

User manual

QAM output module

Model		Item no.	
QAM output module		492055	
		492056	
Version	F	Date	08/2016
		EN	

Attention! / Achtung! / Consignes de sécurité!

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.

EN

- 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.

Table of contents / Inhaltsverzeichnis / Sommaire

Attention! / Achtung! / Consignes de sécurité!	2
1. Introduction	4
1.1 Box content	4
1.2 QAM module	4
1.3 Labels	4
1.4 Installation of module	5
1.5 Removal of module	5
1.6 CAM / Smart card	6
1.7 Status LED	6
2. TDX service tool	7
2.1 Log in	7
2.2 CA window	8
2.3 CA modules configuration window	8
2.4 Card speed	9
2.5 Choose source (Pool or Transparent CAM)	9
2.6 Use constant bitrate	9
2.7 Card function	10
2.8 Service list area	10
2.9 ER checkbox	11
2.10 Filter options	11
2.11 Common interface	12
2.12 Reset CAM	13
2.13 Submit & Apply	13
2.14 Status information	13
2.15 Delete CA modul	13
2.16 Event log	13
3. Simulcrypt	14
3.1 Definitions	14
3.2 Architecture	14
3.3 Simulcrypt in the TDX	14
3.4 System setup description	14
3.5 Simulcrypt Configuration in Panaccess	15
3.6	15
3.7	15
3.8 Login to Panaccess – access Simulcrypt	15

3.9	Add scrambler information	16
4	How to set up Simulcrypt in the TDX	17
4.1	Prerequisites	17
4.2	How to setup a service to be scrambled	17
4.3	Troubleshooting	20
5	Output window	21
5.1	Definitions	21
5.2	Configuration of output modules.....	22
5.3	Services from the TDX pool	24
5.4	Services from input module	26
5.5	Additional configuration.....	26
5.6	Payload monitor	27
5.7	Status information.....	27
5.8	Check configuration	28
5.9	Delete output modules	28
5.10	Event log	28
6	Network window	29
6.1	Definitions	29
6.2	Configuration.....	30
6.3	EIT information.....	30
6.4	Submit & Apply	32
7	Channel list	33
8	Save configuration	33
9	Your notes	34
	Declaration of Conformity	35

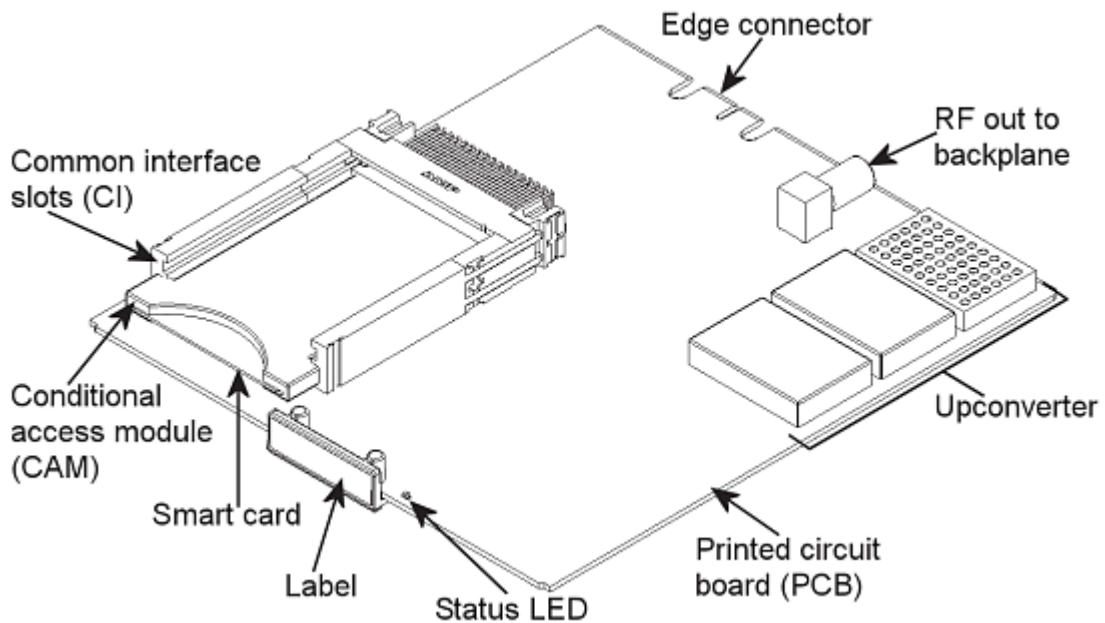
1. Introduction

1.1 Box content

A new output module is wrapped in antistatic bubble wrap and packed in a cardboard box when you receive it. Included in the box is a user guide instructing you in how to use the TDX Service Tool to configure the module.

1.2 QAM module

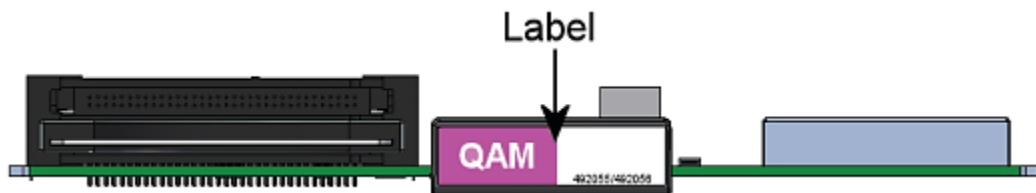
The QAM output module is available in two versions, one version with Common Interface (CI) and one without. Below you can see an illustrated description of a QAM module with CI slots.



1.3 Labels

A label is placed on the output module where you can write the information regarding the configuration of the module. Besides the information that you write on the label, the module type and part number are also displayed on the label.

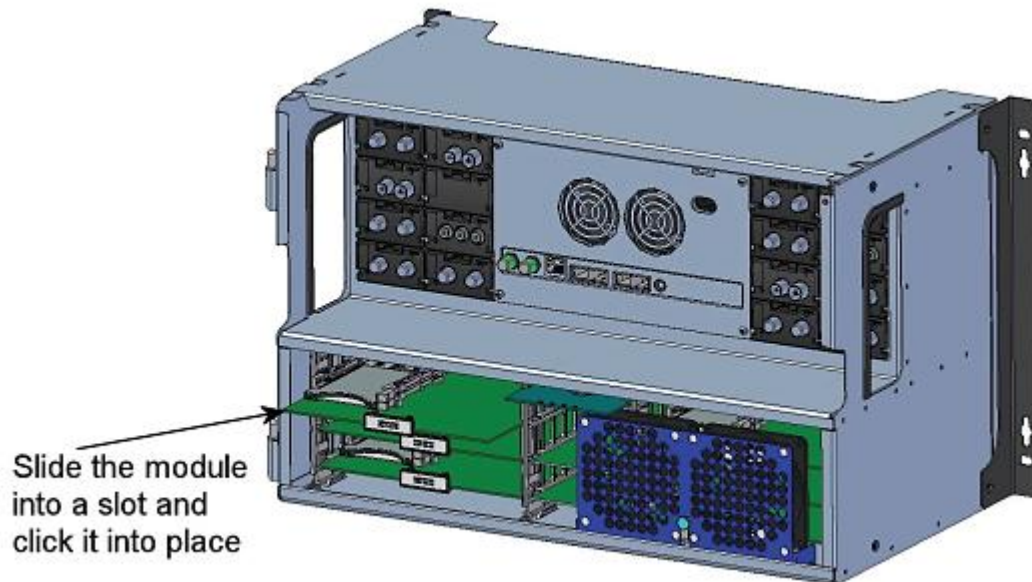
NOTE:
The coloured part of the label informs you of the module type. Each type of module is allocated a unique coloured label.



On the bottom of the module you will find a label with the bar code and a serial number printed on it.

1.4 Installation of module

You install an output module by sliding the module into a module slot in the lower section of the headend unit and click it into place.

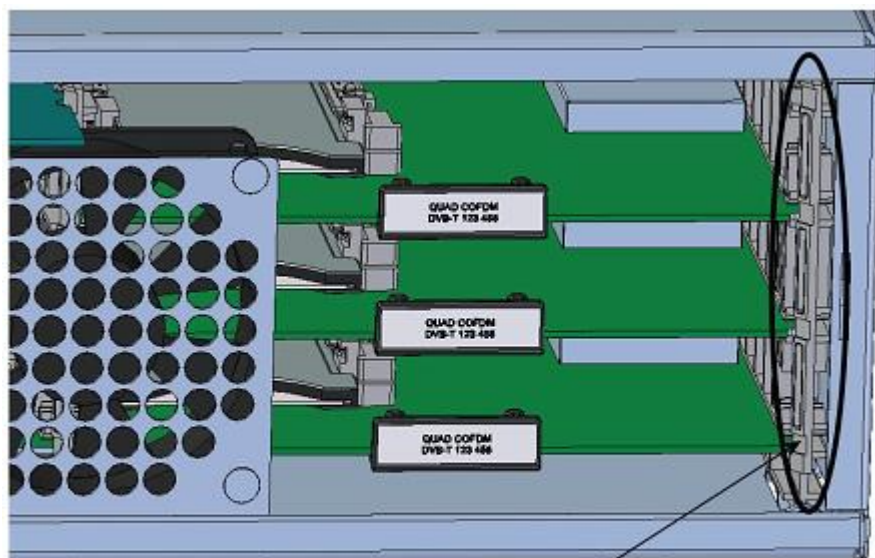


NOTE:

You can use hot swapping when you insert a module into or remove a module from the TDX system.

1.5 Removal of module

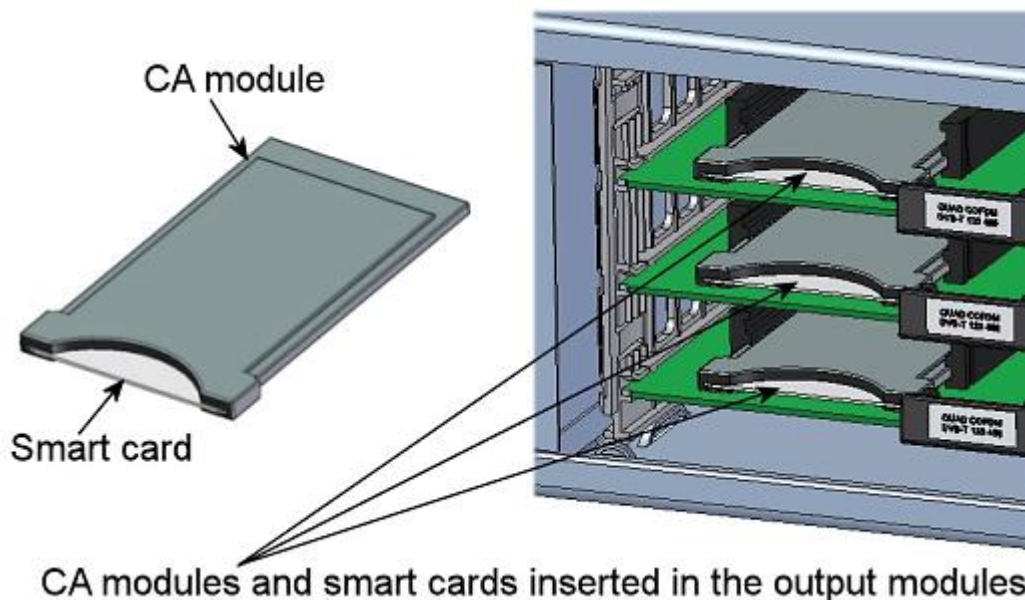
You release a CI module from a slot by using the lock mechanism that is placed to the right of the modules in the output section. Move the lock mechanism slightly to release the module.



To take a module out of a slot in the output section, tip the lock mechanism and then pull the module out

1.6 CAM / Smart card

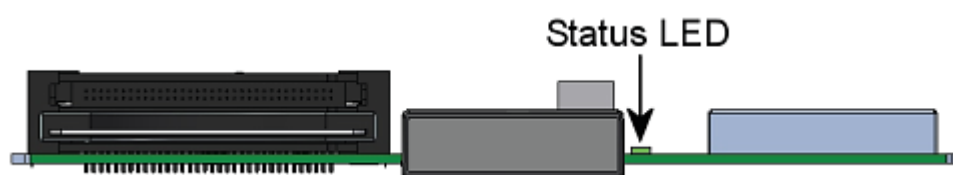
You can insert 2 Conditional Access modules (CA) into each of those output modules that have Common Interface (CI) slots. Each CA module is able to unscramble at least one service. Which services depend on the service provider of the CA module and smart card.



1.7 Status LED

There is a status LED on the front of each module. The LED indicates whether the module functions according to its purpose or fails.

Green - flashing	The output module receives data.
Green - constant on	The output module receives valid services.
Red	When starting the TDX system the output module and the system controller negotiate connection speed. If the LED continues to be red either the output module or the system controller has not been inserted correctly.
No colour	The output module has not been configured yet or the module has not been inserted correctly.



When you update the software of a module the status LED provides you with information about the updating process.

Orange	Boot loader state.
Temporary off	Initiation of the software update.
GMT Offset:	Menu is valid only when selected "User Define" in GMT Usage menu . The GMT offset range is "-11:30 ~ +12:00", increasing half hour progressively.
Temporary green	Every time the modules receives a valid data package. Repeated until the update is completed without errors.
Red	" Software update failed.

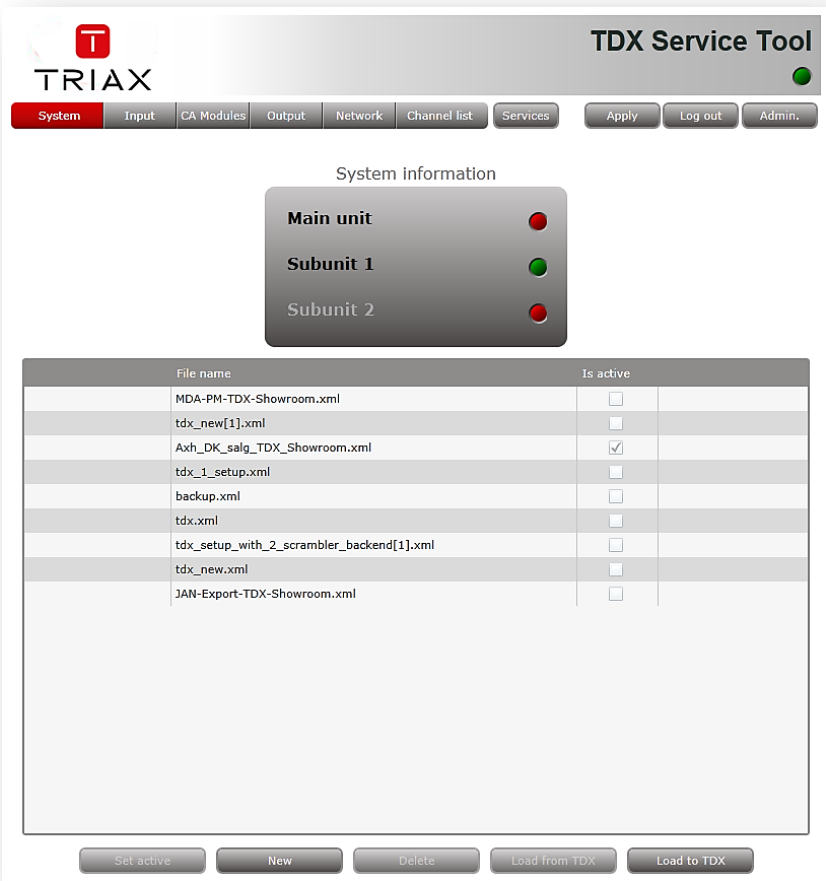
2. TDX service tool

2.1 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"

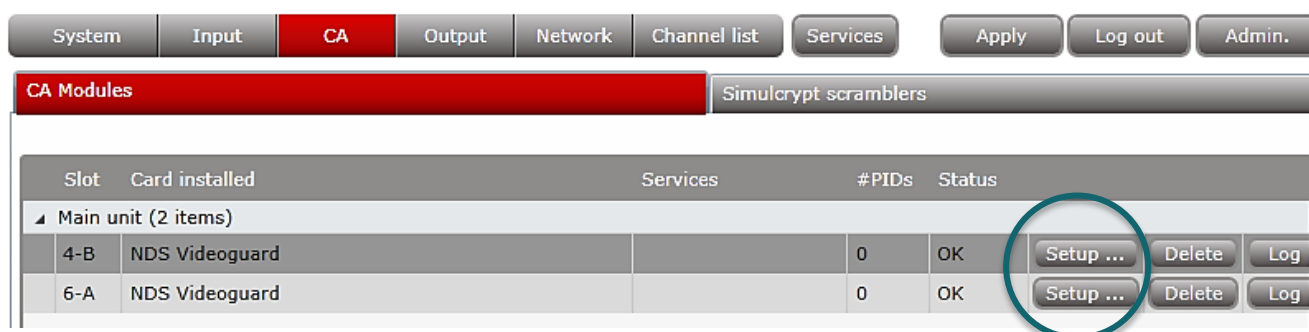


Enter Password and press "Log in" – system window is displayed



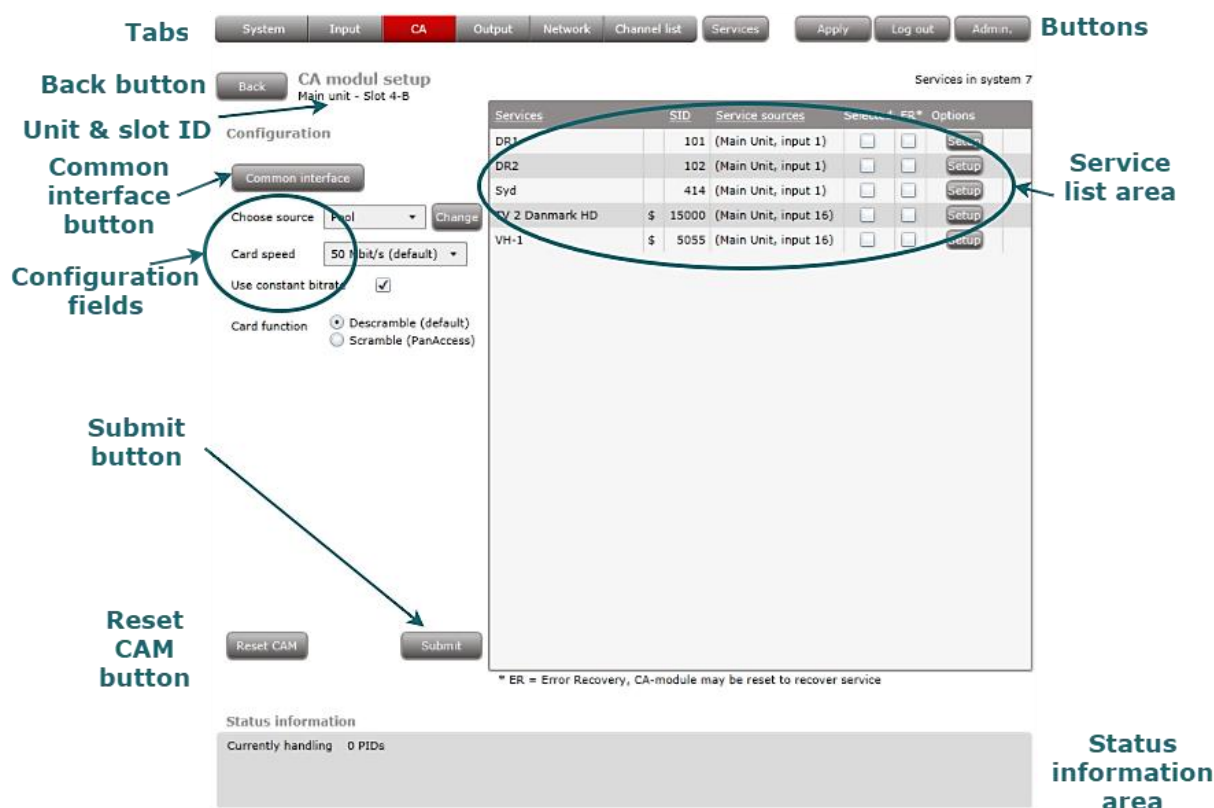
2.2 CA window

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.



2.3 CA modules configuration window

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



2.4 Card speed

Open the drop-down list with the card speeds if you want a higher card speed than the default card speed. Select the required card speed.

System
Input
CA
Output
Network
Channel list
Services
Apply
Log out
Admin.

Back

CA modul setup
 Main unit - Slot 4-B

Configuration

Common interface

Choose source Pool Change

Card speed 50 Mbit/s (default)

Use constant bit 72 Mbit/s

Card function 96 Mbit/s

☒ Scramble (PanAccess)

Services in system 6

Services	SID	Service sources	Selected	ER*	Options
DR1	101	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
DR2	102	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
Syd	414	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
TV 2 Danmark HD	\$ 15000	(Main Unit, input 16)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
TV SYD	1214	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
VH-1	\$ 5055	(Main Unit, input 16)	<input type="checkbox"/>	<input type="checkbox"/>	Setup

2.5 Choose source (Pool or Transparent CAM)

You can choose to get your source from either the Pool or Transparent CAM.

System
Input
CA
Output
Network
Channel list
Services
Apply
Log out
Admin.

Back

CA modul setup
 Main unit - Slot 4-B

Configuration

Common interface

Choose source Pool Change

Card speed Input 1 DVB-T

Use constant bit Input 16 DVB-T2

Card function ☒ Descramble (default)

☐ Scramble (PanAccess)

Services in system 7

Services	SID	Service sources	Selected	ER*	Options
DR1	101	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
DR2	102	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
Syd	414	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
TV 2 Danmark HD	\$ 15000	(Main Unit, input 16)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
VH-1	\$ 5055	(Main Unit, input 16)	<input type="checkbox"/>	<input type="checkbox"/>	Setup

2.6 Use constant bitrate

This check box is selected as default. If you prefer a variable bitrate, instead of a bitrate where null packets are used to keep the bitrate constant, click the check box to deselect the use of constant bitrate.

2.7 Card function

Here you decide whether you want the CA module to descramble services that are scrambled or you want the module to scramble services that are not scrambled. The Descramble button is default. Click the Scramble (PanAccess) button if you want to scramble services using the PanAccess Scrambler.

System

Input

CA

Output

Network

Channel list

Services

Apply

Log out

Admin.

Back

CA modul setup
Main unit - Slot 4-B

Configuration

Common interface

Choose source

Pool

Change

Card speed

50 Mbit/s (default)

Use constant bitrate
☒

Card function

☒ Descramble (default)
☐ Scramble (PanAccess)

Services in system 7

Services	SID	Service sources	Selected	ER*	Options
DR1	101	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	<div style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">Setup</div>
DR2	102	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	<div style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">Setup</div>
Syd	414	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	<div style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">Setup</div>
TV 2 Danmark HD	\$ 15000	(Main Unit, input 16)	<input type="checkbox"/>	<input type="checkbox"/>	<div style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">Setup</div>
VH-1	\$ 5055	(Main Unit, input 16)	<input type="checkbox"/>	<input type="checkbox"/>	<div style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">Setup</div>

2.8 Service list area

Select the service(s) that you want to descramble in the Service list area by clicking the service(s) at the selected button. Scrambled services are marked with a dollar sign - \$.

System

Input

CA

Output

Network

Channel list

Services

Apply

Log out

Admin.

Back

CA modul setup
Main unit - Slot 4-B

Configuration

Common interface

Choose source

Pool

Change

Card speed

50 Mbit/s (default)

Use constant bitrate
☒

Card function

☒ Descramble (default)
☐ Scramble (PanAccess)

Services in system 7

Services	SID	Service sources	Selected	ER*	Options
DR1	101	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	<div style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">Setup</div>
DR2	102	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	<div style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">Setup</div>
Syd	414	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	<div style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">Setup</div>
TV 2 Danmark HD	\$ 15000	(Main Unit, input 16)	<input type="checkbox"/>	<input type="checkbox"/>	<div style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">Setup</div>
VH-1	\$ 5055	(Main Unit, input 16)	<input type="checkbox"/>	<input type="checkbox"/>	<div style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">Setup</div>

2.9 ER checkbox

If you select the ER checkbox of a service in the list area, you enable automatic error recovery for the service. By selecting the ER checkbox you enable a constant monitoring of the signal transmission status through the CA module.

The CA module is automatically reset if the signal transmission fails. When a CA module is reset, the signal transmission is interrupted for all the services associated with that CA module.

The ER checkbox should not be enabled for services where signals are not transmitted on a 24-hour basis.

System
Input
CA
Output
Network
Channel list
Services
Apply
Log out
Admin.

Back

CA modul setup
 Main unit - Slot 4-B

Configuration

Common interface

Choose source Pool Change

Card speed 50 Mbit/s (default)

Use constant bitrate ☒

Card function ☒ Descramble (default)
☐ Scramble (PanAccess)

Services in system 7

Services	SID	Service sources	Selected	ER*	Options
DR1	101	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
DR2	102	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
Syd	414	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
TV 2 Danmark HD	\$ 15000	(Main Unit, input 16)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
VH-1	\$ 5055	(Main Unit, input 16)	<input type="checkbox"/>	<input type="checkbox"/>	Setup

2.10 Filter options

To change the Filter options for a service, click the Setup button of the service in question to open the Filter options window.

System
Input
CA
Output
Network
Channel list
Services
Apply
Log out
Admin.

Back

CA modul setup
 Main unit - Slot 4-B

Configuration

Common interface

Choose source Pool Change

Card speed 50 Mbit/s (default)

Use constant bitrate ☒

Card function ☒ Descramble (default)
☐ Scramble (PanAccess)

Services in system 7

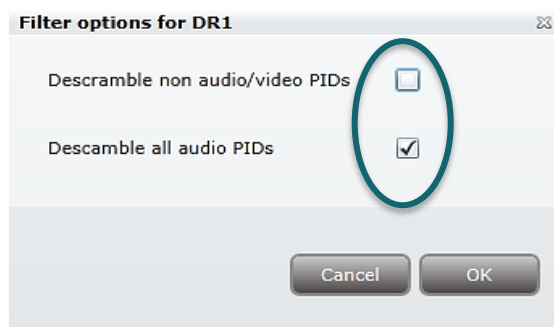
Services	SID	Service sources	Selected	ER*	Options
DR1	101	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
DR2	102	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
Syd	414	(Main Unit, input 1)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
TV 2 Danmark HD	\$ 15000	(Main Unit, input 16)	<input type="checkbox"/>	<input type="checkbox"/>	Setup
VH-1	\$ 5055	(Main Unit, input 16)	<input type="checkbox"/>	<input type="checkbox"/>	Setup

By default all audio PIDs (Packet Identifier) associated with the service are descrambled.

To descramble all PIDs that are not audio or video related, click the Descramble non audio/video PIDs checkbox.

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

Deselecting the Descramble all audio PIDs checkbox, displays a field with a drop-down list below the checkbox.

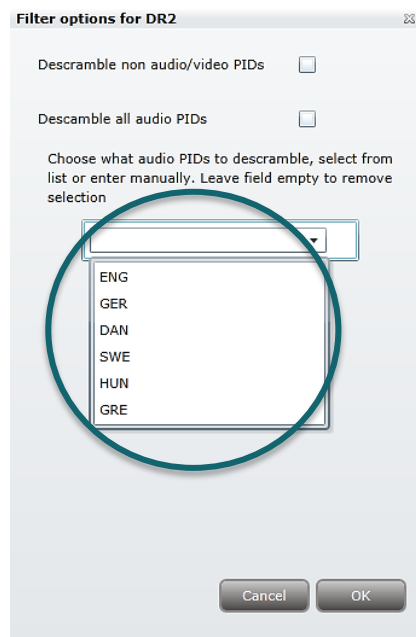
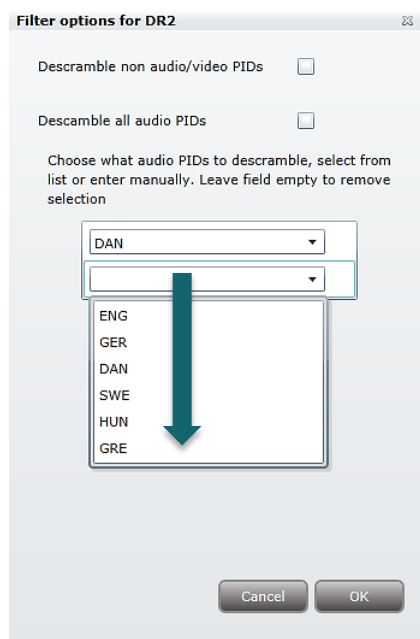


Open the drop-down list and select the the language of the audio PID you want to descramble.

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.

2.11 Common interface

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.

2.12 Reset CAM

If the CA module malfunctions, click the Reset CAM button to reboot the CA module.

A message window is displayed asking you to confirm that you want to reset the CA module.

When a CA module is reset, the signal transmission is interrupted for all the services associated with that CA module.



2.13 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.



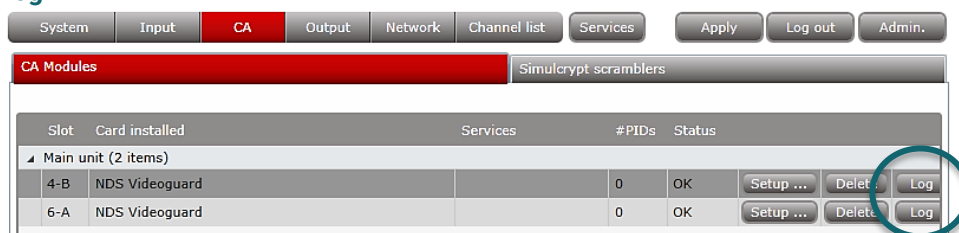
2.14 Status information

To be implemented later.

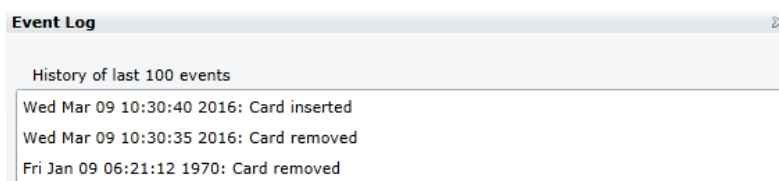
2.15 Delete CA modul

If you want to remove a CA module, click the Delete button of the module in question in the CA Modules window. A message window is displayed asking you to confirm that you want to remove the output module.

2.16 Event log



If you want to display a history of the events related to the CA module, click the Log button of the module in question to open the Event Log window.



3. Simulcrypt

3.1 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.

3.2 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** perform the actual scrambling of service content and inserts the CA message flows into transport streams in a standardized way.

3.3 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:

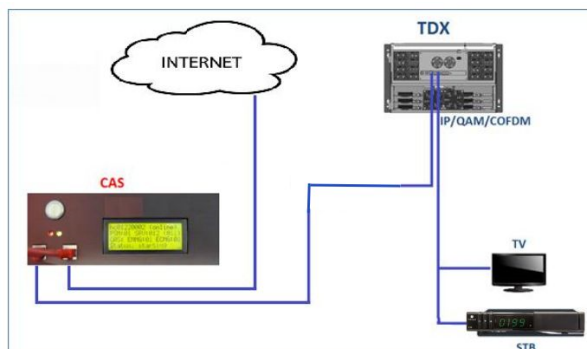
- Select a scrambler, ie. a Simulcrypt enabled backend module
- Configure CAS parameters for scrambling the service
- Map the scrambled service to outputs via the TDX pool

The CAS server and scrambler related configuration is inspired by the existing configuration of CI scrambler modules.

3.4 System setup description

- TDX & CAS need to be connected in SAME LAN
- TV & STB Connected as example above
- STB: able to Descramble service

Now TDX and CAS system both in same LAN



3.5 Simulcrypt Configuration in Panaccess

Configure as example below

HomeRoomsProductsSmartcardsMonitoringConfigurationSub-operat

System settings

Simulcrypt config

Simulcrypt configuration

HC ID	Scrambler		ECMG	EMMG				ID	
	ID	Type		IP Address	Port	Channel ID	Stream ID		Data ID
All									
hc01220123	38580c000478	PSM	10.10.123.247	11500	5000	1	1	1	0x4AFC0000

OpenPrint

Page 1 of 1200

View 1 - 1 of 1

© TRIAX 2016 Imprint

Precaching: 60.3% pause

3.6


•

3.7

3.8 Login to Panaccess – access Simulcrypt

HomeRoomsProductsSmartcardsMonitoringConfigurationSub-operator

HomeNewsMy SettingsMy system tasksImprint



Welcome

Welcome to TRIAX CAS Management - the man

Version 4.0

Any time you are not sure how to proceed, move your mouse to the ? symbol at the top right corner. It will show you the help for the current page you are on.

Also have a look at the manual TRIAX_CAS_manual_en_v4.0_web.pdf for further information by clicking on the ? symbol

System settings

Simulcrypt config

Network configuration

Home

NEWS

Wrench

Gears

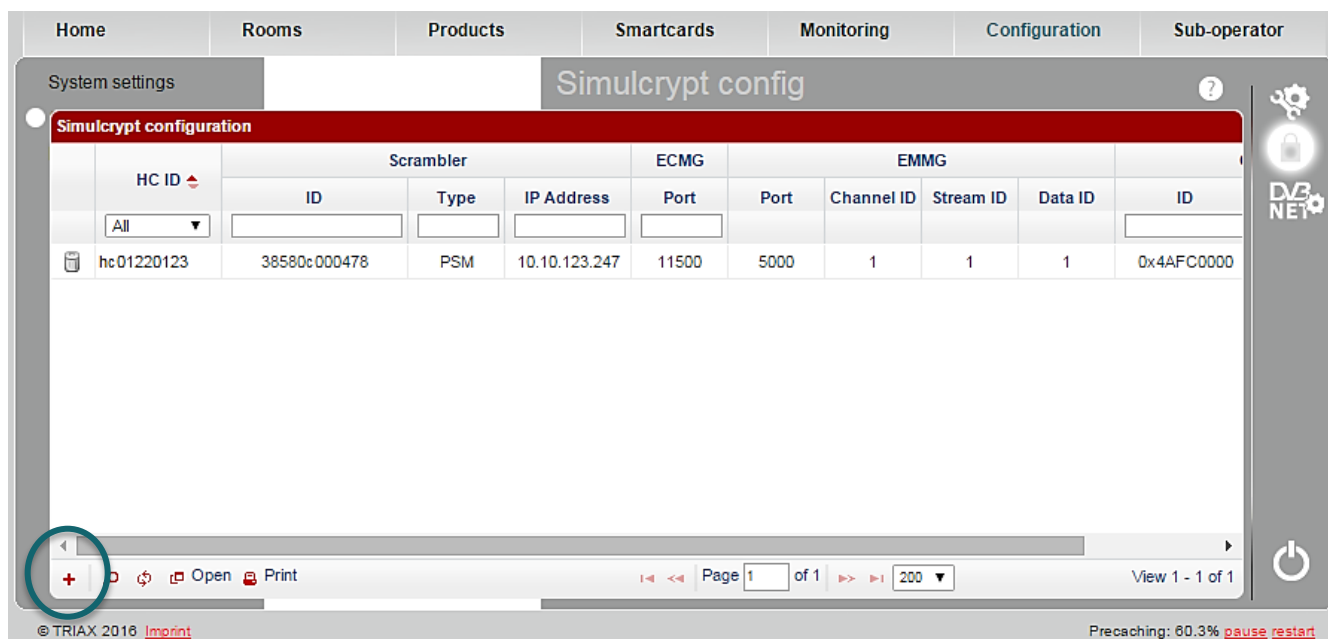
S

Power

© TRIAX 2016 Imprint

Precaching: 100% pause restart

3.9 Add scrambler information



System settings | **Simulcrypt config** | ?

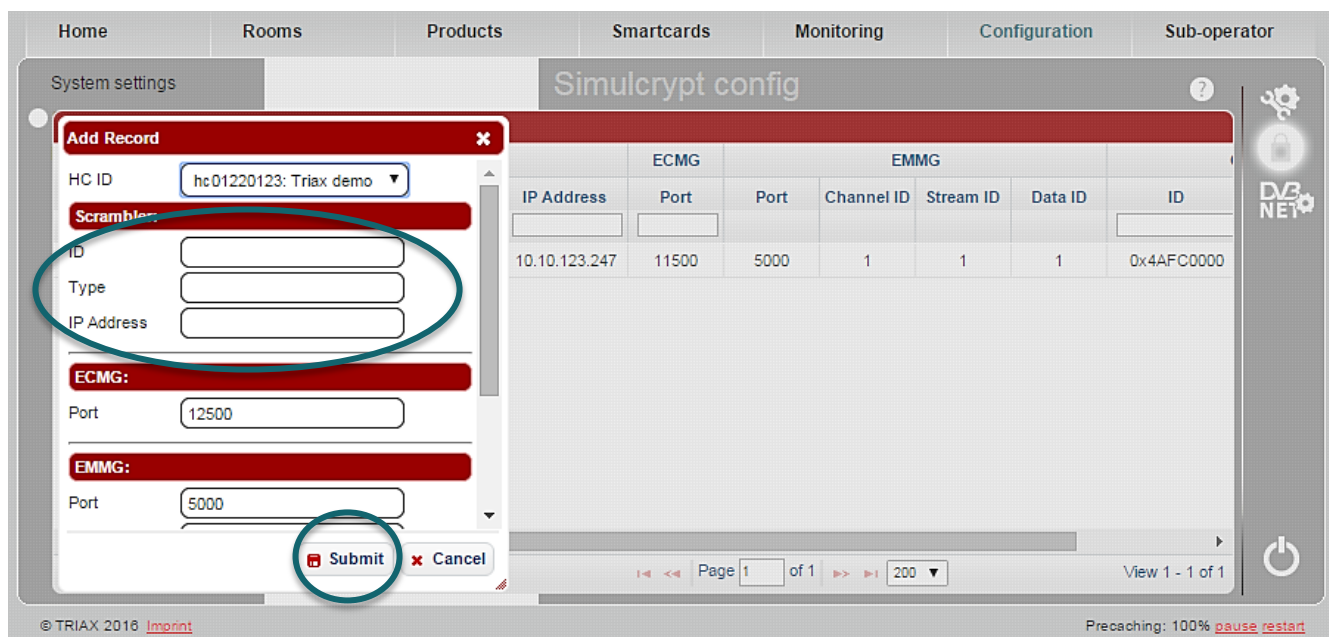
Simulcrypt configuration

HC ID	Scrambler			ECMG		EMMG			ID
	ID	Type	IP Address	Port	Port	Channel ID	Stream ID	Data ID	
hc01220123	38580c000478	PSM	10.10.123.247	11500	5000	1	1	1	0x4AFC0000

+ Open Print Page 1 of 1 View 1 - 1 of 1

© TRIAX 2016 [Imprint](#) Precaching: 60.3% [pause](#) [restart](#)

Press +
Enter scrambler information – click submit.
Now scrambler information is added in the Panaccess System.



System settings | **Simulcrypt config** | ?

Add Record ✕

HC ID: hc01220123: Triax demo

Scrambler:

ID:

Type:

IP Address:

ECMG:

Port:

EMMG:

Port:

IP Address	ECMG		EMMG			ID
	Port	Port	Channel ID	Stream ID	Data ID	
10.10.123.247	11500	5000	1	1	1	0x4AFC0000

Page 1 of 1 View 1 - 1 of 1

© TRIAX 2016 [Imprint](#) Precaching: 100% [pause](#) [restart](#)

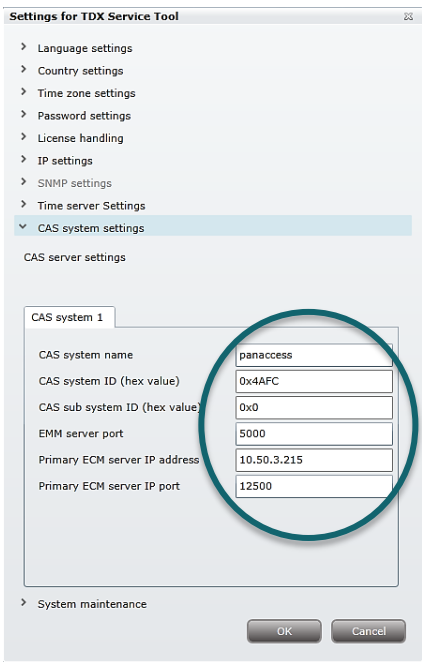
4 How to set up Simulcrypt in the TDX

4.1 Prerequisites

- TDX should be connected to the CAS System
- TDX should have quality input signal to use
- User should have license(s)

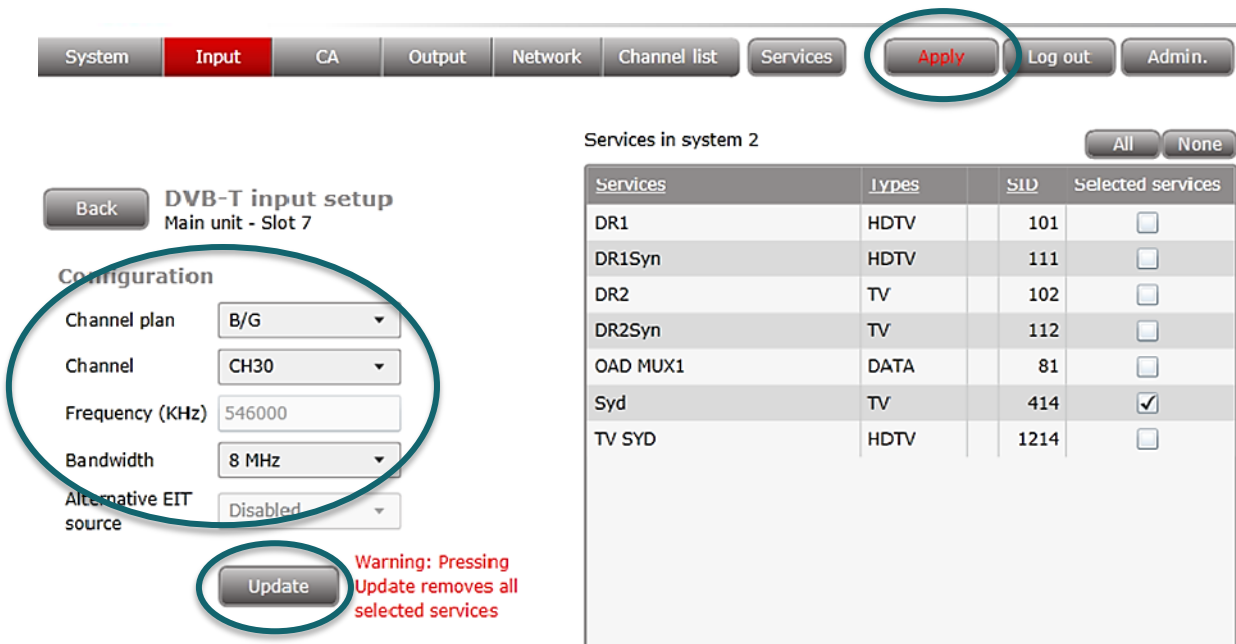
How to set up Simulcrypt in the TDX:

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



4.2 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



Services	Types	SID	Selected services
DR1	HDTV	101	<input type="checkbox"/>
DR1Syn	HDTV	111	<input type="checkbox"/>
DR2	TV	102	<input type="checkbox"/>
DR2Syn	TV	112	<input type="checkbox"/>
OAD MUX1	DATA	81	<input type="checkbox"/>
Syd	TV	414	<input checked="" type="checkbox"/>
TV SYD	HDTV	1214	<input type="checkbox"/>

Click on CA then on Simulcrypt scramblers.
Click on Setup

CA Modules

Simulcrypt scramblers

Slot	Running mode	Services	Status			
Main unit (4 items)						
2	Limited CAS (12 service)	DR1, DR2	OK	Setup ...	Delete	Log
3	Inactive		OK	Setup ...	Delete	Log
4	Inactive		OK	Setup ...	Delete	Log
6	Inactive		OK	Setup ...	Delete	Log
Unit 1 (1 item)						
1	Inactive		OK	Setup ...	Delete	Log
Unit 2 (1 item)						
1	Inactive		OK	Setup ...	Delete	Log

Choose running mode options:

- Inactive
- Full CAS (DIG)
- Limited CAS (12 service)

Input 001 in access criteria in selected box

- Click on Submit

System Input CA Output Network Channel list Services Apply Log out Admin.

Back Scrambler setup Services in system 7

Main unit - Slot 2

Configuration

Running mode

Inactive

Full CAS (DIG)

Limited CAS (12 service)

Services	Orig. SID	SID	Service sources	Access criteria	Selected
DR1	101	4	(Main Unit, input 1)	1	<input checked="" type="checkbox"/>
DR2	102	5	(Main Unit, input 1)	2	<input checked="" type="checkbox"/>
Syd	414	6	(Main Unit, input 1)	0	<input type="checkbox"/>
TV 2 Danmark HD	\$ 15000	1	(Main Unit, input 16)	0	<input type="checkbox"/>
VH-1	\$ 5055	2	(Main Unit, input 16)	0	<input type="checkbox"/>

Make sure Status is OK

System Input **CA** Output Network Channel list Services Apply Log out Admin.

CA Modules **Simulcrypt scramblers**

Slot	Running mode	Services	Status			
▲ Main unit (4 items)						
2	Limited CAS (12 service)	DR1, DR2	OK	Setup ...	Delete	Log
3	Inactive		OK	Setup ...	Delete	Log
4	Inactive		OK	Setup ...	Delete	Log
6	Inactive		OK	Setup ...	Delete	Log
▲ Unit 1 (1 item)						
1	Inactive		OK	Setup ...	Delete	Log
▲ Unit 2 (1 item)						
1	Inactive		OK	Setup ...	Delete	Log

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

System Input **CA** Output Network Channel list **Services** Apply Log out Admin.

CA Modules **Simulcrypt scramblers**

Service list

☒ Name
 ☒ Type
 ☒ SID
 ☒ Source
 ☒ Bitrate
 ☒ CAM
 ☒ PAL
 ☒ QAM
 ☒ QAM SID
 ☒ COFDM
 ☒ COFDM SID
 ☒ IP
 ☒ IP SID

ID	Service	Type	SID	Source	Bitrate	CAM	LCN	HDLCN	PAL output	QAM out
1	TV 2 Danmark HD	HDTV	\$ 15000	DVB-T CH55	0 Mbit/s		0	0		
2	VH-1	TV	\$ 5055	DVB-T CH55	0 Mbit/s		0	0		
4	DR1	HDTV	101	DVB-T CH30	4 Mbit/s	Main, scrambler	0	0		S29(370
5	DR2	TV	102	DVB-T CH30	3 Mbit/s	Main, scrambler	0	0		S29(370
6	Syd	TV	414	DVB-T CH30	3 Mbit/s		0	0		S29(370
7	DR1_scrambled	HDTV	\$ 4	SCRAMBLER	0 Mbit/s		0	0		
8	DR2_scrambled	TV	\$ 5	SCRAMBLER	0 Mbit/s		0	0		

4.3 Troubleshooting

Problem	Solution
<p>How to troubleshoot</p> <ul style="list-style-type: none"> Example: routing a non-scrambled service to a working scrambler should not give an error. IF however there is an error..... 	<ul style="list-style-type: none"> ✓ 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 in Panaccess or the like
<p>Is system setup done correct ?</p> <ul style="list-style-type: none"> When you troubleshoot Correct information ? Panaccess configured correct ? 	<ul style="list-style-type: none"> ✓ 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 in Panaccess. Check also status in Panaccess logs
<p>Troubleshoot in TDX</p> <ul style="list-style-type: none"> When troubleshooting the TDX make sure the following To enable a Simulcrypt scrambled service, the user must 	<ul style="list-style-type: none"> ✓ 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

5 Output window

5.1 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.

Tabs

SystemInputCA**Output**NetworkChannel listServicesApplyLog outAdmin.

Buttons

Output modulesIP outputs

Slot	Output	HW installed	Channel	Status			
Main unit (16 items)							
2	1	QAM	S25	OK	Setup	Delete	Log
2	2	QAM	S26	Disabled	Setup		Log
2	3	QAM	S27	Disabled	Setup		Log
2	4	QAM	S28	Disabled	Setup		Log
3	1	IPOUT-MODULE	Prio. 1	OK	Setup	Delete	Log
3	2	IPOUT-MODULE	Prio. 2	OK	Setup		Log
3	3	IPOUT-MODULE	Prio. 3	OK	Setup		Log
3	4	IPOUT-MODULE	Prio. 4	OK	Setup		Log
4	1	QAM	S21	OK	Setup	Delete	Log
4	2	QAM	S22	Disabled	Setup		Log
4	3	QAM	S23	Disabled	Setup		Log
4	4	QAM	S24	Disabled	Setup		Log
6	1	IPOUT-MODULE output configured as NONE	Prio. 1	Not configured	Setup	Delete	Log
6	2	IPOUT-MODULE output configured as NONE	Prio. 2	Not configured	Setup		Log
6	3	IPOUT-MODULE output configured as NONE	Prio. 3	Not configured	Setup		Log
6	4	IPOUT-MODULE output configured as NONE	Prio. 4	Not configured	Setup		Log
Unit (8 items)							
1	1	COFDM output configured as NONE		Disabled	Setup	Delete	Log
1	2	COFDM output configured as NONE		Disabled	Setup		Log
1	3	COFDM output configured as NONE		Disabled	Setup		Log
1	4	COFDM output configured as NONE		Disabled	Setup		Log
6	1	PAL HD->SD output configured as NONE		Disabled	Setup	Delete	Log
6	2	PAL HD->SD output configured as NONE		Disabled	Setup		Log
6	3	PAL HD->SD output configured as NONE		Disabled	Setup		Log
6	4	PAL HD->SD output configured as NONE		Disabled	Setup		Log

Module list

Setup buttons

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

5.2 Configuration of output modules

The first time the Service Tool displays the Configuration window for an output module in a new configuration the fields in the window will display default values and/or be empty, and the output module is disabled.

- Disabled output** If you want to enable this module, click the Disabled output checkbox.
- Channel plan** To select another TV system, open the drop-down list with the systems you can choose from.
Select the system you want to use.
- You can configure a QAM module either:**
- by using the specifications of the channel plan
 - or by entering a frequency manually.

Tabs System Input CA **Output** Network Channel list Services Apply Log out Admin. **Buttons**

Back button Back **QAM output setup**
Main unit - Slot 2 - Output 1

Unit & slot ID Configuration

Configuration fields

Disabled output ☐

Channel plan B/G

Channel S25 (338000) Main unit, Slot : ▾

Frequency (KHz) 338000

Channel spacing 8 MHz

Select input Services ▾ Services...

RF level correction +0 dB

Symbol rate 6875

QAM Mode 64-QAM

Transportstream ID 20

Manual SDI version ☐ -1

Configuration fields

Submit button Reset output Submit

Bandwidth monitor Payload

Status information area Status information

Configuration of output modules - continued

- Channel, Frequency and Channel spacing
- **Using the channel plan definitions:**
Open the drop-down list with the predefined channels and select the channel you want to use. When you have selected a channel the Frequency and Channel spacing fields are automatically filled in.

Channel	Enter a frequency manually: Open the Channel drop-down list and select "Frequency" list.
Frequency	Enter the desired frequency in KHz in the Frequency field.
Channel spacing	Open the drop-down list with the channel spacings and select the channel spacing you want to use.
	<div>NOTE: When you have selected a channel using the channel plan or entered a frequency manually, then you have also set up the other three RF channels on the module in question. You only need to select services for each of the three other RF channels, or disable one or more of the three channels.</div>
Select input	You can select services in two ways, either: <ul style="list-style-type: none">• by selecting services from the TDX-pool or• by selecting services from an input module you select.

Disabled output

☐

Channel plan

B/G

Channel

S25 (338000) Main unit, Slot :

Frequency (KHz)

338000

Channel spacing

8 MHz

Select input

Services

Services...

RF level correction

+0 dB

5.3 Services from the TDX pool

Open the drop-down list and select "Services" from the drop-down list. Click the Services... button next to Select input field to open the Select services window


Disabled output ☐

Channel plan

Channel

Frequency (KHz)

Channel spacing

Select input 

RF level correction

In the Select Services window you can select the service or services that you want to output.

NOTE:
By clicking one of the underlined column headlines you can sort the list into alphabetical or numerical order.

Select services

Select service(s) from list

Services	Types	SID	Service sources	Select service(s)	Output SID
DR1_scrambled	HDTV	\$ 101	(Main Unit, scrambled)	<input type="checkbox"/>	7
DR2_scrambled	TV	\$ 102	(Main Unit, scrambled)	<input type="checkbox"/>	8
TV 2 Danmark HD	HDTV	\$ 15000	(Main Unit, input 15)	<input type="checkbox"/>	1
VH-1	TV	\$ 5055	(Main Unit, input 1)	<input type="checkbox"/>	2

Mux name

Click the checkbox to the right of the service(s) you want.

By default each service listed in the Select services window has an automatically assigned Service ID (SID) which is displayed in the Output SID column.

The SID must be a number between 1 and 65535.

The SID must be unique inside a network with the same Original Network ID (ONID) and Transport Stream ID (TS-ID). All QAM output modules in your TDX headend system uses the same ONID but separate TS-IDs for each output.
You can manually change the SID of the services you have selected in the Output SID column.

Select services

Select service(s) from list

Services	Types	SID	Service sources	Select service(s)	Output SID
DR1_scrambled	HDTV	\$ 101	(Main Unit, scramble	<input type="checkbox"/>	7
DR2_scrambled	TV	\$ 102	(Main Unit, scramble	<input type="checkbox"/>	8
TV 2 Danmark HD	HDTV	\$ 15000	(Main Unit, input 16	<input type="checkbox"/>	1
VH-1	TV	\$ 5055	(Main Unit, input 16	<input type="checkbox"/>	2

Mux name

CancelOK

If you assign the same SID to services distributed via the same output, the TDX system will check the SIDs and display a warning that explains the problem.



If you want to give your selection of services a name, enter the name in the Mux name field.

NOTE:
The services you have selected will no longer be available in the TDX-pool for other output modules.

Click OK to return to the Configuration window.

Select services

Select service(s) from list

Services	Types	SID	Service sources	Select service(s)	Output SID
DR1_scrambled	HDTV	\$ 101	(Main Unit, scramble	<input type="checkbox"/>	7
DR2_scrambled	TV	\$ 102	(Main Unit, scramble	<input type="checkbox"/>	8
TV 2 Danmark HD	HDTV	\$ 15000	(Main Unit, input 16	<input type="checkbox"/>	1
VH-1	TV	\$ 5055	(Main Unit, input 16	<input type="checkbox"/>	2

Mux name

CancelOK

5.4 Services from input module

To select the services from a particular input module, open the drop-down list of the Select input field and select "Transparent" from the list. Click the Services... button to open the Select input modules window.

Disabled output ☒
 Channel plan B/G
 Channel S22 (314000)
 Frequency (KHz) 314000
 Channel spacing 8 MHz
 Select input Services...
 RF level correction

Select input

Select input from list

Slot	HW installed	Frequency	Selected
Unit: 1 (9 items)			
1	DVB-T	546000 KHz	<input type="checkbox"/>
2	DVB-S	0 KHz	<input type="checkbox"/>
3	DVB-S	0 KHz	<input type="checkbox"/>
4	DVB-S	0 KHz	<input type="checkbox"/>
6	DVB-S	0 KHz	<input type="checkbox"/>
7	DVB-S	0 KHz	<input type="checkbox"/>
8	DVB-S	0 KHz	<input type="checkbox"/>
13	DVB-S	0 KHz	<input type="checkbox"/>
16	DVB-T2	746000 KHz	<input type="checkbox"/>

Cancel OK

Click the checkbox of the module you want to use. If you want to give your selection of services a name, enter the name in the Mux name field. Click OK to return to the Configuration window. Next you select or enter values in the other fields in the Configuration window.

5.5 Additional configuration

RF level correction	To select another RF level correction, open the dropdown list and select the level you want to use.
Symbol rate	Enter the desired symbol rate (from 3150 to 7200 kS) in the Symbol rate field.
QAM mode	To select which QAM mode to use, open the dropdown list and select the QAM mode you want to use.

Transportstream ID	By default each QAM output has an automatically assigned transport stream ID. It is possible to change the ID.
---------------------------	--

NOTE:
Each QAM output in your TDX headend system must have a unique transport stream ID.

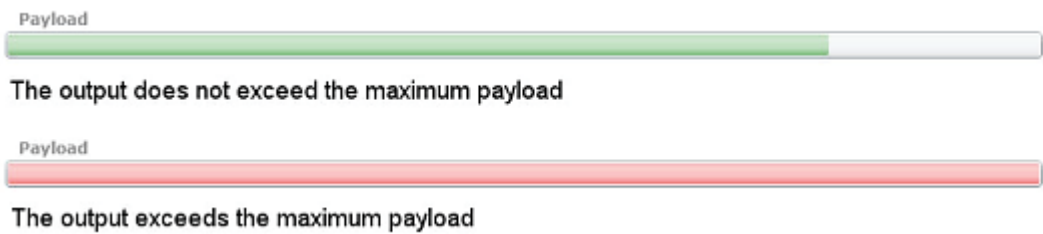
Manual SDT version	By default this checkbox is deselected. If it is necessary to control when a new SDT version is sent, then select the checkbox and enter a version number (0-31) in the field next to the checkbox. It is recommended that you keep the default value.
---------------------------	--

Disabled output ☐
 Channel plan B/G
 Channel S25 (338000) Main unit, Slot :
 Frequency (KHz) 338000
 Channel spacing 8 MHz
 Select input Services...
 RF level correction +0 dB

Symbol rate 6875
 QAM Mode 64-QAM
 Transportstream ID 20
 Manual SDT version ☐ -1

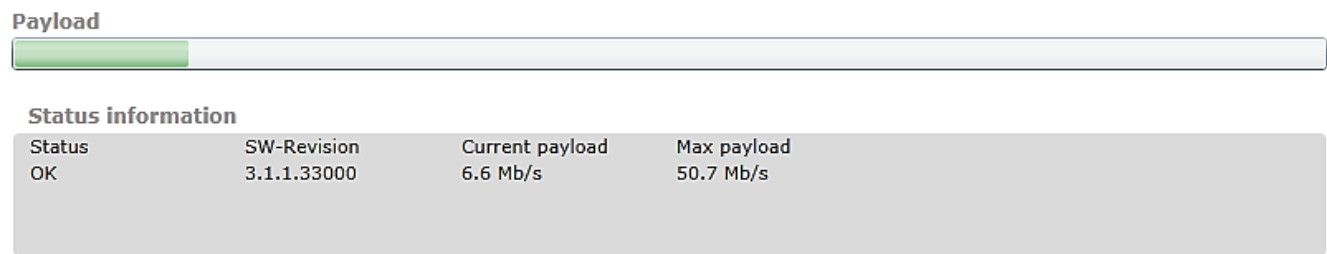
5.6 Payload monitor

The payload monitor above the status information area is a real time monitor, which graphically indicates the amount of data that is currently being transmitted.
Changes in the configuration have to be submitted before the payload monitor can measure it.
The update frequency is approximately 5 seconds.



5.7 Status information

Status information about the output is placed at the bottom of the Configuration window.



Status	Informs you whether output is enabled or disabled.	Current payload	Informs you about the level of data that is currently being transmitted.
SW revision	Informs you whether output is enabled or disabled.	Max. Payload	Displays the maximum limit on how much data you can transmit.

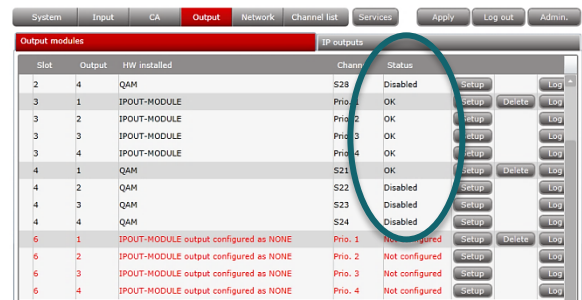
NOTE:
The software version of the QAM module must be identical with the software versions installed on the other input/output modules as well as the headend units.

When you have finished the configuration of the output, click the Submit button to enter the information into the headend system and return to the Output window.
Remember to click the Apply button in the upper right-hand corner to save new settings in the configuration.

5.8 Check configuration

When you return to the Output window the configuration of the output module is displayed in the module list. When writing is black – the module has been configured; when red then it is not configured (or the configuration is deleted)

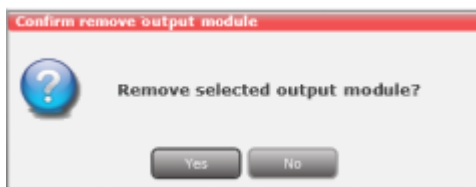
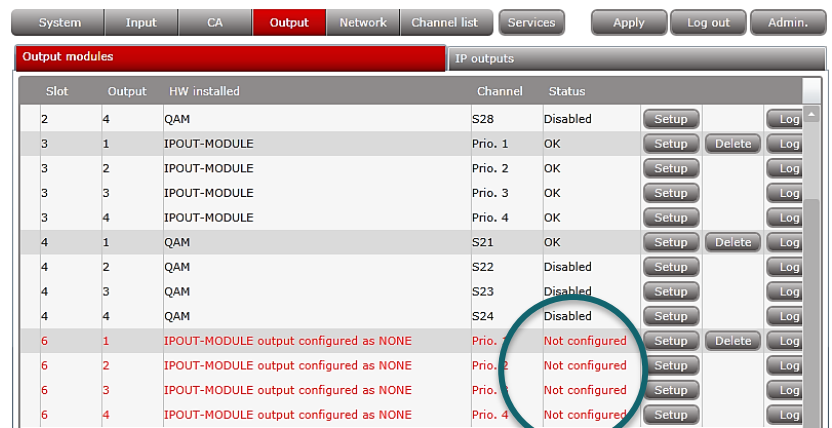
Now you can configure the other outputs of the first QAM module and then continue to configure the other output modules, following the procedure just described.



Slot	Output	HW installed	Channel	Status	Buttons
2	4	QAM	S28	Disabled	Setup, Log
3	1	IPOUT-MODULE	Prio. 1	OK	Setup, Delete, Log
3	2	IPOUT-MODULE	Prio. 2	OK	Setup, Log
3	3	IPOUT-MODULE	Prio. 3	OK	Setup, Log
3	4	IPOUT-MODULE	Prio. 4	OK	Setup, Log
4	1	QAM	S21	OK	Setup, Delete, Log
4	2	QAM	S22	Disabled	Setup, Log
4	3	QAM	S23	Disabled	Setup, Log
4	4	QAM	S24	Disabled	Setup, Log
6	1	IPOUT-MODULE output configured as NONE	Prio. 1	Not configured	Setup, Delete, Log
6	2	IPOUT-MODULE output configured as NONE	Prio. 2	Not configured	Setup, Log
6	3	IPOUT-MODULE output configured as NONE	Prio. 3	Not configured	Setup, Log
6	4	IPOUT-MODULE output configured as NONE	Prio. 4	Not configured	Setup, Log

5.9 Delete 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 QAM 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...

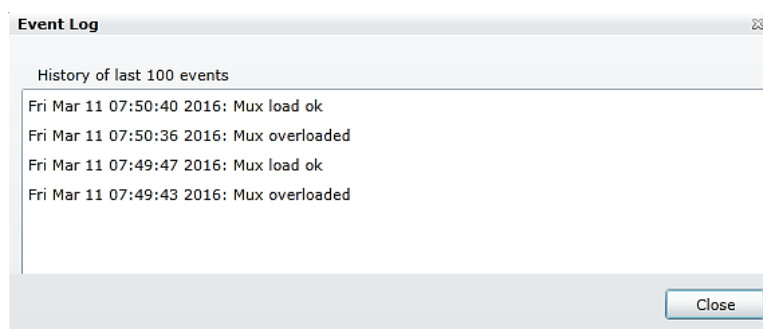



Slot	Output	HW installed	Channel	Status	Buttons
2	4	QAM	S28	Disabled	Setup, Log
3	1	IPOUT-MODULE	Prio. 1	OK	Setup, Delete, Log
3	2	IPOUT-MODULE	Prio. 2	OK	Setup, Log
3	3	IPOUT-MODULE	Prio. 3	OK	Setup, Log
3	4	IPOUT-MODULE	Prio. 4	OK	Setup, Log
4	1	QAM	S21	OK	Setup, Delete, Log
4	2	QAM	S22	Disabled	Setup, Log
4	3	QAM	S23	Disabled	Setup, Log
4	4	QAM	S24	Disabled	Setup, Log
6	1	IPOUT-MODULE output configured as NONE	Prio. 1	Not configured	Setup, Delete, Log
6	2	IPOUT-MODULE output configured as NONE	Prio. 2	Not configured	Setup, Log
6	3	IPOUT-MODULE output configured as NONE	Prio. 3	Not configured	Setup, Log
6	4	IPOUT-MODULE output configured as NONE	Prio. 4	Not configured	Setup, Log

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

5.10 Event log

If you want to display a history of the events related to the QAM output, click the Log button of the output in question to open the Event Log window.



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

6 Network window

6.1 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.

Tabs

SystemInputCA ModulesOutputNetworkChannel listServicesApplyLog outAdmin.

Buttons

DVB-T

Network ID12289

Network nameTDX-NET

Set original ID☐

Orig. network ID8400

NIT Standard

DVB

Nordig

EIT:

Full Actual - Full Other

No barker

Shared settings

Manual transportstream ID☐

Use static NIT version☐

NIT version-1

Enable CAT tables☒

DVB-C

Network ID40951

Network nameTDX-NET

Set original ID☐

Orig. network ID70

NIT Standard

DVB

Nordig

EIT:

Full Actual - Full Other

No barker

IP settings

EIT: Disabled

EIT barker IP address0.0.0.0

EIT barker port50176

LCN numbering

Enable HD LCN☐

Services	LCN number
DR2	0
Syn	0
DR K	0
DR Ramasjang	0
DR Test	0
DR Ultra	0
DR3	0
DR3Syn	0
POLKETTINGET	0
DR1	1

Configuration fields

Service list area

Submit button

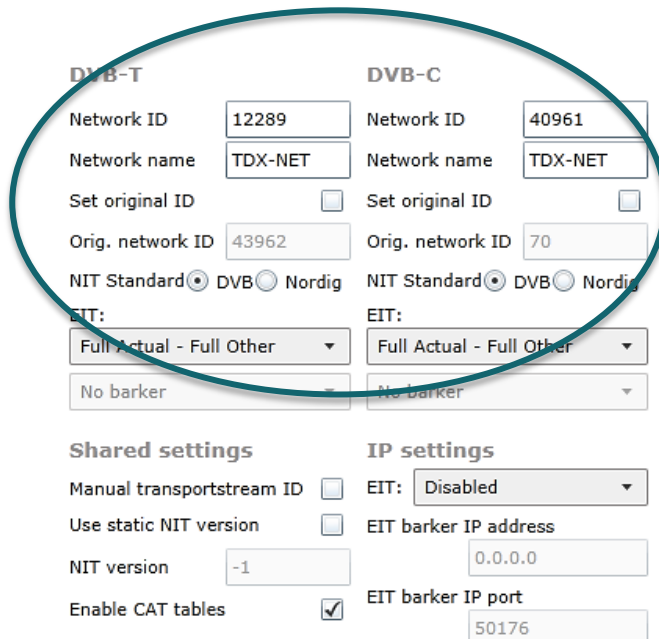
Submit

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

6.2 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 is 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.



DVB-T

Network ID: 12289

Network name: TDX-NET

Set original ID: ☐

Orig. network ID: 43962

NIT Standard: ☒ DVB ☐ NORDIG

EIT: Full Actual - Full Other

No barker

DVB-C

Network ID: 40961

Network name: TDX-NET

Set original ID: ☐

Orig. network ID: 70

NIT Standard: ☒ DVB ☐ NORDIG

EIT: Full Actual - Full Other

No barker

Shared settings

Manual transportstream ID: ☐

Use static NIT version: ☐

NIT version: -1

Enable CAT tables: ☒

IP settings

EIT: Disabled

EIT barker IP address: 0.0.0.0

EIT barker IP port: 50176

6.3 EIT information

Basically, the drop-down list gives you a 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:

Barker channel

No barker

No barker

S25(Main Unit slot 2-1)

S21(Main Unit slot 4-1)

S29(Unit 2 slot 1-1)

0.0.0.0

System Input CA Output **Network**

DVB-T

Network ID: 12289

Network name: TDX-NET

Set original ID: ☐

Orig. network ID: 43962

NIT Standard: ☒ DVB ☐ NORDIG

EIT: Full Actual - Full Other

Full Actual - P/F Other

Full Actual - No Other

P/F Actual - P/F Other

P/F Actual - No Other

No Actual - No Other

Barker channel

NIT version: -1

Enable CAT tables: ☒

DVB-C

Network ID: 40961

Network name: TDX-NET

Set original ID: ☐

Orig. network ID: 70

NIT Standard: ☒ DVB ☐ NORDIG

EIT: Full Actual - Full Other

Full Actual - P/F Other

Full Actual - No Other

P/F Actual - P/F Other

P/F Actual - No Other

Barker channel

0.0.0.0

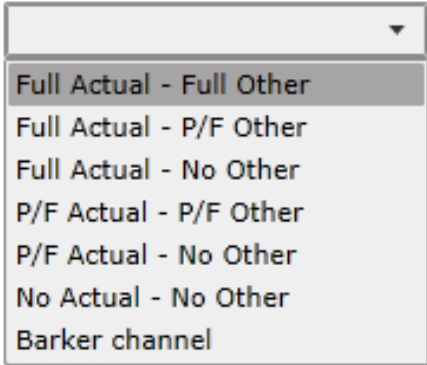
EIT barker IP port: 50176

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.

EIT:



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.

Shared settings

Manual transportstream ID ☐

Use static NIT version ☐

NIT version

Enable CAT tables ☒

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.

LCN numbering

Enable HD LCN ☒

Services	LCN number	HD LCN number
DR1	<input type="text" value="1"/>	<input type="text" value="1"/>
DR2	<input type="text" value="2"/>	<input type="text" value="2"/>
Syd	<input type="text" value="3"/>	<input type="text" value="3"/>
World Fashion Channel	<input type="text" value="4"/>	<input type="text" value="0"/>
I24 News English	<input type="text" value="5"/>	<input type="text" value="0"/>

6.4 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.

The screenshot displays the TRIAX web interface with the 'Network' tab selected. The interface includes a top navigation bar with buttons for 'Home', 'Menu', 'Tools', 'Network', 'Monitoring', 'Help', and 'Log out'. The 'Apply' button is circled in the top right corner. The main content area is divided into two columns for 'Device 1' and 'Device 2', each with fields for 'Network ID', 'Network name', 'Net original ID', 'Prog. network ID', 'MST Standard ID', 'MST', 'Full network', and 'No. network'. Below these are sections for 'Advanced settings' and 'MST settings'. The 'Submit' button is circled at the bottom center. On the right, there is a table for 'MST monitoring' with columns for 'MST number' and 'MST name'.

MST number	MST name
1	1
2	2
3	3
4	4
5	5

7 Channel list

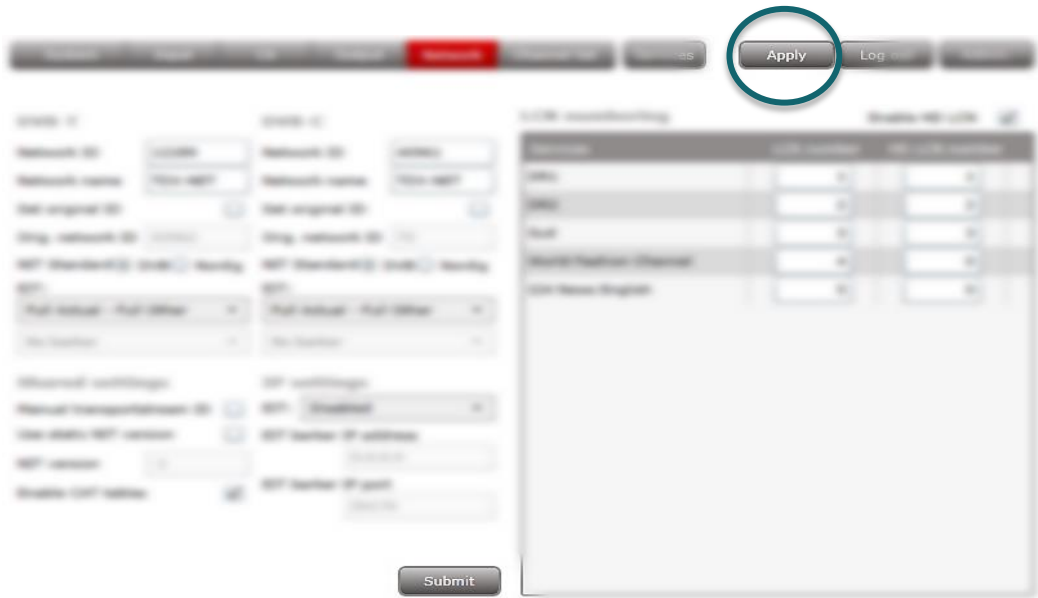
When you have finished configuring all the output modules you have inserted in the headend units the Channel list tab displays a list with all the channels and services that you have selected.

SystemInputCA ModulesOutputNetworkChannel listServicesApplyLog outAdmin.

Channel	Mux name	TSID	Services	Output
239.1.1.10	IP output		DR1	(Main Unit, Slot 3-1)
239.1.1.11	IP output		DR2	(Main Unit, Slot 3-1)
239.1.1.12	IP output		DR3	(Main Unit, Slot 3-1)
239.1.1.13	IP output		DR K	(Main Unit, Slot 3-1)
S21		40	DR2, Syd	(Main Unit, Slot 4-1)
S22		41	DR1	(Main Unit, Slot 4-2)
S23		42	DR K, DR Ramasjang, DR Test	(Main Unit, Slot 4-3)
S24		43	DR Ultra, DR3, DR3Syn, FOLKETINGET	(Main Unit, Slot 4-4)

8 Save configuration

An important button when you change your configuration of the headend system is the Apply button placed in the upper right-hand corner of the TDX Service Tool window.



Whenever you have made changes in your configuration, "Apply" on the Apply button turns red to tell you that you have unsaved changes that need to be saved. Click the Apply button to save the changes. When changes have been saved the "Apply" text turns white again.

WARNING

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

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Declaration of Conformity

The manufacturer declares that this product Triax TR 43 complies with the following directives and standards:

Low voltage directive 2006/95/EC
EN 60 065
European EMC directive EMC 2004/108/EC
EN 55 013
EN 55 020
EN 61000-3-2
EN 61000-3-3

Manufacturer

Triax A/S
Bjørnkærvej 3
DK-8783 Hornsyld
Denmark



Svend Kristiansen
Quality Manager

For further information
and updated manuals go to

triax.com/support

