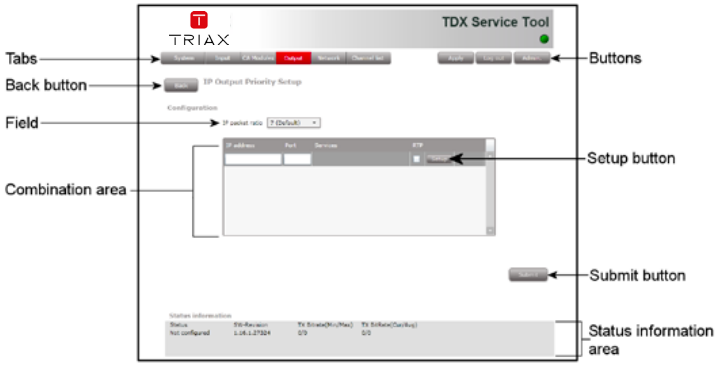
When you output IP services, IP packets may be lost as a result of output overload. To minimize the effect of the IP packet loss, you can divide your IP services into four groups and prioritize the output so that services in priority group 1 will be the last group to be affected from packet loss. Services in priority group 4 will be the first group to be affected from packet loss.

To configure the IP output module, click the Setup button to display the Configuration window.



## Configuring IP modules

Default or empty values are displayed when the a new configuration is opened in the TDX Service Tool's Configuration window.



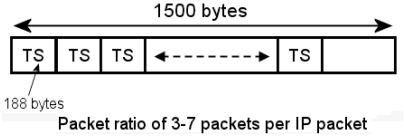

**IP packet ratio**

Specifiy how many transport stream (TS) packets are to be contained in each IP packet.

The size of a TS packet is 188 bytes.

The maximum number of TS packets per IP packet is '7'.

The maximum IP packet size is 1500 bytes.




Packet ratio of 3-7 packets per IP packet

**Note** The tranport stream transmits only one service.

**Combination area**

Specifies IP address/Port/Service to service configurations.

Enter a multicast IP address between 224.0.0.0 and 239.255.255.255 in the **IP address** field.

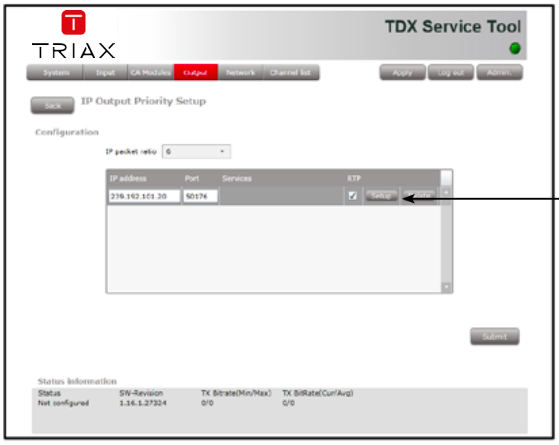
Enter the desired IP port number in the Port field within the range '1025 to '65535'.

Select the RTP check box to enable Real-Time Transport Protocol.

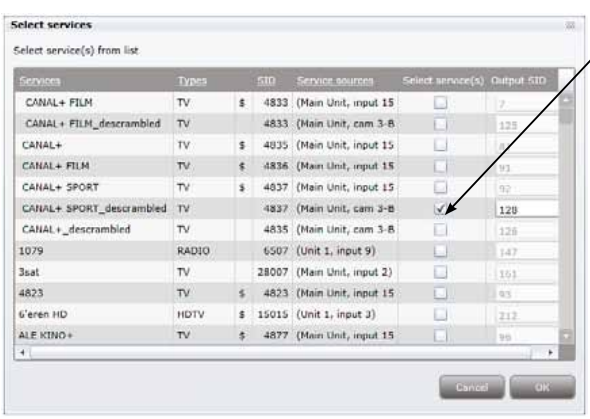
**Note** The IP addresses specified must not conflict with any other IP addresses used in the entire network.

## Creating IP/Service combinations

A maximum of 96 IP services can be output per IP output module.

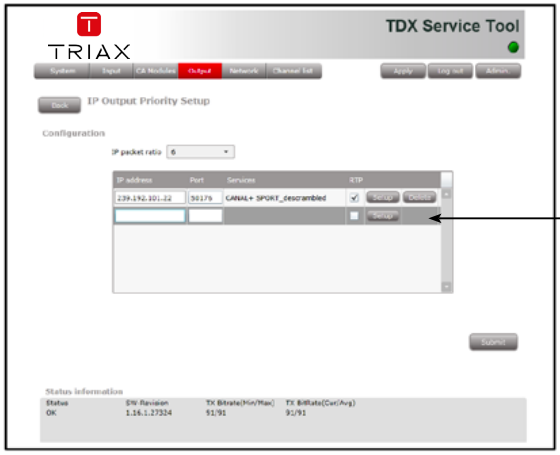



1. Press the **Setup** button.




2. Select the service that is to be associated with the IP address..
3. Press the **OK** button.

**Note** Only one service can be assigned per IP address.

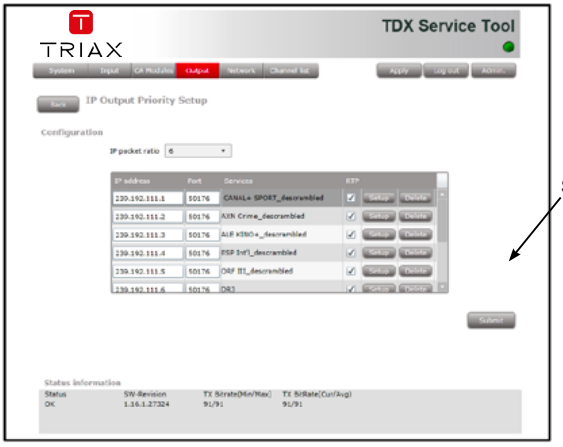



A new configuration line has been added in the combination area

A new empty configuration line is added in the combination area in the **Configuration** window.

4. Continue specifying more IP address/service combinations.

**Note** Each service in the TDX-pool can only be assigned to one IP address. Previously assigned service are not available for assignment when configuring other IP output modules.




Submit button.

5. Press the **Submit** button when assignment of services to IP addresses is completed.
6. Press the **Apply** button if all configuration actions are completed.

## Editing IP/Service combinations

1. Press the **Setup** button associated with the IP/Service combination to be edited.
2. Make the required changes.
3. Press **OK**
4. Press **Submit** in the **Configuration** window.
5. Press the **Apply** button when all configuration actions are completed.

## Specifying Service ID's

Each service listed in the Select services window has by default an automatically assigned Service ID (SID), which is displayed in the **Output SID** column.

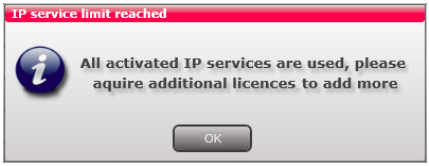
The Service ID can, however, be manually specified.

1. Press the **Setup** button associated with the IP/Service combination to be edited.
2. Change the SID to an unallocated number within the number range '1 to 65535'.
3. Press the **Submit** button.


An error message is displayed if the manually specified Service ID is incompatible.

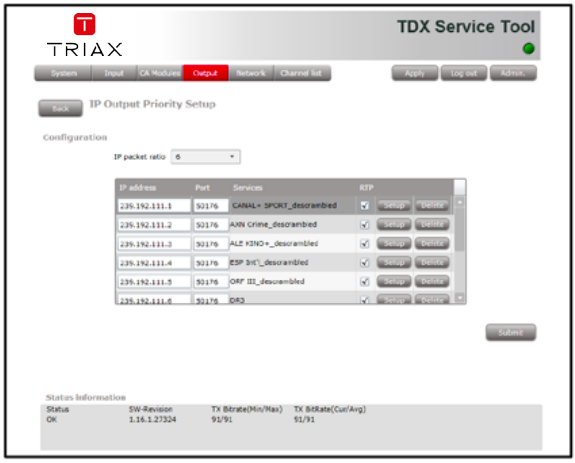
1. Press **OK** on the error message.
2. Change the Service ID for the IP address/Service specified in the error message.
3. Press **OK**.
4. Press **Submit** in the **Configuration** window.
5. Press the **Apply** button if all configuration actions are completed.


## Licence restrictions




The above warning is displayed if more services have been selected than the number of valid licenses. It is not possible to add additional configuration lines if the number of valid licenses have been exceeded.

## Deleting IP/Service combinations

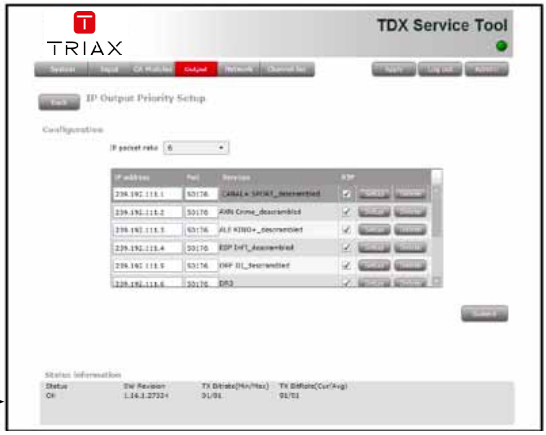



1. Press the **Delete** button associated with the IP address/Port/Service combination to remove it from the configuration area.
2. Press **OK** to confirm that the correct IP/Service combination has been selected.
3. Press the **Submit** button.
4. Press the **Apply** button if all configuration actions are completed.

**Note** The service previously contained in the deleted combination will now be available in the TDX-pool for reassignment.

## Status information

Status information is placed at the bottom of the **Configuration** window.



| | |
|---|---|
| **Status** | Detected errors. |
| **SW-Revision** | The installed output module software version. |
| **TX BitRate (Min/Max)** | The minimum/maximum load of megabits per second (Mbits/s) on the AUX socket. |
| **TX BitRate (Cur/Avg)** | The current/average load of megabits per second (Mbits/s) on the AUX socket. |

## Status LED

A status LED is located on the front of each IP output module. The LED functions as follows:

| | |
|---|---|
| **Green - flashing** | The IP module receives data. |
| **Green - constant** | The IP module receives valid services. |
| **Red** | When starting the TDX system the IP module and the system controller negotiate connection speed. |
| **Red - constant** | Either the IP module or the system controller has not been inserted correctly. |
| **No colour** | The IP module has not been configured or the module has not been inserted correctly. |

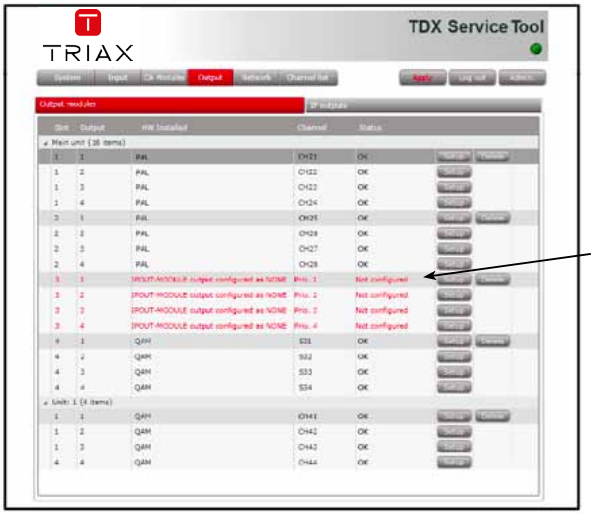
The LED functions as per below when the module's software is being updated:

| | |
|---|---|
| **Orange** | Booting. |
| **Temporary off** | Initiation of the software update. |
| **Temporary green** | Each time the modules receives a valid data package. Repeated until the update is completed without errors. |
| **Red** | Software update failed. |

## Deleting output module

1. Press the **Delete** button for the output module to be removed


2 Confirm that the correct output module is to be removed..




The output module is displayed in ‘Red’ font until it is physically removed from the headend.

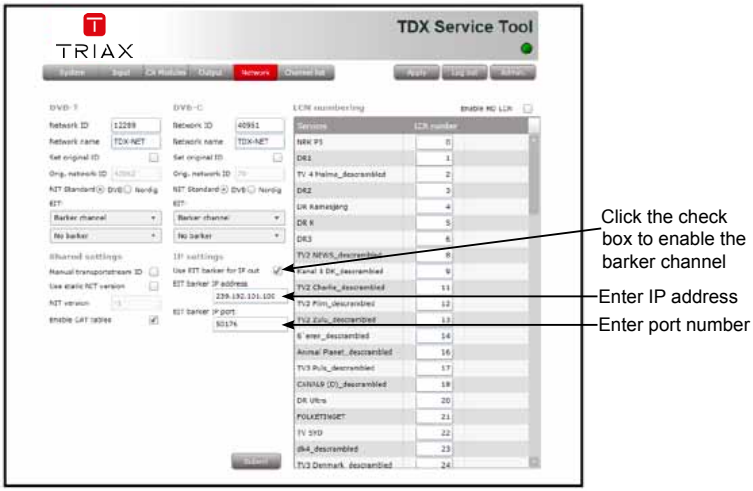
3. Remove the output module from the headend.

## Configuring IP output - EIT

A barker channel carries all EIT information (Event Information Table) for all IP services.

The EIT barker channel can output in two ways depending on how IP output is to be distributed:

- The EIT barker channel outputs through Link 2 on the main unit if IP output is distributed through the Link sockets.
- The EIT barker channel outputs through the AUX socket on the first IP output module in the TDX headend system if IP output is distributed through an IP output module




1. Click the **Network** tab in the TDX Service Tool

**Use EIT barker for IP out** — Select to enable the barker channel for IP output.

**EIT barker IP address** — Specify the desired IP address for the EIT barker channel.

**EIT barker IP port** — Specify the desired IP port number for the EIT barker channel.

2. Press the **Submit** button.
3. Press the **Apply** button if no other configuration actions are required.

**Important** The IP address specified for the barker channel may not be the same as any of the IP addresses used for service distribution.

# TDX Service Tool


The **Network** window now contains a single line of information displaying the unit and socket used by the EIT barker channel.

## Technical data

**Input**

| | |
|---|---|
| Type | TDX BE proprietary control and data |
| Connector | PCIe x1 edge connector<br>RF Connector (F-Connector) |
| Maximum input bandwidth | 720 Mbit/s |
| Data format | Proprietary TDX MPEG2/DVB SPTSs<br>UDP/IP via GbE |

**Output**

| | |
|---|---|
| Type | TDX BE proprietary control and data |
| Connector | PCIe x1 edge connector<br>RF Connector type: F-Connector |
| Maximum total bandwidth | 720 Mbit/s |
| Maximum peak bandwidth | 940 Mbit/s |
| Output format | MPEG2/DVB compliant SPTS |
| Output protocol | UDP/IP multicast via GbE<br>3-7:1 TS / IP packet ratio (configurable via GUI)<br>RTP (optional via GUI) |
| Output SPTS priority | 1-4 (configurable via GUI for each SPTS) |
| EIT | No EIT – must be obtained via native IP OUT |

| **Power supply:** | **Units** | **Data** |
|---|---|---|
| Voltage/current | (V, mA) | 12 / <600 |

| **Environment:** | **Units** | **Data** |
|---|---|---|
| Temperature, operating | (C) | -10…+50 |
| Temperature, storage | (C) | -20…+70 |
| Humidity, operating | (%) | 20…80 |
| Humidity, storage | (%) | 10…90 |

| **Mechanical Data:** | **Units** | **Data** |
|---|---|---|
| Dimensions, product | (mm): | 162 x180 x12 (21 CI) |
| Dimensions, Triax carton | (mm): | 183 x 266 x 55 |
| Weight, gross | (g): | 305 |
| Weight nett | (g): | 215 |

| | |
|---|---|
| Connectors | Integrated PCB edge connector (PCIe x1)<br>RF Connector type: F-Connector |

TRIAX
connecting the future

## Manufacturer

Dear Customer,

Should you require technical assistance in the event that your expert dealer is unable to help you, please contact us at:

Triax A/S
Bjørnkærvej 3
8783 Hornsyld
Denmark

DECLARATION OF CONFORMITY

TRIAX confirms that the product conforms to relevant EEC harmonised standards and consequently can carry the CE-mark.

Relevant harmonised standards:

DE/EN 60728-2 2010, DS/EN 60728-11 2010 and DS/EN 50083-2 2006

This document is only valid with the signature of the person responsible for CE-marking by Triax

Date: October 2012 Signature:

triax.com/support