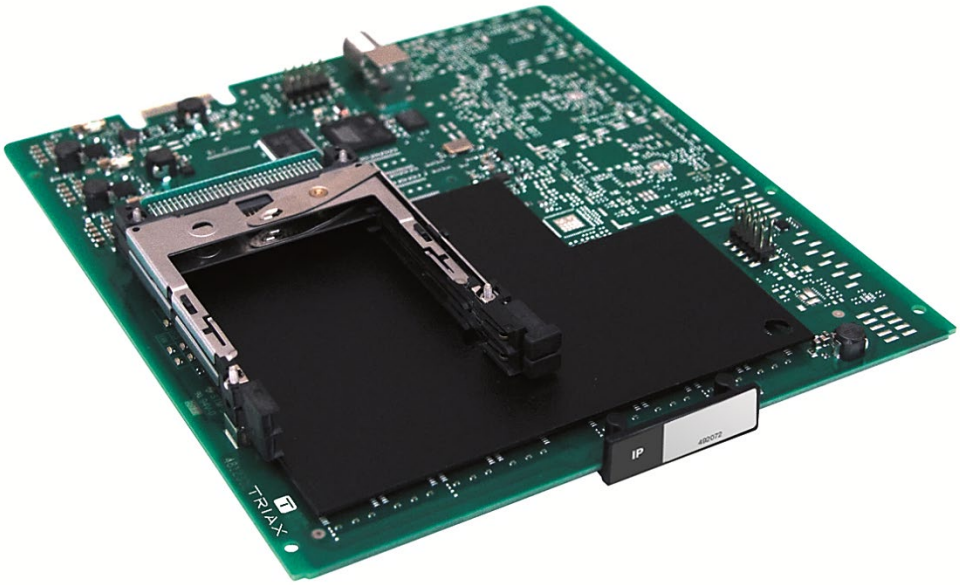
TRIAX
connecting the future



User manual

IP output module

Model	Item no.
IP output module	492072

Version	E	Date	06/2018	EN

triax.com

Attention! / Achtung! / Consignes de sécurité!

EN

Failure to comply with the specified precautionary measures may cause serious injury to persons or damage to property. The installation and commissioning may only be performed by suitably qualified persons, technicians or installers in compliance with safety regulations.

Damage due to improper installation and commissioning, defective connectors on cables or any other incorrect handling will void the warranty.

CAUTION: The safety requirements are according to EN 60728-11 and must be observed.

- Disconnect mains power before working on electrical systems.
- Any additional electrical wiring requirements should always be installed by a suitably qualified person(s).

Installation or service work should NEVER be undertaken during electrical / thunderstorms.

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.

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1. Introduction

1.1 Box content

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

1.2 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. - 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.

1.3 IP output module

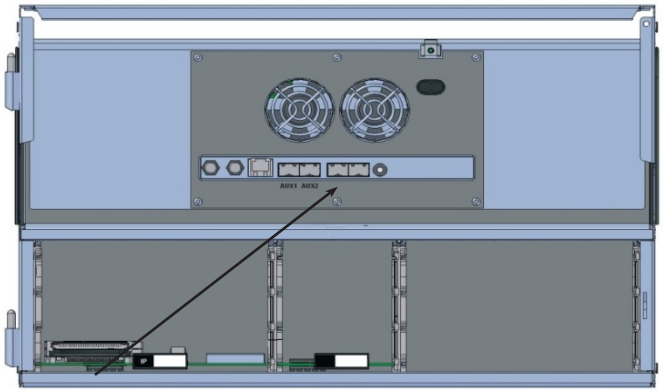
The IP output module is an output module for transmission of digital video, audio and miscellaneous data, encapsulated within one or more MPEG2/ DVB single program transport streams.
The TDX headend system provides the following functionality when the IP output modules have been installed:

- 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
- 78 services on each IP output module/AUX socket
- Possible to change service ID (SID)
- Possible to select from IP via Link.

1.4 Module positioning

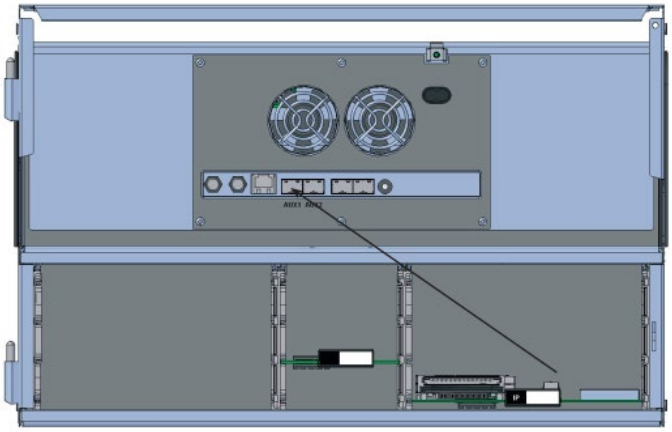
A maximum of two IP output modules, and associated auxiliary boards and SFP transceivers can be installed in a TDX headend. Dedicated positions in the TDX headend are used.

1.5 IP output module placed in slot 3



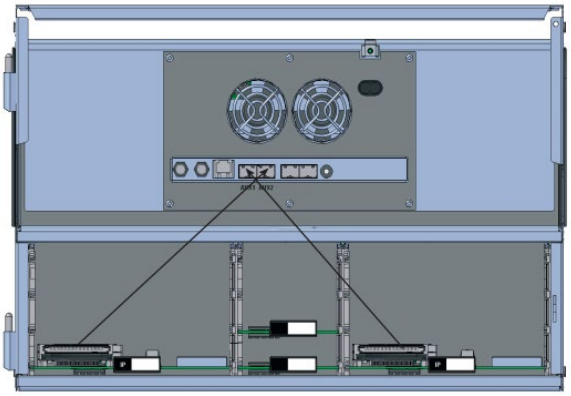
IP module in slot 3, auxiliary board in slot 2, SFP in AUX socket 2.

1.6 IP output module placed in slot 6



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

1.7 IP output module placed in slot 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.

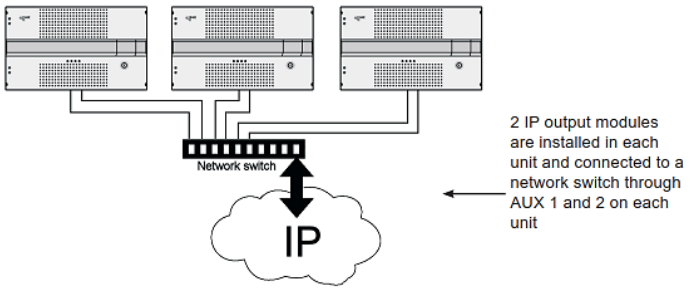
1.8 Labels

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.

1.9 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.



1.10 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)

1.11 Software version

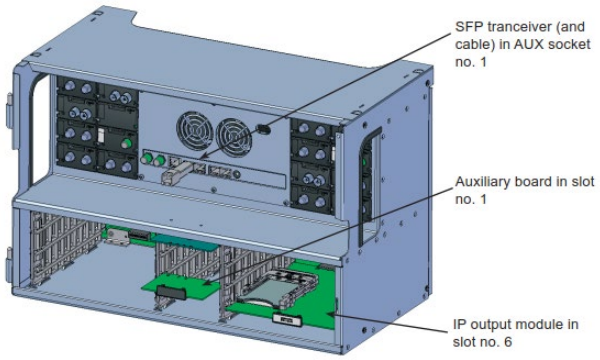
TDX software version 1.16.1.x or later is required.

2. Hardware installation

2.1 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.



2.2 IP output module

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

2.3 Auxiliary board

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.

2.4 SFP transceiver

Insert the SFP transceiver in the correct AUX socket relating to slot position where the IP output module is located:

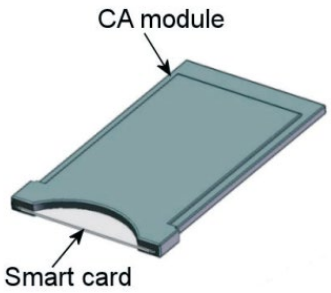
- IP output module in slot no. 6 - SFP transceiver in AUX socket 1
- IP output module in slot no. 3 - SFP transceiver in AUX socket 2.

2.5 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.

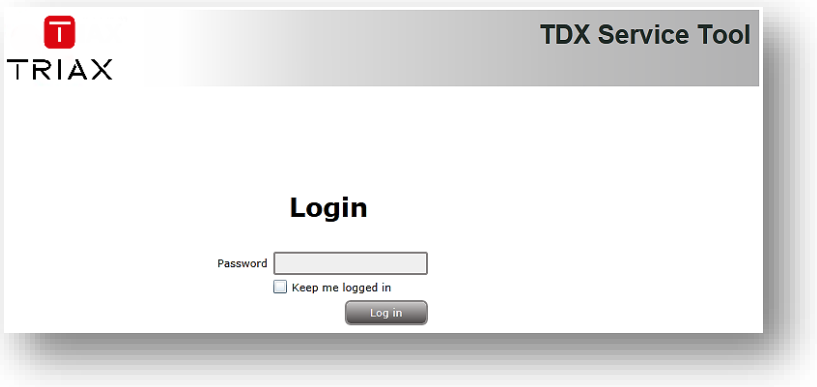
NOTE:
Either (or both) CA position(s) in the IP output module can be used.
.



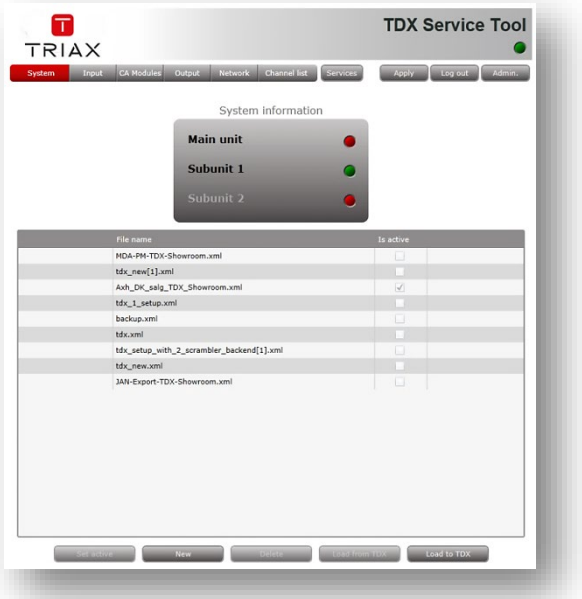
3. TDX service tool

3.1 Log in

When you have loaded the TDX Service Tool from the TDX headend system to your laptop/computer the Login window of TDX Service Tool is displayed. Default IP address/password is: 192.168.0.100 and "triax1234"



Enter Password and press "Log in" – 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.

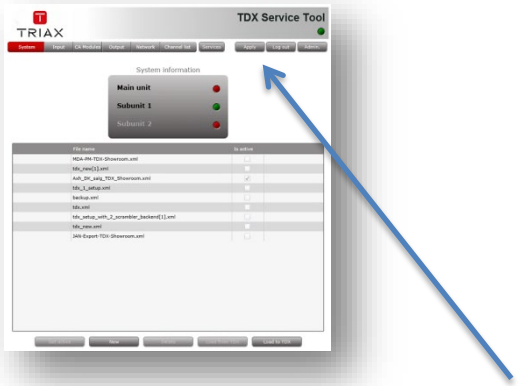
3.2 Applying changes of configuration changes

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.
4.

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.

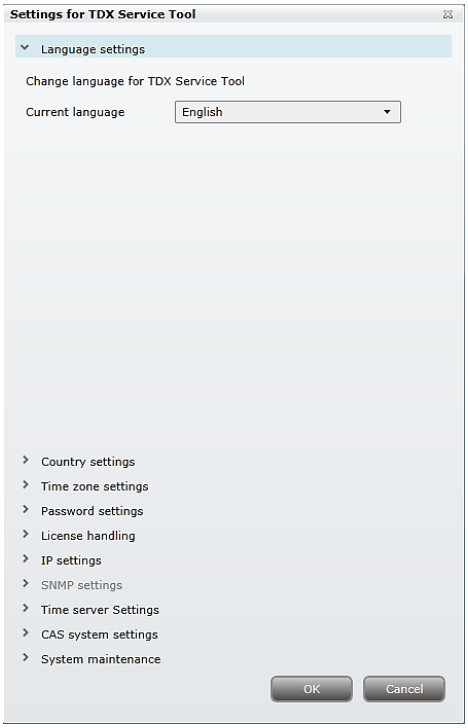


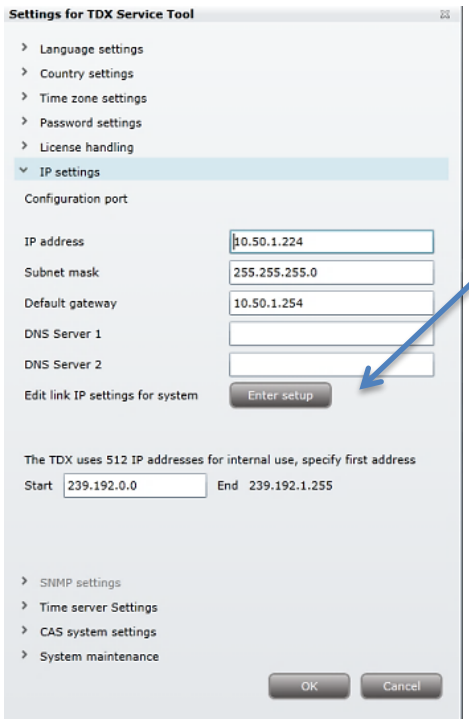
Click the apply button to save changes

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

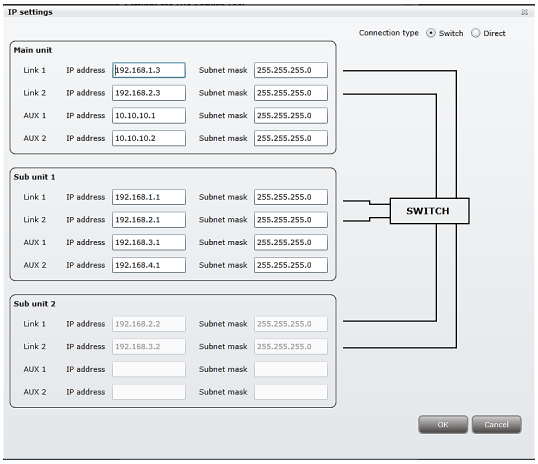
3.3 **Administration window** – open and expand settings

Click the administration button





Press the “Enter setup” button



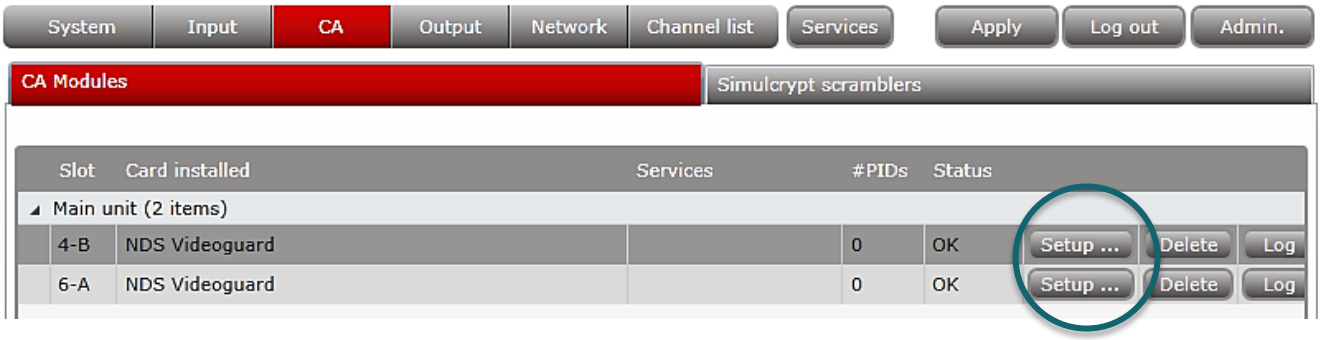
IMPORTANT
The TDX headend system must be rebooted if changes have been made to one or more IP addresses.

Enter addresses in the **AUX** fields and subnet masks that are used in the headend system. Enter the required addresses in the AUX and Subnet mask fields. Press the OK button to return to the Administration window. Press the OK button at the bottom of the Administration window to re-turn to the System.

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

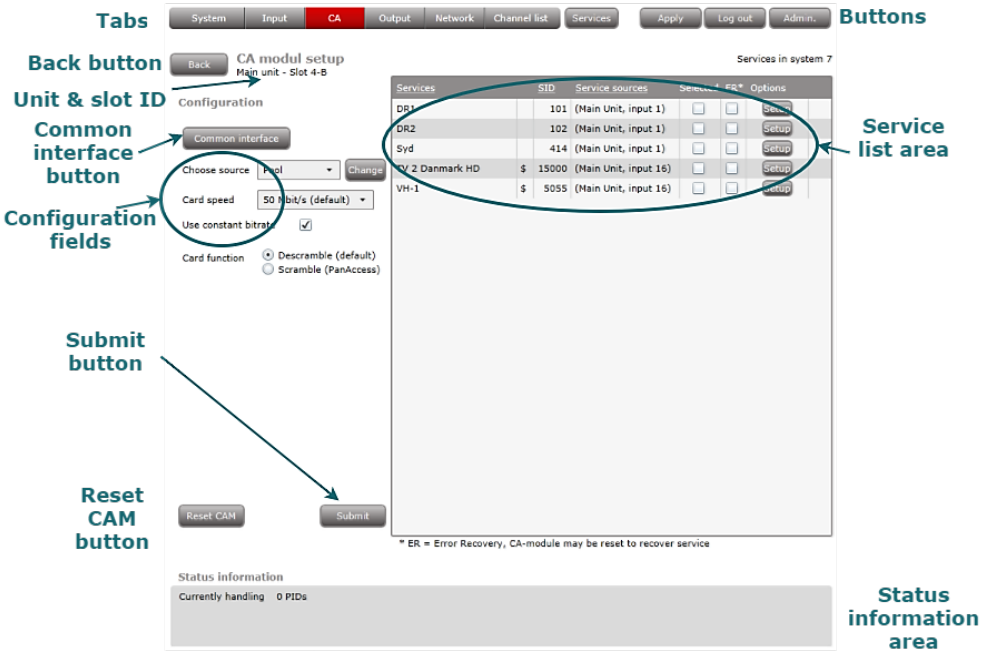
3.4 CA window

Click the CA Modules tab in the TDX Service Tool to display the CA Modules window. The first time you display the CA Modules window in a new configuration the module list only displays the number and type of the CA modules that you have inserted in the main and subunits. You have to configure the CA modules individually. To display the Configuration window, click the Setup button of the CA module you want to configure.



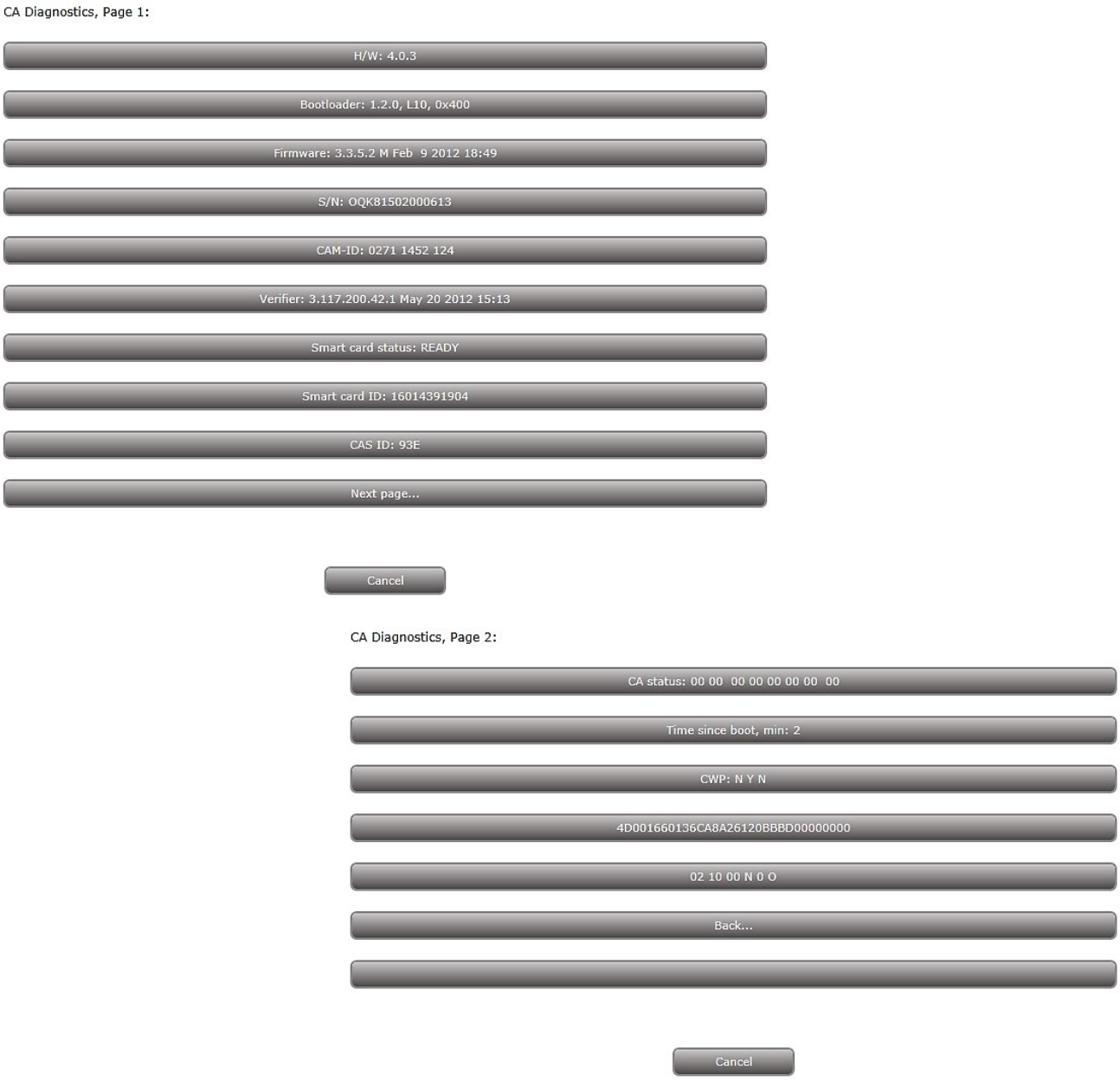
3.5 CA modules configuration window

When you open the Configuration window for a CA module in a new configuration, only default values are displayed.



3.6 Common interface / Smart card information

Clicking the Common interface button gives you access to information from the smart card inserted in the CA module. The type of information provided by the smart card depends on the card itself and its make.
Please refer to the user guides of the CA modules and smart cards you have inserted in the output modules for further information.



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. Press Cancel to return to the CA module setup.

3.7 Setting Smart card parameters

Set the required smart card parameters in the following fields:

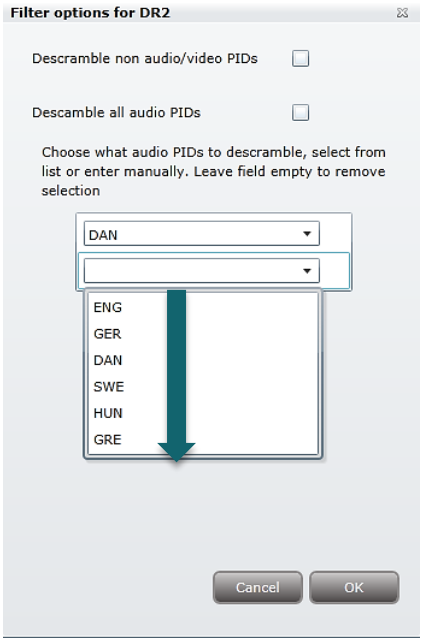
Use constant bitrate	• Deselect the check box if a variable bitrate is to be used. The Use constant bitrate check box is selected by default.
Card function	The Card function radio buttons determine whether CA module scrambling functionality is to be used. • Select the Descramble (default) button to descramble services. • Select the Scramble button to scramble services using the 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.services using the Scrambler.

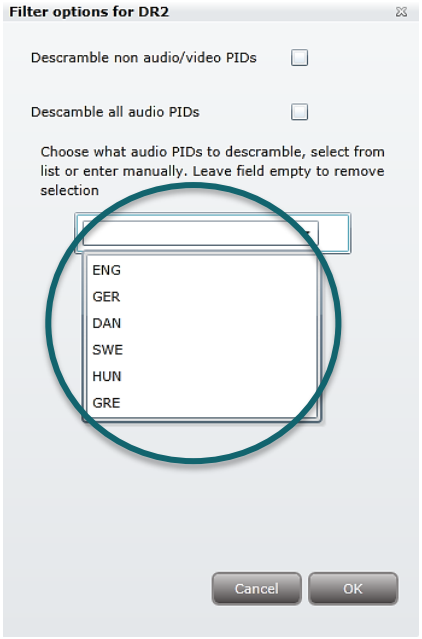
3.8 Selecting Service list – filter options

Open the drop-down list and select the the language of the audio PID you want to descramble.

To descramble only selected audio PIDs you have to deselect the Descramble all audio PIDs checkbox.

An additional field with a language drop-down list is displayed every time you select a language. You can descramble as many audio PIDs as you need.
To remove a selection leave the field empty.



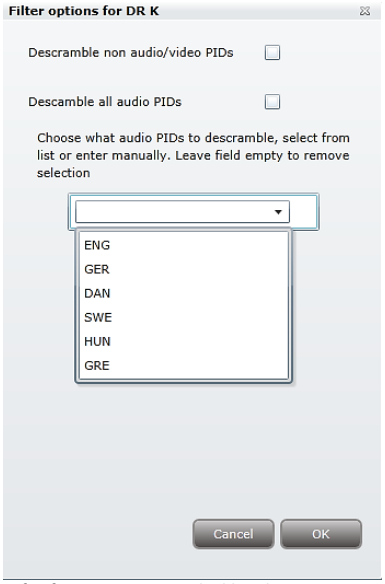


If the language of the audio PID you want to descramble is not displayed in the list you can enter a three letter string signifying the language you need. Click OK to return to the Configuration window.

NOTE:
There is no limit to the number of audio PIDs that can be specified.

3.9 Service list – filter options continued

When selecting the service list, 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.

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. Press Cancel to return to the CA module setup.

Submit & Apply

When you have entered the values you require you have to click the Submit button to enter this information into the headend system. Remember to click the Apply button in the upper right-hand corner to save the new settings.

3.10 Troubleshooting

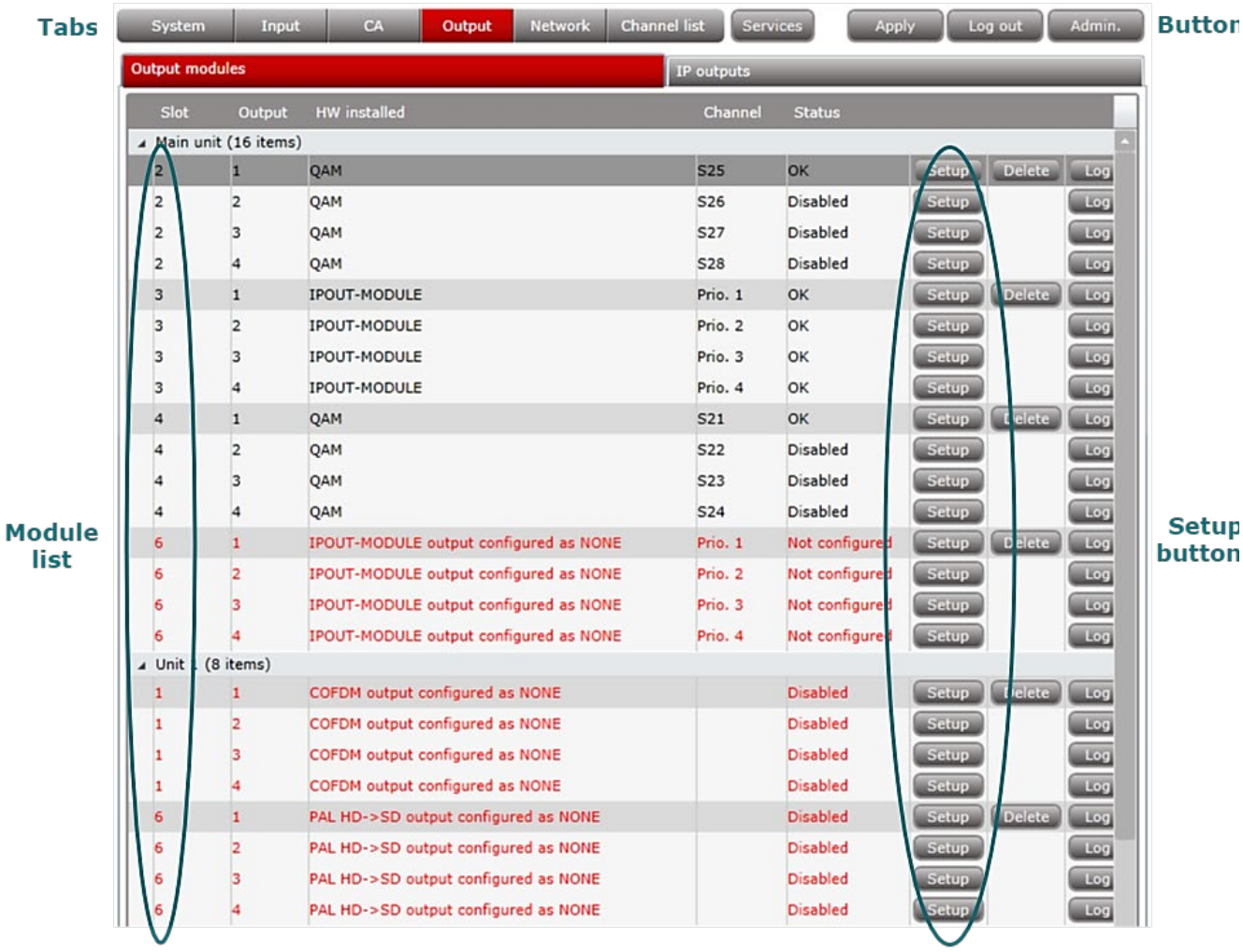
Problem	Solution
How to troubleshoot	
• Example: routing a non-scrambled service to a working scrambler should not give an error. IF however there is an error……	✓ it might be scrambler not connecting to CAS system ✓ it might be CAS server settings wrong entered in TDX admin window. ✓ it might be wrong values added in Simulcrypt configuration or the like
Is system setup done correct ?	
• When you troubleshoot • Correct information ? • Scrambler configured correct ?	✓ make sure TDX and CAS system are in the same LAN ✓ make sure you have entered correct information in the CAS server settings, in the TDX admin window ✓ make sure TDX headend scrambler information has been configured correct
Troubleshoot in TDX	
• When troubleshooting the TDX make sure the following • To enable a Simulcrypt scrambled service, the user must	✓ install one or more modules with Simulcrypt ✓ install proper license for Simulcrypt in the TDX ✓ configure CAS ID and address information per TDX system ✓ connect and configure a CAS server ✓ Select a scrambler, ie. a Simulcrypt enabled output module ✓ configure CAS parameters for scrambling the service ✓ map the scrambled service to outputs via the TDX pool

4. Output window

4.1 Definitions

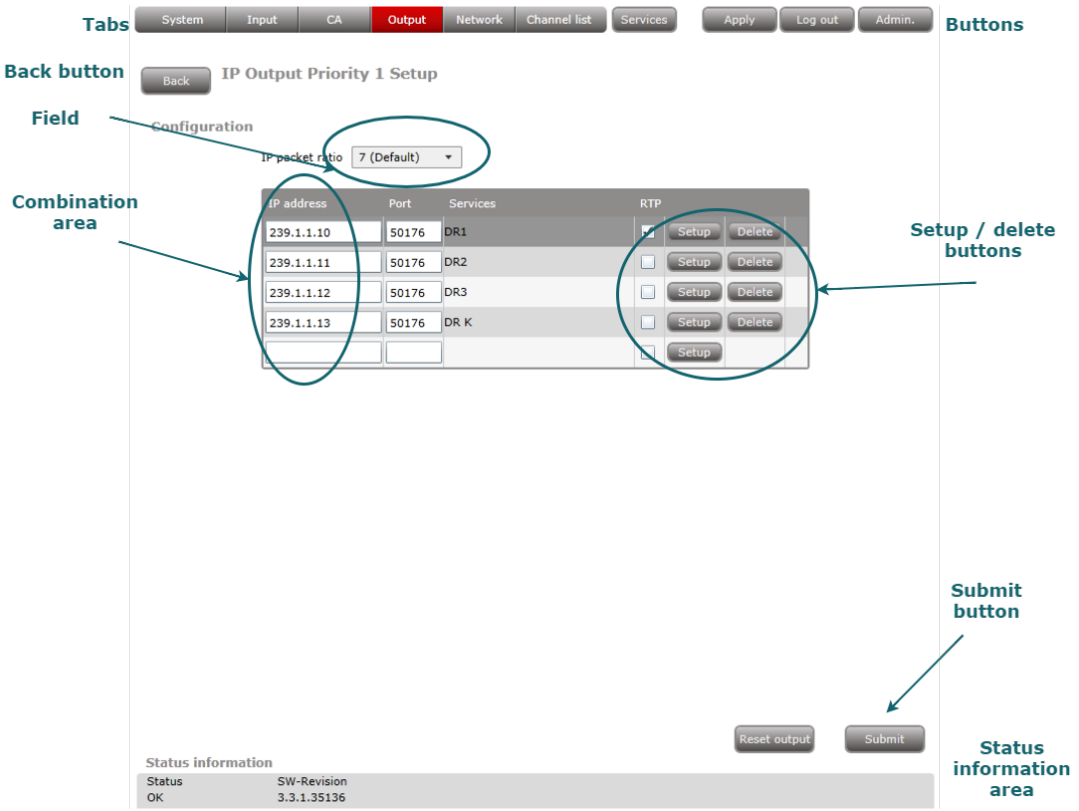
Click on the Output tab in the TDX service tool

NOTE:
The first time you display the Output window in a new configuration the module list only displays the number and type of output modules that you have inserted in the main and subunits.



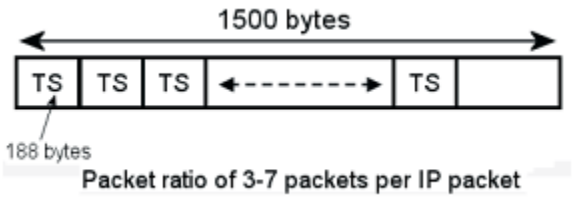
Output modules has to be configured individually. Select a QAM output module and click Setup button to display the configuration window of the module

4.2 Configuration of IP modules



4.3 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 transport stream transmits only one service.

4.4 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.

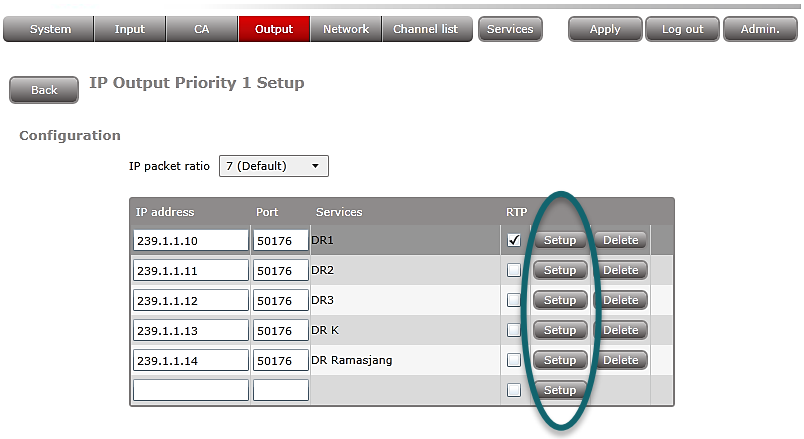
NOTE:
The IP addresses specified must not conflict with any other IP addresses used in the entire network.

4.5 Creating IP/Service combinations

A maximum of 78 IP services can be output per IP output module.

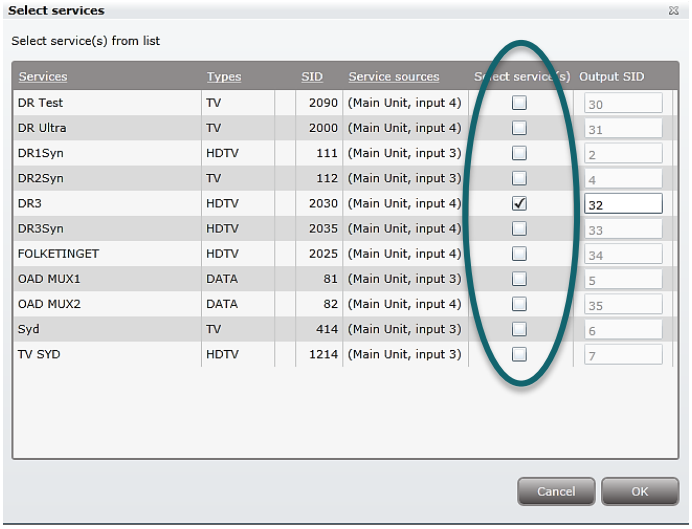
NOTE:
The transport stream transmits only one service.

Click the setup button



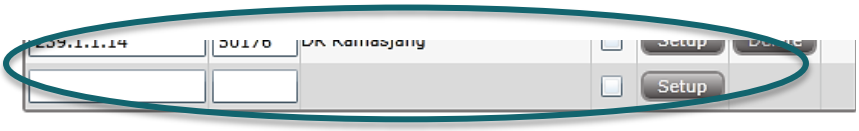
Select the service that is to be associated with the IP address. Press the OK button.

NOTE:
Only one service can be assigned per IP address.



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



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

4.6 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..

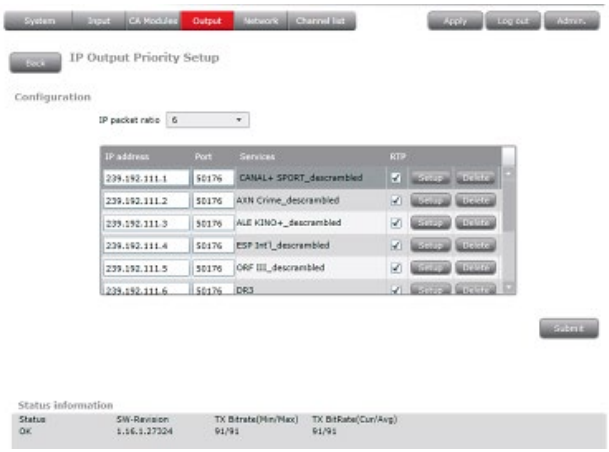
4.7 Specifying Service ID's

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.



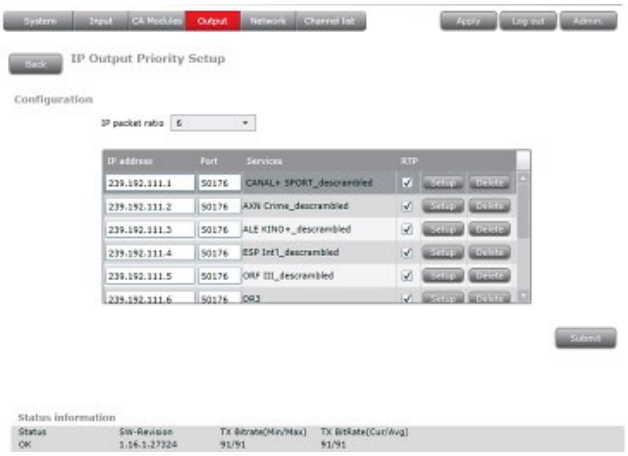
4.8 Licence restrictions

This 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.

,

4.9 Deleting IP/Service combinations

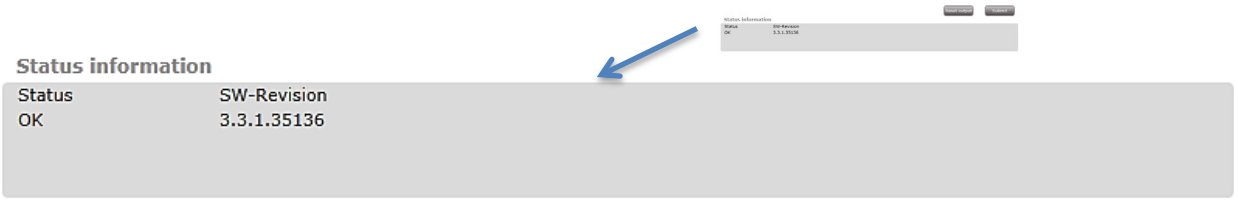
1 Press the Delete button associated with the IP address/Port/Service combination to remove it from the configuration area.
2. Press OK to confirm that the correct IP/Service combination has been selected.
3. Press the Submit button.
4. Press the Apply button if all configuration actions are completed.



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

4.10 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.

4.11 Status LED

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

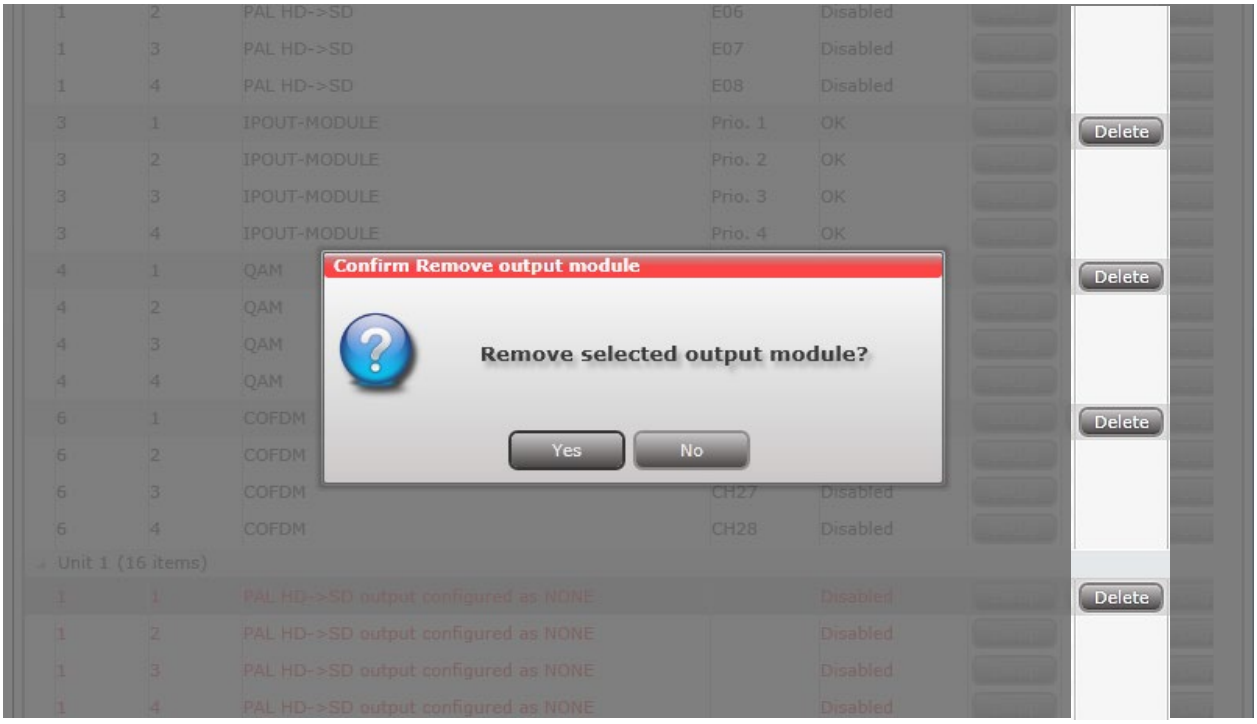
Green - Flashing	The IP module receives data.
Green - Constant	The IP module receives valid services.
Red	When starting the TDX system the IP module and the system controller negotiate connection speed.
Red - Constant	Either the IP module or the system controller has not been inserted correctly.
No color	The IP module has not been configured or the module has not been inserted correctly.

When module S/W is updated – the LED functions is as below:

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.

4.12 Deleting output modules

To remove an output module and the associated configuration you can use the Delete button of the module in question in the Output window.
Click the Delete button of the output module you want to remove. A message window is displayed asking you to confirm that you want to remove the output module. The deleted (or not configured) modules are in red writing…



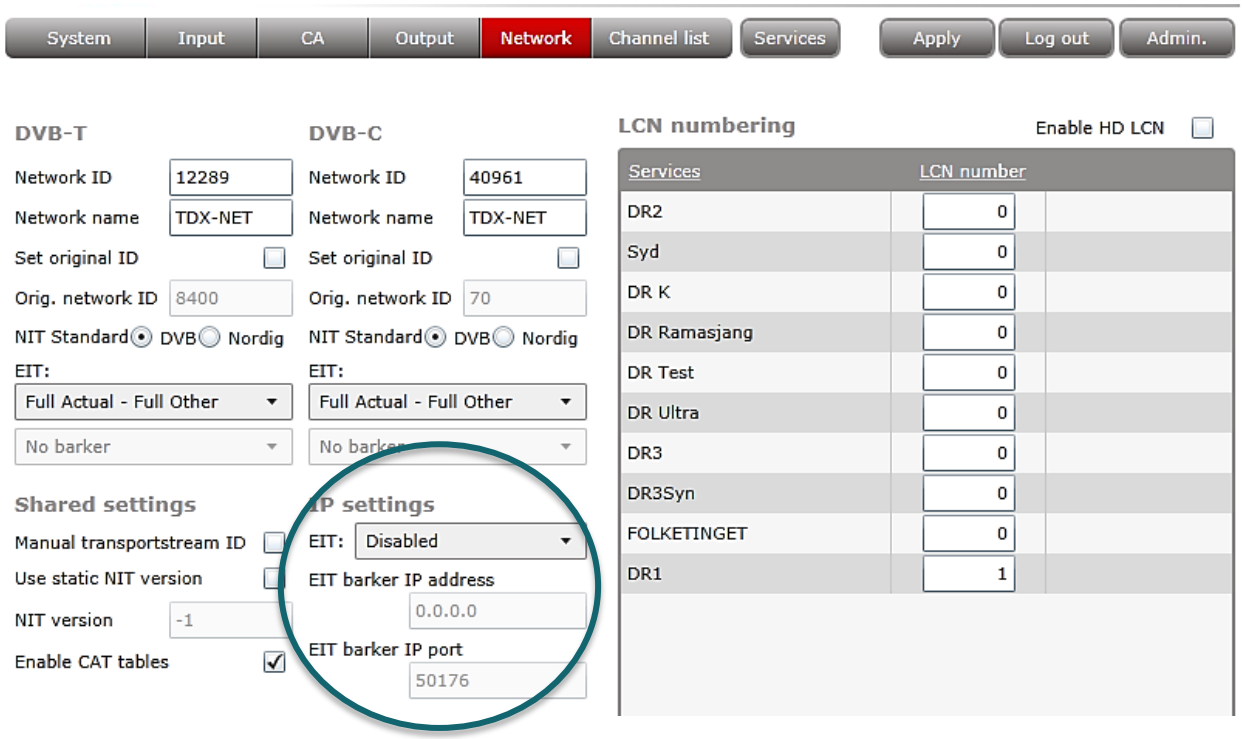
Until you have physically removed the output module from the headend unit, the module list will display four lines in RED.

4.13 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

.

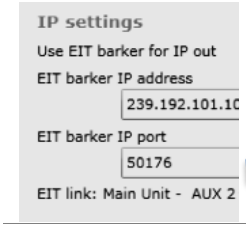


Click to enable Barker channel – enter IP address – enter port number
1 Click the Network tab in the TDX Service Tool

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.



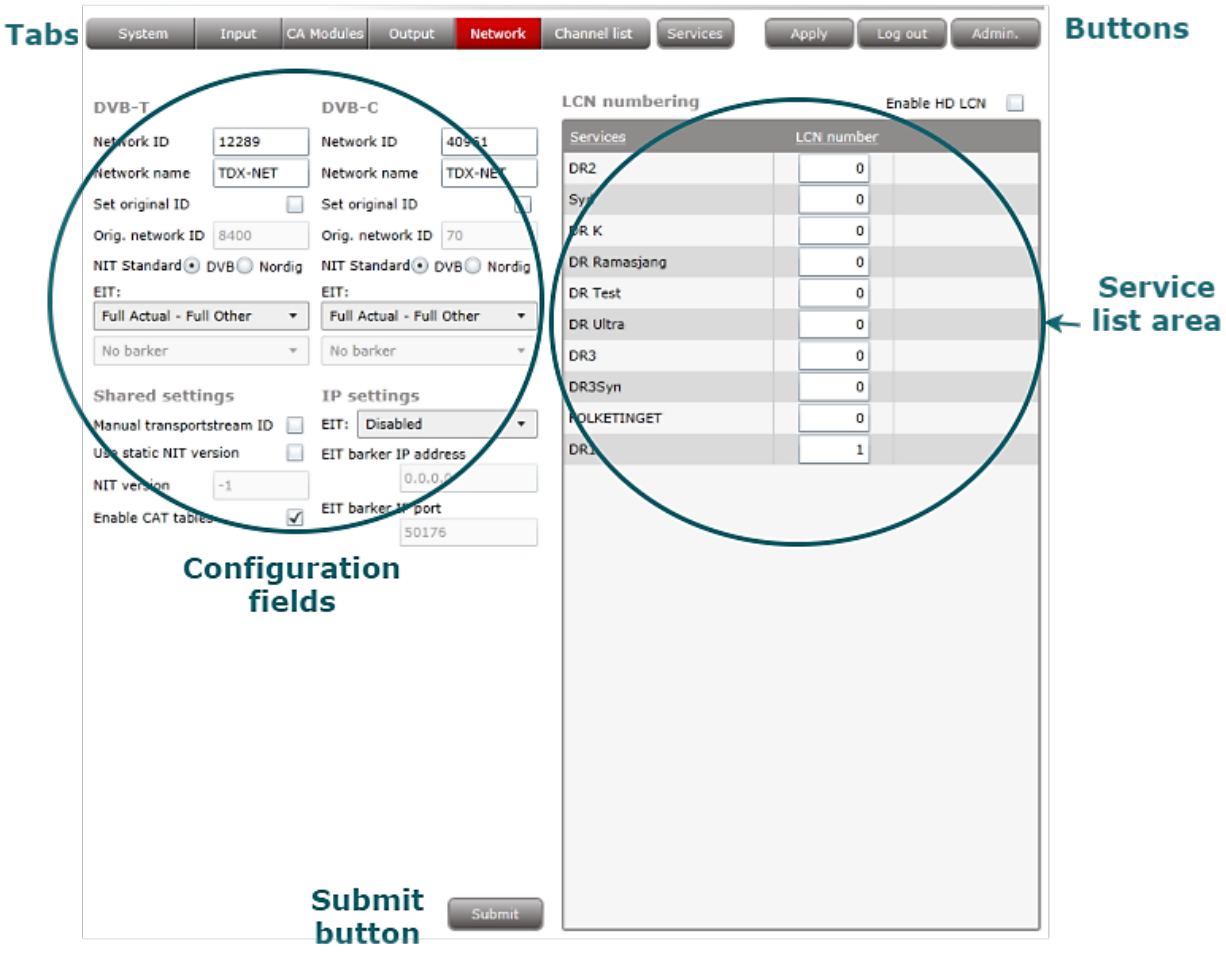
Information about which unit and socket the EIT barker channel uses.

The Network window now contains a single line of information displaying the unit and socket used by the EIT barker channel.
More thorough information in the next chapter 6 “Network window”

5. Network window

5.1 Definitions

Click the Network tab in the Service Tool to display the Network window. The first time you display the Network window the fields in the window will display default values and/or be empty. The service list area will display all the digital services you have configured to output using the Output tab.

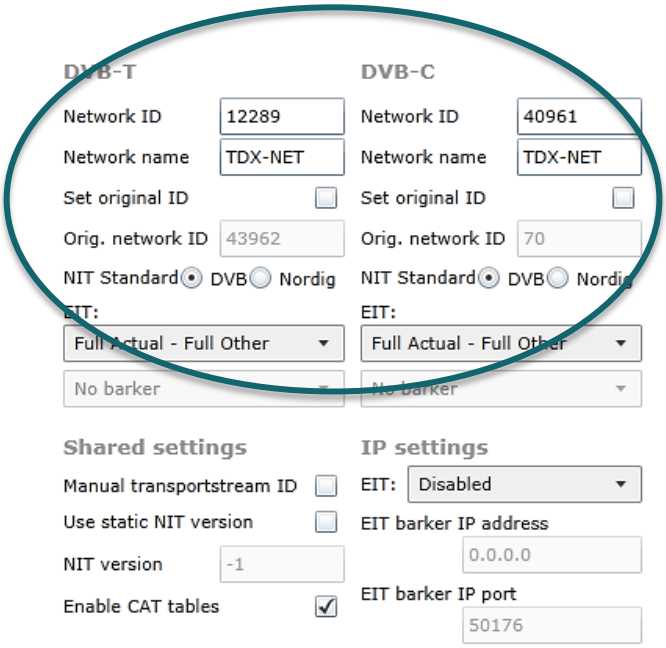


End-users need the network ID if they have to do a NIT (Network Information Table) search when searching for services on their televisions or set-top boxes. Some set-top boxes may also need the original network ID in connection with a NIT search.

Network IDs and and names are required for both both DVB-T and DVB-C.

5.2 Configuration

Network ID	Enter the required network ID in the Network ID field. If it is an open network, the network ID has to follow the "ETSI TR 101 211" guidelines. If it a closed network you can determine the ID yourself.
Network name	Enter a network name in the Network name field. The maximum number of characters you can enter in the field is 255.
Set original ID	To change the default values of the original network ID, click Set original ID checkbox to enable the Orig. network ID field.
Original network ID	Enter the required original network ID in the Orig. network ID field.
NIT standard	Select which standard you want to use, DVB or Nordig. By default DVB is selected.
EIT information	The Event Information Table (EIT) drop-down list enables you to change the EIT settings for both DVB-T and DVB-C.



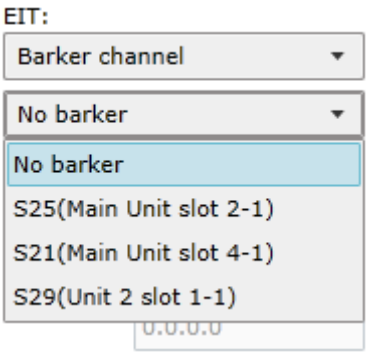
5.3 EIT information

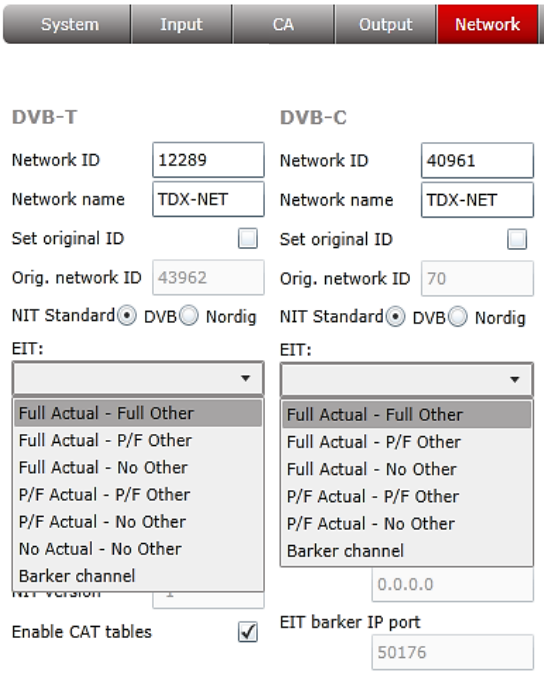
Basically, the drop-down list gives you at choice between using a barker channel or using all outputs for transmitting EIT information.

By using a barker channel all EIT information, i.e. actual present/following and actual schedule EIT for all services, will be transferred from the individual outputs to the barker channel thereby making more room/ payload available to the transmission of services.

NOTE:
If you use a barker channel to carry the EIT information you have to make sure that the set-top boxes used by end-users are NorDig compliant, i.e. they can read a Linkage Descriptor from a NIT.

To use a barker channel for transmitting all EIT information, select "Barker channel" in the EIT drop-down list. Below the EIT drop-down list, select the channel you want to use as barker channel in the drop-down list.

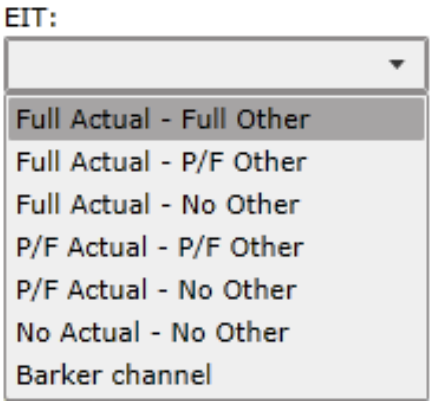




EIT information - continued

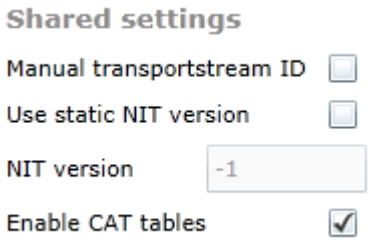
If you prefer not to use a barker channel you have the following options:

Full Actual - Full Other	All outputs will have all EIT information available, so all actual present/following, actual schedule, other present/following and other schedule EIT are sent out with all muxes.
Full Actual - P/F Other	All outputs will have actual present/following and actual schedule EIT information, but only other present/following EIT information.
Full Actual - No Other	All outputs will have actual present/following and actual schedule EIT information, and no other EIT information.
P/F Actual - P/F Other	All outputs will have actual present/following EIT information and other present/following EIT information only.
P/F Actual - No Other	All outputs will have actual present/following EIT information.
No Actual - No Other	No EIT information is output.



Shared settings:

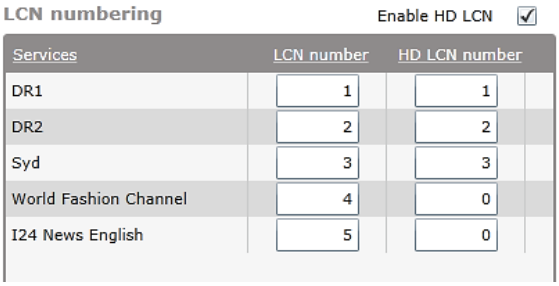
Manual transport stream ID	Select the Manual transportstream ID if you want to enable the Transportstream ID field in the Configuration windows for output modules..
Use static NIT version	By default the Use static NIT version checkbox is deselected.
NIT version	Enter the desired number in the LCN number field to the right of each service in the service list area.
Enable CAT tables	Enter the desired number in the LCN number field to the right of each service in the service list area.



In the service list area you determine the numerical output order of the digital services on the television or set-top box of the end-user.

Enable HD LCN	Select the Enable HD LCN checkbox if you want an HD channel to take precedence over the same channel in SD mode.
LCN number and HD LCN Number	Enter LCN numbers for both the SD and HD channels in the fields in the service list area.

NOTE:
You cannot give the same LCN number to more services.



5.4 Submit & Apply

When you have entered the values you require you have to click the Submit button to enter this information into the headend system. Remember to click the Apply button in the upper right-hand corner to save the new settings.

Input

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

Output

• Type	TDX BE proprietary control and data
• Connector	PCIe x1 edge connector 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 3-7:1 TS / IP packet ratio (configurable via GUI) 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

• Voltage/current	(V, mA) 12 / <600

Invironment

• Temperature, operating	(C) -10…+50
• Temperature, storage	(C) -20…+70
• Humidity, operating	(%) 20…80
• Humidity, storage	(%) 10…90

Mechanical 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) RF Connector type: F-Connector

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:

A. Simulcrypt Intro

1. Definitions

DVB Simulcrypt defines a system architecture that allows different Conditional Access Systems (CAS) to cooperate with head-end equipment from different vendors.
A Simulcrypt system provides CAS specific management and control, for use with a generic service scrambling mechanism in the head-ends

The basic Simulcrypt system consists of a single CAS server connected to a single head-end, e.g. a TDX single-unit or multi-unit system. Multiple head-ends may be connected to the same CAS server(s), distinguished by the IP addresses of the head-ends.
This makes no difference to the scenario seen from the head-end.

2. Architecture

The Simulcrypt architecture splits the CA functionality in two major parts:

- CAS server part handles the CAS specific management and control flow to distribute access rights to entitled receivers. These parts are private to each CAS vendor and comprise heavy encryption of keys and control words to be distributed in public messages but decoded by entitled receivers only. CAS servers communicate with head-ends via the Simulcrypt protocol over TCP/IP connections. The message format is standardized, but much of the message content is private to the CA system

- Head-end part performs the actual scrambling of service content and inserts the CA message flows into transport streams in a standardized way.

3. Simulcrypt in the TDX

From a high level user perspective, the Simulcrypt feature comes with Digital Backend modules (QAM, COFDM and/or IP OUT) and is made available via the licensing system. It is managed via the Service tool and connects to CAS servers over TCP/IP through the management port.

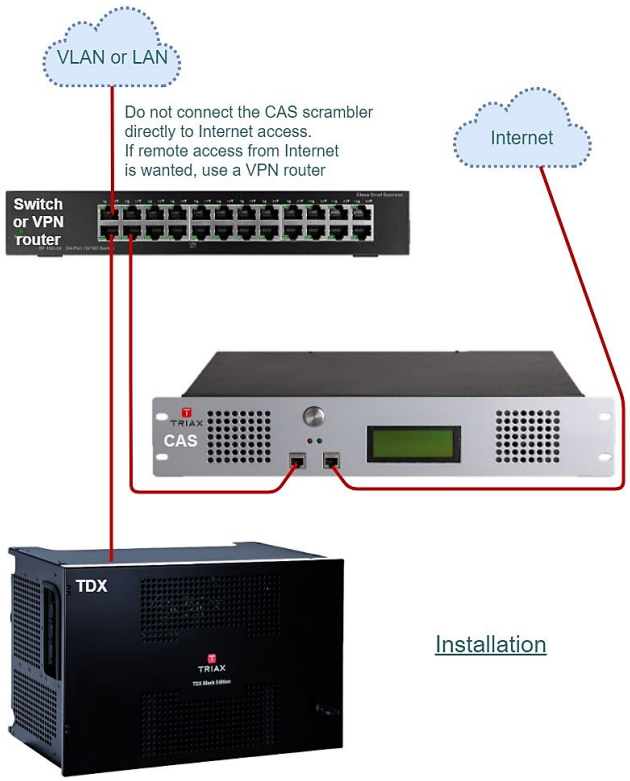
To enable Simulcrypt scrambling, the user must:

- Install one or more output modules with Simulcrypt option
- Install proper license for Simulcrypt in the TDX
- Configure CAS ID and address information per TDX system
- Connect and configure a CAS server

To enable a Simulcrypt scrambled service, the user must:

- Select a scrambler, ie. a Simulcrypt enabled backend module
- Configure CAS parameters for scrambling the service
- Map the scrambled service to outputs via the TDX pool

The CAS server and scrambler related configuration is similar to the existing configuration of CI scrambler modules.



Installation

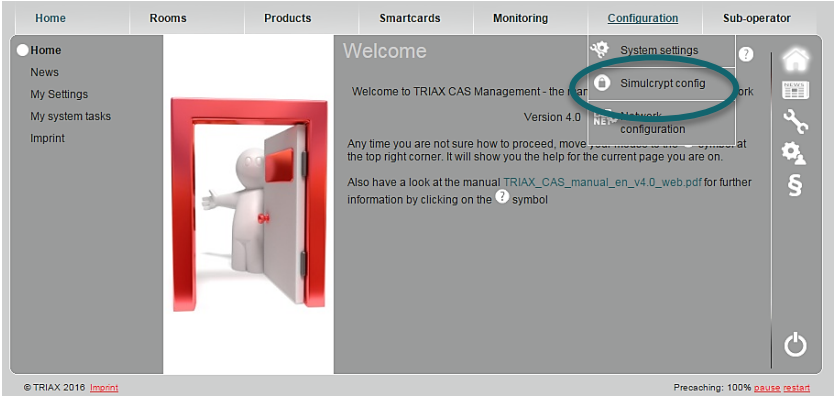
B. Panaccess setup

1. System setup description - Panaccess

- The CAS server requires internet connection for creating a VPN session to www.triax.cas.com
- The CAS scrambler port is required to be in the same network (VLAN) as the TDX
- The ECM port 12500 is forwarded to CAS scrambler port for TDX access outside VLAN
- TV & STB Connected as example above
- STB: able to Descramble service

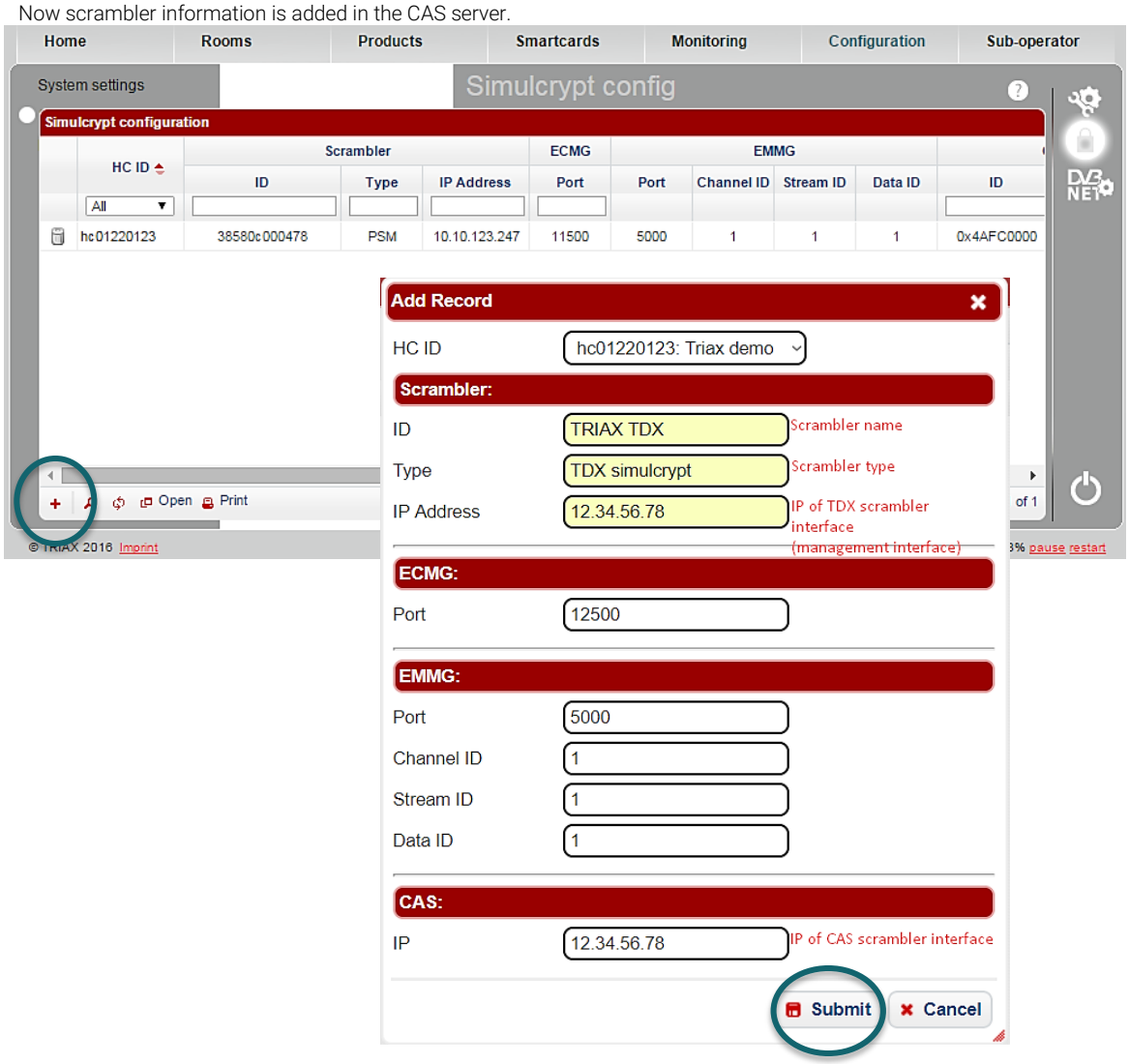
2. Simulcrypt Configuration in CAS server – login

A thorough description of how to setup, is described in the User manual for the CAS server.



3. Add scrambler information

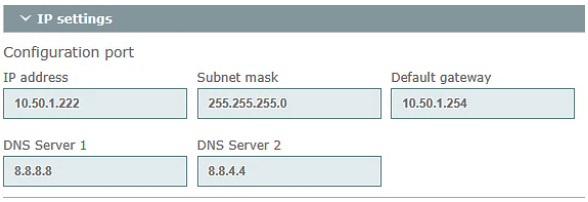
Press +
Enter scrambler information – click submit.
Now scrambler information is added in the CAS server.



C. How to set up Simulcrypt in the TDX

1. Prerequisites

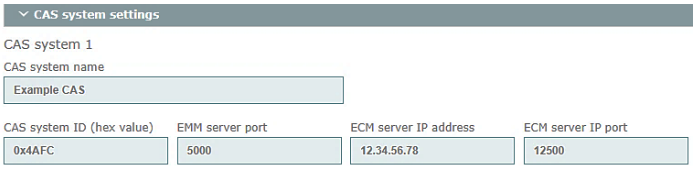
- TDX should be connected to the CAS System – see installation drawing on page I.
- TDX should have quality input signal to use
- User must have valid license(s)



The TDX configuration port has to be in the same VVLAN as the CAS server,

➢ if the CAS server has IP 10.10.85.1
– then the TDX has to be set up to 10.10.85.xx

- Enter relevant information in "CAS system settings" from TDX Admin options window.
- Enter mandatory fields in the Service tool, as shown in example.
- Click OK and apply



CAS system ID

- As shown in the CAS server Simulcrypt settings w/o zeroes/end. Ie. 0x4AFC000 is 0x4AFC
- Panaccess: 0x4AFC / Samsung: 0x112

EMM server port

- As defined in the CAS server. Default: 5000

ECM server IP adress

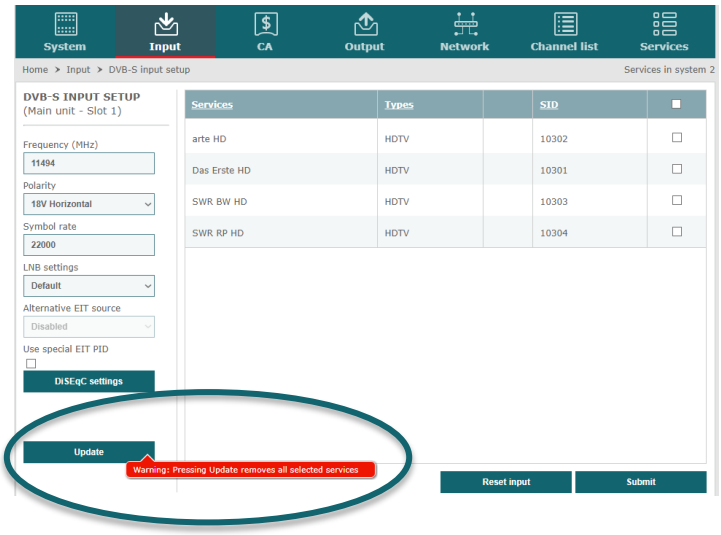
- IP adress from the CAS server

ECM server IP port

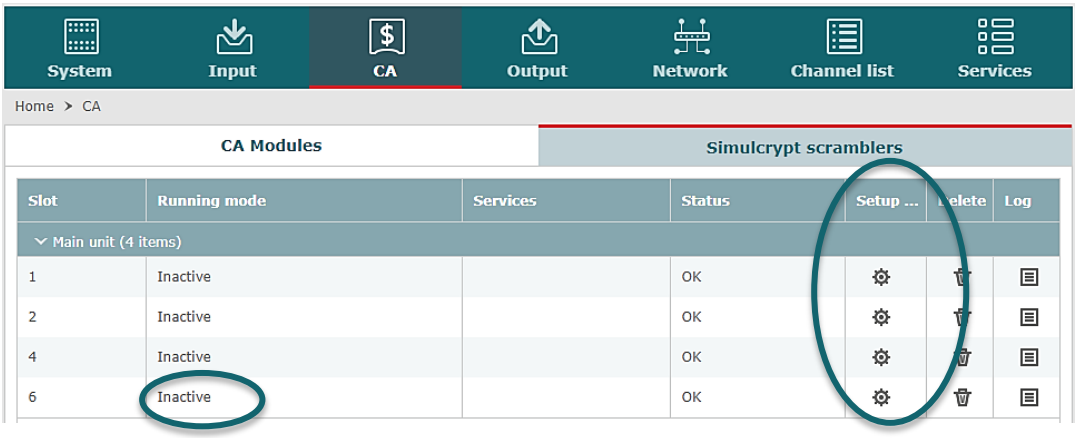
- As defined in the CAS server.
- Panaccess: 12500 / Samsung: 9999

2. How to setup a service to be scrambled

- Route non scrambled service to scrambler
- Configure "input" in TDX as example below
- Click Update and Apply – remember when clicking Update, previously selected services will be removed



Click on CA then on Simulcrypt scramblers. Click on Setup

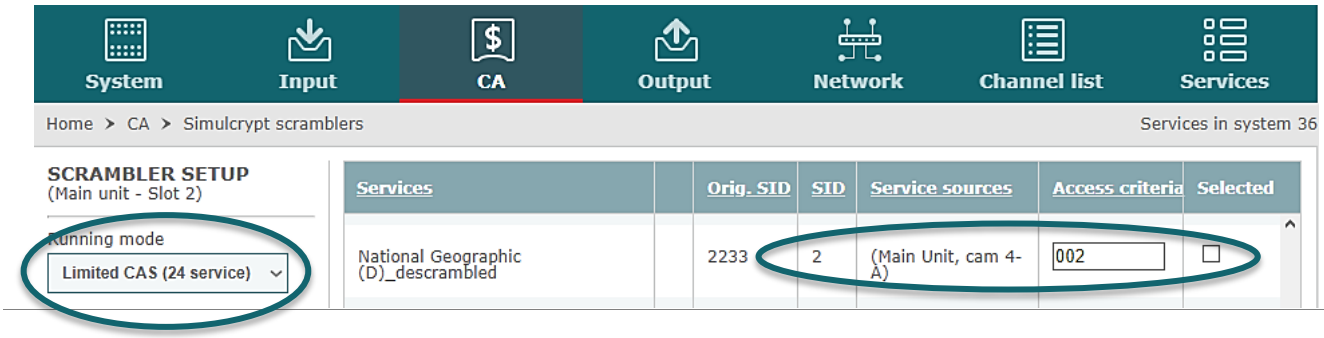


Choose running mode options:

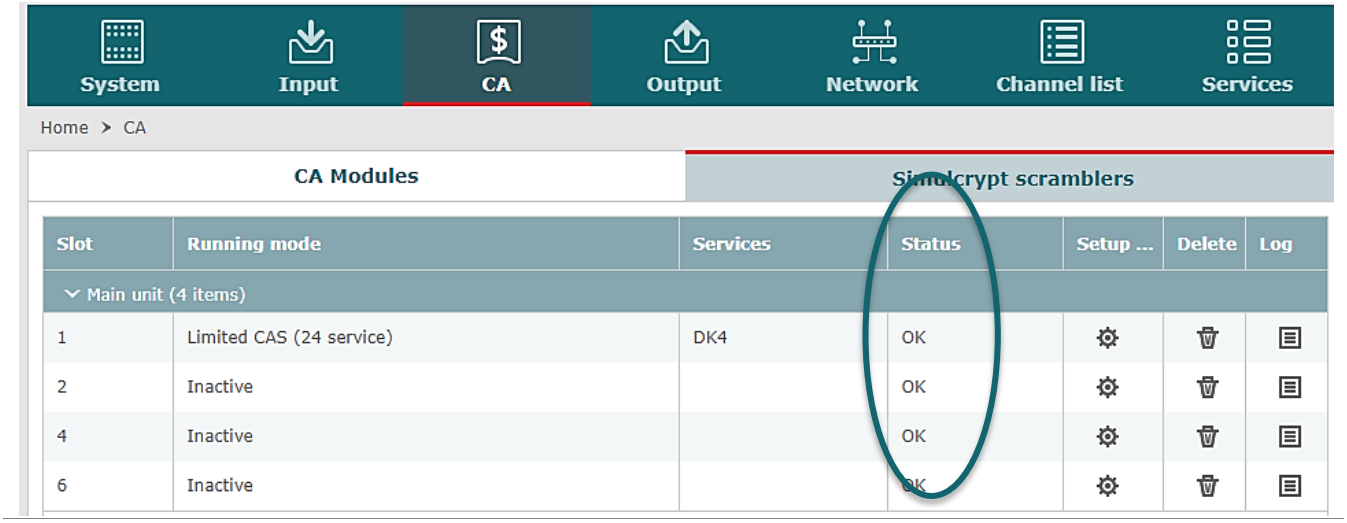
- Inactive – *no license*
- Full CAS (DIG) – *all licenses possible*
- Limited CAS (12 service) – *only 12 licenses*

- Access criteria: (0 is default) write as service SID of the service in HEX (SID 2 = 002 access criteria

- Click on Submit

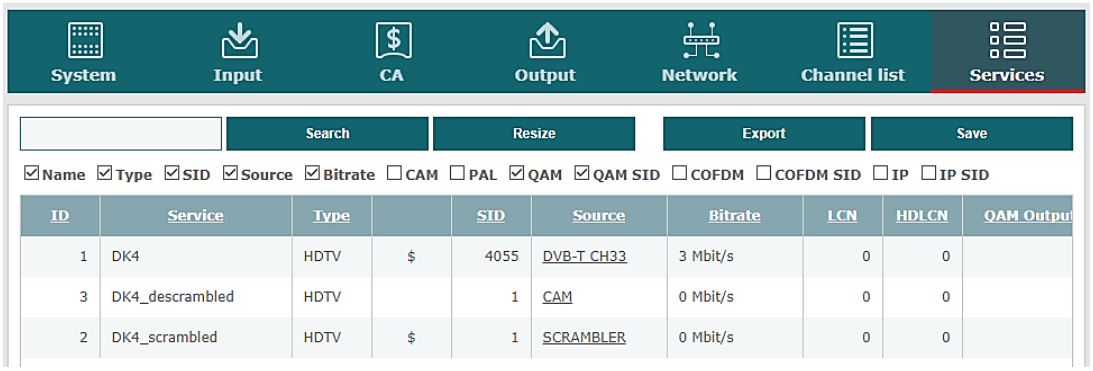


Make sure Status is OK



Make sure service is configured correct and available in "Service List" as below

- *DK4* is the "raw" channel coming direct from the antenna/dish
- *DK4_descrambled* is the descrambled channel from ie. DVB-S, descrambled by CAM +smartcard and put back into the pool
- *DK4_scrambled* is the (re) scrambled channel coming from Simulcrypt



D. Samsung DRM / LYNK server

NOTE
Samsung LYNK and SINC server installation are NOT supported by TRIAX. If support is needed, please contact Samsung support. TRIAX will however help retrieve a server license from Samsung.

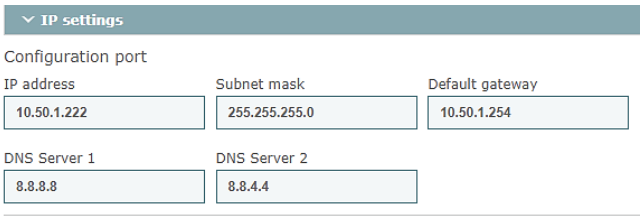
1. Prerequisites & setup

Setup TDX Simulcrypt

- TDX should be connected to the CAS System – see installation
- TDX input signal should be good quality
- User must have valid license(s)
- The TDX configuration port has to be in the same VVLAN as the CAS server, - if the CAS server has IP 10.10.85.1, then the TDX has to be set up to 10.10.85.xx

- Enter relevant information in "CAS system settings" from TDX Admin options window.
- Enter mandatory fields in the Service tool, as shown in example.
- Click OK and apply

- Software, version 4.2.x.xxxx or newer
- "4180xx – Samsung DRM" Licence
- Configure Simulcrypt as described in chapter A and B
- Configure services to be scrambled



CAS system ID

- As shown in the CAS server Simulcrypt settings w/o zeroes/end. Ie. 0x4AFC000 is 0x4AFC
- Panaccess: 0x4AFC / **Samsung: 0x112**

EMM server port

- As defined in the CAS server. Default: 5000

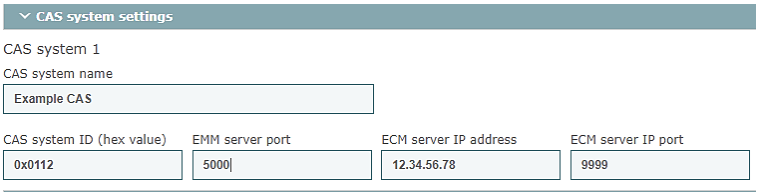
ECM server IP adress

- IP adress from the CAS server

ECM server IP port

- As defined in the CAS server.

Panaccess: 12500 / **Samsung: 9999**



Setup LYNK (DRM) / SINC server

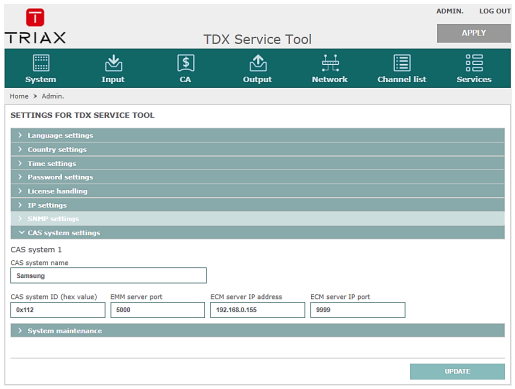
- Hardware – Dual core 2GHz / 4GB RAM / 100GB HD
- Software required
  - Windows 2008 server or newer / Win7 can be used for test
  - Java Runtime Environment – JRE (latest version)
  - Tomcat (ver. 6,7, or 8)
  - Samsung LYNK / SINC software

- Prepare a server running the operating system needed
- Install Samsung CAS server (LYNK)
- Configure Samsung Cas server
- Install SINC server
- Configure SINC server

2. Configure TDX and CAS system settings

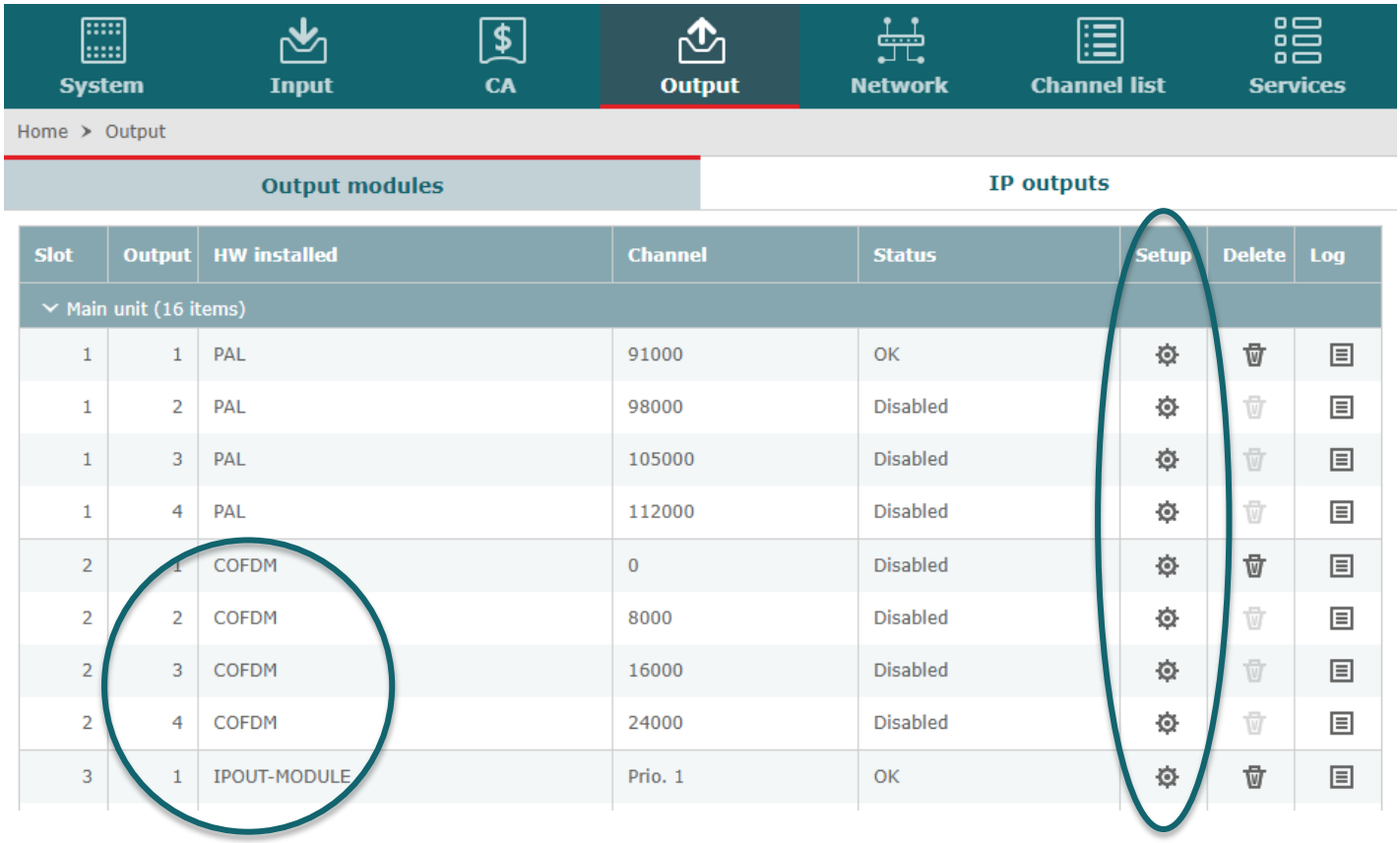
- Purchase and enter the Samsung DRM license
- Configure CAS settings
  - CAS ID: 0x112 (Samsung DRM)
  - EMM port: default port "5000"
  - ECM server: IP address of LYNK server
  - ECM port: default port "9999"

- These CAS settings must be provided form the person installing the LYNK server



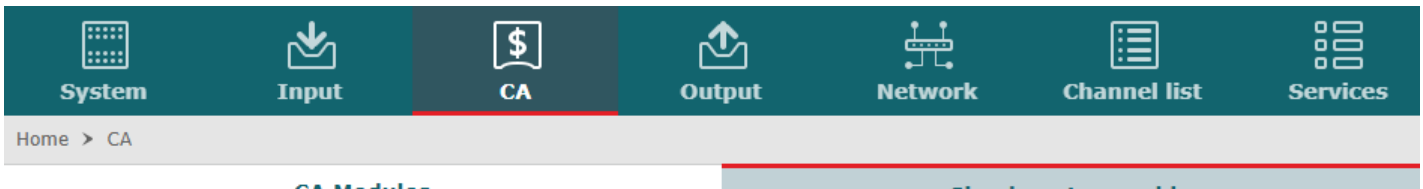
E. Visuel guide to setup for all scrambling methods

- Configuring Simulcrypt scramblers, use only Digital output modules (QAM, CoFDM, IP) not Analog modules.
- When module is found, then press Setup



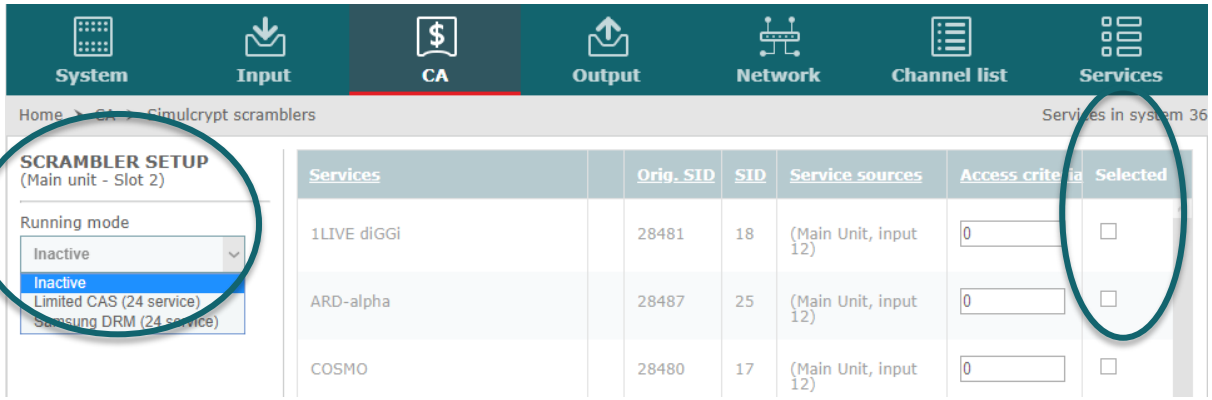
Slot	Output	HW installed	Channel	Status	Setup	Delete	Log
Main unit (16 items)							
1	1	PAL	91000	OK			
1	2	PAL	98000	Disabled			
1	3	PAL	105000	Disabled			
1	4	PAL	112000	Disabled			
2	1	COFDM	0	Disabled			
2	2	COFDM	8000	Disabled			
2	3	COFDM	16000	Disabled			
2	4	COFDM	24000	Disabled			
3	1	IPOUT-MODULE	Prio. 1	OK			

- On the CA tab, press Setup

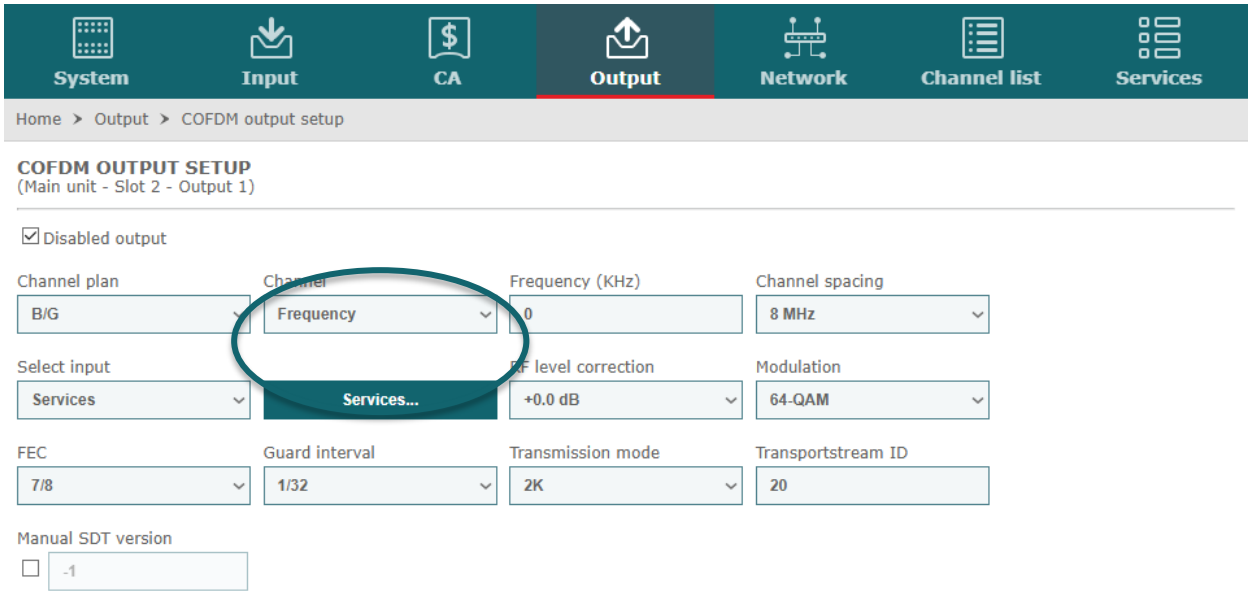


Slot	Running mode	Services	Status	Setup	Delete	Log
Main unit (3 items)						
2	Inactive		OK			
3	Inactive		OK			
4	Inactive		OK			

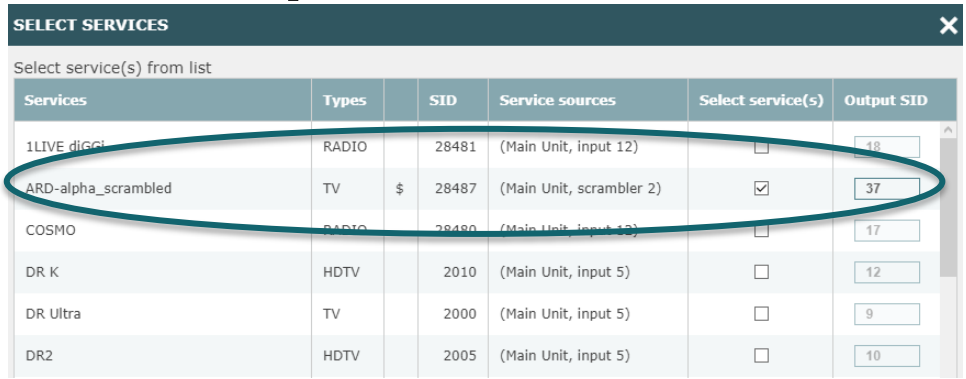
- Select running mode, then select service to be scrambled



- On the Output tab, select Services



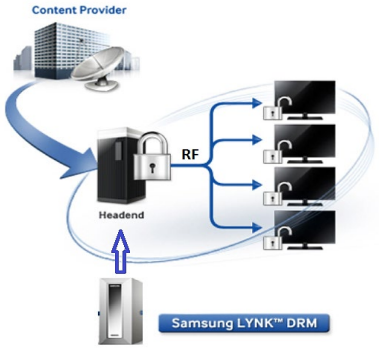
- And then select the _scrambled service



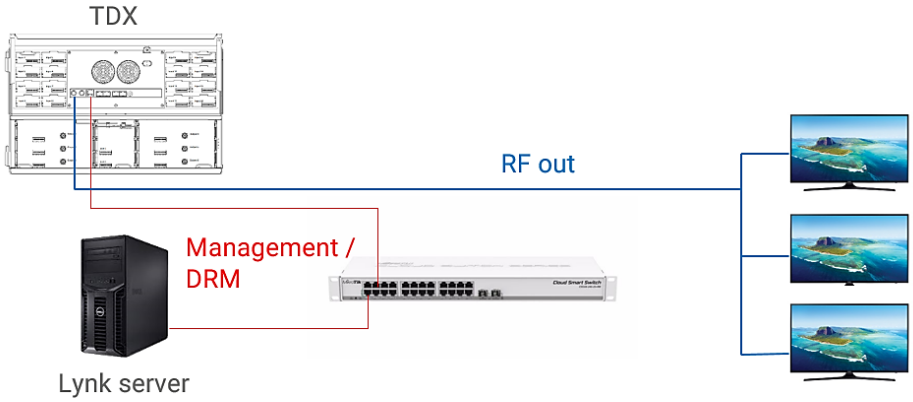
F. LYNK server – purpose & principle

1. The purpose of the LYNK server

- The DRM (Digital rights management) server
- Provides the
  - ECM (entitled control message)
  - EMM (entitled management message)
- Works solely with RF output (DVB-T / -C)
  - IP out requires additional SINC server

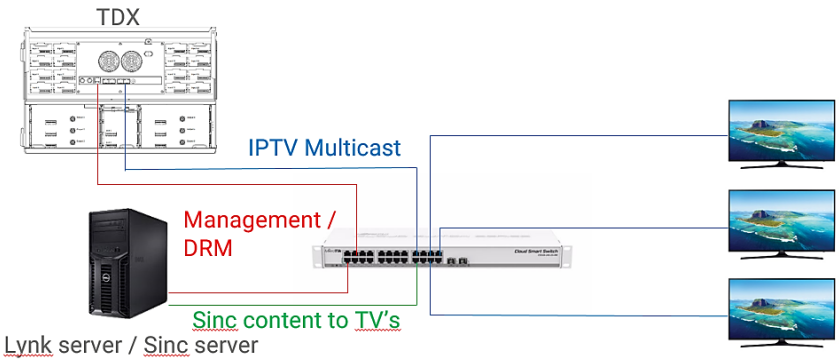


2. Principle diagram RF out



- The TDX uses the management port, and the LYNK server must be connected to the same VLAN
- They communicate and exchange data (TDX sends controlword and receives EMM / ECM)
- The TDX distributes the EMM's and ECM's in the RF output signal

3. Principle diagram IP out



- The TDX uses the management port, and the LYNK server the Ethernet interface – they must be in the same VVLAN
- IPTV and SINC server must also be on same VVLAN. IGMP is always configured on IPTV VVLAN
- The LYNK and SINC server is running on same H/W with one NIC (network interface controller)
- They communicate and exchange data (TDX sends controlword and receives EMM / ECM)
- The TV sets will communicate with the SINC server and receive their certificates; which is necessary for the TV's to run IP mode in the network.
- The TDX output is IP multicast

6. Your notes

TRIAX
connecting the future

For further information
and updated manuals go to

triax.com/support

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