User Manual

TDcH & TDmH – Compact Headend & Mini Headend

Article		Article no.
TDcH 16S-I-Q	Compact Headend	492780
TDcH 16S-I		492781
TDcH 22STC-I		492782
TDcH 16S-Q		492790
TDcH 16S		492791

Article		Article no.
TDmH IP	Mini Headend	492770
TDmH 8S		492772
TDmH 8S-I		492773
TDmH 14STC-I		492774

Version	V1.13	Date	2025-08-19	EN

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1 Safety regulations and notes

ATTENTION

- Failure to comply with the specified precautionary measures may cause serious injury to persons or damage to property.
- The assembly, installation, additional electrical wiring, servicing 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 device meets the EU directives **2011/65/EU, 2014/30/EU and 2014/35/EU**.
- The safety requirements are according to the standards EN 62368-1 resp. EN 60728-11 and must be observed, especially concerning equipotential bonding and earthing.
- Observe the relevant country-specific standards, regulations and guidelines on the installation and operation of antenna systems.
- Before starting installation or service work disconnect the receiving system from mains.
- Installation or service work should NEVER be undertaken during electrical / thunderstorms.
- Avoid short circuits!
- To ensure electromagnetic compatibility, make sure all connectors are tightly mounted, and that cables and connectors are of the right quality / screening.
- Prior to linking the T/C input port with a terrestrial antenna, it's imperative to ensure that a RED-compliant filter or amplifier is installed between the antenna and the headend to adhere to the directive.
- Take action to prevent static discharge when working on the device!
- Due to the risk of fires caused by lightning strikes, we recommend that all mechanical parts (e.g. distributor, equipotential bonding rail, etc.) be mounted on a non-combustible base. Wood panelling, wooden beams, plastic covered panels and plastic panels are all examples of combustible bases.

Back up battery:

The unit includes a preinstalled Lithium battery (CR2032) as backup power source for the clock.

Type: Panasonic BR-2032/BN, Battery, Coin Cell, Single Cell, 3 V, 2032, 225 mAh

Do not attempt to replace the non-rechargeable coin-cell battery. Replacement of the battery must only be done by a special trained technician.

There is a danger of an explosion if the coin-cell battery is incorrectly placed. The lithium battery contains lithium and can explode if it is not properly handled or disposed of. Replace only with a battery of the same type. To avoid possible injury or death, do not: (1) Throw or immerse into water, (2) allow it to heat more than 100°C (212°F) or (3) attempt to repair of disassemble it. Dispose of it as required by local ordinance or regulations and your company's safety standards.

To prevent fire, short circuit or shock hazard

- Do not expose the unit to rain or moisture.
- Install the unit in a dry location without infiltration or condensation of water. In case of the formation of condensation wait until the system is completely dried.
- Do not expose it to dripping or splashing.
- If any liquid should accidentally fall into the cabinet, disconnect the power plug.
- Install the head-end station where it is protected from direct exposure to sunlight.
- Install the head-end station not within the immediate vicinity of heat sources.
- Do not install the head end in cabinets or recesses which are not ventilated.
- Do not place any vessels containing liquids on the head-end station.
- Do not place anything on the head-end station which could initiate fires.

To avoid any risk of overheating

- Install the unit in a well aired location and keep a minimum distance around the apparatus for sufficient ventilation.
- Do not place anything on the unit that might cover the ventilation holes.
- Do not install the product in a dusty place.
- Use the apparatus only in moderate climates (not in tropical climates)
- Respect the minimum and maximum temperature specifications.
- Ensure that the headend station is adequately ventilated.

To avoid any risk of electrical shocks

- Controller must be correctly grounded according to applicable national regulations.
- For a complete disconnection from the mains, the mains plug must be pulled out of the mains socket. Ensure that the mains plug can be pulled out without difficulties.
- Pull out power plug when making connections of cables.
- To avoid electrical shock, do not open the housing.

To avoid interferences with LTE services in Europe

- Do not select a channel higher than UHF 48 in countries with LTE II / 700 operation.
- Do not select a channel higher than UHF 60 in countries with LTE I / 800 operation.
- Use coaxial cables with screening effectiveness of >85dB (Class A) at least or >95dB (Class A+)

WEEE disposal

Electronic devices should never be disposed of in the household rubbish. In accordance with directive 2011/65/EU of the European Parliament and the European Council from June 8, 2011 which addresses old electronic and electrical devices, such devices must be disposed of at a designated collection facility. At the end of its service life, please take your device to one of these public collection facilities for proper disposal.

2 Revision history

Revision	Date	Changes
1.0		TDcH Compact Headend user manual - First release
1.1		Management Port description added
1.2		New Compact Headend Version TDcH 16S-I and TDcH 22STC-I added
1.3		SCR (Satellite Channel Router) description added
1.4		IP-out functionality added
1.5		IP-in functionality added
1.6	2023-12-07	Besides updating screen dumps and general updating, feature description added for • VSecure scrambling • Alternative EIT (EIT Barker) for all RF inputs (DVB-S2/C/T2). • Alias for naming input connections. • Rename a service at the output page • Payload indication at CAM page added • 8 days EIT option added to existing 4 days EIT option for schedule EIT. Document based on features in SW version 2.6.0.
1.7	2024-04-17	Added TDmH variants 492770, 492772, 492773, and 492774.
1.8	2024-05-23	Added VLAN and Service Overview via URL features. Added description for time.
1.9	2024-06-26	Small explanation corrections for VLAN and Service Overview via URL features. Added PRO:IDIOM feature and new variants supporting PRO:IDIOM: 492787, 492788, 492775 and 492776.
1.10	2024-10-31	Stacking feature plus Service Overview file via GUI.
1.11	2025-04-10	Media Player feature and Trial Period added. Available from SW 4.9.
1.12	2025-04-29	Manual reviewed and smaller adjustments made.

3 TDcH Compact Headend & TDmH Mini Headend

3.1 Introduction

TRIAX offers two series of headend variants.

The TDcH Compact Headend was the first series introduced in the market. This highly reliable headend series offers many stable features and is flexible in variants and licenses.

Years later, the TDmH Mini Headend was introduced as a miniature series based on the highly reliable TDcH. This headend series was introduced to offer even more variants for different applications.

This user manual is for both headend series. Some of the features listed are only available in TDcH or in specific variants.

3.2 Description

TDcH and TDmH Headend supports DVB-S2X, DVB-T2, DVB-C and IP-in receiving and conversion to IPTV and/or QAM / COFDM modulation with the possibility to decrypt and/or scramble services centrally in the headend.

Built for wall- as well as 19" racks mounting and equipped with up to 4 DVB-S2X inputs, 1 DVB-T2/C input and 1 IP input, 16 DVB-S2X tuners, 6 DVB-T2/C tuners, 16 QAM or COFDM modulators and 8 CI slots.

The TDcH and TDmH Headends are optimized and engineered to meet specific TV distribution requirements in hospitality, multi-dwelling units and related sectors.

Our brand new, intuitive platform smoothly integrates easy installation, an intuitive and elegant graphical user interface, central decryption, remote access, and straightforward TV service updates with LCN.

3.2.1 TDcH variants

TDcH 16S-Q [492790]	4 x SAT IF inputs with integrated multiswitch 16 x DVB-S2 tuners 1 x IP (RJ45 or SFP LC duplex) 16 x QAM full band modulators
TDcH 16S-I-Q [492780]	4 x SAT IF inputs with integrated multiswitch 16 x DVB-S2X tuners 1 x IP (RJ45 or SFP LC duplex) 8 x CI interfaces 16 x QAM full band modulators
TDcH 16S [492791]	4 x SAT IF inputs with integrated multiswitch 16 x DVB-S2 tuners 1 x IP (RJ45 or SFP LC duplex) 16 x QAM or COFDM full band modulators
TDcH 16S-I [492781]	4 x SAT IF inputs with integrated multiswitch 16 x DVB-S2 tuners 1 x IP (RJ45 or SFP LC duplex) 8 x CI interfaces 16 x QAM or COFDM full band modulators
TDcH 16S-I-PROIDIOM [492787]	Identical to TDcH 16S-I [492781], plus with support for Pro:Idiom (LG) scrambling.
TDcH 22STC-I [492782]	4 x SAT IF inputs with integrated multiswitch 1 x Terr / Cable input with integrated splitter 16 x DVB-S2 tuners 6 x DVB-T/T2/C tuners 1 x IP (RJ45 or SFP LC duplex) 8 x CI interfaces 16 x QAM or COFDM full band modulators

TDcH 22STC-I-PROIDIOM [492788]	Identical to TDcH 22STC-I [492782], plus with support for Pro:Idiom (LG) scrambling.

3.2.2 TDmH variants

TDmH IP [492770]	48 x IPTV inputs SPTS and MPTS UDP/RTP 1 x IP (RJ45 or SFP LC duplex) 8 x QAM or COFDM full band modulators
TDmH 8S [492772]	4 x SAT IF inputs with integrated multiswitch 8 x DVB-S2X tuners 1 x IP (RJ45 or SFP LC duplex) 8 x QAM or COFDM full band modulators
TDmH 8S-I [492773]	4 x SAT IF inputs with integrated multiswitch 8 x DVB-S2 tuners 1 x IP (RJ45 or SFP LC duplex) 4 x CI interfaces 8 x QAM or COFDM full band modulators
TDmH 8S-I-PROIDIOM [492775]	Identical to TDmH 8S-I [492773], plus with support for Pro:Idiom (LG) scrambling.
TDmH 14STC-I [492774]	4 x SAT IF inputs with integrated multiswitch 1 x Terr / Cable input with integrated splitter 8 x DVB-S2 tuners 6 x DVB-T/T2/C tuners 1 x IP (RJ45 or SFP LC duplex) 4 x CI interfaces 8 x QAM or COFDM full band modulators
TDmH 14STC-I-PROIDIOM [492776]	Identical to TDmH 14STC-I [492774], plus with support for Pro:Idiom (LG) scrambling.

3.2.3 Common Features

4 x SAT IF inputs

Integrated multi switch
SCR (Satellite Channel Router) support
DiSEqC support
LNB LOF configuration

1 x Terr – Cable input (TDcH 22STC-I, TDmH 14STC-I)

Integrated splitter

1 x Connections

IP input

SID and TSID management, PID management
XSPF supported

RF input

16/8 x DVB-S2 tuners (except TDmH IP)

6 x DVB-T/T2/C tuners (TDcH 22STC-I, TDmH 14STC-I)

8/4 x CI interfaces

(all variants with "I" include in the name)

16 x QAM full band modulators

(TDcH 16S-Q, TDcH 16S-I-Q)

- Electronically adjustable output level
- Suitable for adjacent channels, option for disabling individual channels
- Adjustable Symbol rates and modulation

16 x QAM or COFDM full band modulators

(all variant except TDcH 16S-Q and TDcH16S-I-Q)

- Electronically adjustable output level
- Suitable for adjacent channels, option for disabling individual channels
- For QAM adjustable Symbol rates and modulation, and for COFDM adjustable modulation, FEC and Guard Interval

Service Multiplexing

- Service Multiplexing at each output transponder to optimize available bandwidth
- Service Multiplexing at the CA modules to reduce amount of needed CAM's
- Service routable from any input to any output

SID, TSID and ONID management

- To handle conflicts during multiplexing
- To carry out changes if required
- To replace a service with another service without any need for re-tuning the TVsets.

HTML user interface via self-signed HTTPS

PID management

- To handle PID conflicts
- PID filtering, for example to reduce audio channels from a TV service
- Distribute the same TV service multiple times with different languages
- To replace a service with another service without any need to re-tune the TVsets

Service naming

- Distribute the same TV service multiple times with different language and different name
- Give the service an alternative name
- If a service has no original name, an optional service name can be configured
- If multiple services have the same original name, unique service names can optionally be configured.

EPG management

EPG handling to manage the amount of EPG-data distributed in an output transponder

Transport Stream Processing

- Network Information Table (NIT) for complete head-end station
- LCN (Logical Channel Numbering)

Transparent Transport Stream routing

- A whole untouched transponder can be routed to CAM to ensure all metadata are intact and present for the CA module
- A whole untouched transponder can be routed to an output to ensure all metadata is present or just for debug

Payload measurement

- Realtime payload measurement at CI slot to monitor transport stream to CAM is fine and not overloaded with services
- Realtime payload measurement at RF output to monitor transport at output is fine and not overloaded with services
- Realtime payload measurement at CI slot, RF output and IP output to monitor if data exists at all

SNMP traps

- To remotely monitor changes
- Supported traps described in the MIB

3.2.4 Upgrade Features (license based)

IP-in

The IP-in functionality requires an activation license key.

Additional to common features, supported functionalities for IP-in:

- Receive up to 96 x UDP or RTP MPEG-TS multicast streams
- Specify source address and port to ensure correct source
- Licenses comes in
  - 4 x IP SPTS or MPTS inputs
  - 16 x IP SPTS or MPTS inputs
  - 48 x IP SPTS or MPTS inputs
  - 96 x IP SPTS or MPTS inputs

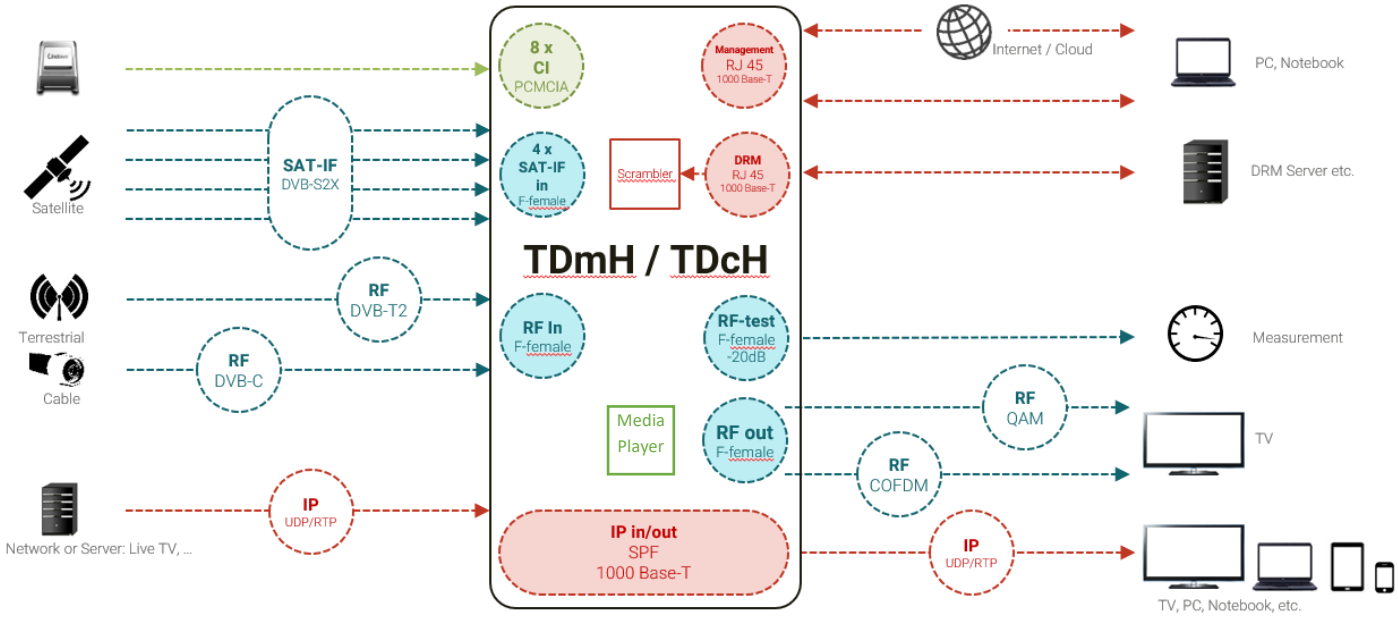
IP-out

The IP-out functionality requires an activation license key.

Additional to common features, supported functionalities for IP-out:

- Stream up to 100 UDP MPEG-TS multicast streams
- Supported Service Discovery protocols: M3U, M3Ue, M3Uepp, XSPF
- EPG for all IP out services in Samsungs XML format for SINC or REACH server
- EIT for current service inside the SPTS streamed via UDP/RTP multicast direct to the TV set

3.2.5 Block diagram



***Note*:**

IP-in license-based function

IP-out license-based function

3.3 Packing contents

1 piece	TDcH Compact headend or TDmH Mini headend
1 piece	Mains cable
2 pieces	Wall mounting brackets
4 pieces	Screws

3.4 Technical data

Type	TDcH 16S-Q	TDcH 16S	TDcH 16S-I-Q	TDcH 16S-I	TDcH 22STC-I	TDmH IP	TDmH 8S	TDmH 8S-I	TDmH 14STC-I
Art. number [Pro:Idiom (LG)]	**492790**	**492491**	**492780**	**492781** **[492787]**	**492782** **[492788]**	**492770**	**492772**	**492773** **[492775]**	**492774** **[492776]**
Interfaces									
Management Interface	1 x 1000 Base-T (RJ 45)								
SimulCrypt / DRM	1 x 1000 Base-T (RJ 45) not supported with current software release								
Ip-in and –out	1 x 1000 Base-T (SFP)								
CI slots	-	-	8 x PCMCIA (front access)			-	-	4 x PCMCIA (front access)	
USB	USB 2.0, Type A conn (Data transfer, additional storage,…) not supported current software release					-	-	-	-
DVB-S2X input									
Satellite inputs	4 x F connectors, 75 Ω, 400 mA per input LNB power feed					-	4 x F connectors, 75 Ω, 400 mA per input LNB power feed		
Number of transponders	16					-	8		
Frequency range	950 – 2150 MHz					-	950– 2150 MHz		
Level range	44 – 90 dBµV					-	44 – 90 dBµV		
Return loss	> 10dB					-	> 10dB		
DVB-S modulation	QPSK; 8PSK, 16APSK, 32APSK (16APSK and 32APSK will be supported in later SW version)					-	QPSK; 8PSK, 16APSK, 32APSK (16APSK and 32APSK will be supported in later SW version)		
DVB-S modes	QPSK 1/2, 2/3, 3/4, 5/6, 7/8					-	1/2, 2/3, 3/4, 5/6, 7/8		
DVB-S2 modes	QPSK 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 8PSK 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 16APSK 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 32APSK 3/4, 4/5, 5/6, 8/9, 9/10					-	QPSK 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 8PSK 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 16APSK 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 32APSK 3/4, 4/5, 5/6, 8/9, 9/10		
Multistream	Supported					-	Supported		
Symbol rate DVB-S	QPSK: 1 – 45 MSymb/s					-	QPSK: 1 – 45 MSymb/s		
Symbol rate DVB-S2	QPSK: 4.5 – 45 MSymb/s 8PSK: 4.5 – 45 MSymb/s 16APSK: 4.5 – 39 MSymb/s 32APSK: 4.5 – 32 Msymb/s					-	QPSK: 4.5 – 45 MSymb/s 8PSK: 4.5 – 45 MSymb/s 16APSK: 4.5 – 39 MSymb/s 32APSK: 4.5 – 32 Msymb/s		
Max. data rate / tuner	83 Mbit/s					-	83 Mbit/s		
Input selection	DiSEqC 1.0 Control 13/18VDC, 22kHz and SCR via JESS (EN 50607:2015)					-	DiSEqC 1.0 Control 13/18VDC, 22kHz and SCR via JESS (EN 50607:2015)		
DVB-T/T2/C input									
Terrestrial / Cable input	-	-	-	-	1 x F connector, 75Ω	-	-	-	1 x F connector, 75Ω
Tuners	-	-	-	-	6	-	-	-	6
Supply voltage DVB-T antenna	-	-	-	-	Not supported	-	-	-	Not supported
Input frequency range	-	-	-	-	47 – 862 MHz	-	-	-	47 – 862 MHz
Channel bandwidth	-	-	-	-	7/8 MHz	-	-	-	7/8 MHz
Level range	-	-	-	-	40 – 95 dBµV	-	-	-	40 – 95 dBµV
Input noise	-	-	-	-	< 7 dB	-	-	-	< 7 dB
Return loss	-	-	-	-	> 10 dB	-	-	-	> 10 dB
DVB-T									
Demodulator type	-	-	-	-	COFDM	-	-	-	COFDM
Modulation DVB-T	-	-	-	-	QPSK, 16QAM, 64QAM	-	-	-	QPSK, 16QAM, 64QAM
Channel bandwidth	-	-	-	-	6/7/8 MHz	-	-	-	6/7/8 MHz
FFT modes	-	-	-	-	2k, 8k	-	-	-	2k, 8k
Code rate	-	-	-	-	1/2, 2/3, 3/4, 5/6, 7/8	-	-	-	1/2, 2/3, 3/4, 5/6, 7/8
Guard interval	-	-	-	-	1/4, 1/8, 1/16, 1/32	-	-	-	1/4, 1/8, 1/16, 1/32
DVB-T2									
Demodulator type	-	-	-	-	COFDM	-	-	-	COFDM
Modulation DVB-T2	-	-	-	-	QPSK, 16QAM, 64QAM, 256QAM	-	-	-	QPSK, 16QAM, 64QAM, 256QAM
Channel bandwidth	-	-	-	-	6/7/8 MHz	-	-	-	6/7/8 MHz
FFT modes	-	-	-	-	1k, 2k, 4k, 8k, 16k, 32k	-	-	-	1k, 2k, 4k, 8k, 16k, 32k
Code rate	-	-	-	-	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	-	-	-	1/2, 3/5, 2/3, 3/4, 4/5, 5/6

Type	TDcH 16S-Q	TDcH 16S	TDcH 16S-I-Q	TDcH 16S-I	TDcH 22STC-I	TDmH IP	TDmH 8S	TDmH 8S-I	TDmH 14STC-I
Art. number [Pro:Idiom (LG)]	**492790**	**492491**	**492780**	**492781** **[492787]**	**492782** **[492788]**	**492770**	**492772**	**492773** **[492775]**	**492774** **[492776]**
Guard interval	-	-	-	-	1/4, 19/128, 1/8, 19/256, 1/16, 1/32, 1/128	-	-	-	1/4, 19/128, 1/8, 19/256, 1/16, 1/32, 1/128
DVB-C									
Demodulator type	-	-	-	-	QAM	-	-	-	QAM
Modulation	-	-	-	-	16QAM, 64QAM, 128QAM, 256QAM	-	-	-	16QAM, 64QAM, 128QAM, 256QAM
Symbol rate	-	-	-	-	1 - 7,2 MS/s	-	-	-	1 - 7,2 MS/s
IP-Input									
Number of IP input streams	4, 16 or 96 x SPTS/MPTS (*license required*)					48 x SPTS/MPTS	4, 16 or 48 x SPTS/MPTS (*license required*)		
Data interface	1 x 1000 Base-T SFP or Fibre SFP ; 1000BaseX (SerDes) mode								
Protocols	IEEE802.3 Ethernet SPTS Streaming (VBR) including PAT, SDT, PMT, CAT and EIT MPTS Streaming (VBR) including PAT, SDT, PMT, CAT and EIT Multicast UDP and RTP MPEG Transport Stream via IP Protocol								
IP packet format	MPEG								
IP-Bitrate	max. 950 Mbit/s at SFP interface for all SPTS streams								
CI interfaces									
Supported CAM vendors	-	-	Aston, Neotion, SMARDTV, SMiT			-	-	Aston, Neotion, SMARDTV, SMiT	
Supported modules and cards	-	-	Conax: Canal Digital (Nordic), Telewizja (Poland), T Home (Hungary) Cryptoworks: ORF (Austria), UPC Direct (Hungary) Irdeto: ORF (Austria) Nagravision: Canal Digital (NL), Canal + (France), Cyfra (Poland), Cyfrowy (Poland), Multicanal (Spain), UPC, NDS, Viasat (Nordic + Baltic) Viaccess: Fransat (France), Eurosport (Poland)			-	-	Conax: Canal Digital (Nordic), Telewizja (Poland), T Home (Hungary) Cryptoworks: ORF (Austria), UPC Direct (Hungary) Irdeto: ORF (Austria) Nagravision: Canal Digital (NL), Canal + (France), Cyfra (Poland), Cyfrowy (Poland), Multicanal (Spain), UPC, NDS, Viasat (Nordic + Baltic) Viaccess: Fransat (France), Eurosport (Poland)	
Bitrate	-	-	Configurable: 50, 72, 96Mbps			-	-	Configurable: 50, 72, 96Mbps	
PID and service limit	-	-	PID and service limit is given by the CAM			-	-	PID and service limit is given by the CAM	
Supply voltage	-	-	5V			-	-	5V	
RF output									
RF out	1 x F connector								
HF measuring output	1 x F connector, -20 dB								
Frequency range	306 – 862 MHz								
Channels	S 21 – C 69								
Channel settings	16 channels in a row, single channels can be switched off					8 channels in a row, single channels can be switched off			
Return loss	> 10 dB								
Output impedance	75 Ω								
QAM modulation									
Output level range	85 – 95 dBµV								
Modulation scheme	QAM 16, 32, 64, 128, 256								
Dynamic phase error	< 0.3								
MER	> 43 dB								
Symbol rate	3.5 – 7.2 MS/s								
COFDM modulation									
Output level range	-	83 – 93 dBµV	-	83 – 93 dBµV					
Carrier to spurious ratio:	-	> 60 dB	-	> 60 dB					
Modulation scheme:	-	QPSK, 16 QAM, 64 QAM	-	QPSK, 16 QAM, 64 QAM					
MER	-	>=40dB	-	>=40dB					
Output mode:	-	2k	-	2k					
Guard intervals:	-	1/4, 1/8, 1/16, 1/32	-	1/4, 1/8, 1/16, 1/32					
IPTV Output									
Number of IP output streams	100 x SPTS (*license required*)					48 x SPTS (*license required*)			
Data interface	1 x 1000 Base-T SFP or Fibre SFP ; 1000BaseX (SerDes) mode								
Protocols	IEEE802.3 Ethernet SPTS Streaming (VBR) including PAT, SDT, PMT, CAT and EIT								

Type	TDcH 16S-Q	TDcH 16S	TDcH 16S-I-Q	TDcH 16S-I	TDcH 22STC-I	TDmH IP	TDmH 8S	TDmH 8S-I	TDmH 14STC-I
Art. number [Pro:Idiom (LG)]	**492790**	**492491**	**492780**	**492781** **[492787]**	**492782** **[492788]**	**492770**	**492772**	**492773** **[492775]**	**492774** **[492776]**
	Multicast UDP and RTP MPEG Transport Stream via IP Protocol 7 TS packets pr. Ethernet packet								
IP packet format	MPEG								
IP-Bitrate	max. 950 Mbit/s at SFP interface for all SPTS streams								
PID-Filtering and Remapping	Yes								
TTL	1-255 (default 16)								
EIT	Inside SPTS for current service								
XML EPG	EPG data in XML format as specified by Samsung Configurable language and Maturity Rating Country for XML EPG								
Scrambling									
VSecure (Philips) [Philips TV + special CAM]	-	-	-	*License required* *48 x*		-	-	*License required* 48 x	
Pro:Idiom (LG) [Special hardw. variants required]	-	-	-	24 x		-	-	24 x	
LYNK (Samsung)	-	-	-	*License required* 48 x		-	-	*License required* 48 x	
Simulcrypt (128bit AES)	-	-	-	*License required* (future) 48 x		-	-	*License required* (future) 48 x	
Features									
SNMP	SNMP traps (*license required*)								
Media Player	2 or 4 Media Players (license required) Input file formats: TS, MP4, MPG, PDF Supported conversion video codec: MPEG2, H.264 Supported conversion audio codec: AAC, AC3, MP3, MP2 Max bitrate configurable [1-50Mbps]; Internal storage: 2GB								
Common NIT/SDT/EIT	Option via license					-	-	-	-
Stackable (common GUI plus feature to Common NIT/SDT/EIT)	Option via license					-	-	-	-
General									
Mains supply	100 - 264 VAC, 50/60 Hz								
Ground connection	Ground clamp								
Power consumption * Without CAM and LNB power	*typ. 35 W, max. 90 W	*typ. 32 W, max. 90 W	*typ. 39 W, max. 90 W	*typ. 36 W, max. 90 W	*typ. 46 W, max. 90 W	typ. 20W, max. 25W	typ. *30 W, max. 65 W	typ. *33 W max. 73 W	typ. *40 W, max. 80 W
Ambient temperature	-10°C to +50°C								
Dimensions in mm	(W x D x H) 434 x 220 x 90					(W x D x H) 434 x 168 x 45			
Weight	3.8 kg	3.8 kg	4.0 kg	4.1 kg	4.1 kg	2.6 kg	2.8 kg	3.0 kg	3.1 kg

4 Mounting the unit

4.1 Installing the device

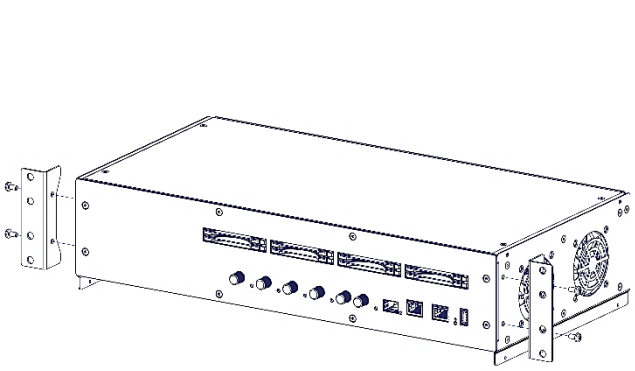
The TDcH & TDmH can be mounted in a 19” rack or wall mounted in any direction needed.

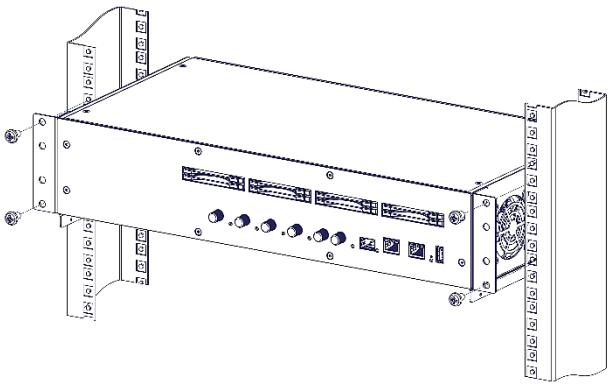
Ensure that the unit is correctly grounded, according to applicable national regulations.

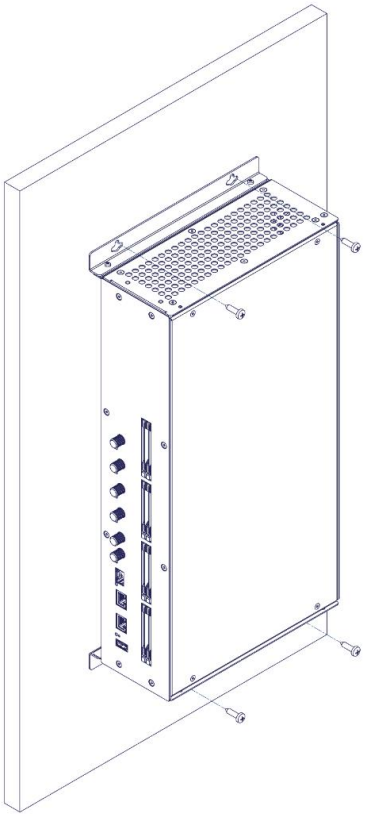
Ensure that min. 4 cm ventilation space is available on both sides of the equipment, so that the fans and ventilation holes are not covered!

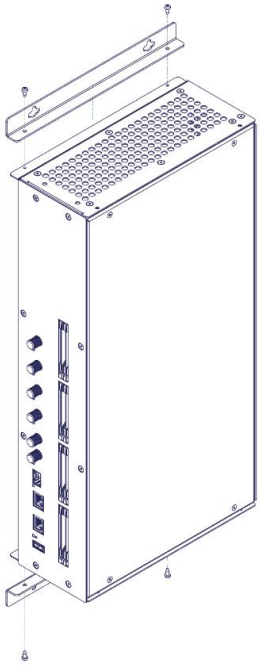
4.1.1 Example of mounting options for the TDcH

An example of mounting options for the TDcH similar option can also be applied to TDmH.









4.1.2 Example of mounting options for the TDmH

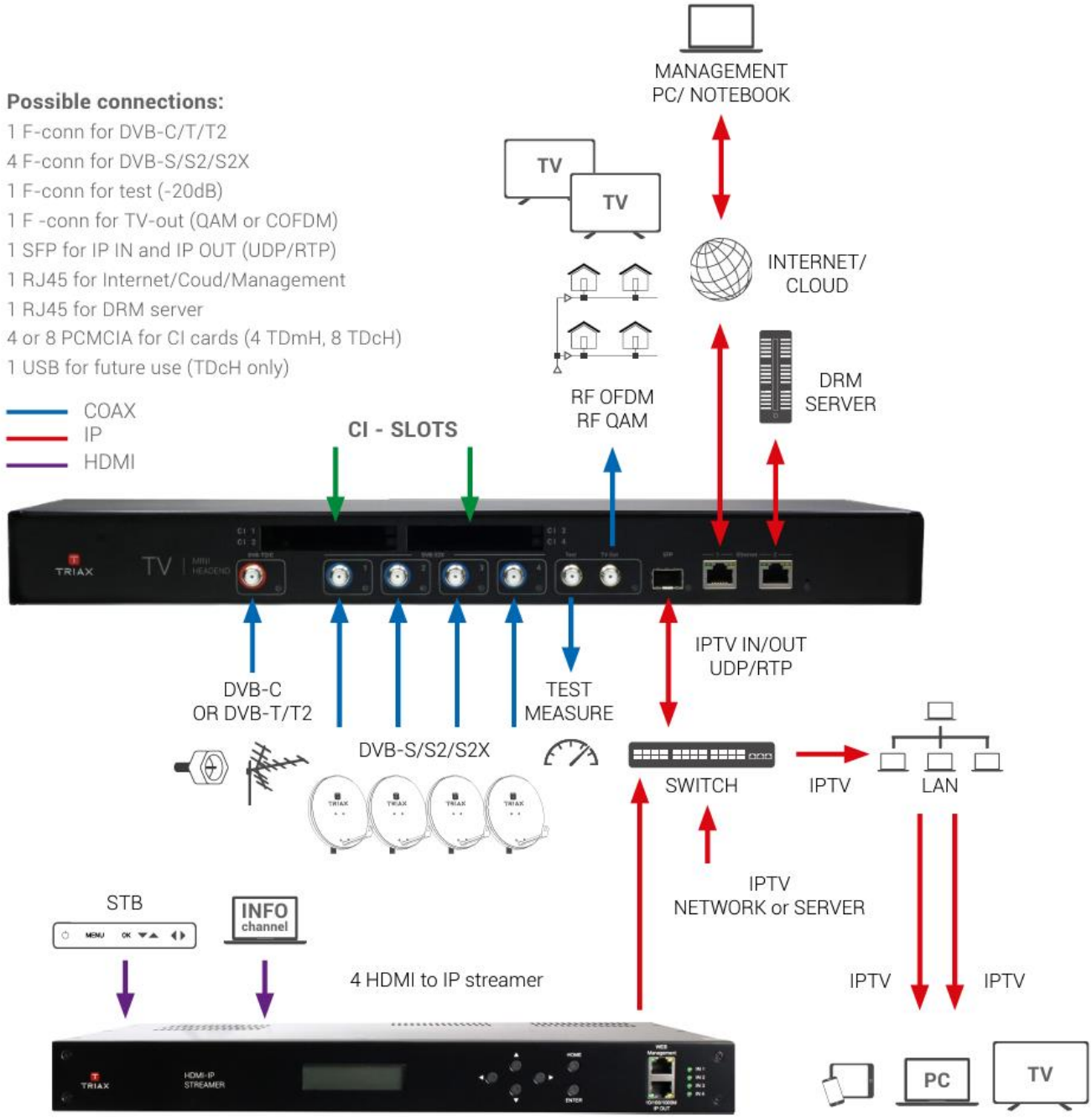
The positioning of the TDmH brackets when installing the headend in either a rack or wall mount configuration. The 19” rack mounting is the default position of the brackets, but the installer can change to wall mount installation, by removing the 2*4 screws and turn the brackets, and mount the 2*4 screws again.

4.1.3 Potential equalisation

Equalise the potential (PE) in accordance with IEC/EN/DIN EN 60728.

Connect the PE connection terminal to a PE rail (supplied by customer) using the PE wire (Cu 4 mm² - 9 mm²).

4.2 Device overview



4.3 Connecting the device

Connect the SAT IF inputs to the corresponding outputs of an LNB or multi switch. Make sure that all inputs have the same level and are in the required level range!
Connect the Terr/Cable input to the corresponding output of a terrestrial or cable distribution. Make sure that the input level is in the required level range!
Connect the included mains cable to the IEC connector.
Connect the mains cable to a mains socket with protective conductor connection. *Note* the voltage specified on the device.
This device has no power switch and starts immediately after connecting the operating voltage.
Configure the device as described in the chapter “Installation & Easy Setup”
Once the programming is finished, connect the RF output to the cable network.

5 Installation & Easy Setup

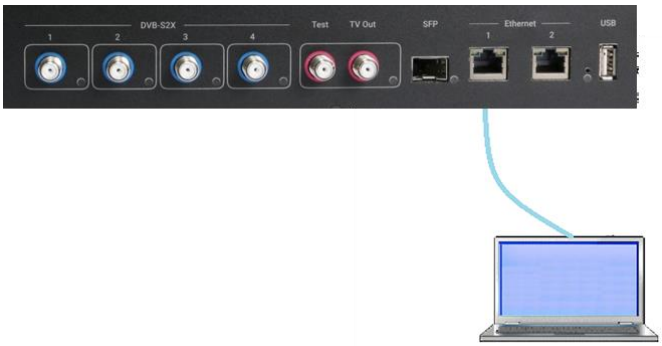
5.1 Installation

5.1.1 Static IP address

A static address must be used on the computer you use to configure the headend. Refer to the computer's operating software documentation for assistance on using static IP addresses.

5.1.2 Physical connection to headend

Connect a Cat5e shielded cable or better between the computer's network port and the management port on the headend.



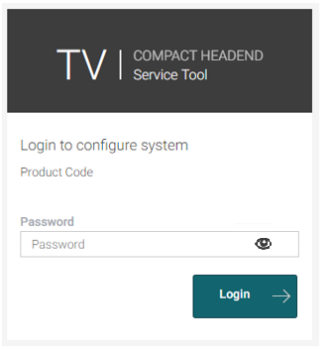
Note:
Please use Ethernet port 1 to connect your PC to the headend

Ethernet port 2 is reserved for future use. Currently the management GUI can't be reached at this port. The port is configured to get the IP address via DCHP.

5.1.3 Starting service tool

Open a web browser window.
Recommended browser:
- Google Chrome version 90.x.x.x
- Mozilla Firefox version 88.x.x
- Microsoft Edge 90.x.x.x

Enter **http://192.168.0.100** in the web address field. Press **Enter**.
Enter the password. Press the **Login** button.



Note:
Password = **triax1234** when the service tool is opened on each headend for the first time. At the first login to the unit, the password must be changed to a unique password, as described in the section "Change password".

Up to 10 sessions can be opened and logged in to the same units user interface!
If the user does not log out, the session will be kept open.
When the 11th session is opened the first login session will be closed.

5.1.4 System status LED

Input LED indications

Below the reset button there is a general system status LED.
The following status LED indications are available:

Off:	The system is turned off
Flashing green:	The system is starting up
Flashing orange (green+red):	Software update in progress
Steady green:	System is up and running OK. No error seen within the last 24 hours. All demodulators using this input is OK (tuned/locked). CA modules are descrambling OK. No packages dropped at outputs.
Steady red:	At least one error has occurred in the system within the last 24 hours. E.g. one or more demodulator(s) using this input indicate(s) ERROR (not locked/tuning lost), descrambling fails at one or more CA modules, or packages dropped at a least one output.

5.1.5 Input LEDs

Input LEDs indication

Black (Off):	This input is not in use by any demodulator
Amber (Green+Red):	One or more demodulator(s) using this input, indicates WARNING (bad signal (C/N to high, level to low, etc…)
Red:	One or more demodulator(s) using this input, indicates ERROR (not locked)

5.1.6 Output LED

Output LED indications

Green:	All outputs are OK
Red:	One or more output(s) indicates ERROR (overload)

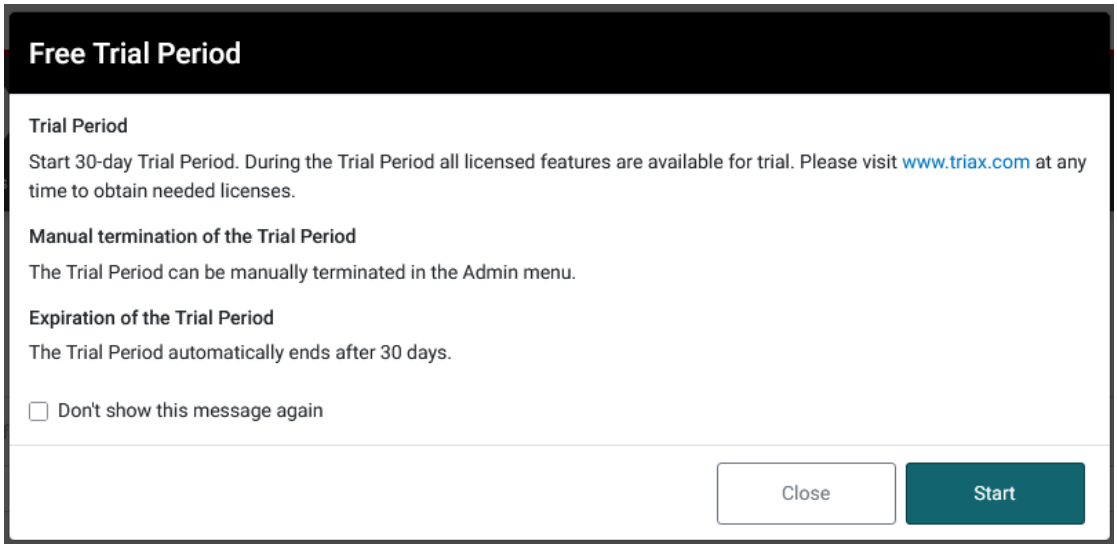
5.1.7 Reset button

The following Reset functions are available:

When the reset button is pressed (during startup) until the LED flashes green, then the system resets to factory defaults.
When the reset button is pressed (during startup) until the LED flashes red, then the system starts in recovery mode.

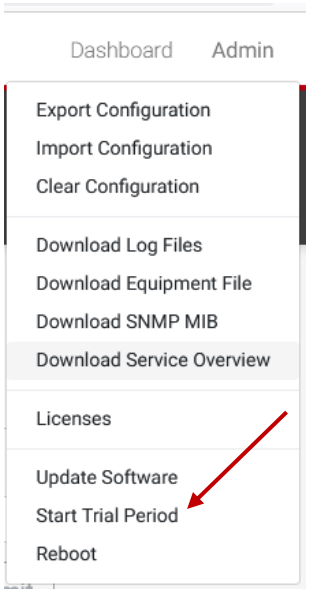
5.2 Free Trial Period

When logging in to the system for the first time, a free trial period will be offered.



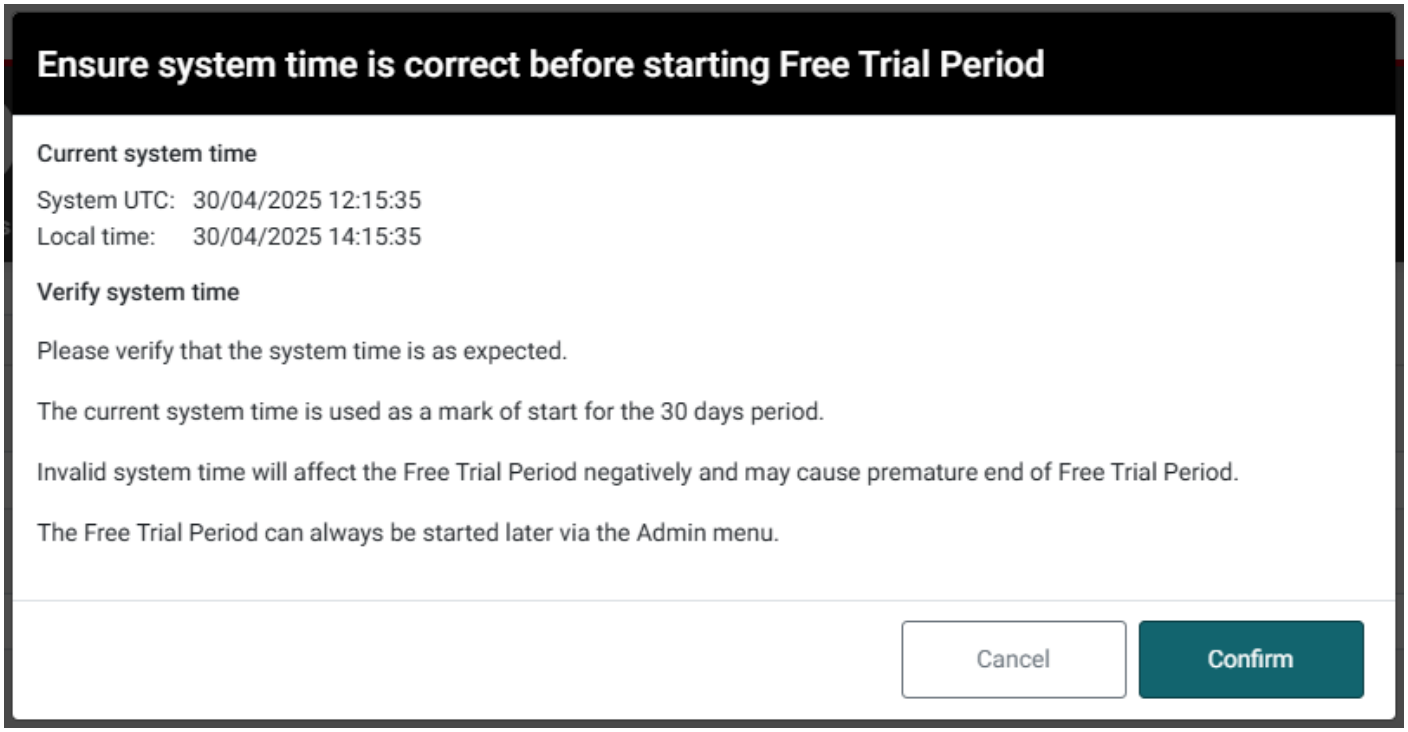
If it is not desired to start the Trial Period, then chose “Close”. To avoid showing the Trial Period offer message on each login, then tick the box “Don’t show this message again”.

The Trial Period can also be started via the Admin menu, if the Trial Period offer has not yet been activated.



Before starting the Free Trial Period, it is very important to ensure that the system time is correct.

Invalid system time will affect the Free Trial Period negatively and may cause premature end of Free Trial Period.

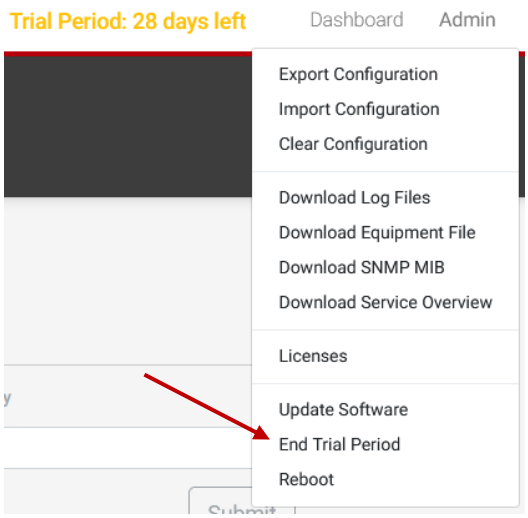


The times shown in the pop-up are the systems UTC time. System means the current TDcH/TDmH unit. This is important to check the date is correct. The time is given in UTC. The local time is also shown. This local time is the local time for the system including the local time offset for the PC used for managing the headend. This local time is also used elsewhere in the GUI. For more information about time in the system, search for “System time” and see the description for the times shown at the Dashboard.

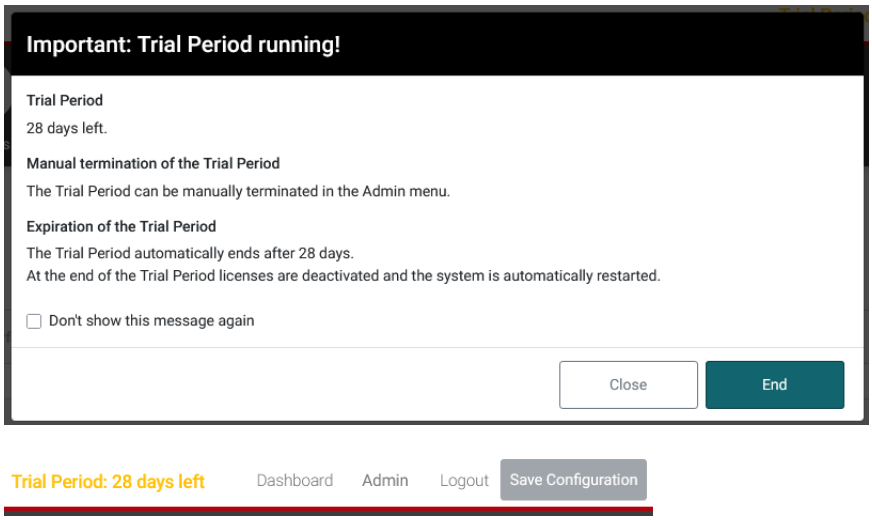
The Trial Period will run for 30 days. During this period all licensed features are available for trial.

After 30 days the Trial Period automatically ends, if not manually terminated. When the Trial Period ends, the system will restart and then any feature that requires a license will only work if a license has been installed.

The Trial Period can manually be terminated in the Admin menu.



The remaining time for an ongoing Trial Period is show as a popup on each login, and at the top to the GUI.



It is possible to install licenses during the Trial Period. After the Trial Period ends or is terminated, the installed licenses will still be effective. Thus, if a feature that requires a license was configured then it will still work if the required license is installed.

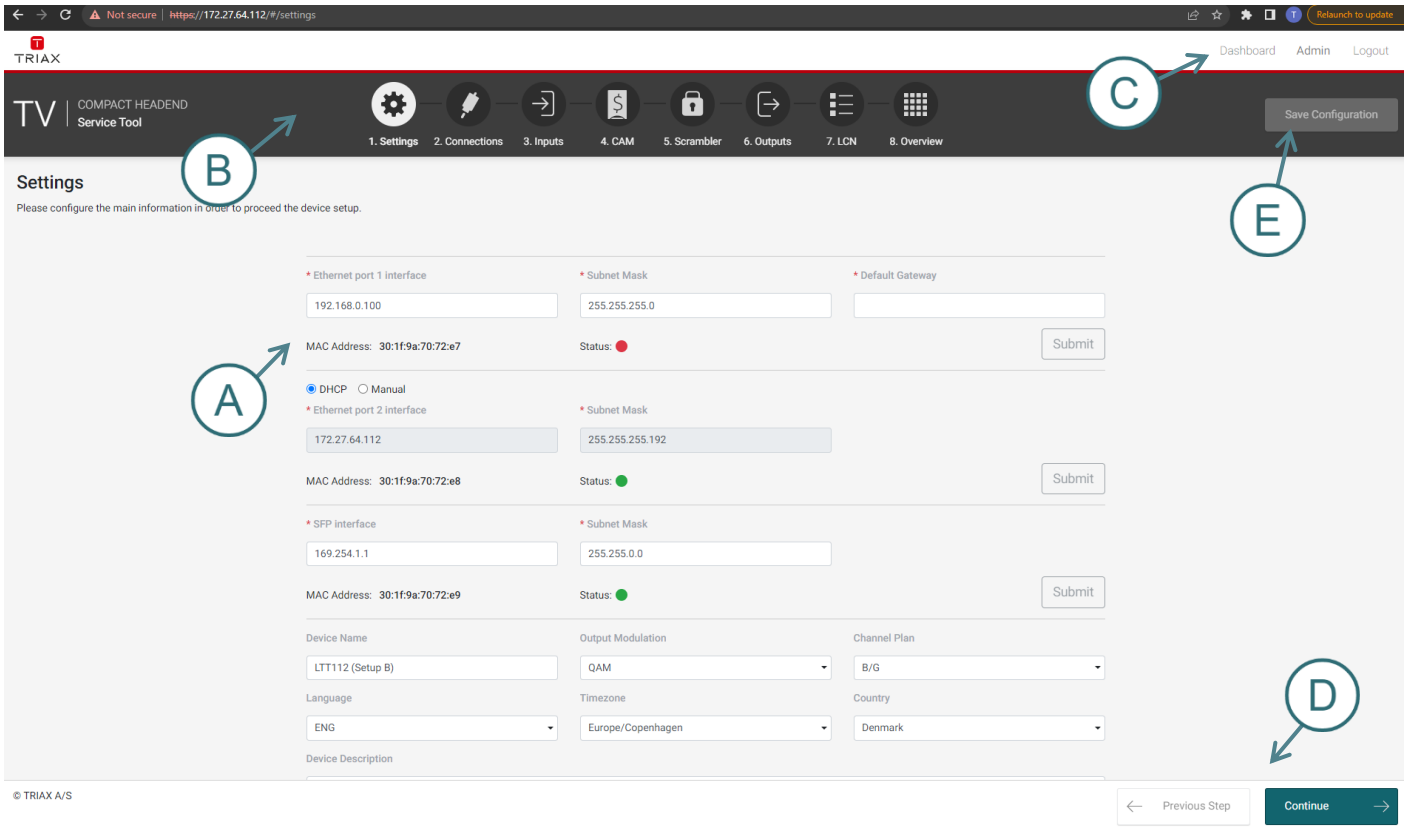
After the Trial Period ends, the GUI will highlight the missing licenses if the system is configured with features that requires a license. The missing licenses will not be highlighted during the Trial Period.

In general it is suggested that the Trial Period is ended by manual termination, to ensure that all licenses has been install.

If the missing license are not installed, the configuration must be adjusted to remove the warning for the missing licenses.

Good practice: Warning must be removed, because a warning for e.g. missing IP-out licenses may mask for other important warnings.

5.3 TDcH & TDmH web interface (GUI)



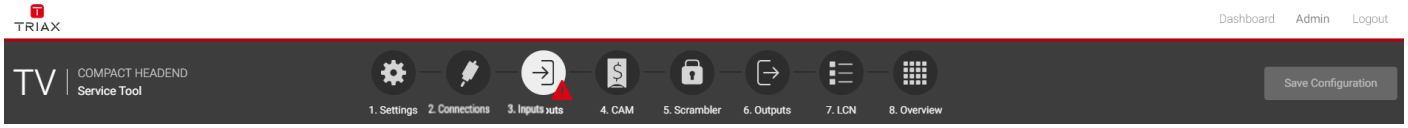
A. Information window
B. Navigation bar
C. Administrator and Dashboard menu
D. Installation wizard function to continue or go one step back
E. Save Configuration

When logged in, you will be met by 8 panes:

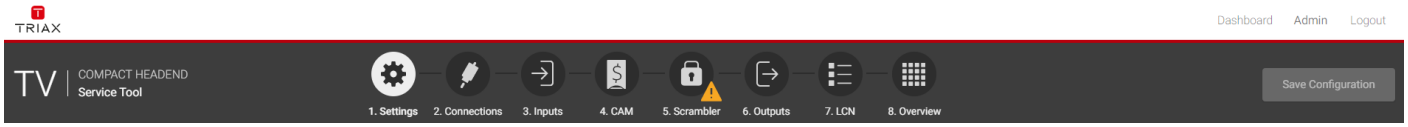
1.	Settings	basic settings of the system (TDcH & TDmH setup)
2.	Connections	assign input cables to available tuners
3.	Inputs	configure to desired provider and services
4.	CAM	assign services to CAMs (only shown if the model supports it)
5.	Scrambler	assign services to scrambler (only shown if the model supports it)
6.	Outputs	assign services to outputs
7.	LCN	assign services to required LCN number and configure the network settings
8.	Overview	see the complete assignment from inputs to outputs

Less than 8 panes might be shown if the TDcH & TDmH model does not support the feature. E.g. CAM and Scrambler panes are not shown for TDcH & TDmH models without CI slots.

5.3.1 Error indication

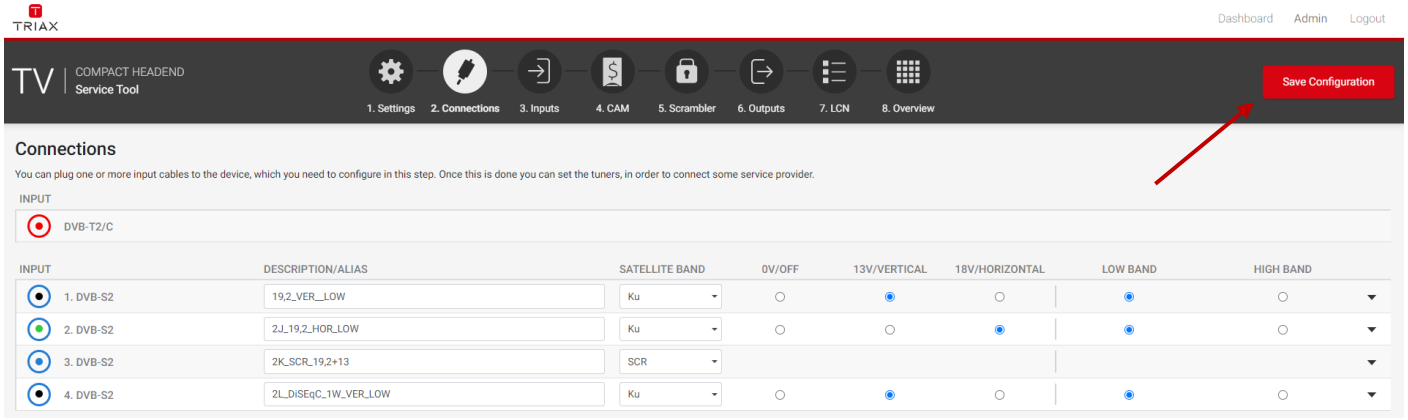


If there is an error in any part of the configuration, the user interface indicates this with a symbol in the relevant sector of the navigation menu. In other parts of the user interface the error symbol is also used to indicate an error or configuration failure.



Any warnings are indicated by a symbol.

5.3.2 Save configuration



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

Whenever you have made changes in your configuration, the “Save Configuration” button turns red to tell you that you have unsaved changes that need to be saved.

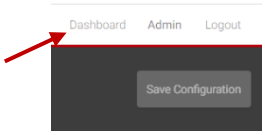
Click the “Save Configuration” button to save the changes. When changes have been saved, the “Save Configuration” button loses the red colour.

5.3.3 Admin options

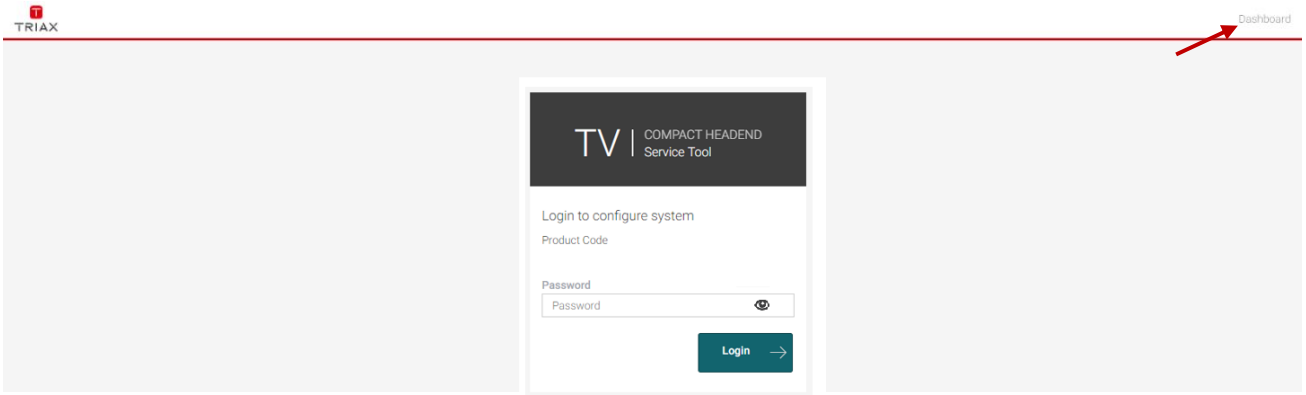
To enter the Admin options you need to Login.
At the top right you can switch between the Dashboard and the Configuration.

5.4 Dashboard

There are two possibilities to open the Dashboard overview of a TDcH or TDmH unit.



a) When logged in, it is possible to open the Dashboard by pressing the Dashboard in the Administrator menu at the top right corner.
b) You can open the Dashboard from the login page at the top right corner.



Note:
For the Dashboard, it is not required to log in and to know the password.

The entered password can be seen if you press the eye.
This Dashboard can be used by hotel employees to see an overview during a failure analysis or report an issue to the installer.

5.4.1 System information at the Dashboard

General information about the system is shown at the Dashboard.

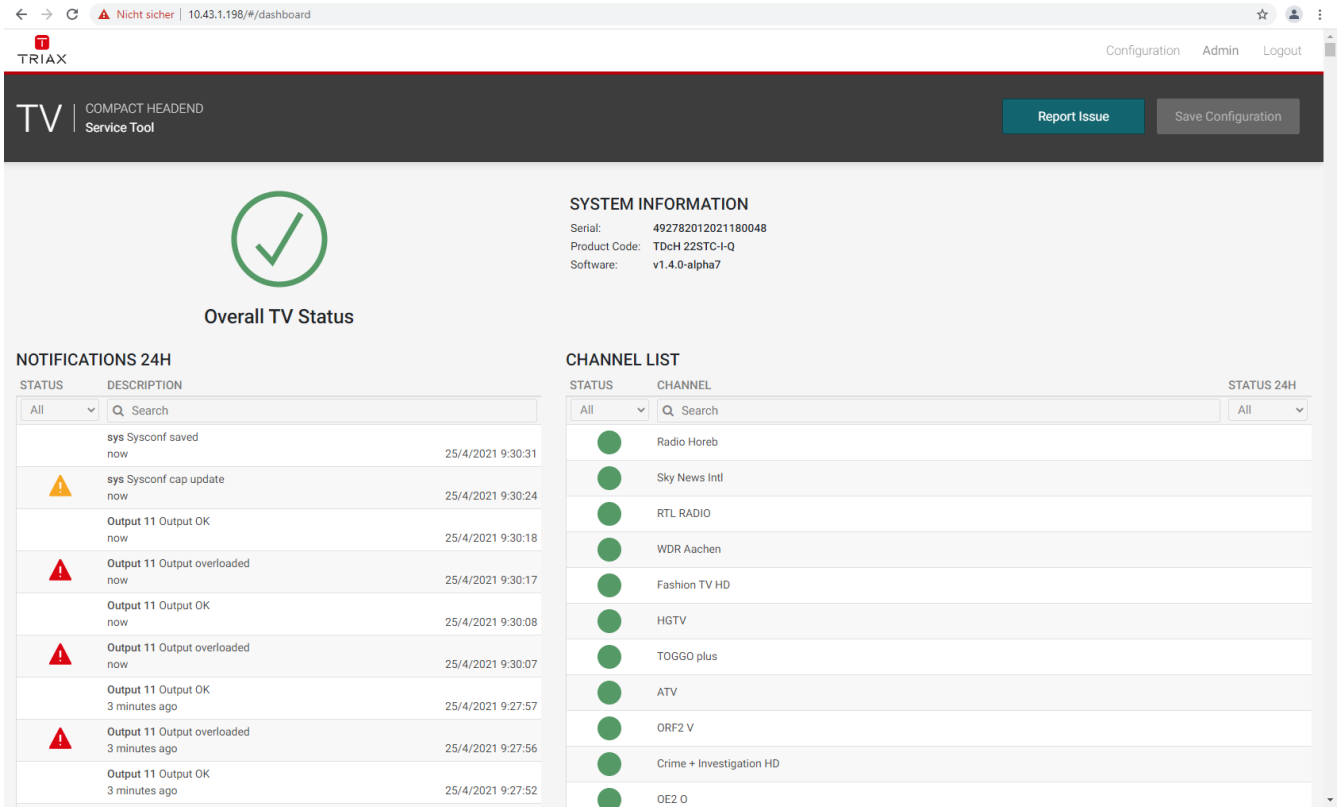
The times are shown in three ways:

- *System UTC*: The time in the headend system. The UTC (Coordinated Universal Time) reference to the time without any offset.
- *System time*: The time in the headend system including the Time zone, configured at the setting page. This is the time used in TOT, that is communicated to the TV sets. The TV set can use this time for setting up the time at the TV set, thus used e.g. for EPG.
- *Local time*: This is the time shown in the GUI. This time depends on the local time at the PC used for GUI management.

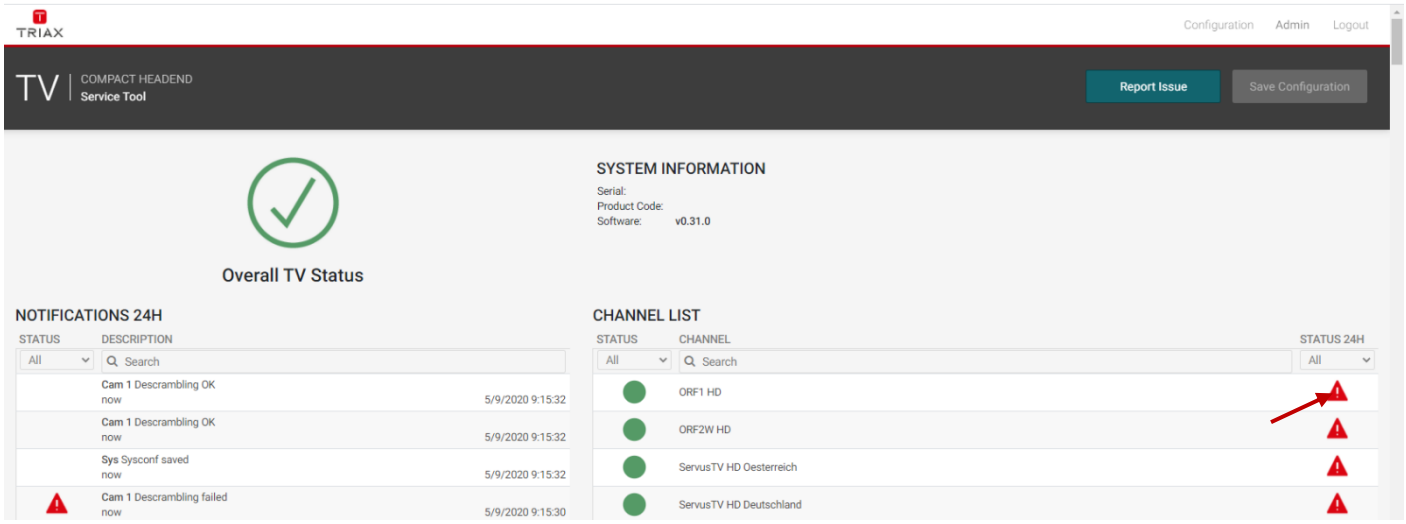
The example above shows the *System UTC* at the TDcH unit. The *System time* shows the time at the TDcH unit with Time zone configured to Kiev (+3 hours including daylight saving time), meaning the TDcH is configured to be deployed in Ukraine (Kiev). The *Local time* is seen from the user being managing the unit. In this example the user is placed in Denmark, where the Time zone for the used PC is Copenhagen (+2 hours including daylight saving time).

5.4.2 Notifications in the Dashboard

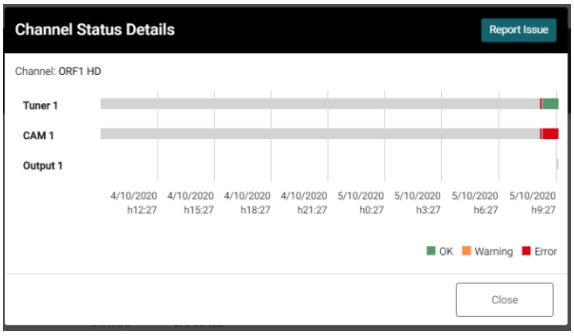
In the Dashboard view you will find the overall TV Status. The window is divided in two sectors. The left side shows all notifications of the last 24 hours and the right side shows a status on TV service level.



5.4.3 Channel Status Details at the Dashboard



When you are in the Dashboard mode and click on the error indication on the right side, a Channel Status Details window will pop up.



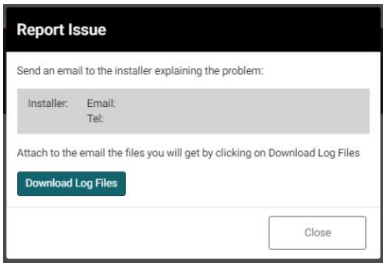
In this window you can find the status over the last 24 hours.

The window also shows where the failure has occurred, such as the tuner, CAM or output.

This also helps to evaluate where the errors took place and the possible reasons for the failure.

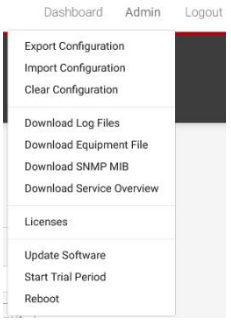
5.4.4 Report Issue

By pressing the report issue button, a window opens where you can download the log file. Please send us the log file together with your issue explanation.



5.5 Admin menu

In the Admin Menu you have the option to Export the current configuration, import a configuration file, and clear the configuration.



Export Configuration
Export the configuration from the TDcH & TDmH system to the download folder on the connected PC.

Note:
The configuration file is not human readable!

Import Configuration
Import a configuration file from the connected PC to the TDcH & TDmH system.

Note:
Configuration files can only be loaded from the same TDcH & TDmH model!
As an example:
- TDcH22STC-I config can be loaded at a TDcH22STC-I system
- TDcH22STC-I config **can NOT** be loaded at a TDcH16S-I

Note:
A configuration file from a system with a license required feature activated can be loaded to a system that does not have this feature activated via a license. The system however will show an error message indicating the missing license. There are then two options: a) buy and install the missing license, or b) delete the configuration for the current feature e.g. IPin, IPout, SNMP or Scrambling.

Clear Configuration
Clear the configuration at the system.

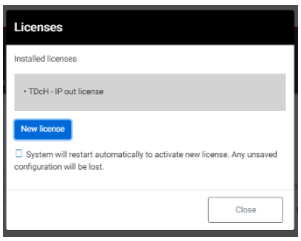
Note:
The function “Clear Configuration” will delete the configuration, set the IP address to the default IP address and also set the password to the default password!

Download Log Files
Function to download the log file of the compact headend.

Download Equipment File
Function to download the Equipment file of the compact headend.

Note:
The Equipment file is needed to generate a license in the PRT tool (Product Registration Tool).

Licenses

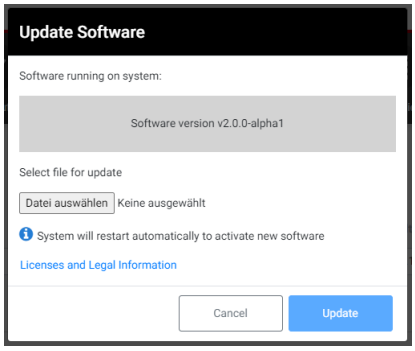


Licenses can be ordered. To order a license the equipment file is needed.

After the order process, the user receives a license file which will have to be loaded to the compact Headend the License was generated for.

Note:
The license cannot be used for any other compact headend with a different serial number

Update Software



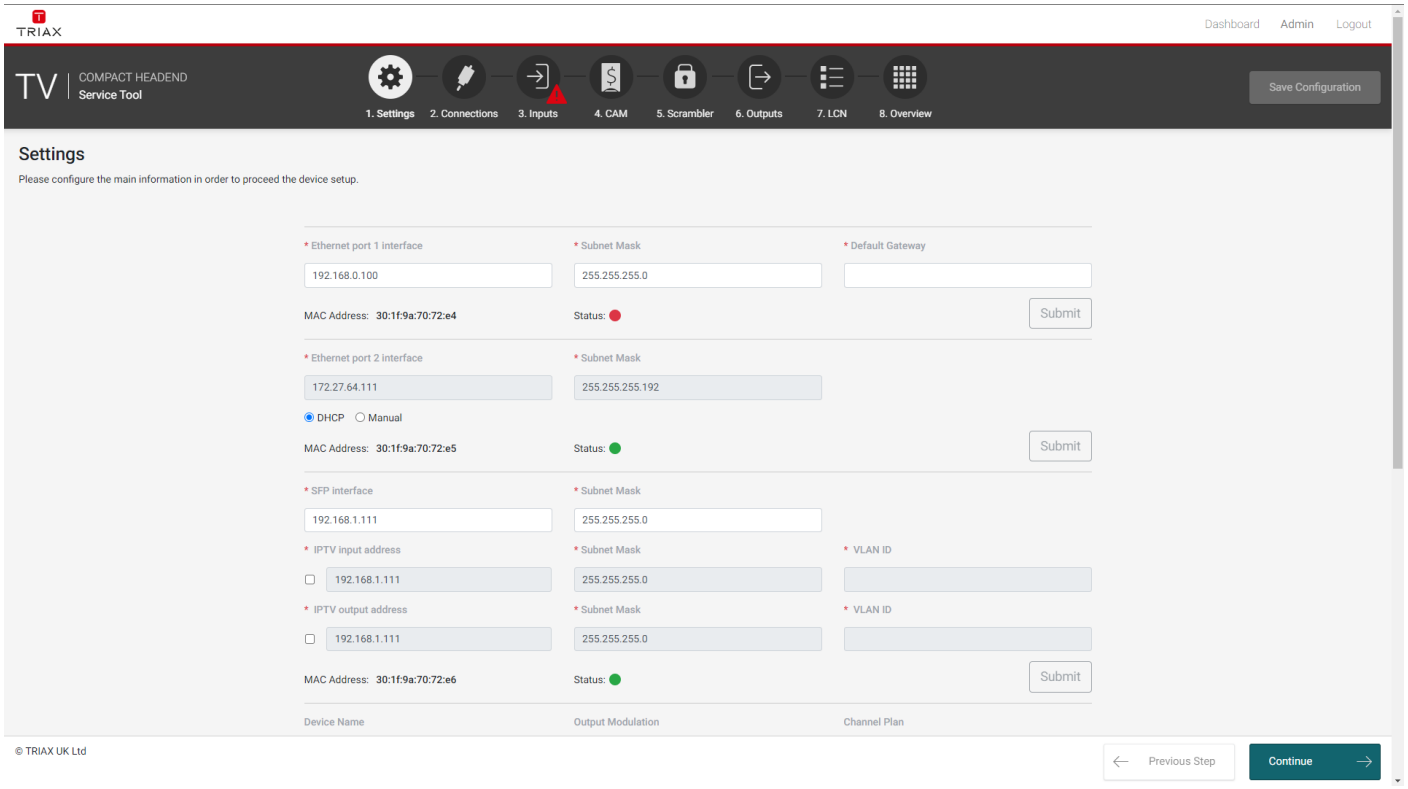
It is possible to update the software. The system will automatic reboot after update.

Reboot

Note:
During reboot any unsaved configuration will be lost.

5.6 Settings

Start with the folder “Settings” to set up the general settings and information of the TDcH & TDmH headend.



5.6.1 Ethernet Port 1 (Management Port)

Ethernet port 1 interface

This is the IP address of the Management port (Ethernet 1) of the Headend.

It may be necessary to specify a specific IP addresses for the headend to avoid network IP address conflicts.

Note:
If a PC is connected direct to the Management port with an Ethernet cable, the network address of the PC has to be in the same range as the headend.
The TDcH & TDmH management port IP addresses can be reset to factory default settings if required. This is done via the reset button on the headend unit. For more information see “Reset button” section.

Subnet Mask

This is the Subnet Mask of the network that the Management Port is connected to.

Default Gateway

This is the Default Gateway in the network that the Management Port is connected to.

MAC Address:
MAC address of this interface.

Status:
Green indicates this interface is connected.

5.6.2 System reset

The following reset functions are available:

1. *Factory defaults:*
   When the reset button is pressed (during start up) and held until the LED flashes green, then the system resets to factory defaults.
2. *Recovery mode:*
   When the reset button is pressed (during start up) and held even longer longer until the LED flashes red, then the system starts in recovery mode. The system can be accessed at Ethernet port 1 at the default IP address.

5.6.3 Ethernet port 2

This is the IP address of the Ethernet port 2 of the Headend.

It may be necessary to specify a specific IP address for the headend to avoid network IP address conflicts.

Note:
The ethernet Port 2 can be configured with either a static IP address or to dynamically obtain an IP address using DHCP.

Subnet Mask
This is the Subnet Mask of the network that the ethernet Port 2 is connected to.

MAC Address:
MAC address of this interface.

Status:
Green indicates this interface is connected.

5.6.4 SFP interface

This is the IP address of the SFP interface of the Headend. This interface is used for IPTV input and output.

Subnet Mask
This is the Subnet Mask of the network that the SFP interface is connected to.

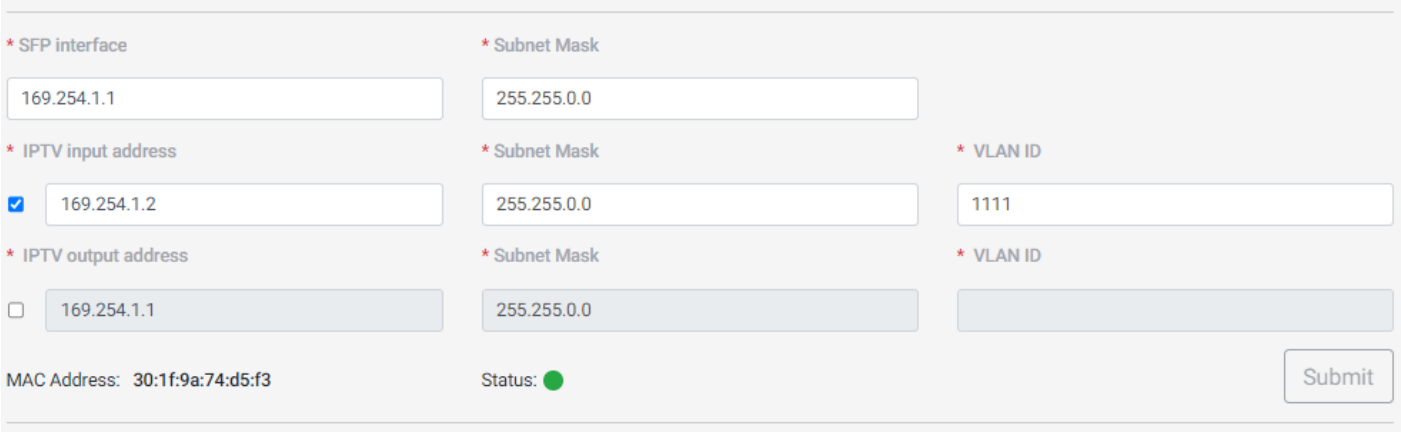
MAC Address:
MAC address of this interface.

Status:
Green indicates that this interface is connected.

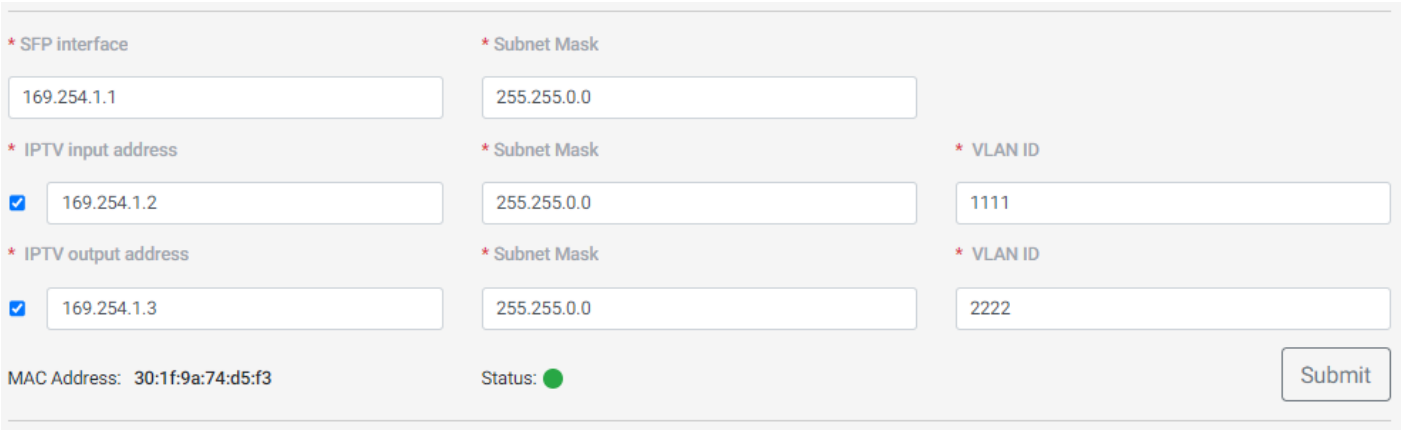
Yellow indicates that this interface is connected, but either the interface itself or one of its VLANs are not configured or functioning correctly.

5.6.5 VLAN at SFP interface

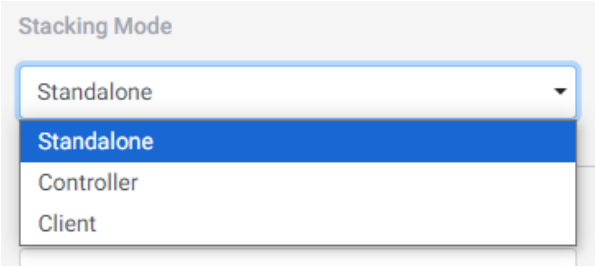
The SFP interface offers an option for VLANs, where one VLAN can be used for IPTV input and another can be used for IPTV output.
If VLAN is enabled for IPTV input, as in the example shown below, the IPTV input traffic must be tagged with the configured VLAN ID (1111). Streams that are either tagged with a different VLAN or untagged will be ignored. The Headend will also only join (IGMP) any configured multicast streams on the configured VLAN.
If VLAN is not enabled for IPTV input, the input streams must be untagged.



If VLAN is enabled for IPTV output, as in the example shown below, the traffic of any configured IPTV output streams will be tagged by the Headend with the configured VLAN ID (2222).
If VLAN is not enabled for IPTV output, the output streams are not VLAN tagged.



5.6.6 Stacking Mode



By default the TDcH and TDmH are set to Standalone Mode. This is the legacy mode, where only a single headend unit is deployed. If more units are deployed in a solution, then each unit must be assigned a specific Stacking role. This role is assigned in the Stacking Mode dropdown list. The roles in a stacking solution are:

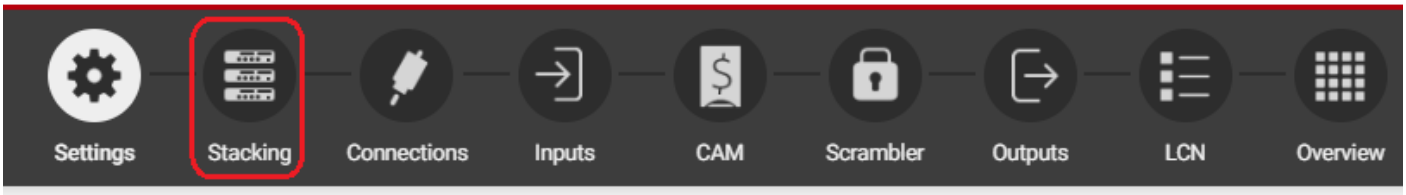
- *Controller*; The unit where the DVB Network Settings are configured for the complete solution and Client units are selected to be part of the solution.
- *Client*; Up to two units that can be connected to the *Controller*.

Only TDcH units can be assigned the role as *Controller*. Both TDmH and TDcH can be assigned the *Client* role.

The SDT and NIT at all enabled RF outputs (QAM or COFDM) contain information from all units, when more units are connected to each other in a stacking solution.

The units shall be connected to each other via one of the Ethernet ports or the SFP port. It doesn't matter what port that is used. The ports are easily connected directly to each other or via a switch. If a L3 switch is used, then it must be configured to allow multicast and mDNS traffic. The used ports must be configured to unique IP addresses at the same subnet, either manually or by DHCP (only Ethernet port 2).

A Stacking page is added to the menu, if Stacking Mode is different from Standalone.

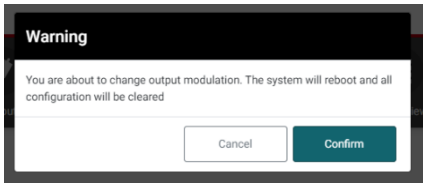


See section 5.7 Stacking for more details about the stacking feature.

5.6.7 Device Name

Description field to give the compact Headend or project any name.

5.6.8 Output Modulation



The TDcH & TDmH (except TDcH 16S-I-Q and TDcH 16S-Q models) support QAM and COFDM modulation. With this menu it is possible to switch between the QAM and COFDM output modulation.

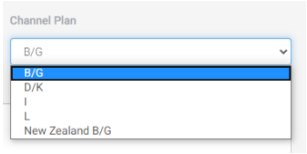
It is important to ensure the modulation is set correct before continuing.

Note:

If the output modulation is changed all configuration will be deleted and a restart is needed!

A Warning message will be shown.

5.6.9 Channel Plan



Click on the “Channel Plan” field to open the drop down and select the Channel Plan you would like to use.

Channel Plan description:

System B/G		System I		System D/K		System L		System B/G New Zealand	
Name	Centre frequency	Name	Centre frequency	Name	Centre frequency	Name	Centre frequency	Name	Centre frequency
S-21	306,00	S-21	306,00	S-21	306,00	S-21	306,00	CH21	474,00
S-22	314,00	S-22	314,00	S-22	314,00	S-22	314,00	CH22	482,00
S-23	322,00	S-23	322,00	S-23	322,00	S-23	322,00	CH23	490,00
S-24	330,00	S-24	330,00	S-24	330,00	S-24	330,00	CH24	498,00
S-25	338,00	S-25	338,00	S-25	338,00	S-25	338,00	CH25	506,00
S-26	346,00	S-26	346,00	S-26	346,00	S-26	346,00	CH26	514,00
S-27	354,00	S-27	354,00	S-27	354,00	S-27	354,00	CH27	522,00
S-28	362,00	S-28	362,00	S-28	362,00	S-28	362,00	CH28	530,00
S-29	370,00	S-29	370,00	S-29	370,00	S-29	370,00	CH29	538,00
S-30	378,00	S-30	378,00	S-30	378,00	S-30	378,00	CH30	546,00
S-31	386,00	S-31	386,00	S-31	386,00	S-31	386,00	CH31	554,00
S-32	394,00	S-32	394,00	S-32	394,00	S-32	394,00	CH32	562,00
S-33	402,00	S-33	402,00	S-33	402,00	S-33	402,00	CH33	570,00
S-34	410,00	S-34	410,00	S-34	410,00	S-34	410,00	CH34	578,00
S-35	418,00	S-35	418,00	S-35	418,00	S-35	418,00	CH35	586,00
S-36	426,00	S-36	426,00	S-36	426,00	S-36	426,00	CH36	594,00
S-37	434,00	S-37	434,00	S-37	434,00	S-37	434,00	CH37	602,00
S-38	442,00	S-38	442,00	S-38	442,00	S-38	442,00	CH38	610,00
S-39	450,00	S-39	450,00	S-39	450,00	S-39	450,00	CH39	618,00
S-40	458,00	S-40	458,00	S-40	458,00	S-40	458,00	CH40	626,00
S-41	466,00	S-41	466,00	S-41	466,00	S-41	466,00	CH41	634,00
CH21	474,00	CH21	474,00	CH21	474,00	CH21	474,00	CH42	642,00
CH22	482,00	CH22	482,00	CH22	482,00	CH22	482,00	CH43	650,00
CH23	490,00	CH23	490,00	CH23	490,00	CH23	490,00	CH44	658,00
CH24	498,00	CH24	498,00	CH24	498,00	CH24	498,00	CH45	666,00
CH25	506,00	CH25	506,00	CH25	506,00	CH25	506,00	CH46	674,00

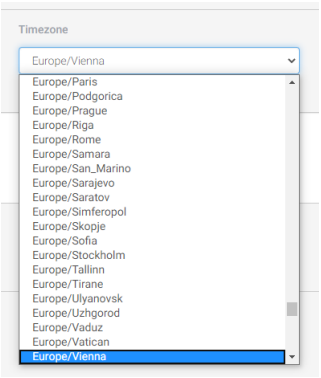
System B/G		System I		System D/K		System L		System B/G New Zealand	
Name	Centre frequency	Name	Centre frequency	Name	Centre frequency	Name	Centre frequency	Name	Centre frequency
CH26	514,00	CH26	514,00	CH26	514,00	CH26	514,00	CH47	682,00
CH27	522,00	CH27	522,00	CH27	522,00	CH27	522,00	CH48	690,00
CH28	530,00	CH28	530,00	CH28	530,00	CH28	530,00	CH49	698,00
CH29	538,00	CH29	538,00	CH29	538,00	CH29	538,00	CH50	706,00
CH30	546,00	CH30	546,00	CH30	546,00	CH30	546,00	CH51	714,00
CH31	554,00	CH31	554,00	CH31	554,00	CH31	554,00	CH52	722,00
CH32	562,00	CH32	562,00	CH32	562,00	CH32	562,00	CH53	730,00
CH33	570,00	CH33	570,00	CH33	570,00	CH33	570,00	CH54	738,00
CH34	578,00	CH34	578,00	CH34	578,00	CH34	578,00	CH55	746,00
CH35	586,00	CH35	586,00	CH35	586,00	CH35	586,00	CH56	754,00
CH36	594,00	CH36	594,00	CH36	594,00	CH36	594,00	CH57	762,00
CH37	602,00	CH37	602,00	CH37	602,00	CH37	602,00	CH58	770,00
CH38	610,00	CH38	610,00	CH38	610,00	CH38	610,00	CH59	778,00
CH39	618,00	CH39	618,00	CH39	618,00	CH39	618,00	CH60	786,00
CH40	626,00	CH40	626,00	CH40	626,00	CH40	626,00	CH61	794,00
CH41	634,00	CH41	634,00	CH41	634,00	CH41	634,00	CH62	802,00
CH42	642,00	CH42	642,00	CH42	642,00	CH42	642,00	CH63	810,00
CH43	650,00	CH43	650,00	CH43	650,00	CH43	650,00	CH64	818,00
CH44	658,00	CH44	658,00	CH44	658,00	CH44	658,00	CH65	826,00
CH45	666,00	CH45	666,00	CH45	666,00	CH45	666,00	CH66	834,00
CH46	674,00	CH46	674,00	CH46	674,00	CH46	674,00	CH67	842,00
CH47	682,00	CH47	682,00	CH47	682,00	CH47	682,00	CH68	850,00
CH48	690,00	CH48	690,00	CH48	690,00	CH48	690,00	CH69	858,00
CH49	698,00	CH49	698,00	CH49	698,00	CH49	698,00		
CH50	706,00	CH50	706,00	CH50	706,00	CH50	706,00		
CH51	714,00	CH51	714,00	CH51	714,00	CH51	714,00		
CH52	722,00	CH52	722,00	CH52	722,00	CH52	722,00		
CH53	730,00	CH53	730,00	CH53	730,00	CH53	730,00		
CH54	738,00	CH54	738,00	CH54	738,00	CH54	738,00		
CH55	746,00	CH55	746,00	CH55	746,00	CH55	746,00		
CH56	754,00	CH56	754,00	CH56	754,00	CH56	754,00		
CH57	762,00	CH57	762,00	CH57	762,00	CH57	762,00		
CH58	770,00	CH58	770,00	CH58	770,00	CH58	770,00		
CH59	778,00	CH59	778,00	CH59	778,00	CH59	778,00		
CH60	786,00	CH60	786,00	CH60	786,00	CH60	786,00		
CH61	794,00	CH61	794,00	CH61	794,00	CH61	794,00		
CH62	802,00	CH62	802,00	CH62	802,00	CH62	802,00		
CH63	810,00	CH63	810,00	CH63	810,00	CH63	810,00		
CH64	818,00	CH64	818,00	CH64	818,00	CH64	818,00		
CH65	826,00	CH65	826,00	CH65	826,00	CH65	826,00		
CH66	834,00	CH66	834,00	CH66	834,00	CH66	834,00		
CH67	842,00	CH67	842,00	CH67	842,00	CH67	842,00		
CH68	850,00	CH68	850,00	CH68	850,00	CH68	850,00		
CH69	858,00	CH69	858,00	CH69	858,00	CH69	858,00		
						CH70	866,00		
						CH71	874,00		
						CH72	882,00		

5.6.10 Language

Possibility to change the language of the user interface between English, German and French.

5.6.11 Timezone

Click on the “Timezone” field to open the drop down and select the time zone where the compact headend is installed.



The time zone is important because this sets ups the time offset which is added to the UTC time received with the service and sent out in the TOT to the TV.

Note:
Please test after the final installation if the time shown on the TV or in the EPG menu of the TV corresponds to the local time.

5.6.12 Time / internal clock

The internal clock in the system runs via a RTC. After a power cycle the clock will automatically continue.
The internal clock needs to be synchronized and initialized. If the clock is not synchronized it will drift and e.g. increase with ~ 1 minute pr. 24 hours, resulting in wrong time at the TV sets and EIT mismatch because of not aligned TDT at the output of the TDcH/TDmH.

Clock synchronization is done via a one of following options:

a) Via NTP (prioritized)
b) Via TDT in received transport stream

Clock synchronization via NTP
The NTP time shall be received either at Ethernet port 1 interface or Ethernet port 2 interface. The NTP server is automatically selected from the network configuration information in the DHCP response. If no valid DHCP response information is received, then the system will default to time1.google.com, time2.google.com, time3.google.com, or time4.google.com.

If the NTP time shall be received via the Ethernet port 1 interface then this port must be connected to the network and a valid and existing “Default gateway” must be configured for this port.

If the NTP time shall be received via the Ethernet port 2 interface then this port must be connected to the network and “DHCP” must be configured for this port.

Clock synchronization via TDT in received transport stream
The TDT in a received transport stream can also be used to synchronize the clock. The system automatically selects the TDT with the lowest jitter. The received transport stream can received by any RF input (DVB-S2X or DVB-T2 or DVB-C). From SW v3.1.0 IP inputs are also supported as TDT source for clock synchronization.

5.6.13 Country

Define the country in which the headend is installed.

Note:
This setting is also important to have the right time zone settings!

5.6.14 Device Description

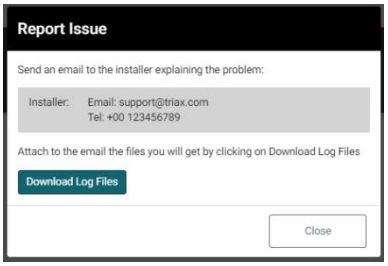
Text field for project description and notes.

5.6.15 Installer

Text field for the installer or company name who is responsible for the installation.

5.6.16 Installer Email and Phone

Text field for the email address and phone number of the installer.



Note:
Please note that this information is used in the report Issue window which can be accessed from the Dashboard.

5.6.17 SNMP

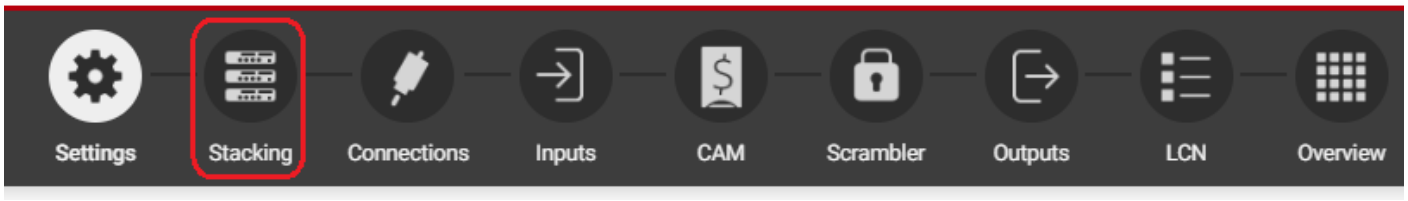
Option to enable SNMP and set address port to the SNMP monitor.

5.6.18 Change Password

The first time you login to the headend, you must change the password to a unique password by following these steps:

1. Specify a new password in the “Change Password” field.
2. Re-specify the new password in the “Confirm New Password” field.
3. Press submit to change the password.

5.7 Stacking

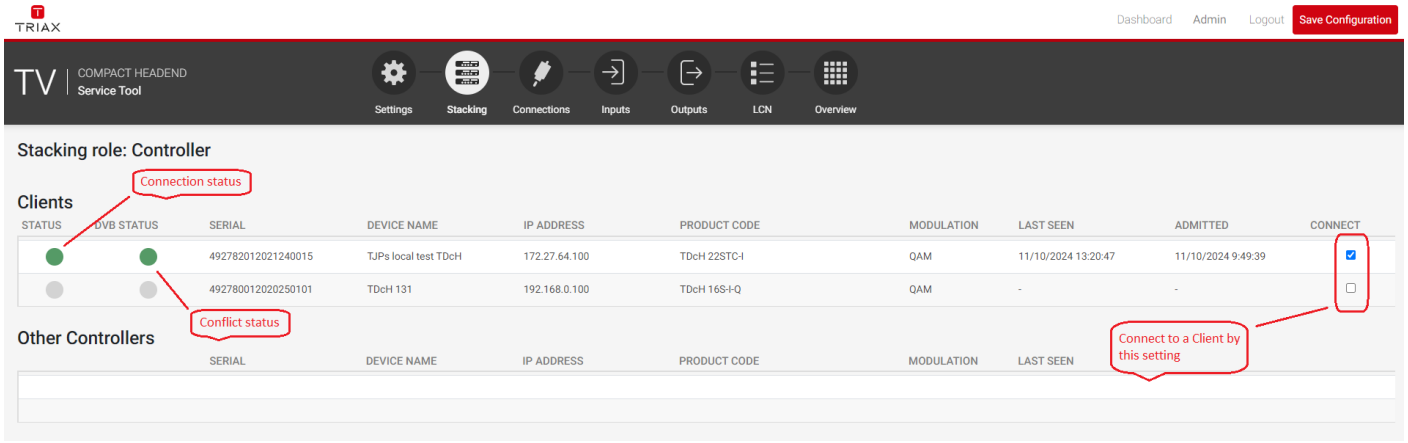


The stacking feature offers:

1. Multiple TDcH/TDmH units in one solution providing NIT and SDT other for the complete stacking solution.
2. Possibility to add up to 3 units. One controller and up to two clients.
    a. A TDcH unit can have the stacking role as either controller or client.
    b. A TDmH unit can have the stacking role as client.
3. Units can be connected to each other via either Ethernet 1, Ethernet 2 or SFP port.
    a. If a L3 switch is used, then shall it be configured to allow multicast and mDNS traffic.

Please read section 5.6.6 Stacking Mode before this section.

The GUI for each unit must be accessed separately. The Stacking page for the controller is shown below.



The Controller's Stacking page shows status for clients connected to the controller. It also show unconnected clients, attempting to connect to the controller. A Client can be added to the solution by selecting "Connect" for the given client.

When an added client successfully connects to the controller, its status is shown. First status indicator from the left is a status for connection between the units. The second status indicator is a status for DVB conflicts between the units. The possible conflicts are listed below.

a) The Output Modulation shall be the same for all units in the stacking solution. See image a.
b) The LCN and HDLCN shall be unique in the stacking solution. See image b.
c) The Output frequency and the Output Transport stream ID shall be unique in the stacking solution. See image c.

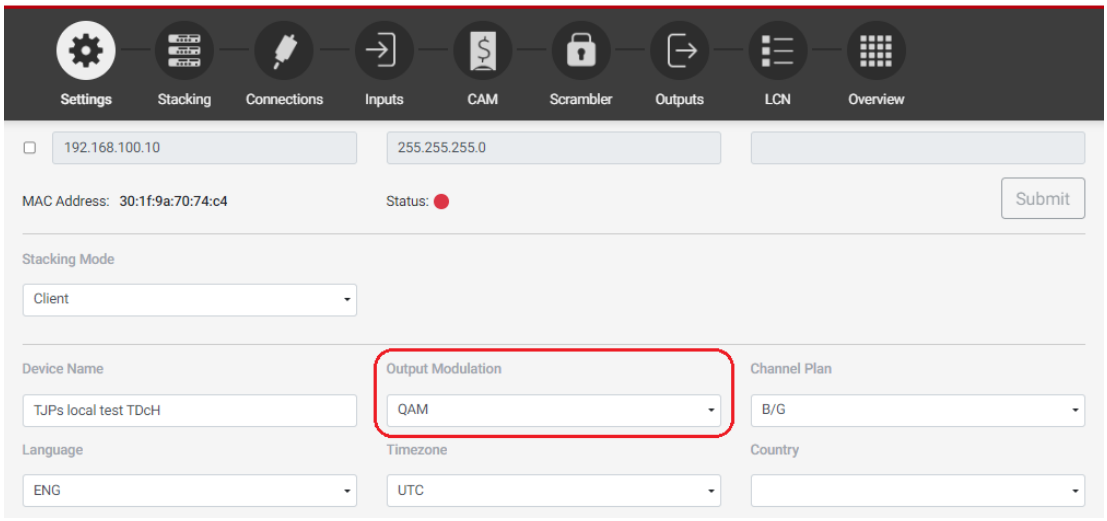


Image a.

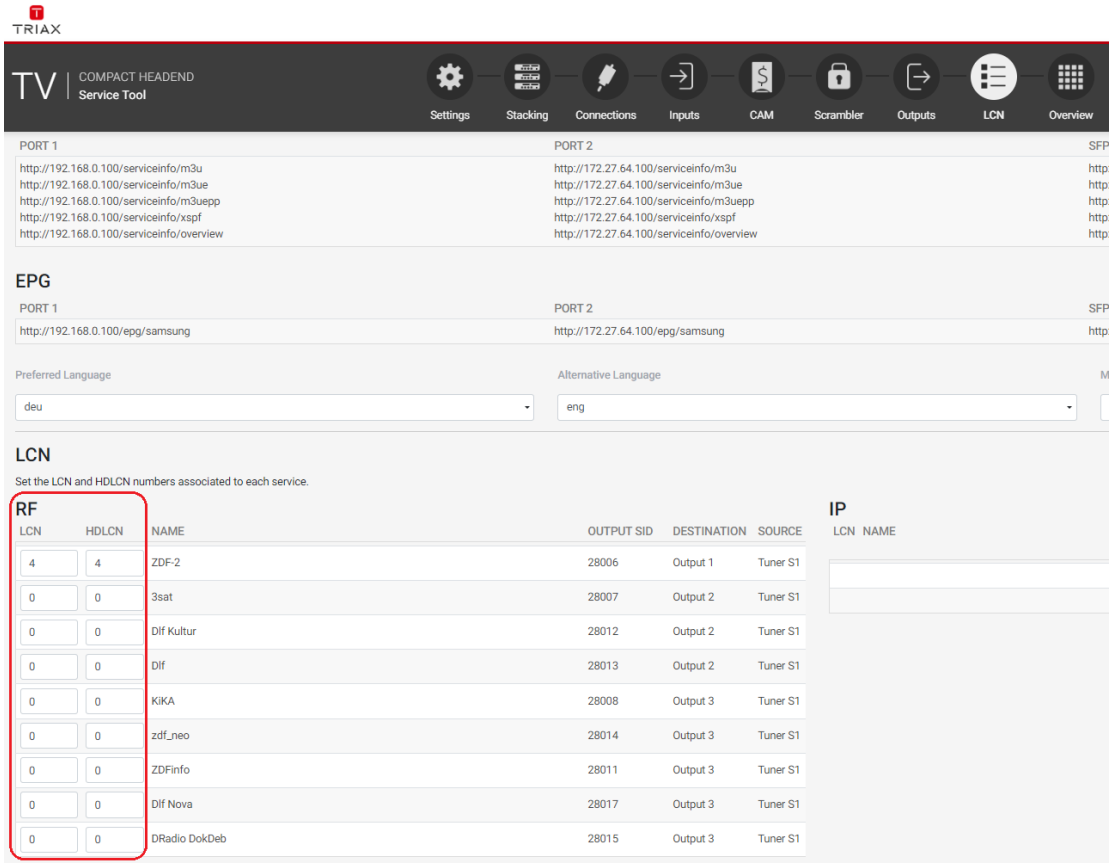


Image b.

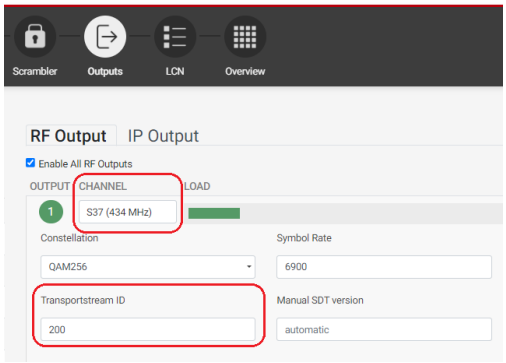
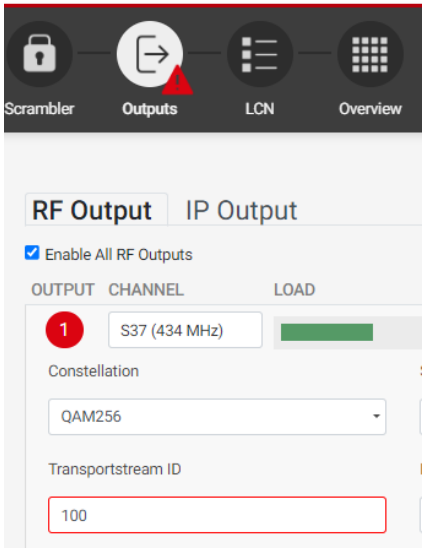
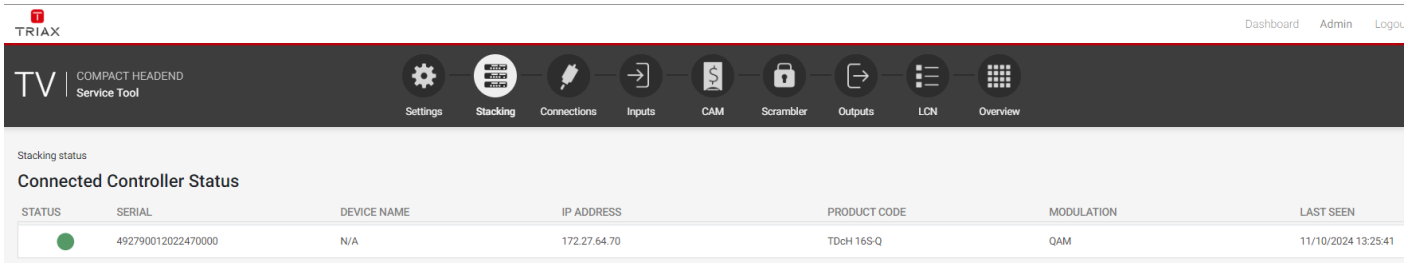


Image c.

A conflict will be indicated in the GUI with a red triangle along with highlighting the affected setting, as shown below for the Transport Stream ID setting at the Output page.



At the client's Stacking page it is shown what controller the client is connected to, along with status for the connection.



5.8 Input connections

5.8.1 DVB-T2/C input

The TDcH 22STC-I and TDmH 14STC-I headends have 1 Terrestrial / Cable input marked with DVB-T2/C and a red colour ring.

Note:
The Input has an LED indicator.
Black (off) indicates no tuners configured to use this input.
Green indicates OK for all tuners configured to use this input.
Red indicates error for one or more tuners configured to use this input.

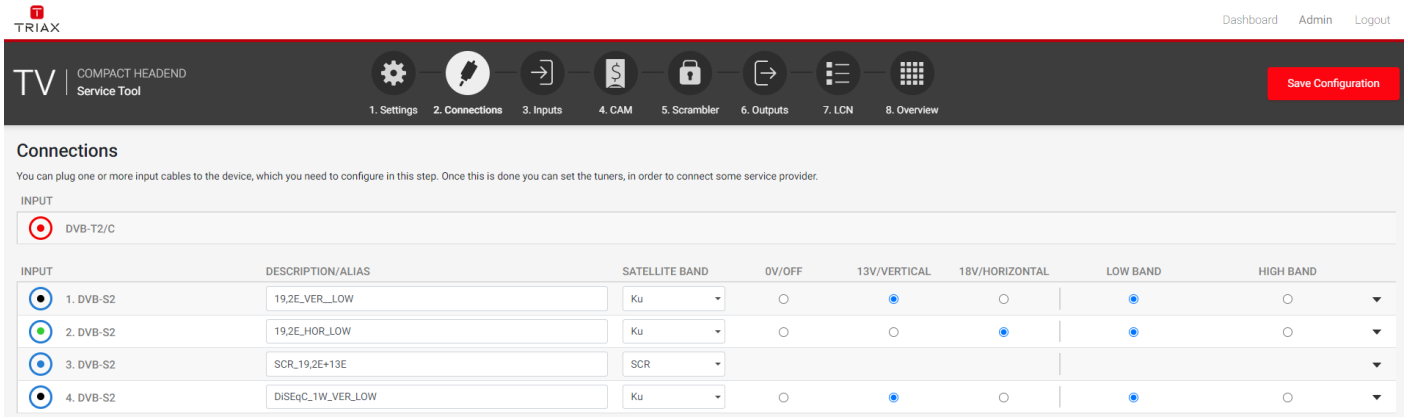
5.8.2 DVB-S2X inputs

The TDcH & TDmH headend (except the TDmH IP model) has 4 SAT-IF inputs marked with DVB-S2X and a blue colour ring.

Note:
The Inputs have an LED indicator.
Black (off) indicates no tuners configured to use this input.
Green indicates OK for all tuners configured to use this input.
Red indicates error for one or more tuners configured to use this input.

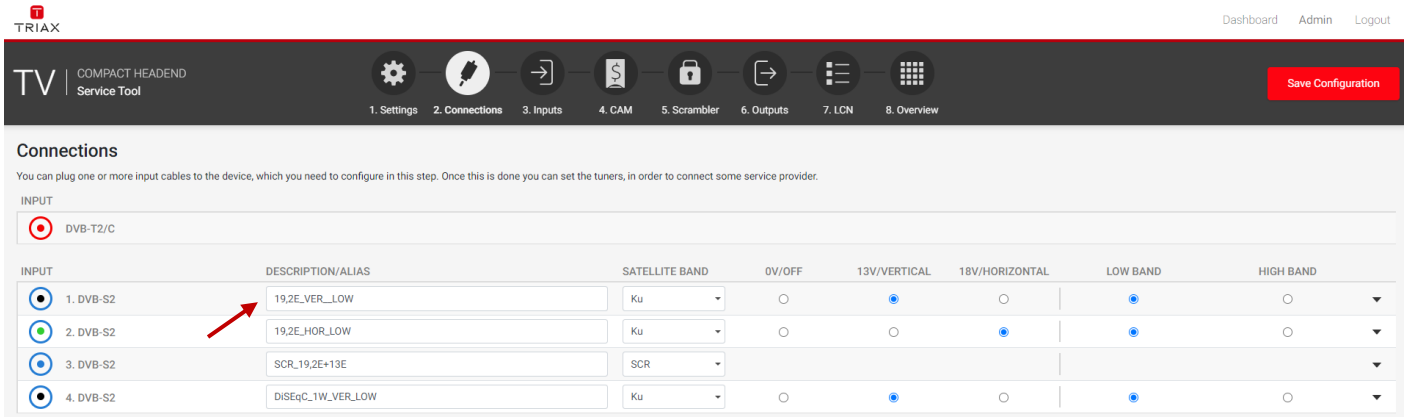
5.8.3 Connections in GUI

Open the folder “Connections” to set up the DVB-S2X input configuration.



5.8.4 Description/Alias

The DVB-S2X inputs can be configured with an alias. This alias is shown in other panes in the GUI, thus it is possible to give the input an alias that describes the source for the input.
E.g. “19,2E_VER_LOW” could describe the 19,2° East – Vertical polarisation – Low band.



5.8.5 Single Satellite Reception

Select the required parameters for each DVB-S2X input:

Satellite Band	Ku, K, C or SCR (See multi satellite reception)
13/18V	for Vertical or Horizontal polarisation
LOW/HIGH	for the Band

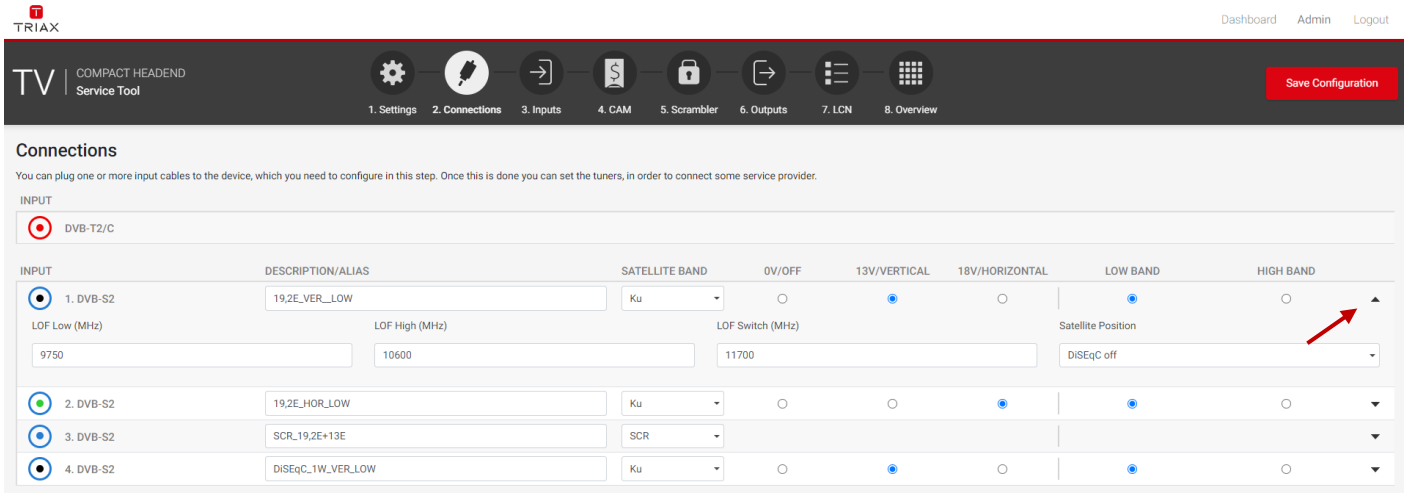
Note:
The input colour shows the setting following the same colour codes TRIAX uses on LNBs and multi-switches.

Yellow: Horizontal, High Band

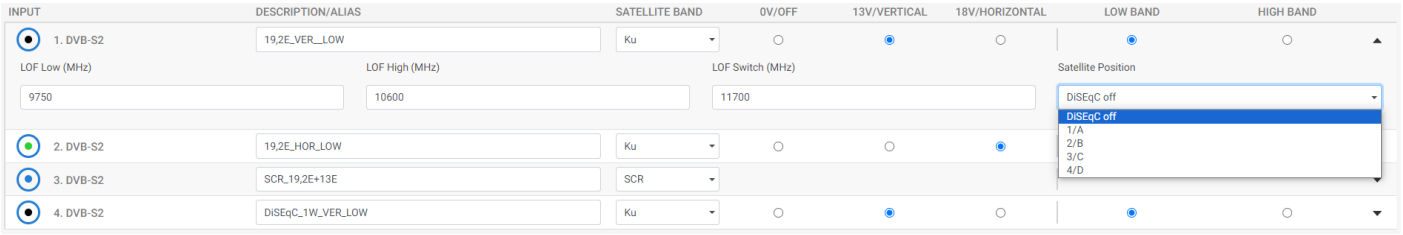
Red: Vertical, High Band

Green: Horizontal, Low Band

Black: Vertical, Low Band



When you press the expand button you can open the DiSEqC settings:



DiSEqC supports four satellite positions. Please select the desired position if required.

Note:
Configure DiSEqC to 1/A, 2/B, 3/C or 4/D will result in DiSEqC commands at the DVB-S2X input describing the position.
Configure DiSEqC to "DiSEqC off" will result in no commands at all, hence no change at the multiswitch. So, changing e.g. 2/B position to "DiSEqC off" will result in the multiswitch still set to 2/B - after a general power failure resulting in both the multiswitch and the TDcH & TDmH power cycling then the multiswitch will start up in default e.g. 1/A resulting in wrong position → no signal at the TDcH & TDmH!

In addition to the DiSEqC settings, the menu also shows the (default) values of the (Local-Oscillator-Frequency)

LOF Low:	Local Oscillator Frequency for the low band Frequencies
LOF High:	Local Oscillator Frequency for the high band Frequencies
LOF Switch:	Border frequency between low and high band

Note:
The LOF frequencies can be adjusted to the requirements of the LNB.

5.8.6 Multiple satellite reception

To support SCR from the Satellite reception and distribution we recommend to use the following TRIAX products:

SCR LNB:

304881 TDSS 024 GOLD, 1 SCR out, 24 User bands
This LNB's can be directly connected to one of the TDcH & TDmH DVB-S2X inputs and allows reception of 24 transponders from one satellite independent from the polarization, thus using just one coax cable can support all 16 DVB-S2X inputs in a TDcH/TDmH unit.

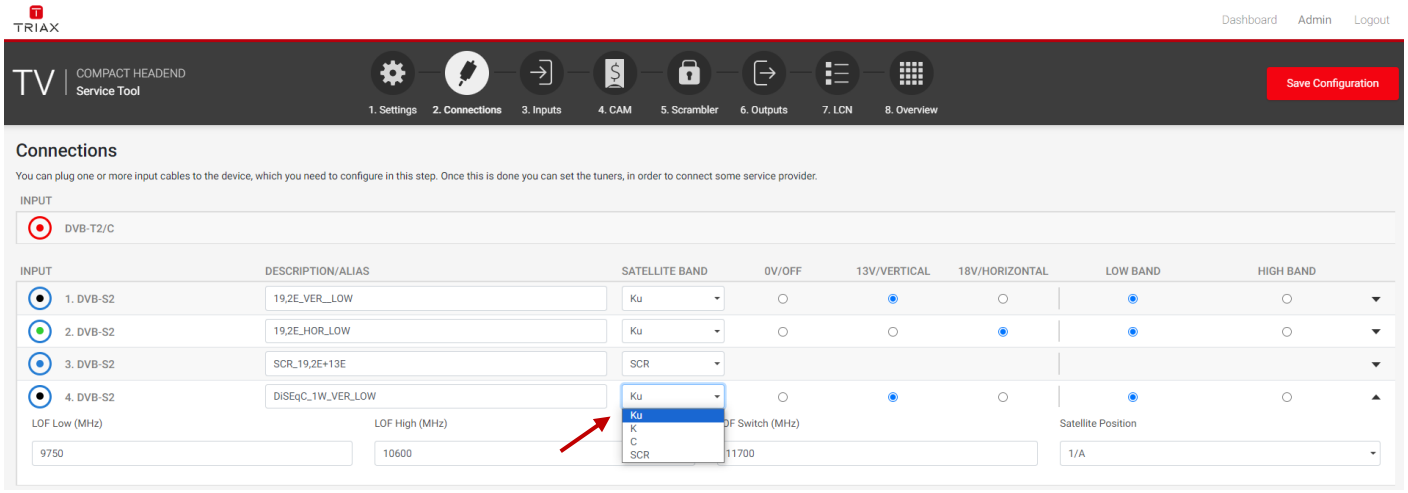
SCR Multi switch:

318185 TdSCR 504, 4 SCR out, 16 User bands each
This multi switch supports 1 satellite position with up to 4 polarizations using 1 Quattro LNB.
Or up to 2 satellite positions with up to 8 polarizations using Wideband LNB's.
16 transponders can be received per coax cable using this switch, thus just one coax cable can support all 16 DVB-S2X inputs in a TDcH/TDmH unit.

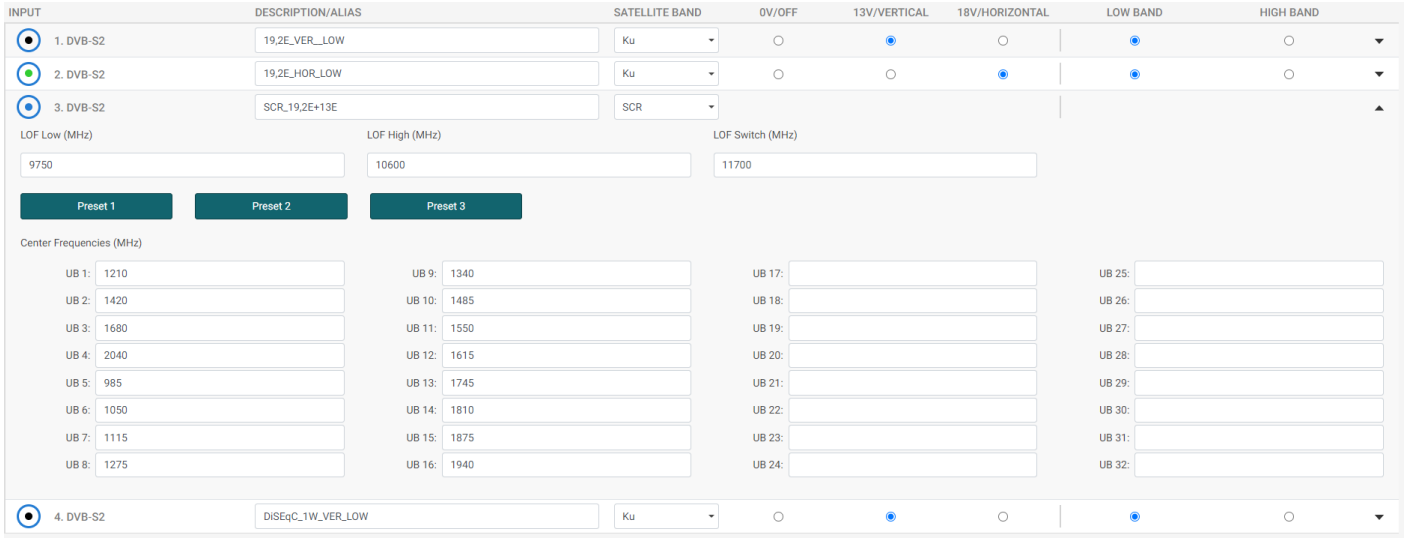
318190 TdSCR 906C, 6 SCR out, 10 User bands each
This multi switch supports 2 satellite positions with up to 8 polarizations using 2 Quattro LNB's.
Or up to 4 satellite positions with up to 16 polarizations using Wideband LNB's.
10 transponders can be received per coax cable using this switch.

Note:
The TDcH & TDmH support the following SCR standards:
- EN50494
- EN50607

If you set the DVB-S2X input to SCR the TDcH & TDmH supports SCR (Satellite Channel Router) functionality and can receive one satellite with up to four polarizations on this input. Each DVB-S2X input can be individually configured.



When you press the expand button you can open the SCR and LOF settings:



The TDcH & TDmH SCR functionality supports up to 32 User bands per SCR input. The centre frequencies can be entered on the table as shown in the screen shot.

The Frequencies the SCR distribution equipment supports can be found on the product label or in the user manual of the used product.

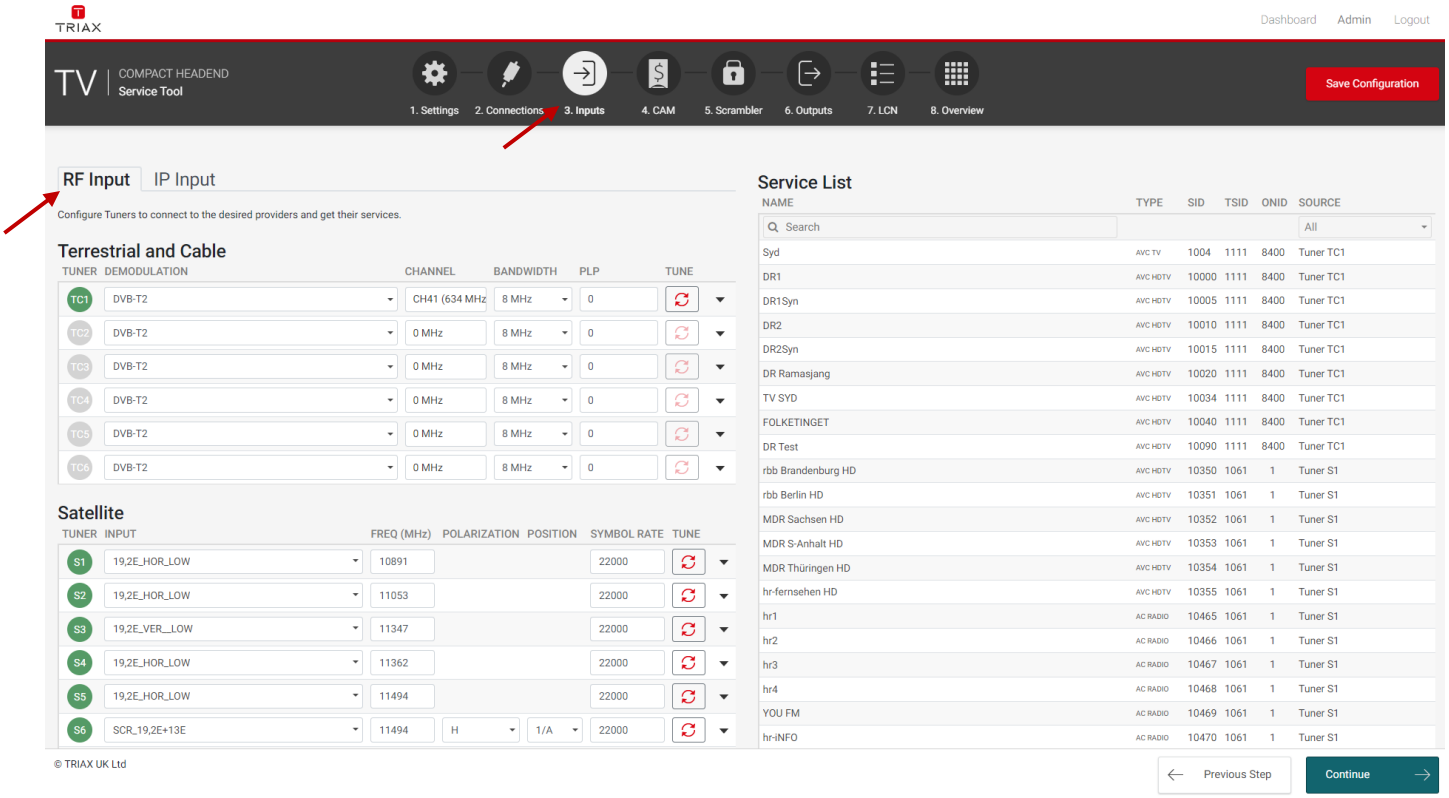
In addition to the SCR user band settings, the menu also shows the (default) values of the (Local-Oscillator-Frequency)

LOF Low:	Local Oscillator Frequency for the low band Frequencies
LOF High:	Local Oscillator Frequency for the high band Frequencies
LOF Switch:	Border frequency between low and high band

Note:
The LOF frequencies can be adjusted to the requirements of the used LNB. Starting a new configuration the LOF frequencies are set to the default values.

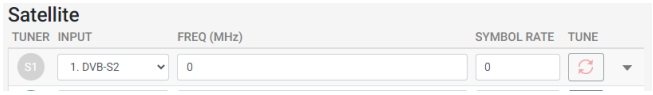
5.9 RF inputs

Click the “Inputs” folder in the Compact Headend Service Tool to display the RF Inputs window.

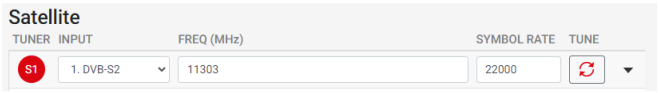


The “Inputs” page shows all RF input tuners. The colour of the tuner number shows the status of each tuner.

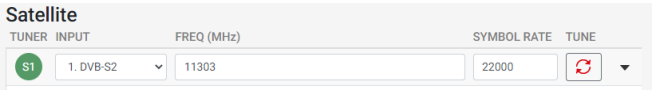
Grey: Tuner is not used



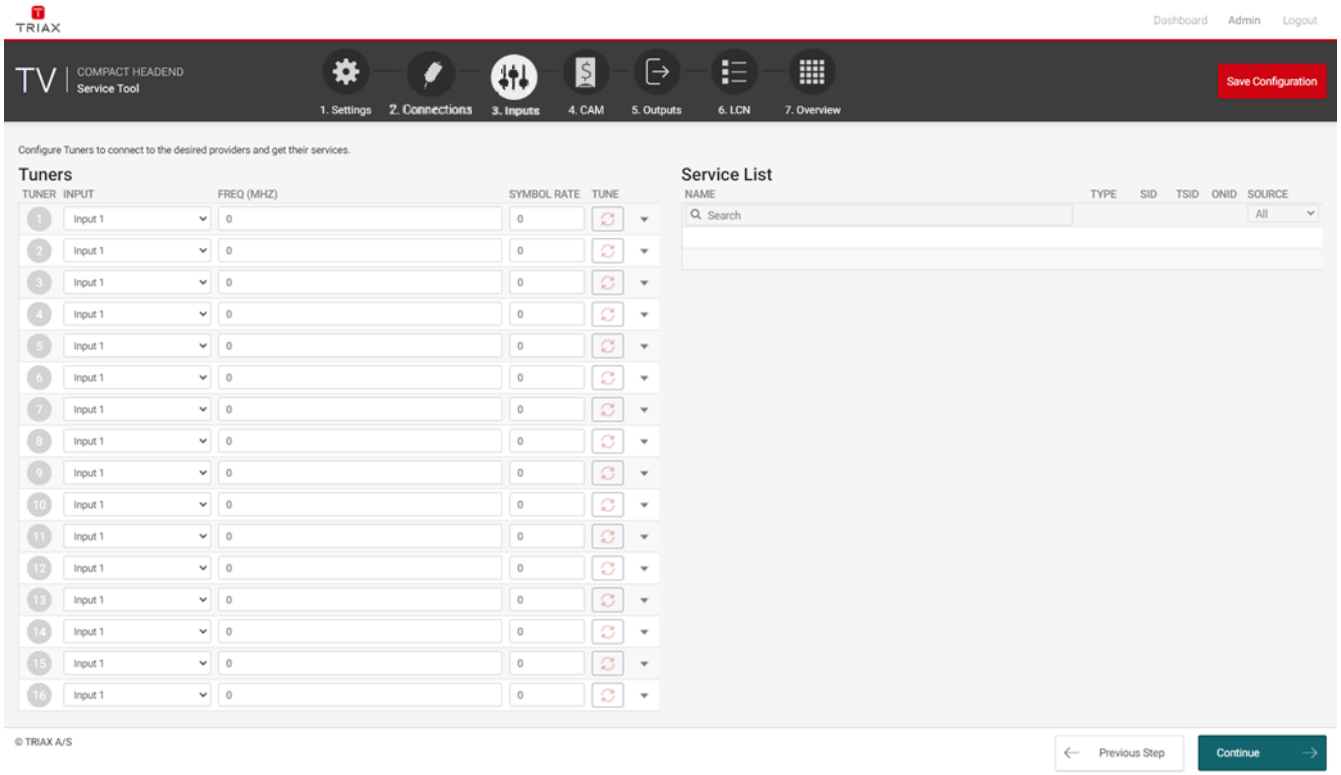
Red: Tuner is not set up correctly or input signal is missing.



Green: Tuner is locked and working.



The first time the Compact Headend Service Tool displays the tuner configuration window in a new configuration, the configuration fields and the list of services will be empty or display default values.

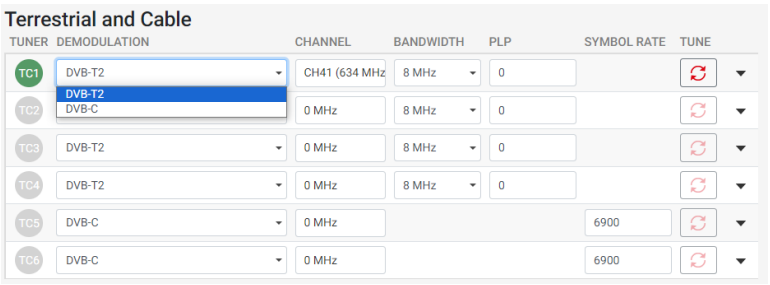


5.9.1 Terrestrial and Cable tuner setup

Note:
This functionality is only available on the Version TDcH 22STC-I and TDmH 14STC-I.

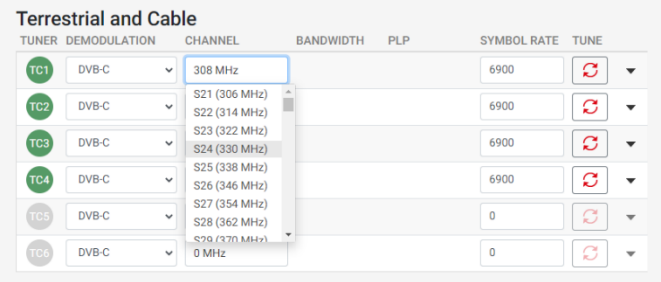
To set up a tuner you must follow the following steps:

1. Select the “Demodulation”:

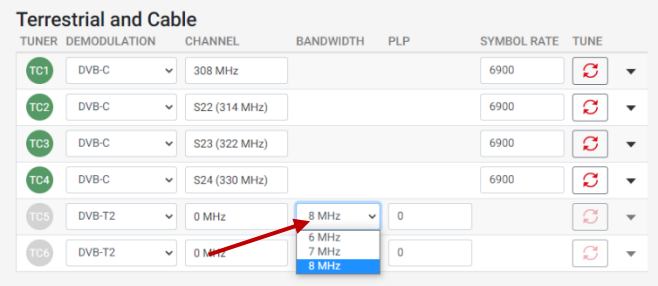


   To select the required demodulation, click on the demodulation field to open the drop-down list with demodulations you can choose from.
   Select the demodulation you want to use.

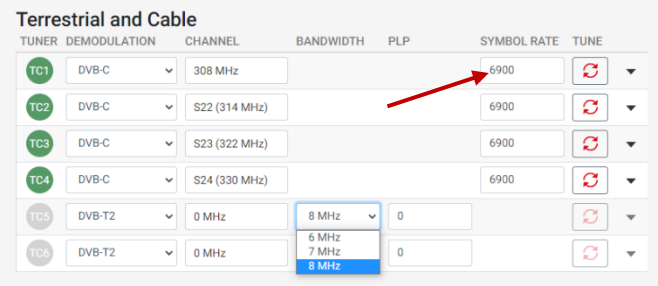
2. Enter the desired frequency in MHz in the channel field or select the corresponding channel from the dropdown list:



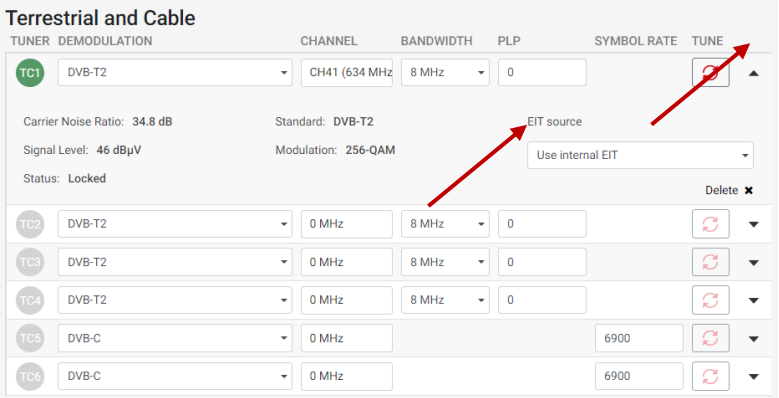
3. If the tuner is used as DVB-T/T2 then please select the required channel bandwidth and PLP number:



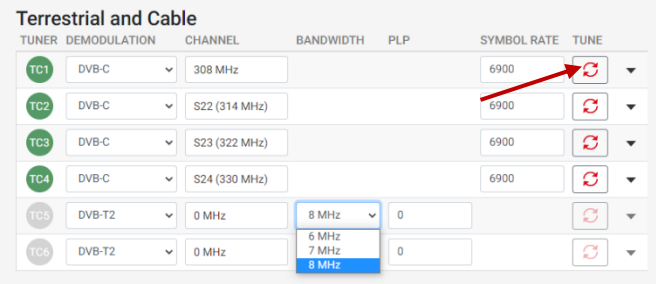
4. If the tuner is used as DVB-C then please select the required symbol rate:



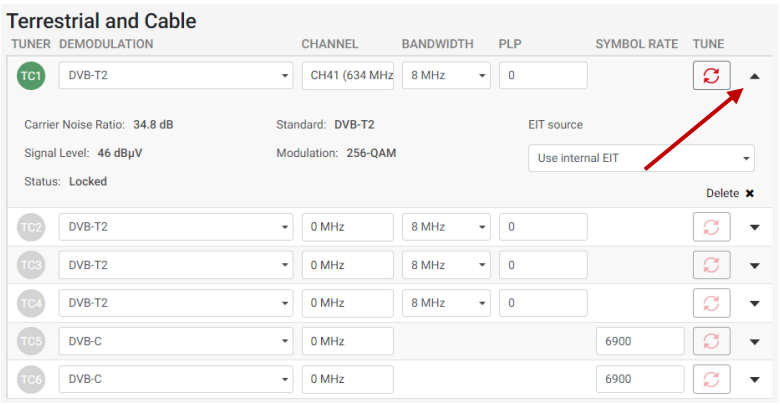
5. If an alternative EIT to the internal EIT in the current transport stream, press expand for the tuner and choose the alternative EIT source:



6. Click the “TUNE” button to activate the setting into the headend system:

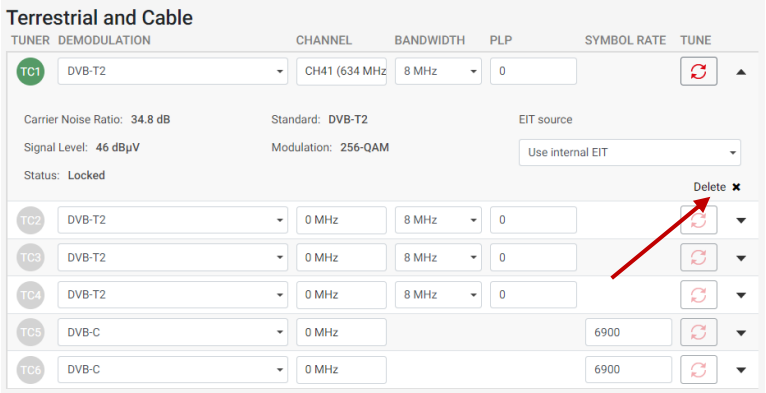


By clicking on the expand button, information details from the selected transponder will be shown:

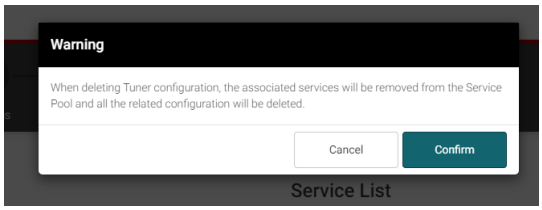


Carrier Noise Ratio:	Shows the carrier to noise ratio of the input signal
Signal Level:	Displays the actual signal level
Standard:	Shows the standard of the input signal
Modulation:	Shows the modulation of the input signal
Status:	Shows the status of the tuner

To delete the tuner input, press the “Delete **x**”:



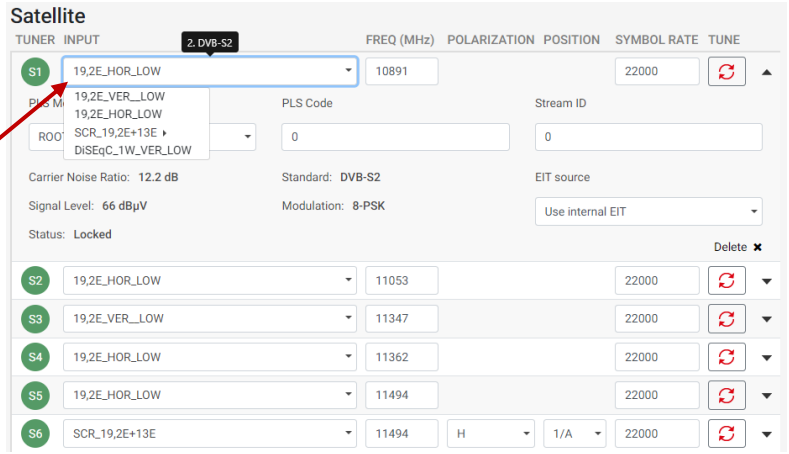
A warning will appear:



5.9.2 Satellite tuner setup

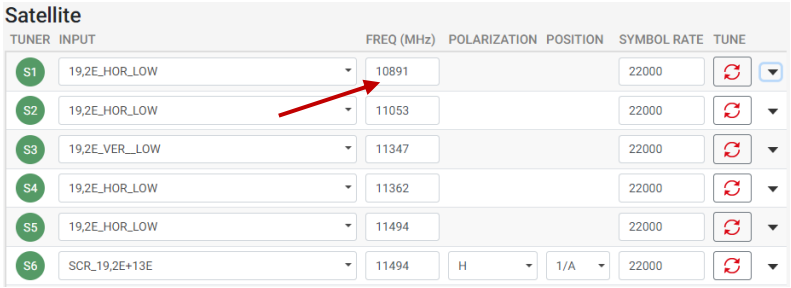
To set up a satellite tuner you must follow the following steps:

1. Select the “Input”:

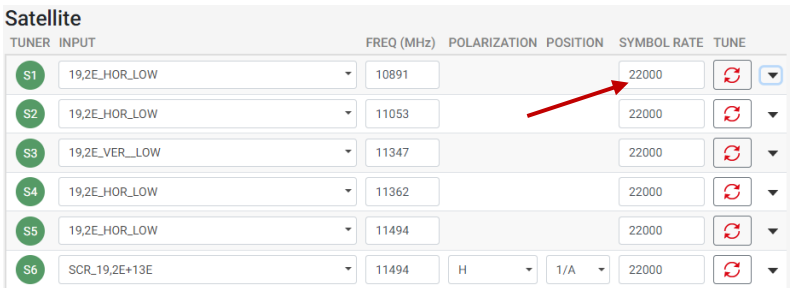


To select the required input / SAT-IF signal, click on the input field to open the drop-down list with the inputs you can choose from.
Select the input you want to use.

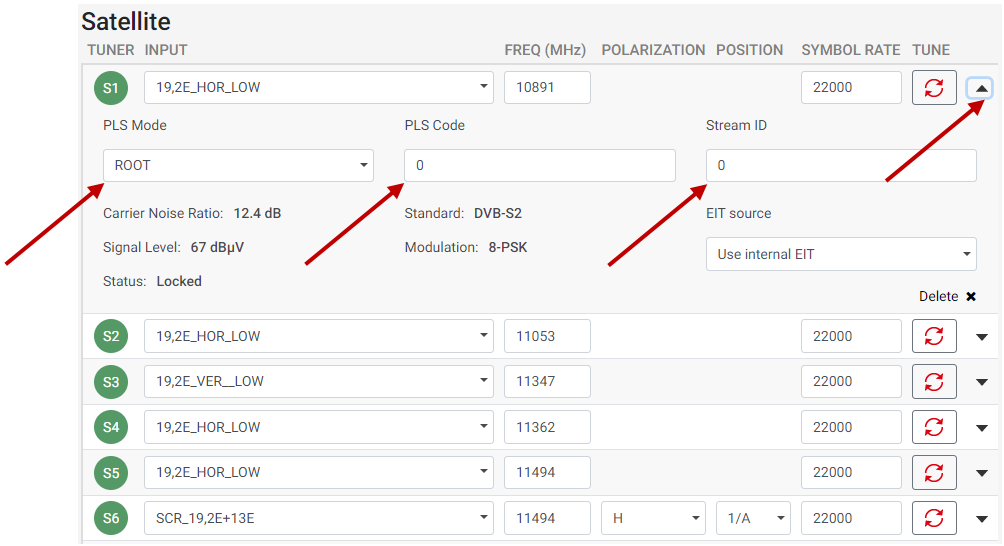
2. Enter the desired frequency in MHz in the frequency field:



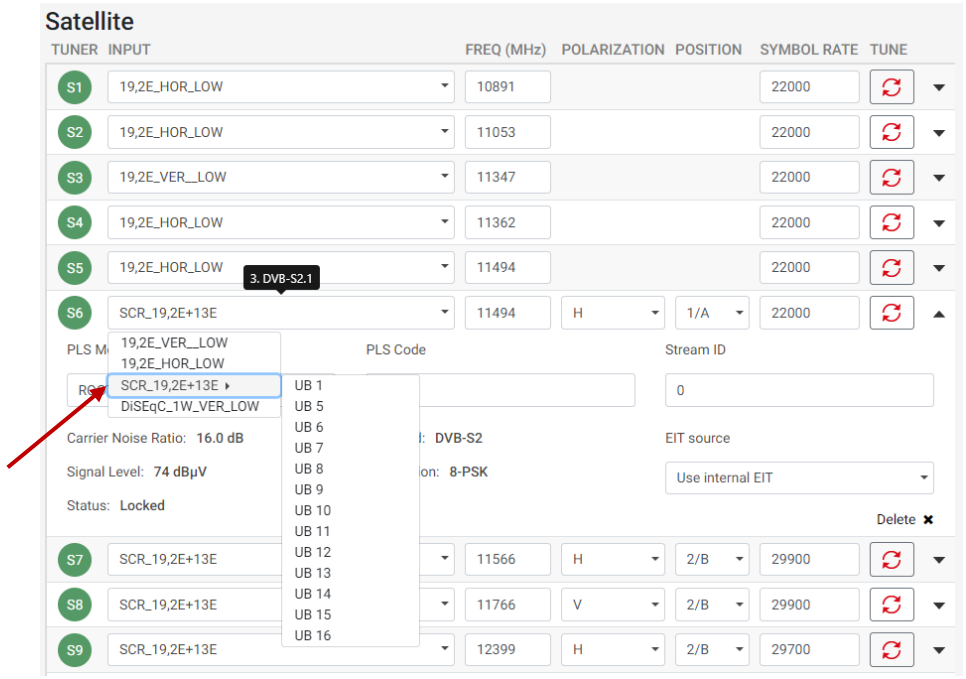
3. Enter the desired symbol rate:



4. If the input source is DVB-S2X Multistream, expand the tuner settings and enter the PLS Mode, PLS Code and Stream ID.

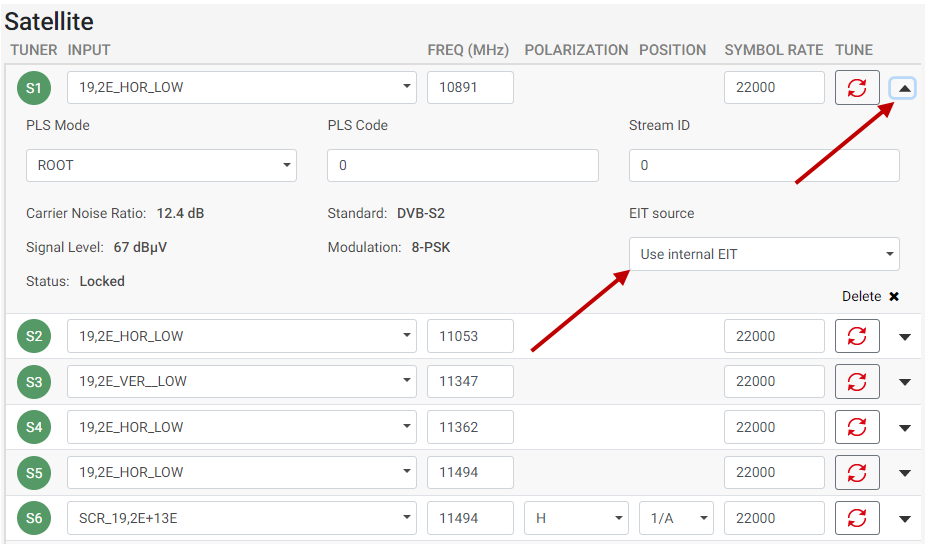


5. If the input source is SCR (Satellite Channel Router)



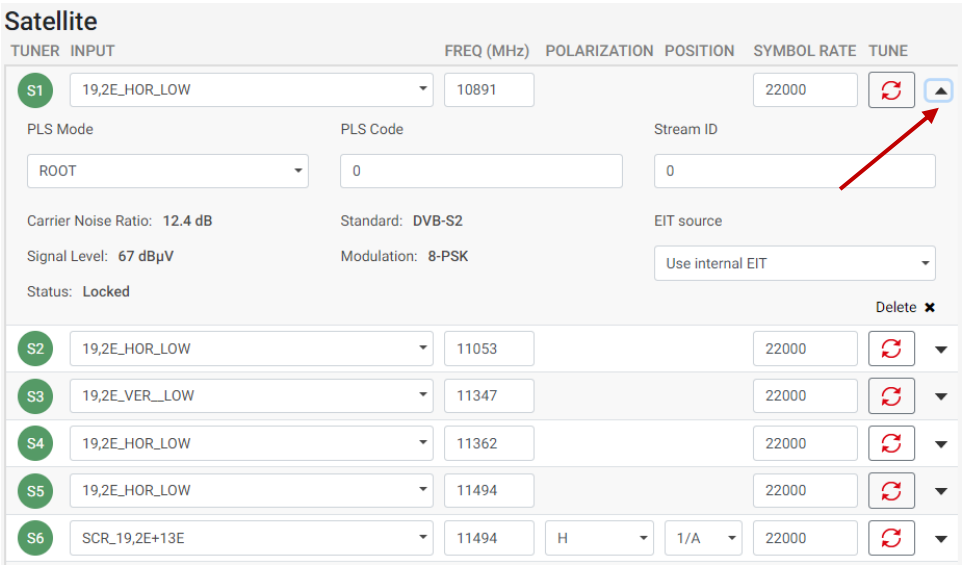
You must select the SCR user band and the Polarisation and Satellite position.

6. If an alternative EIT to the internal EIT in the current transport stream, press expand for the tuner and choose the alternative EIT source:



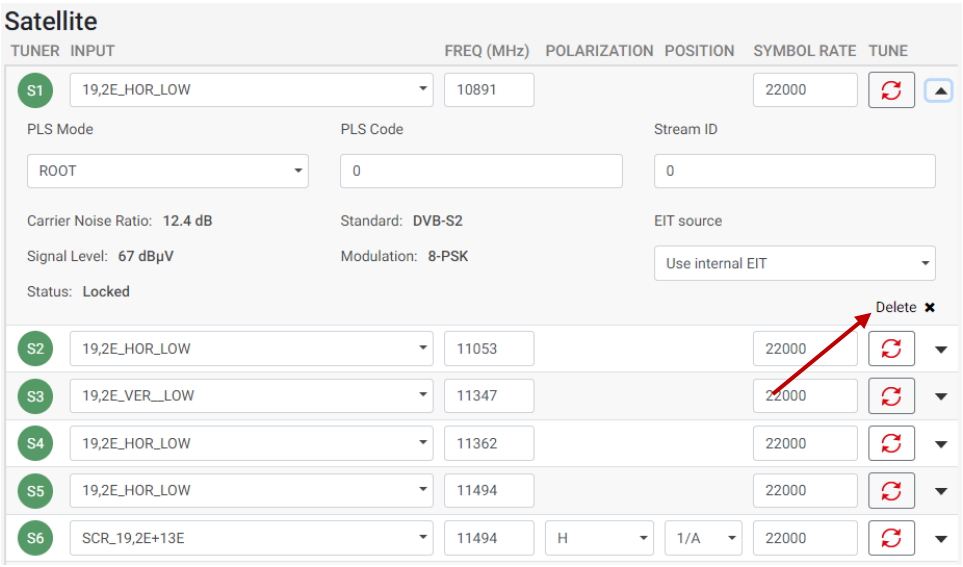
7. Click the “TUNE” button to activate the setting into the headend system:

By clicking on the expand button, information details from the selected transponder will be shown:

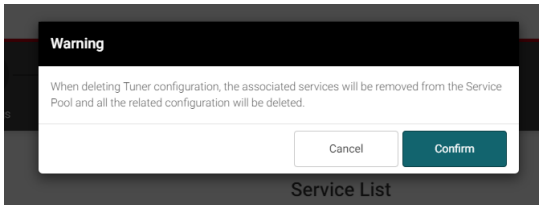


Carrier Noise Ratio:	Shows the carrier to noise ratio of the input signal
Signal Level:	Displays the actual signal level
Standard:	Shows the standard of the input signal
Modulation:	Shows the modulation of the input signal
Status:	Shows the status of the tuner

To delete the tuner input, press the “Delete **x**”:



A warning will appear:

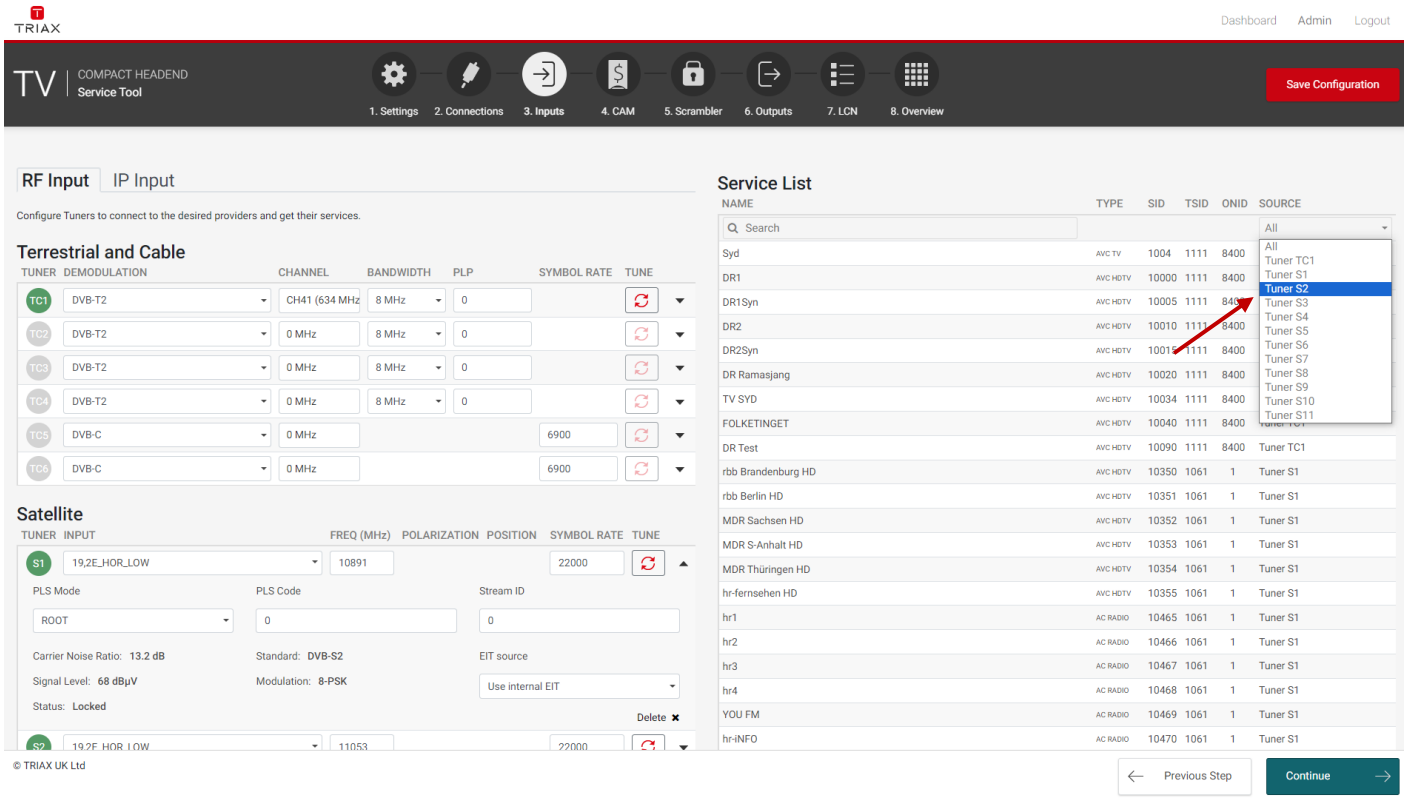


5.9.3 Service List

In the Source field, select the tuner number to see available streams with name, type, SID, TSID and ONID:

First Click → sort rising

Second click at same type → sort falling



Name: Name of the TV or radio service

Note:
If you enter a string in the search field of the service name all services which contain the string are listed in the service list.

Type: Audio and video type of service

SID: Service Identifier

TSID: Transport Stream Identifier

ONID: Original Network Identifier

Source: Tuner number where the service is received

5.10 IP input

5.10.1 Physical connectivity

The TDcH & TDmH headends have 1 IP input for IPTV-in, marked with SFP label, and without a specific colour ring

Note:
The TDcH & TDmH headends system must be connected to a Gigabit network switch to receive and deliver IP services. The network switch must support IGMP version 2 / 3 and contain an adequate number of ports.

Cat 5e shielded or better network cables must be used.

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

Item No.:	492086	SFP RJ45
Item No.:	492087	SFP Fiber 850nm EOLS-8512-MXX (500m)
Item No.:	492088	SFP Fiber 1310nm EOLS-1324-02XX (2km)

5.10.2 IP-in licenses

IP input licenses need to be purchased from TRIAX to be able to receive IP services through the TDcH & TDmH headend system.

Required license numbers:

Item No.:	418745	TDcH 4 x IP-in streams license
Item No.:	418746	TDcH 16 x IP-in streams license
Item No.:	418747	TDcH 96 x IP-in streams license
Item No.:	418752	TDmH 48 x IP-in streams license
Item No.:	418753	TDmH 16 x IP-in streams license
Item No.:	418754	TDmH 4 x IP-in streams license

Licenses are activated using License handling in the Administration window.

5.10.3 Requirements

The headend system includes basic IPTV functionality which enables service delivery over a packet-switched network infrastructure.

To handle IP input through the Link sockets the following requirements must be satisfied:

- IP multicast streaming (UDP streaming)
- Possibility of RTP
- Possibility of IGMP version 2 and version 3
- If no source address is configured, then is IGMPv2 used
- If a source address is configured, then is IGMPv3 used with SSM (Source Specific Multicast)
- SPTS or MPTS including PAT, PMT, CAT, optional SDT

The TDcH & TDmH supports both SPTS and MPTS. With MPTS an inbound stream can contain multiple programmes. The license limits the number of IP-in streams. It does not limit the number of services, thus receiving MPTS can carry more services than the value of the license limit.

Important:

The TDcH & TDmH headend system supports up to 7 TS packets per IP packet at the IP input.

The TDcH & TDmH headend system does not support IP fragmentation at the IP input, which may occur if the IP packets are transmitted over a network with a

Maximum Transmission Unit (MTU) less than approximately 80 + N*188 bytes, where N is the number of packets per IP packet..

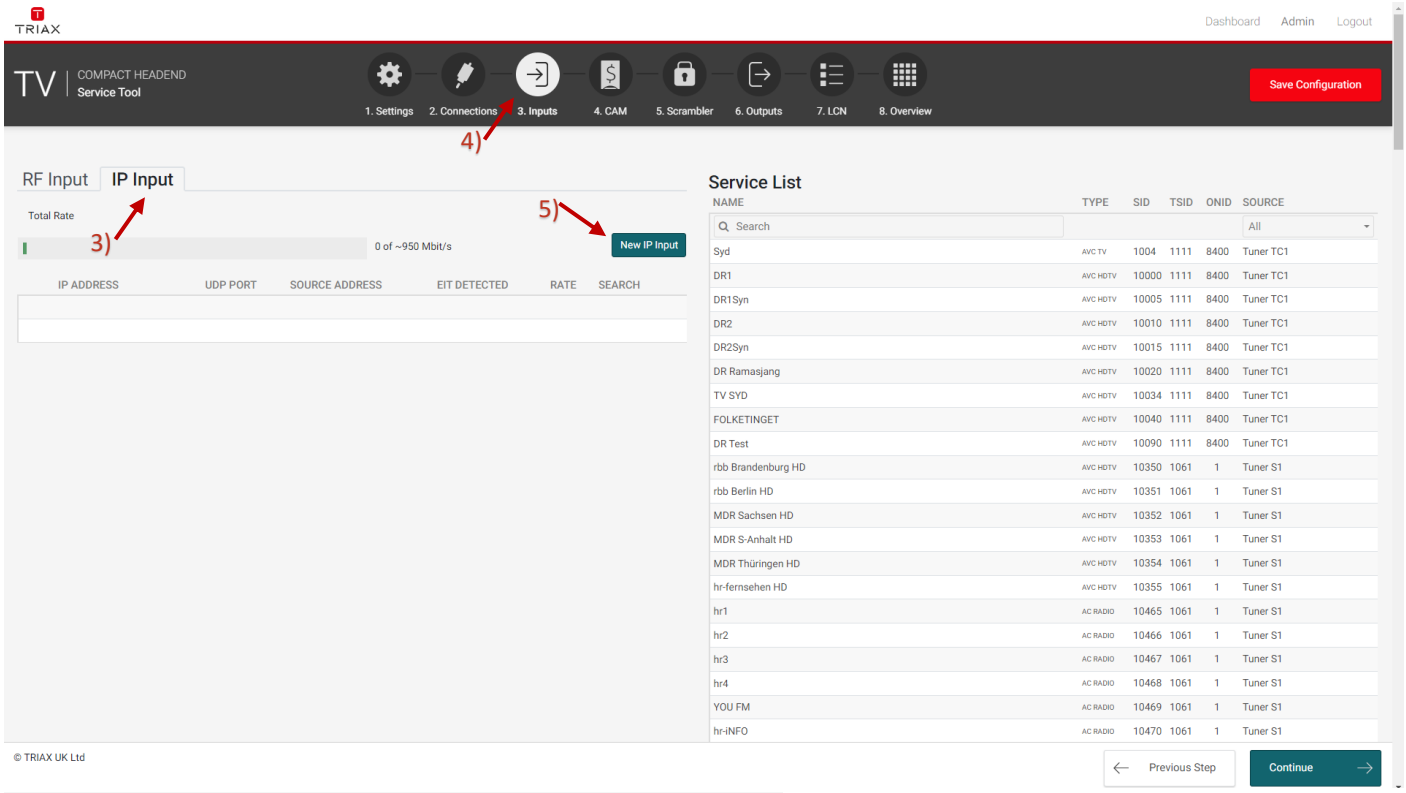
Recommended settings are 7 TS packets per IP packet and a minimum MTU of 1500 bytes in the entire network path

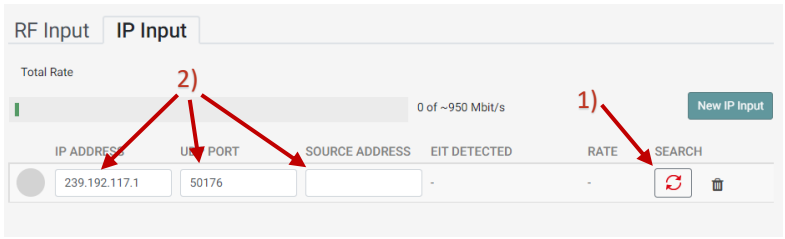
Licenses for IP output are required to be able to use the IPTV functionality in the headend.
The licenses can be purchased from TRIAX Sales, and need to be activated, see: “Activating licenses”.

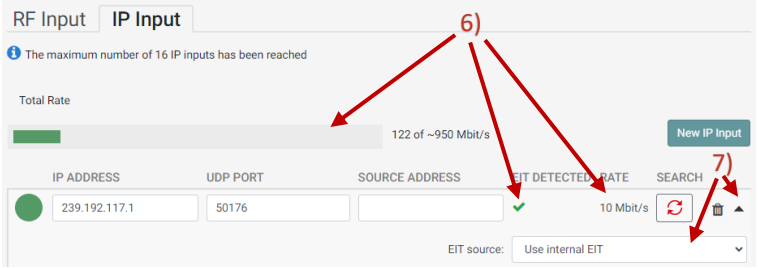
5.10.4 Configuration in GUI

Receive an IP stream by following the steps below:

1) Select the *Inputs* tab in the panes.
2) Select the *IP Input* sub-tab.
3) Press the New IP input button for a new IP input option.
4) Specify the desired IP address and associated UDP port number, and if necessary, the Source address in the corresponding fields.
5) Press the Search button  to receive the IP stream
6) System will automatically update if EIT detected and the rate [Mbit/s] for the stream plus total rate. By default, the EIT is inside each multicast stream is used.
7) An alternative EIT can be configured by selecting the alternative source from the dropdown list among the configured IP inputs multicast addresses.

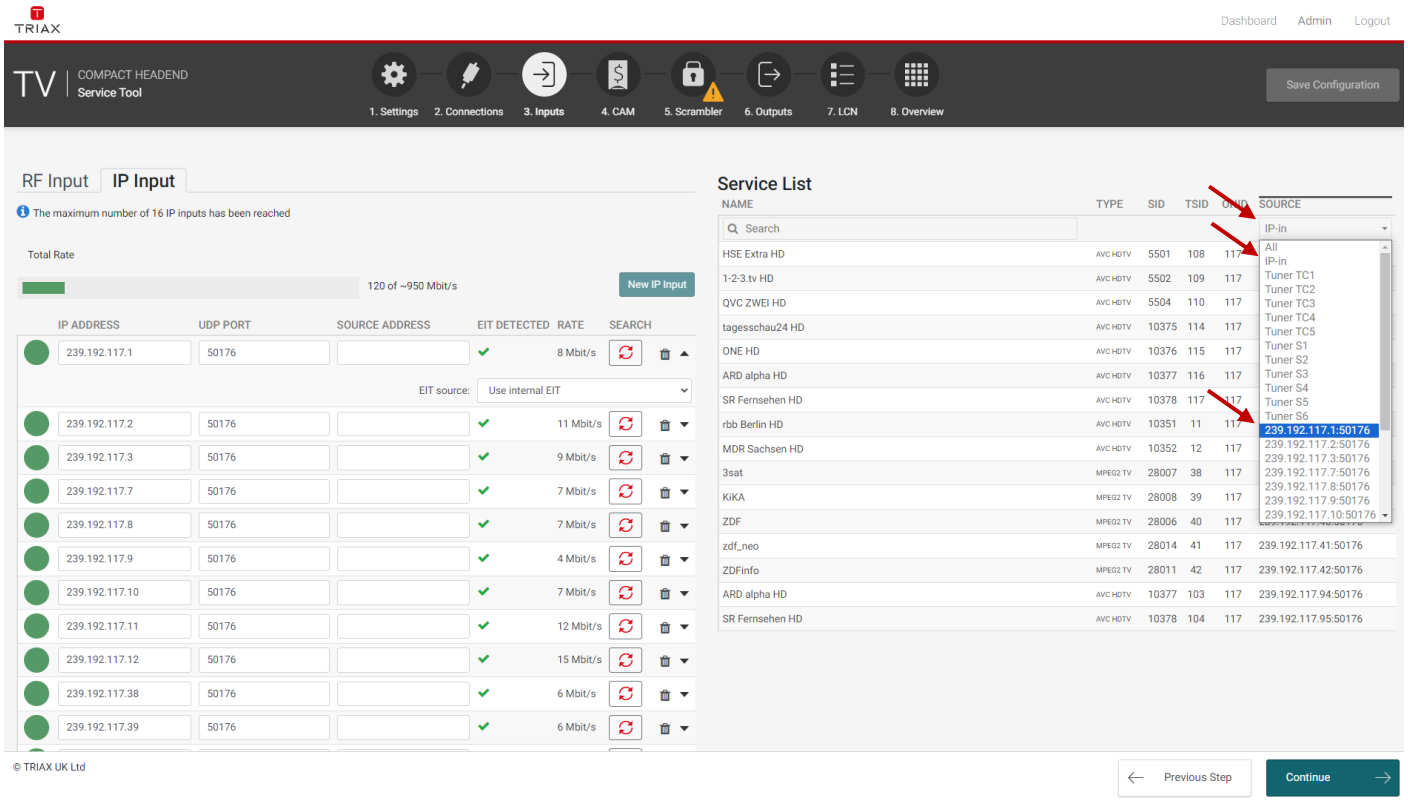






Previously selected services can be refreshed when pressing the Search/Refresh button

Previously selected services can be deleted when pressing the Bin button



List of found services

On the right hand in the GUI in the *Service List* you can filter the available services to display only the IP-in services.

To highlight/sort the services received via “IP Input” select “IP-in” under “SOURCE” at the *Service List*.

To see services from a specific IP-in stream select the actual Multicast address e.g. 239.192.117.1:50176.

5.11 Media Player

5.11.1 Physical connectivity and storage

The TDcH & TDmH headends are based on a strong platform that also offers playback of transport stream files. The files must be uploaded to the headend via the GUI via Ethernet port 1. The headends each have an internal storage available of 2GB for content files.

5.11.2 Media Player licenses

Media Player licenses need to be purchased from TRIAX in order to playback files via the TDcH & TDmH headend system.

Required license numbers:

Item No.:	418780	TDcH 2 x Media Player license
Item No.:	418781	TDcH 4 x Media Player license
Item No.:	418785	TDmH 2 x Media Player license
Item No.:	418786	TDmH 4 x Media Player license

Licenses are activated using the License handling in the Admin menu.

5.11.3 Requirements, supported formats and codecs

The headend system supports the following:

Upload of file formats:

File format	Conversion needed	Container format	Video codec	Audio codec
PDF	Yes	-	-	
MP4 and MPG (MPEG)	Yes	MP4 and MPEG	MPEG2, H264, HEVC (H265)	AAC, AC3, MP3, MP2
TS	No	MPEGTS	MPEG2, H264, HEVC (H265)	AAC, AC3, MP3, MP2

For files that need to be converted to a transport stream, the following output codecs are supported:

File format	Converted video codec	Converted audio codec
PDF	MPEG2, H264	Audio not supported
MP4 and MPG (MPEG)	MPEG2, H264	AAC, AC3, MP3, MP2

For converted files the max bitrate can be in the range 1-50 Mbps.

Important:

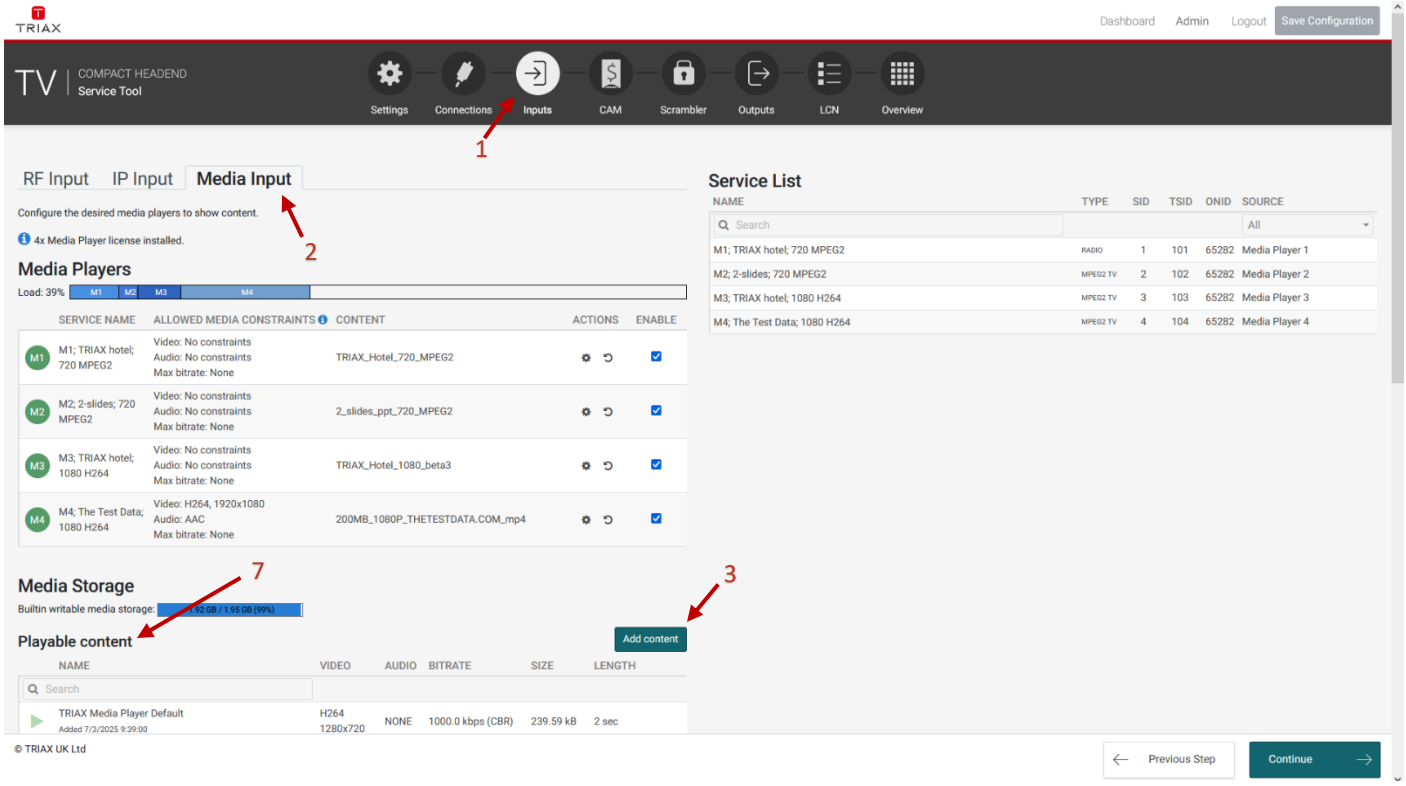
Licenses for Media Player are required to be able to use the Media Player functionality in the headend.
The licenses can be purchased from TRIAX Sales, and need to be activated. See: “Activating licenses”.

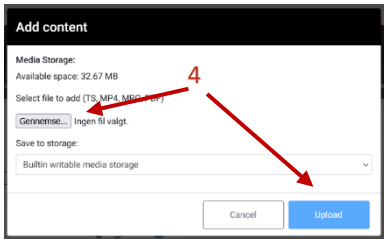
5.11.4 Configuration of the Media Player in the GUI; Upload content

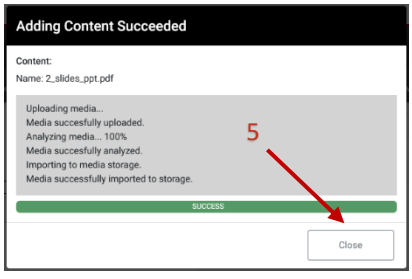
By default only the “TRIAX Media Player Default” content exist at the device. This default content may be used when configuring the Media Player including routing it to outputs.
Additional content can be uploaded through the GUI, and then selected for playback at the desired Media Player.

To upload content for the Media Player follow the steps below:

1) Select the *Inputs* tab in the panes.
2) Select the *Media Input* sub-tab.
3) Press the *Add content* button.
4) Choose a file and press *Upload*.
5) When the file has been uploaded, it will be analysed by the system. On success, press *Close*.
   The analysis will fail, if trying to add a file does not comply to supported formats.
6) The successfully uploaded content is shown under *Media Storage*.
7) A TS file will be shown directly under *Playable content*.
8) Other file formats need to be converted before they are playable. Those uploaded files are listed under *Non-playable content*.



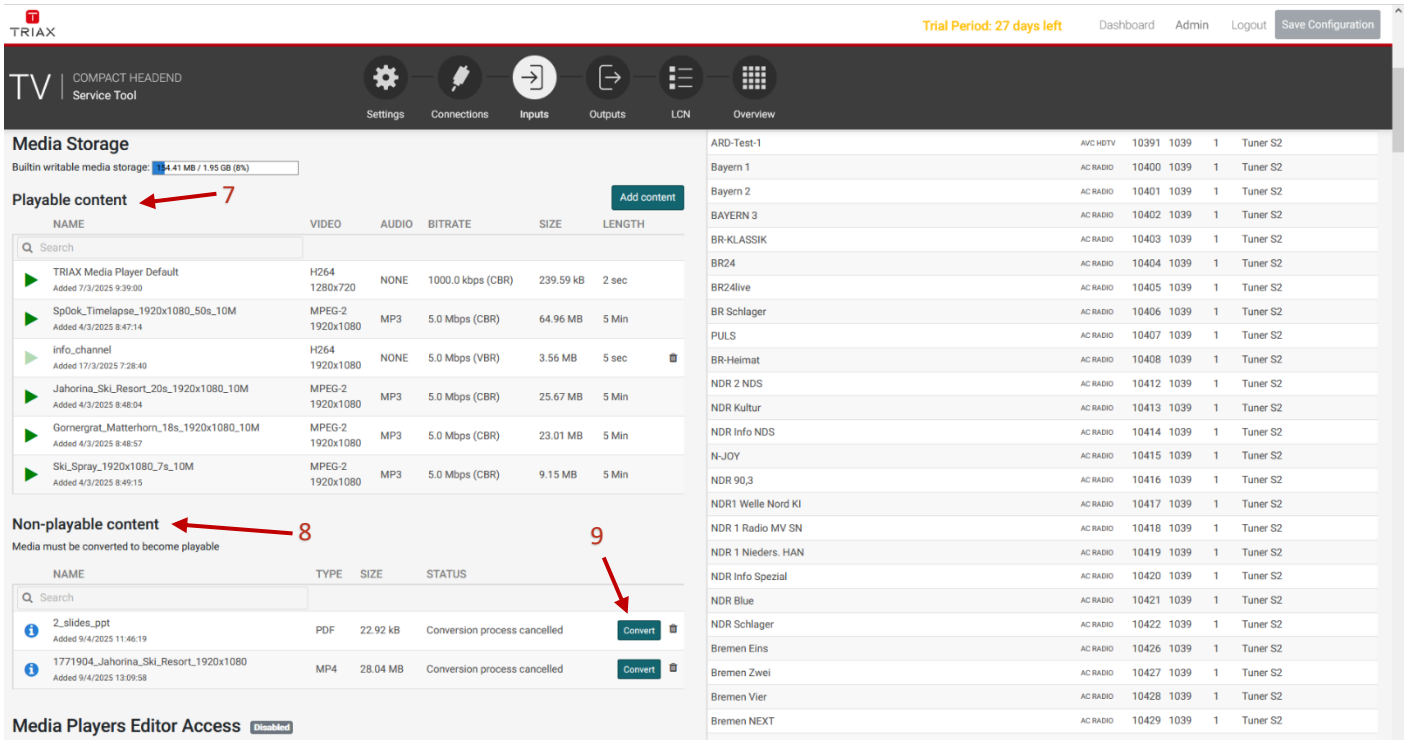


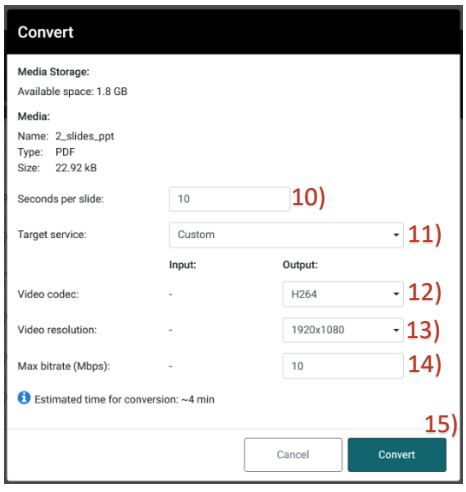


5.11.5 Configuration of the Media Player in the GUI; Convert PDF content

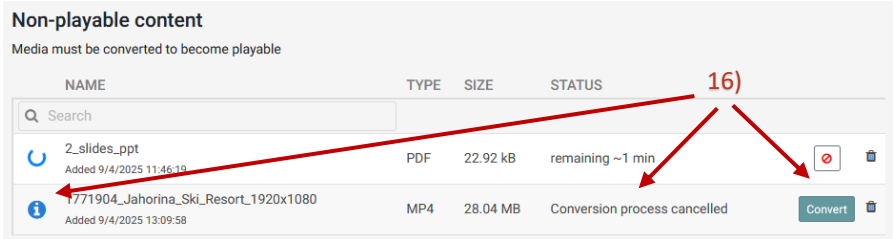
Precondition: Content has been uploaded. For information on how to upload read the previous section.
This section describes conversion of PDF. See next section for conversion of MP4 and MPG. Conversion is not need for TS files. To follow the steps below enter the *Inputs* tabs and *Media Input* as described at previous page.
To convert content for the Media Player follow the steps below:

9) Under the *Non-playable content*, press the *Convert* button for the content to convert.
10) *Seconds per slide*: Select how many seconds each slide (page) of the PDF shall be shown at the screen.
11) *Target service*: By default *Custom*. Custom means that the *Video Codec*, *Video Resolution* and *Max Bitrate* are freely configurable. Alternatively, one of the Media Players can be chosen and the *Constraints* of the selected Media Player will then be used. See a later section describing the *Constraints*.
12) *Video codec*: Choose the video codec complying with the TV sets of the installation.
13) *Video resolution*: Choose the video resolution complying with to the TV set of the installation.
14) *Max Bitrate*: Choose a Max Bitrate that is supported by the TV sets and at the same time fits with the channel plan for the installation. Lower bitrate will allow more space for other services in the channel plan. If the bitrate is too low, the quality will be affected. Default bitrate: 10Mbps.
15) *Convert*: Start the conversion.





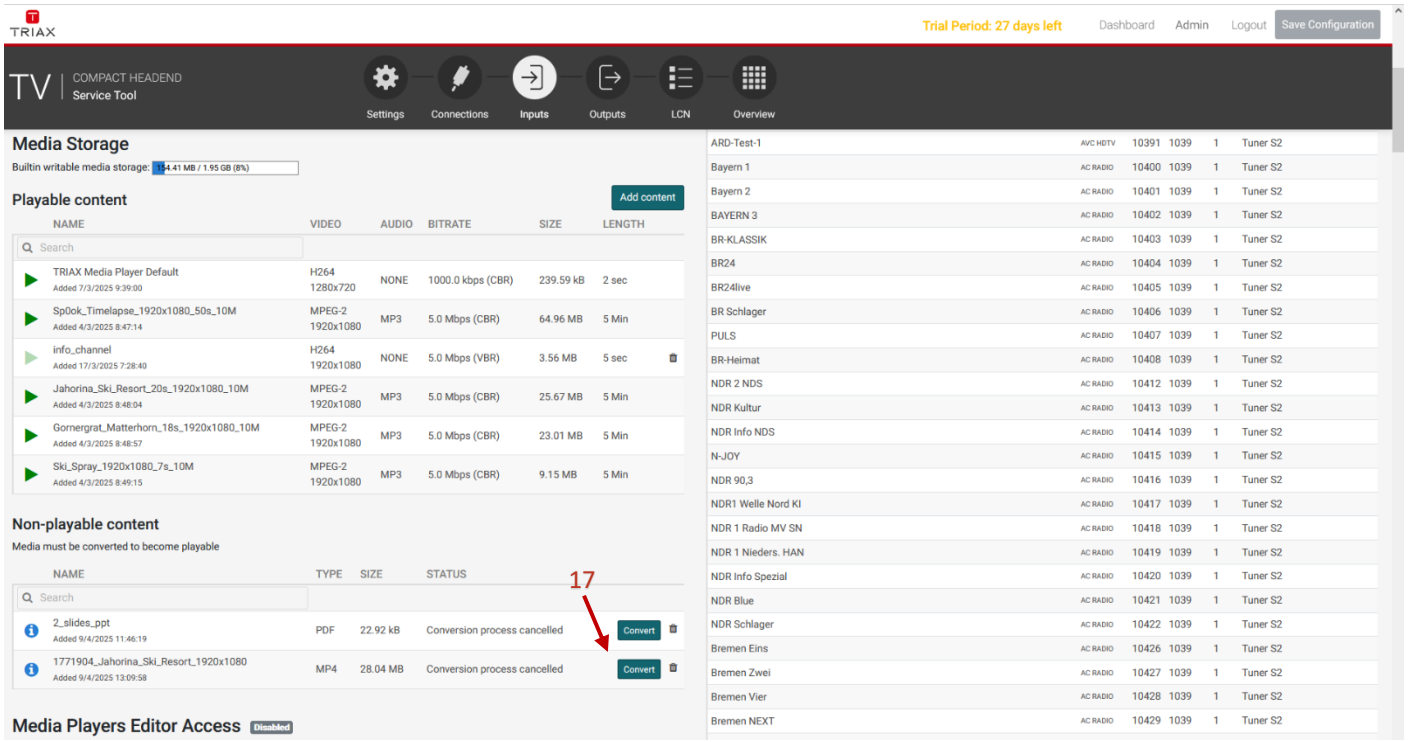
16) During conversion the status is shown at the Media Input page next to the corresponding file. This includes an estimate for the remaining time. The ongoing conversion can be cancelled at the button.

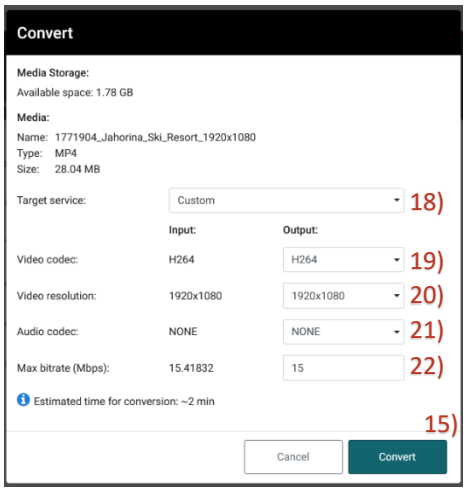


5.11.6 Configuration of the Media Player in the GUI; Convert MP4 and MPG video content

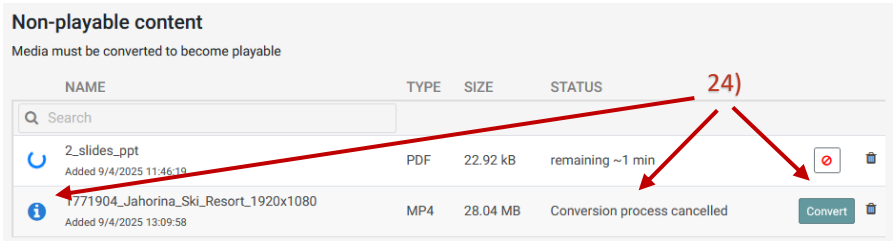
Precondition: Content has been uploaded. For information on how to upload read the section about uploading. This section describes conversion of MP4 and MPG. See the previous section for conversion of PDF. Conversion is not needed for TS files. To follow the steps below enter the *Inputs* tabs and *Media Input* as described at previous page. To convert content for the Media Player follow the steps below:

17) Under the *Non-playable content*, press the *Convert* button for the content to convert.
18) *Target service*: By default *Custom*. Custom means that the *Video Codec*, *Video Resolution* and *Max Bitrate* are freely configurable. Alternatively, one of the Media Players can one of the Media Players be chosen and the *Constraints* of the selected Media Player will then be used. See a later section describing the *Constraints*.
19) *Video codec*: Choose the video codec complying with the TV sets of the installation .
20) *Video resolution*: Choose the video resolution fitting to the TV set at the installation.
21) *Audio codec*: Choose the video resolution complying with to the TV set of the installation. No audio is also an option.
22) *Max Bitrate*: Choose a Max Bitrate that can be handled by the TV sets and at the same time fits with the channel plan for installation. Lower bitrate will allow more space for other services in the channel plan. If the bitrate is too low, the quality will be affected. Default bitrate: 10Mbps.





24) During conversion the status is shown at the Media Input page next to the corresponding file. This includes an estimate for the remaining time. The ongoing conversion can be cancelled at the button.



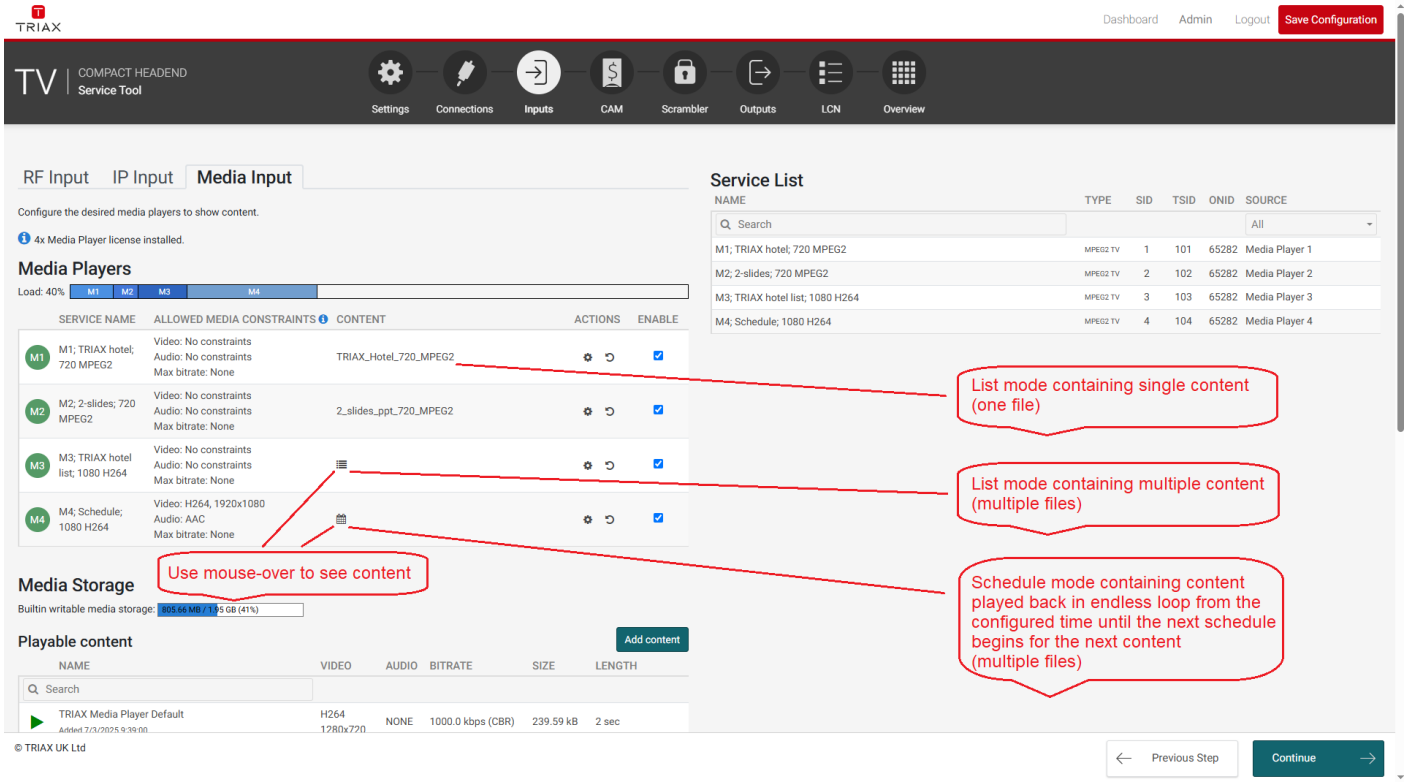
5.11.7 Configuration of the Media Player in the GUI; List mode and Schedule mode

The Media Player offers to playback content in two modes:

- *List mode*
  Contains one or multiple file(s). The content are playback in an endless loop.

- *Schedule mode*
  Contains content schedule for a configured time. The content is played back in an endless loop from the configured time until then next schedule begins.

Example of configured List mode and Schedule mode is shown below.

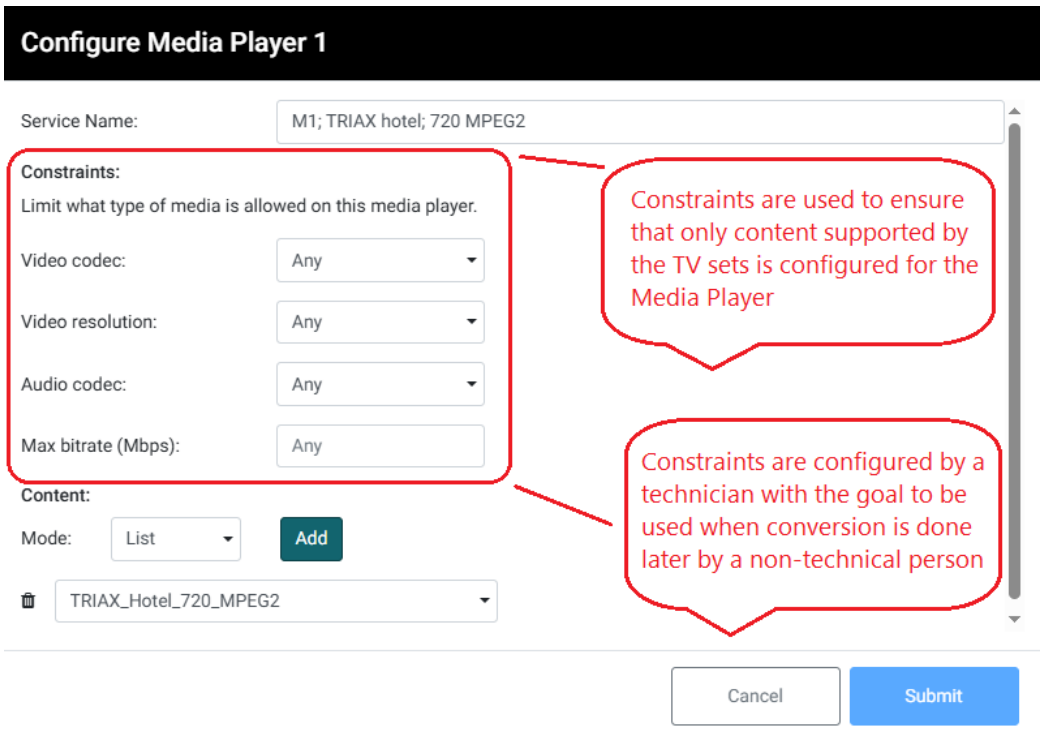


When routing a Service to an RF or IP output remember that it can be routed in two modes: Transparent Mode or Service Mode. See 5.16.2 Select service for more details.

5.11.8 Configuration of the Media Player in the GUI; Constraints

This section describes Constraints in general before going into details about how to configure the Media Player.

Configuring a Media Player offers an option for setting *Constraints* of the current Media Player. The purpose of having Constraints is to allow a technician to limit what kind of content is allowed to be played back by a specific Media Player, ensuring that only content supported by the TV sets or devices of the installation will be configured. This allows for a non-technical person to update the content of a Media Player, mitigating the potential risk that the updated content will not be supported by the TV sets and other devices. I.e. the non-technical person does not have to be familiar with codecs, bitrate and other settings.



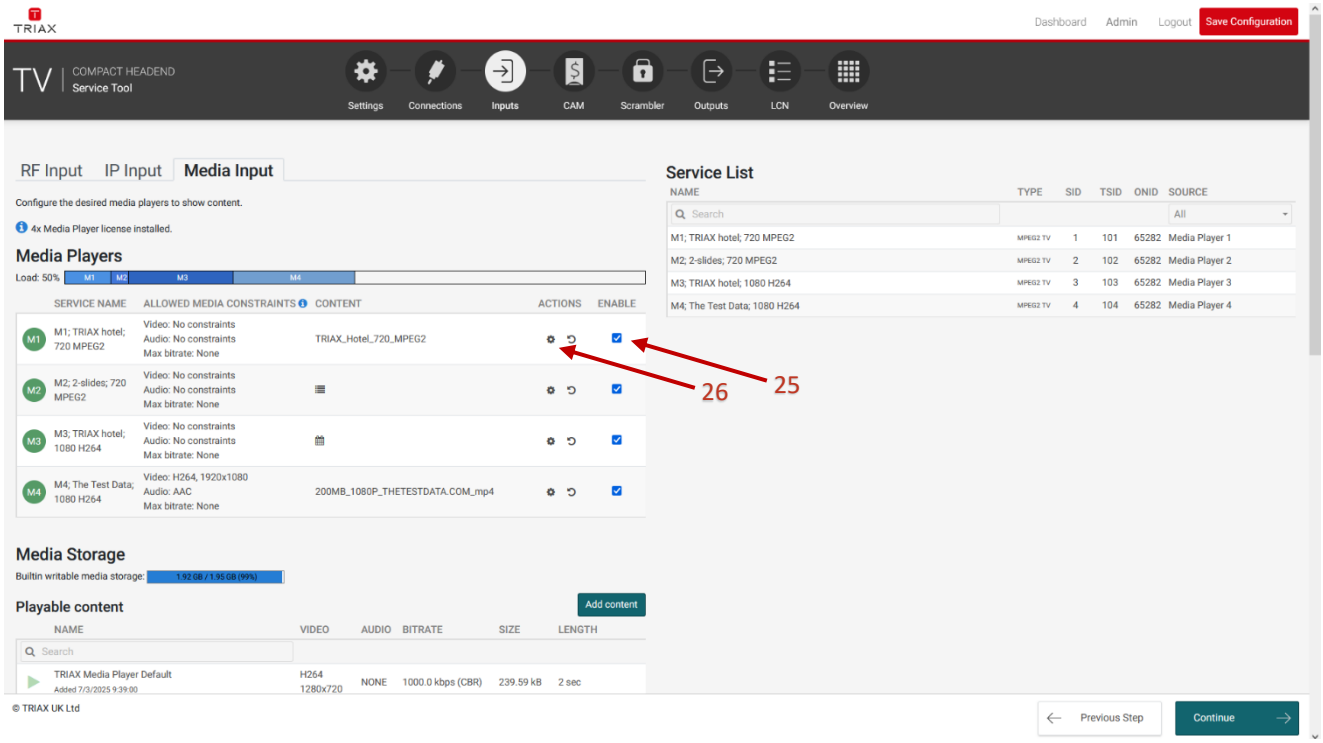
How to configure the Media Player to List mode and Schedule mode is described in the next sections.

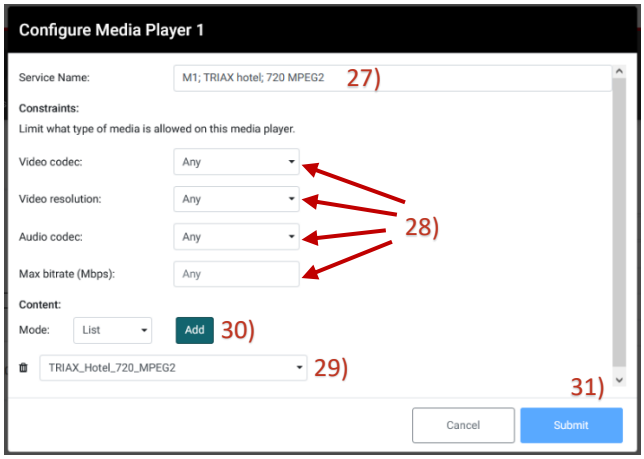
5.11.9 Configuration of the Media Player in the GUI; Configure with content in List mode

Precondition: Read the previous sub-sections describing the Media Player feature regarding Uploading, Conversion, List Mode vs. Schedule Mode, and Constrains.

To configure content playback in List Mode for the Media Player follow the steps below:

25) Press the ENABLE checkbox to enable a Media Player.
26) Press the *"Gear icon"* button for the Media Player.
27) *Service Name*: Give the service a name. This name will be used in the rest of the GUI when selecting the service e.g. for IP or RF output. The service name is insert in the SDT, thus the name is also shown at the TV.
28) *Constraints*: See the previous sub-section for this topic. The constraints defines if content is valid to select for this Media Player. E.g. if choosing H264 Video Codec, then only content with this video codec can be chosen, thus content with MPEG2 video codec will be marked red at the content list.
29) Choose the content to be played back. Notice the constraints described above.
30) *Add*: If more files shall be played back in an endless loop then choose to add more content.
31) *Submit*: Press Submit to apply the settings. Remember to press *Save Configuration*, top right corner



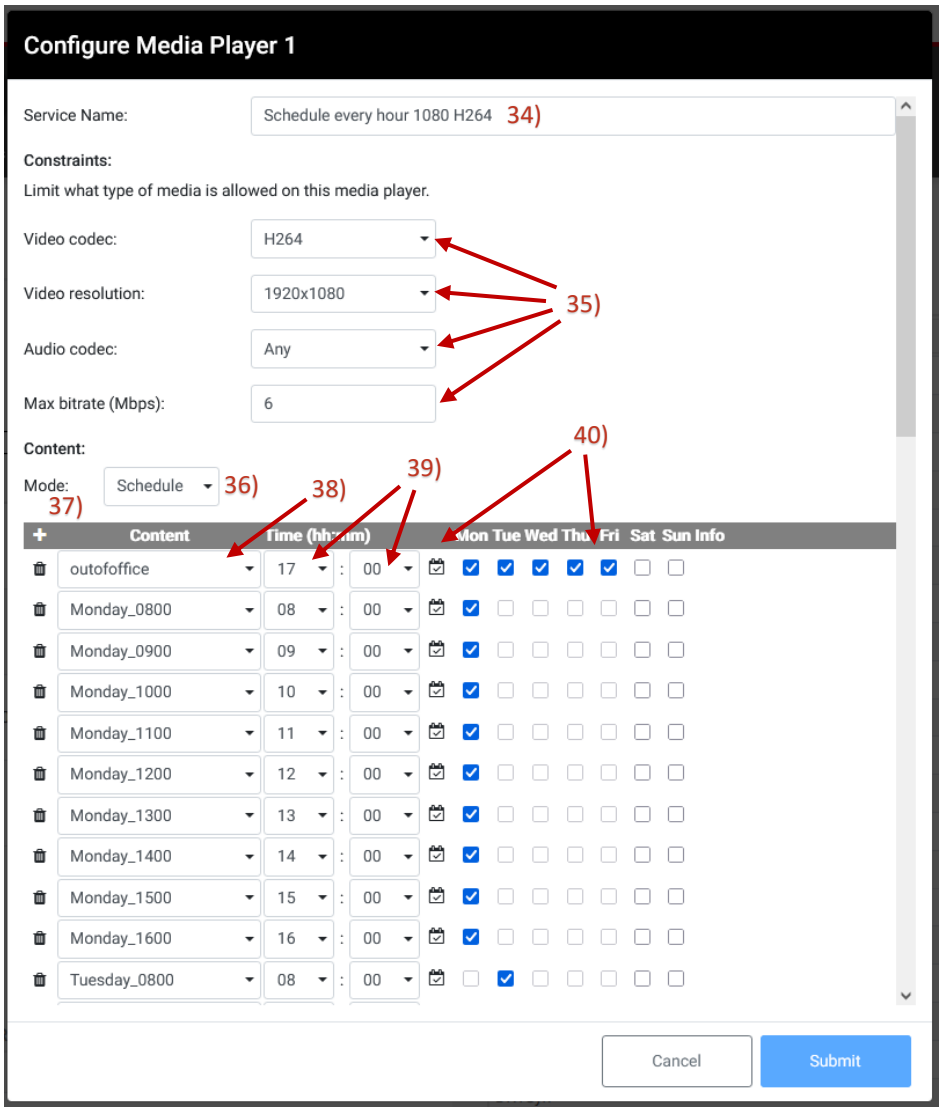


5.11.10 Configuration of the Media Player in the GUI; Configure with content in Schedule mode

Precondition: Read the previous sub-sections describing the Media Player feature regarding Uploading, Conversion, List Mode vs. Schedule Mode, and Constrains.

To configure content playback in Schedule Mode for the Media Player follow the steps below:

32) Press the ENABLE checkbox to enable a Media Player. See previous section under 25).
33) Press the *"Gear icon"* button for the Media Player. See previous section under 26).
34) *Service Name*: Give the service a name. This name will be used in the rest of the GUI when selecting the service e.g. for IP or RF output. The service name is insert in the SDT, thus the name is also shown at the TV.
35) *Constraints*: See the previous sub-section for this topic. The constraints define if content is valid to select for this Media Player. E.g. if choosing H264 Video Codec, then only content with this video codec can be chosen, thus content with MPEG2 video codec will be marked red at the content list.
36) *Mode*: Chose *Schedule*.
37) *Add*: To schedule more then press "+".
38) *Content*: Chose content.
39) *Time*: Select the time that the content playback must start.
40) *Weekday*: Select the weekday for scheduling. To select all days, press



5.11.11 Configuration of the Media Player in the GUI; Media Players Editor Access

The Media Player can be configured by a non-technical-person via a separate login. This login only allow access to updating the Media Player content. To access this login follow the steps below, log out, and log in as “media” user. How to setup access to the Media login is described below:

41) Enter password for the “media” user.

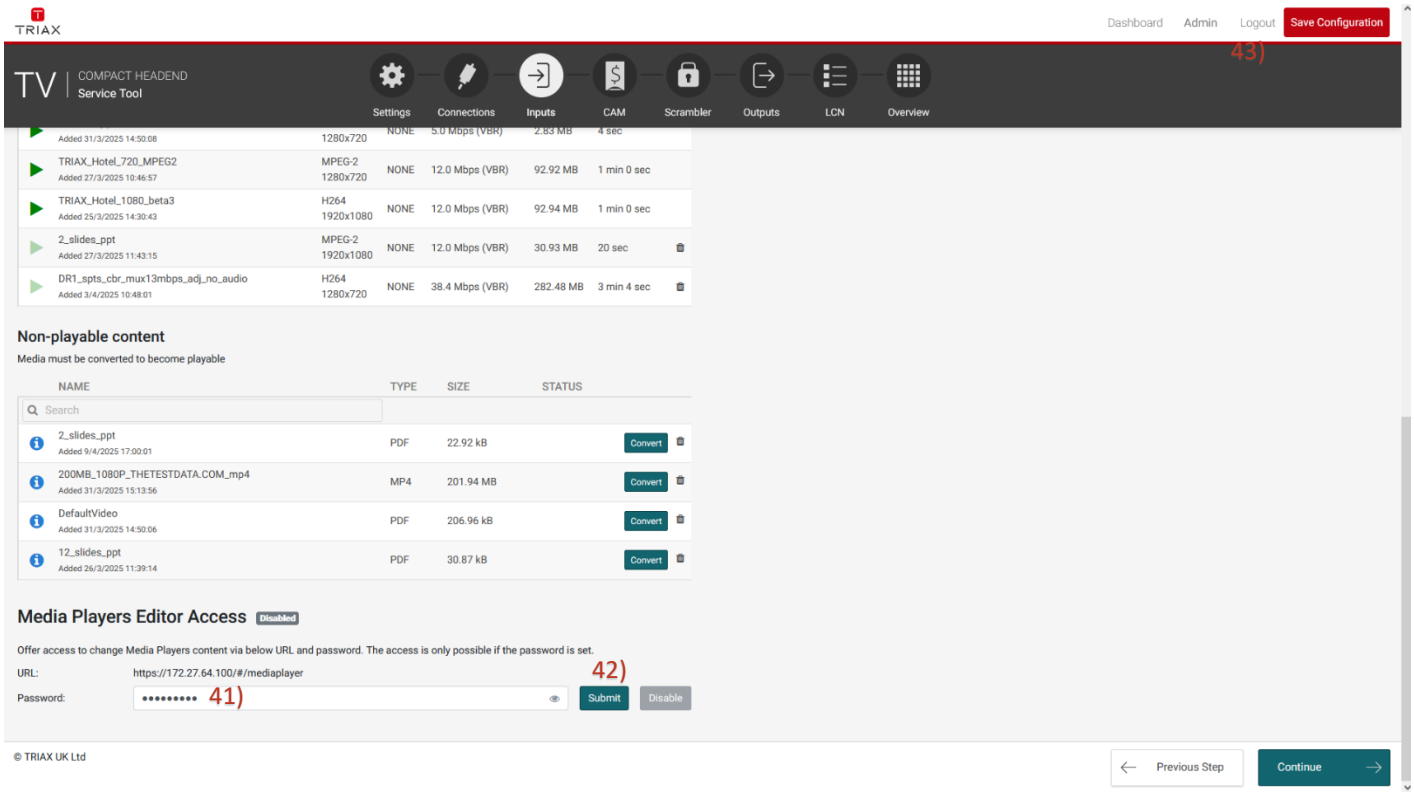
42) Press the *Submit* button. When the Media login use is enabled. It will be indicated by

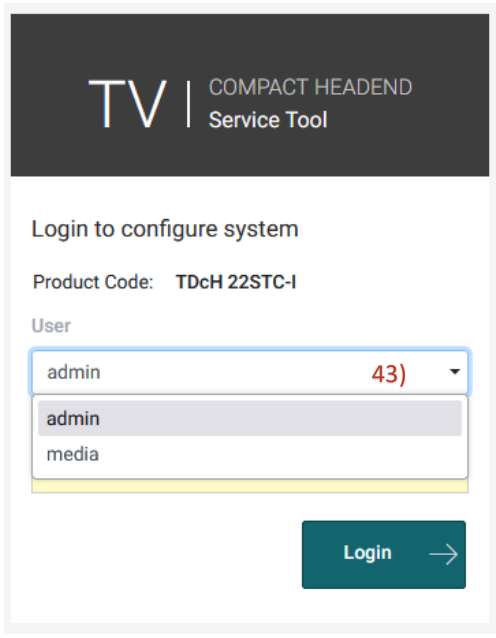
Media Players Editor Access Enabled

(To disable the media login access user click the *Disable* button. It will be indicated by

Media Players Editor Access Disabled)

43) Log out. At the Login page it is now possible to choose “media” user.

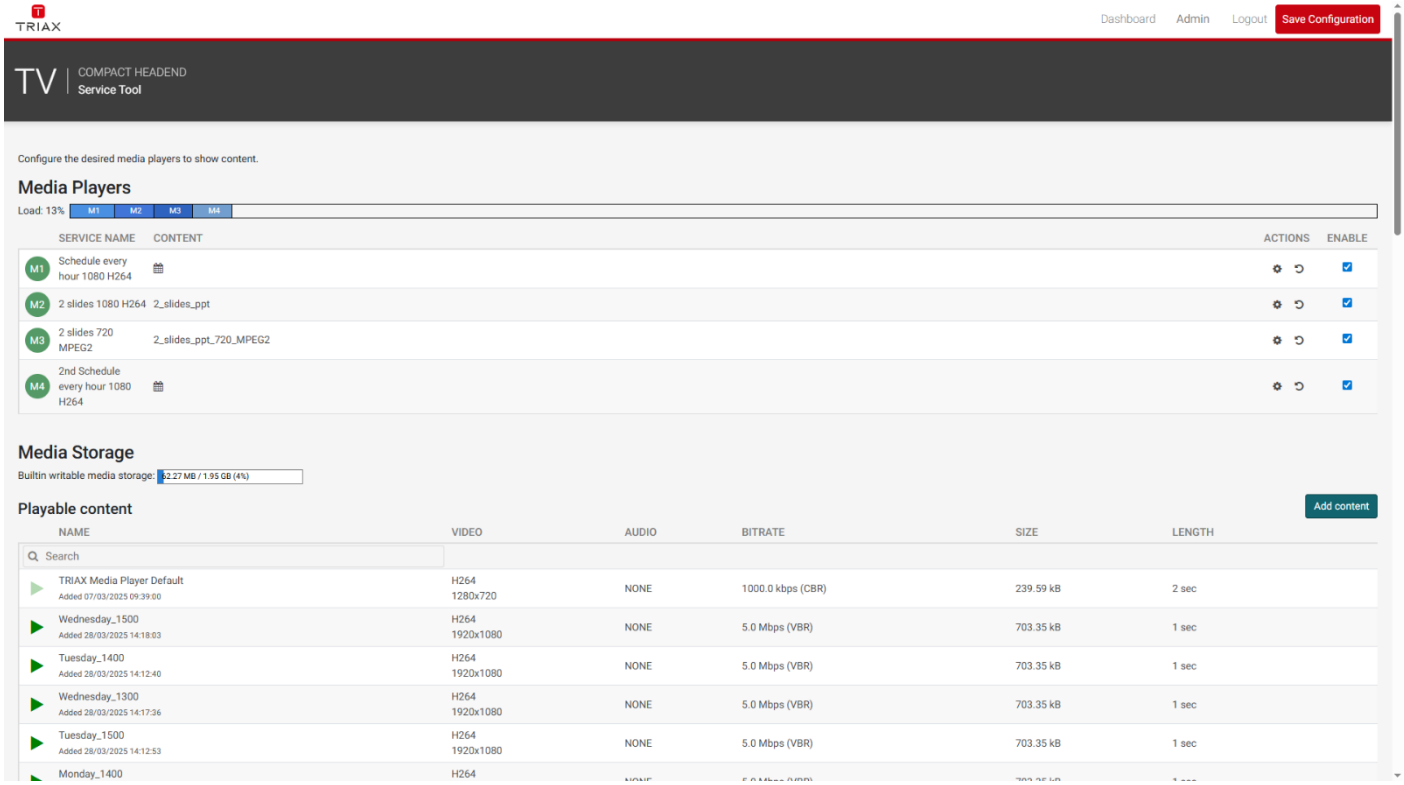




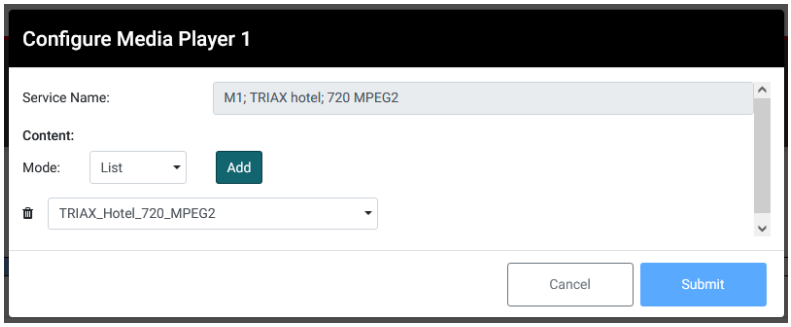
5.12 Configuration of the Media Player; Simple GUI

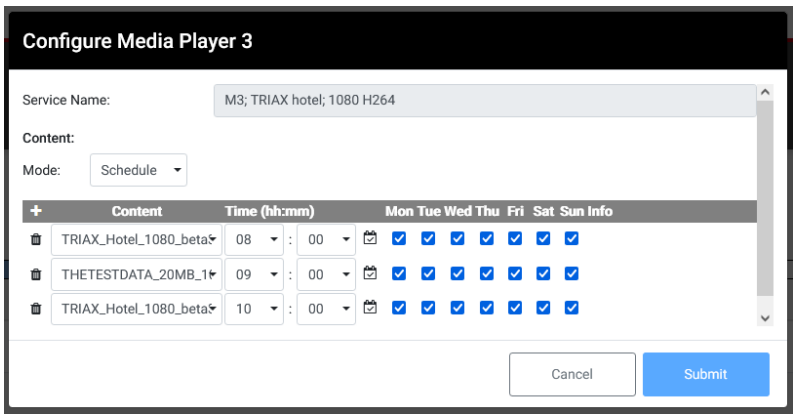
A simple GUI page for configuring the content for the Media Player by a non-technical person.
Read the previous section to enable the “media” user which can access this GUI page.

At this GUI page it is only possible to change the Media Players content. Constraints for the Media Player, how it is routed, etc. is not possible to change. The GUI only contains an overview page for the Media Players as shown below.



The user can press the ⚙ “Gear icon” button to change the content, like shown in the two examples below:





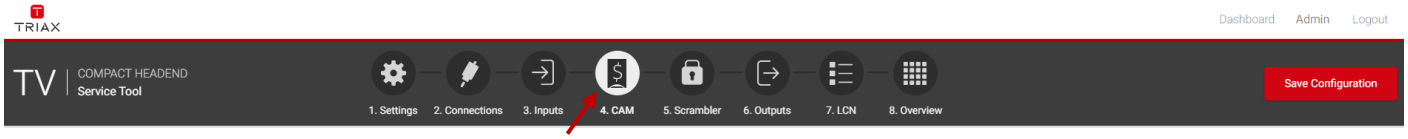
5.13 Media Player in playback portrait or landscape

The Media Player has no option for changing the orientation from landscape to portrait and vice versa. E.g. if a TV set is mounted in portrait mode, then the content being delivered to the TDcH/TDmH must also be in portrait mode.

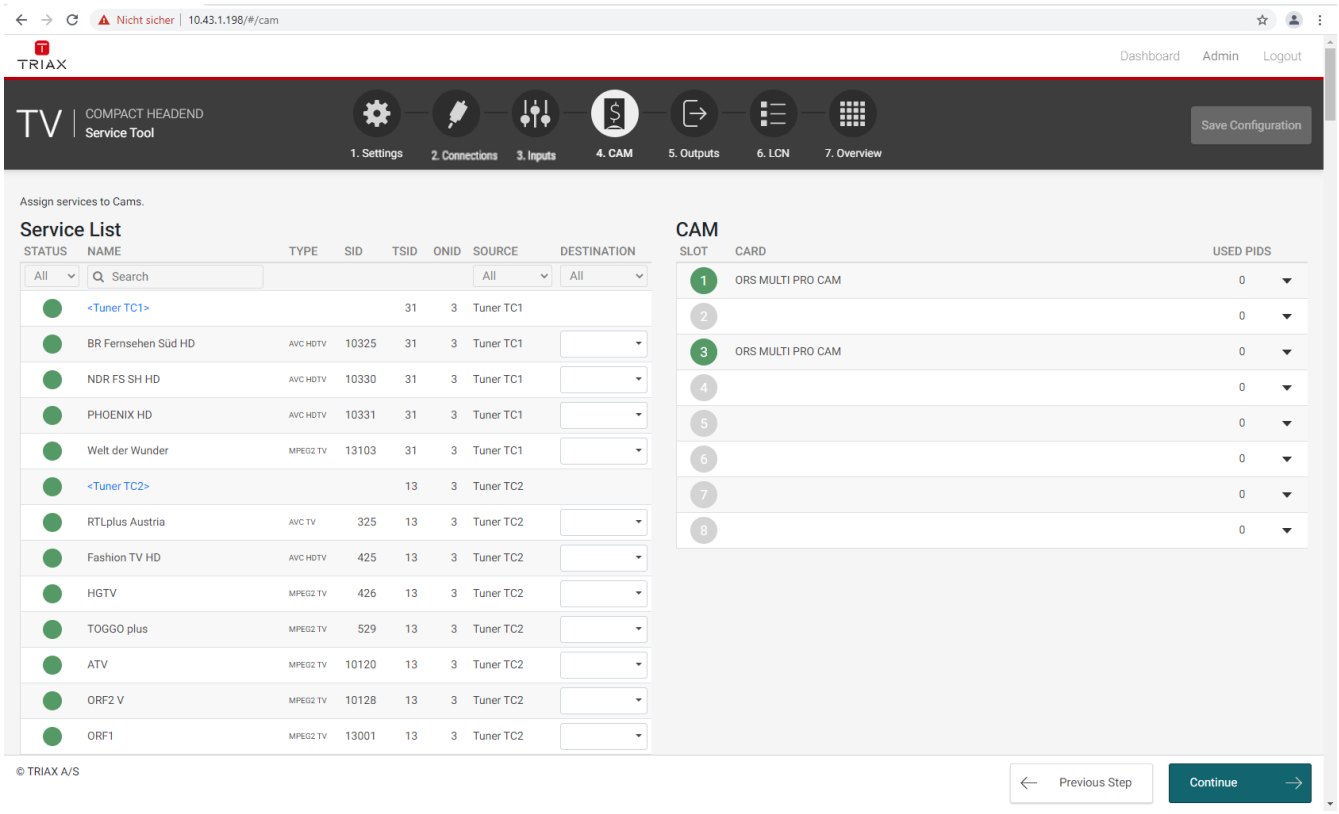
5.14 CAM

Note:
This functionality is not available on the FTA Versions TDcH 16S-Q, TDcH 16S, TDmH IP, and TDmH S8.

Click the “CAM” tab in the TDcH & TDmH Service Tool to display the CA Modules and administration window.

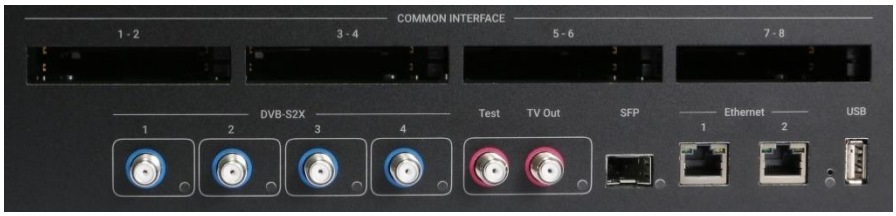


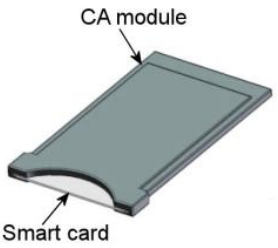
The first time you display the CAM window in a new configuration the module list only displays the number and type of the CA modules that you have inserted in the TDcH & TDmH.



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

5.14.1 CAM / Smart card



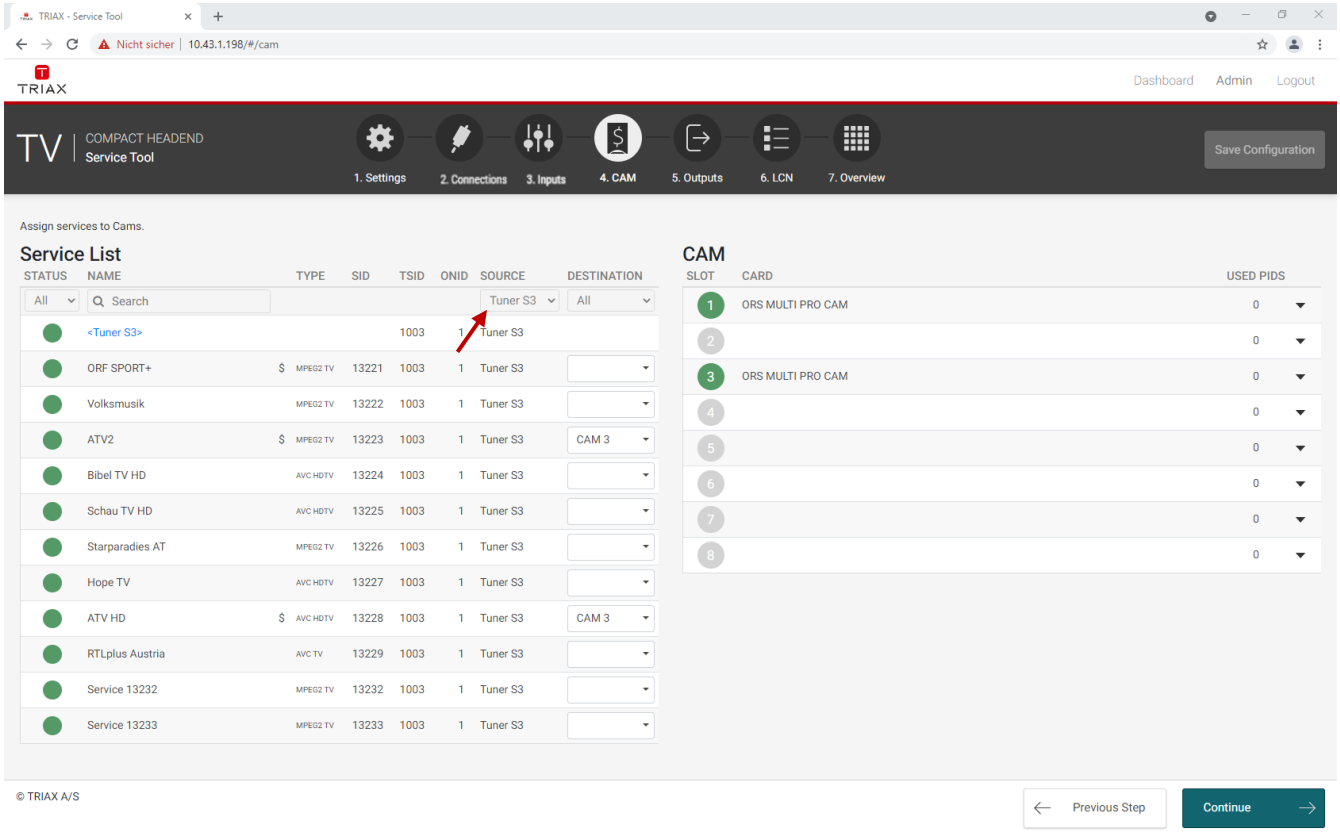


You can insert 4 or 8 Conditional Access Modules (CAM) into a TDmH & TDcH Headends

Each CA module can unscramble at least one service. The amount of services and which services depend on the service provider of the CA module and smart card.

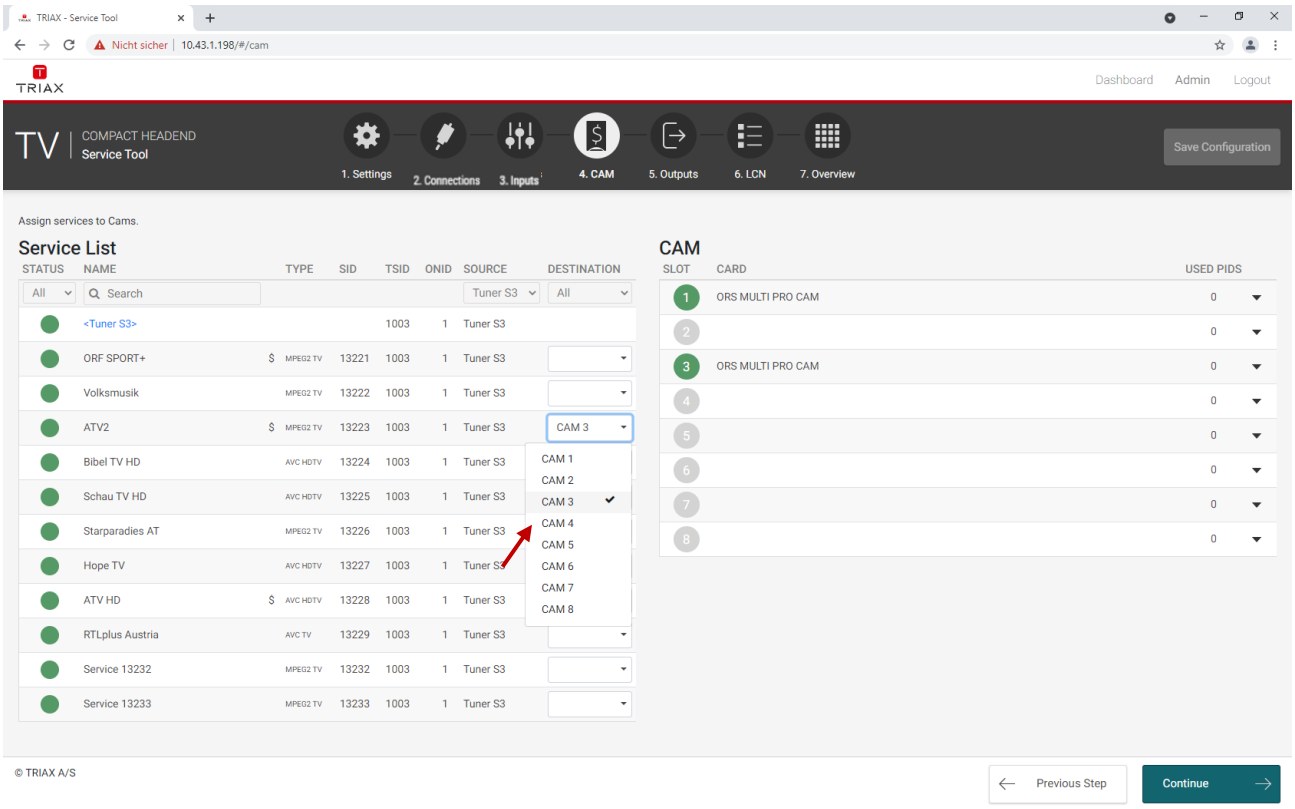
5.14.2 CAM configuration

At the first step you must assign to a CA module the services the CA module should handle. To assign the services open the drop-down menu under SOURCE and choose the tuner you would like to select services for a CA module.

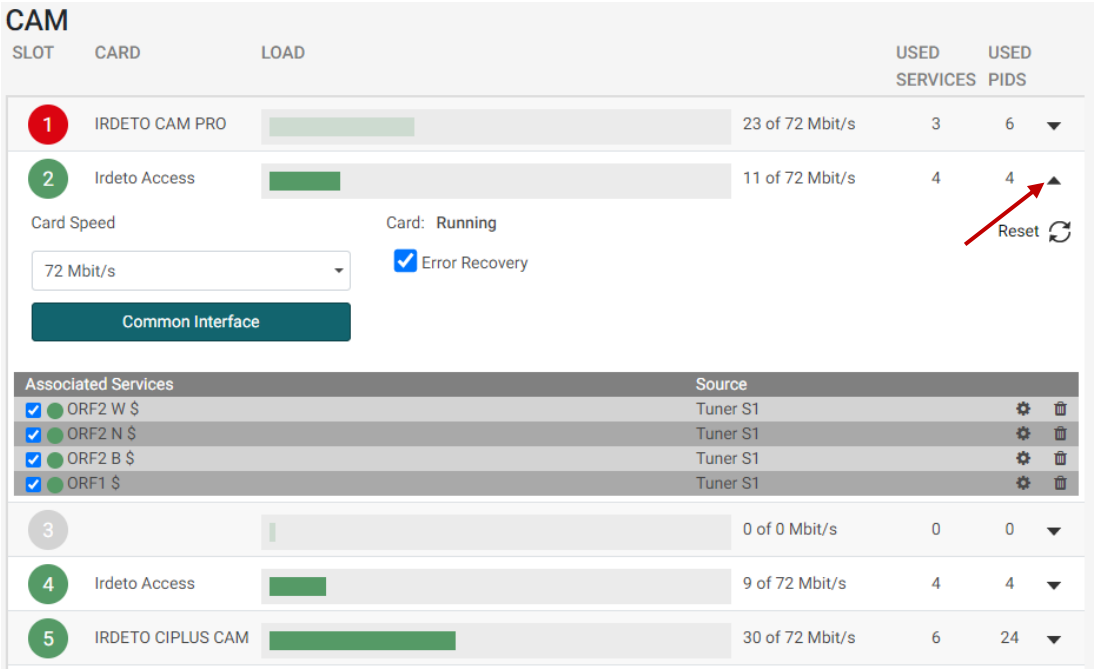


In the DESTINATION column you can now choose the services you would like to send to a CA module.

Note:
It is possible to send services from different transponders to the same CA modules, so that the number of CA modules can be reduced.
Please do not overload the CA module with services and please ensure that the supported amount of PIDs is not overloaded.
The supplier of the CA module can inform you about how many PIDs the CA module can support.

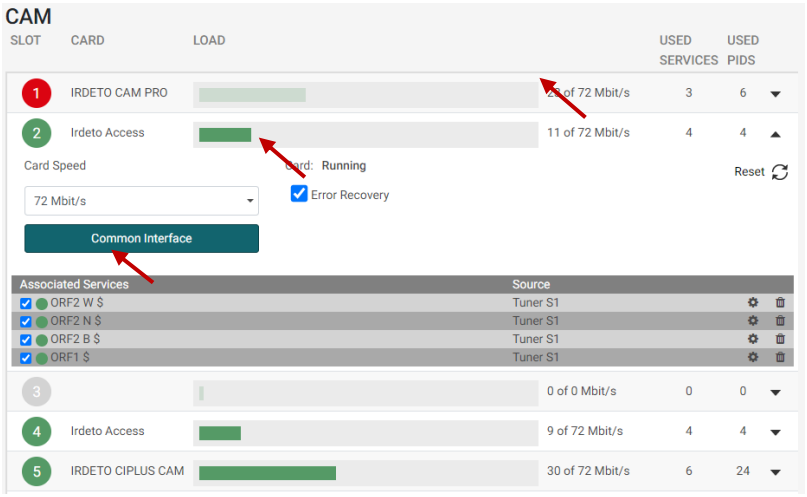


By clicking the expand button on the CA menu the detailed configuration menu opens.



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

Load:
The load shows current used payload and how much is free of the accessible payload. Transport stream packages are dropped if the load bar turns red, in which case the amount of associated services must be reduced.

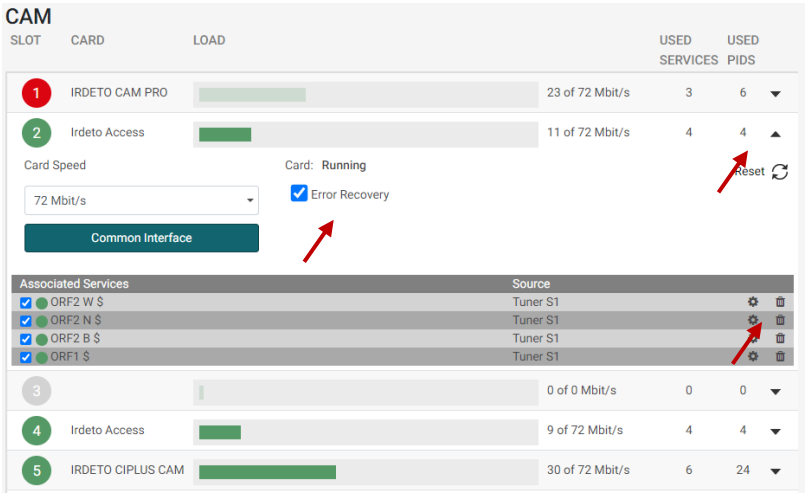


Service list area (Associated Services)
Select the service(s) you want to descramble in the Service list area by clicking the service(s) at the selected button. Scrambled services are marked with a dollar sign - $.

Note:
Please note that the services in the CAM menu have to be assigned with the check box to be descrambled!

Used PIDs:
This number shows how many PIDs the CAM is using for descrambling the TV services.

Please ensure that the CA module is not overloaded with used PIDs. The numbers of PIDs a CA-module can support depends on CA module. Please ask the CAM supplier or the program operator if you are unsure how many PIDs the CA module can support.

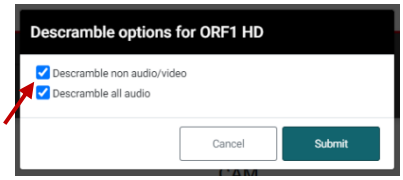


Error Recovery
If you select the “Error Recovery” checkbox then the automatic error recovery is enabled for all services assigned to this CA-module.

Note:
The Error Recovery function does 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 “Error Recovery” checkbox should not be enabled for services where signals are not transmitted on a 24-hour basis.

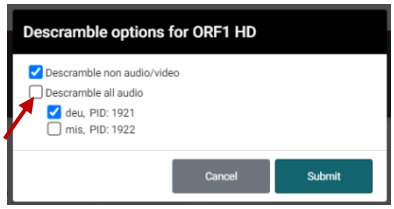
Filter options
To change the Filter options for a service, click the Setup button of the service in question to open the Filter options window.

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



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

To descramble only selected audio PIDs you must 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.

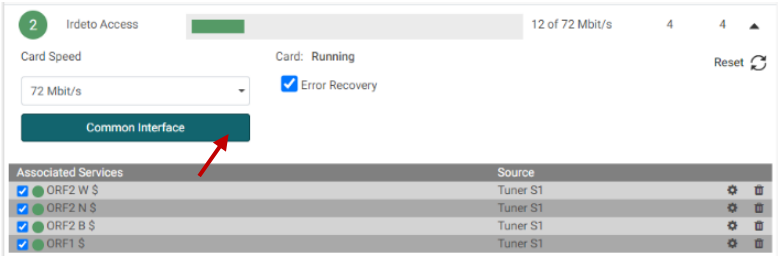


Open the drop-down list and select the language of the audio PID you want to descramble.

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.

5.14.3 Common interface

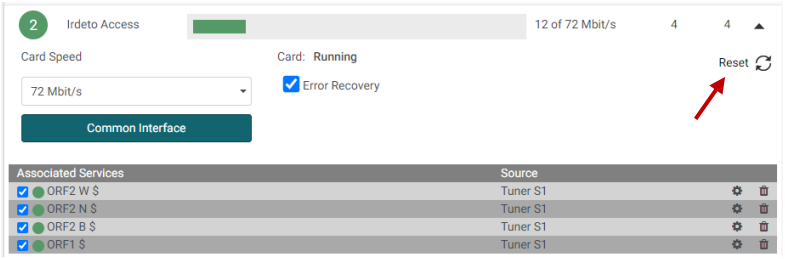
Clicking the Common interface button gives you access to information from the smart card inserted in the CA module. The type of information provided by the smart card depends on the card itself and its make.



Please refer to the user guides of the CA modules and smart cards you have inserted for further information.

5.14.4 Reset CAM

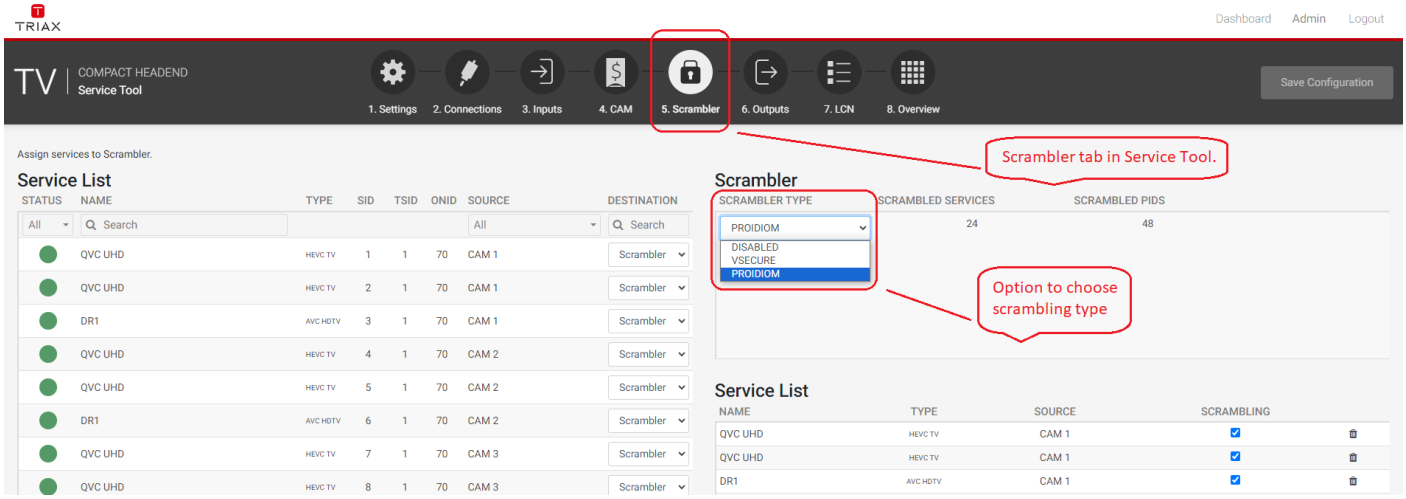
If the CA module malfunctions, click the Reset CAM button to reboot the CA module. When a CA module is reset, the signal transmission is interrupted for all the services associated with that CA module.



5.15 Scrambler

The TDcH & TDmH offer option for scrambling of services. The scrambler feature is not available for all variants. In general only variants with CI slot offers scramble feature. Pro:Idiom scrambling feature requires special variants. See section “3.4 Technical data” for variants vs. scrambler option information.

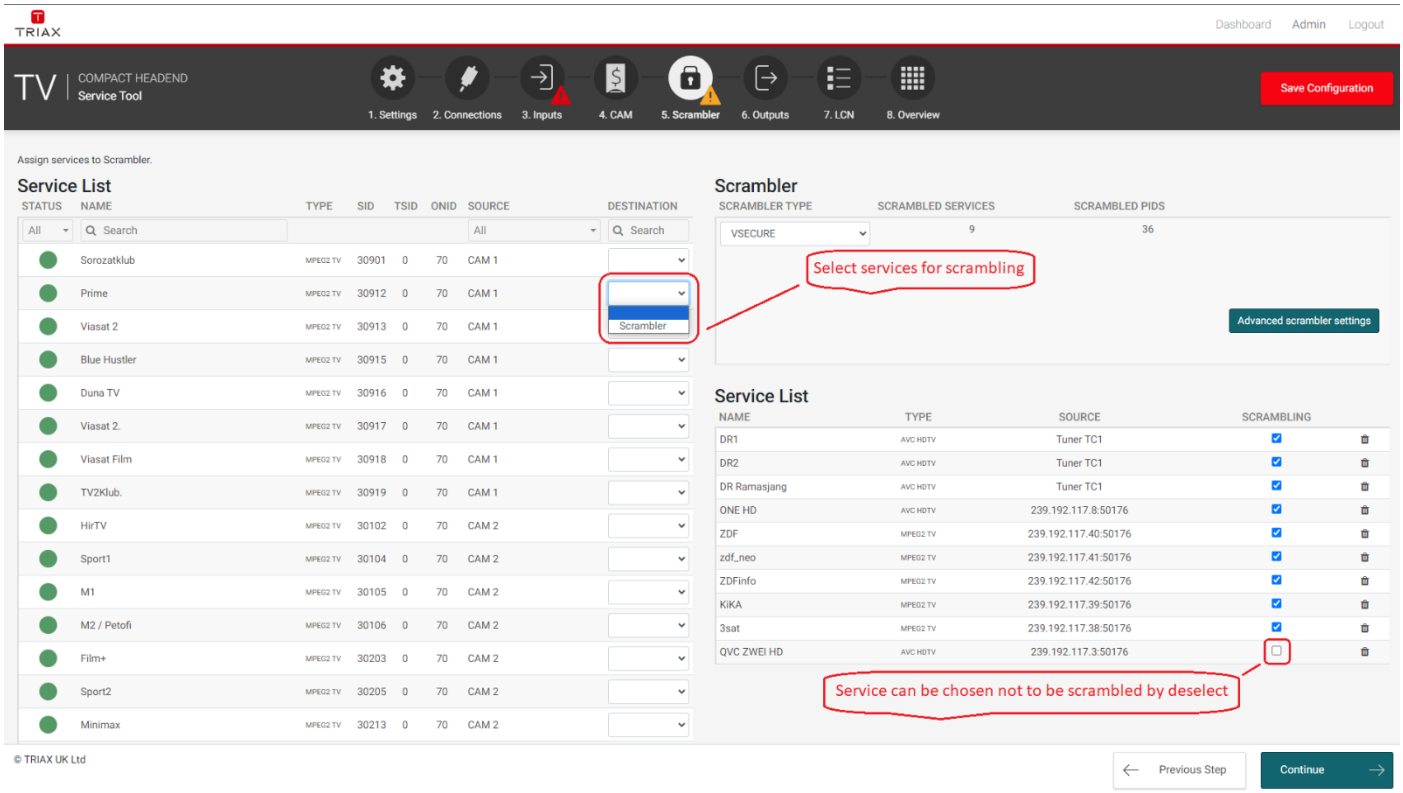
Variants with scrambler feature have a Scrambler tab in the Service Tool.



At the Scrambler page the Scrambler type can be chosen. At default it is disabled.

When a Scrambler type is selected and required license/variant is meet, then services can be select for the scrambler. The selected services will be listed in the Service List.

At the Service List each service can be set to scrambling (default). If this is disabled the service will not be scrambled. This feature is primarily for troubleshooting purpose.

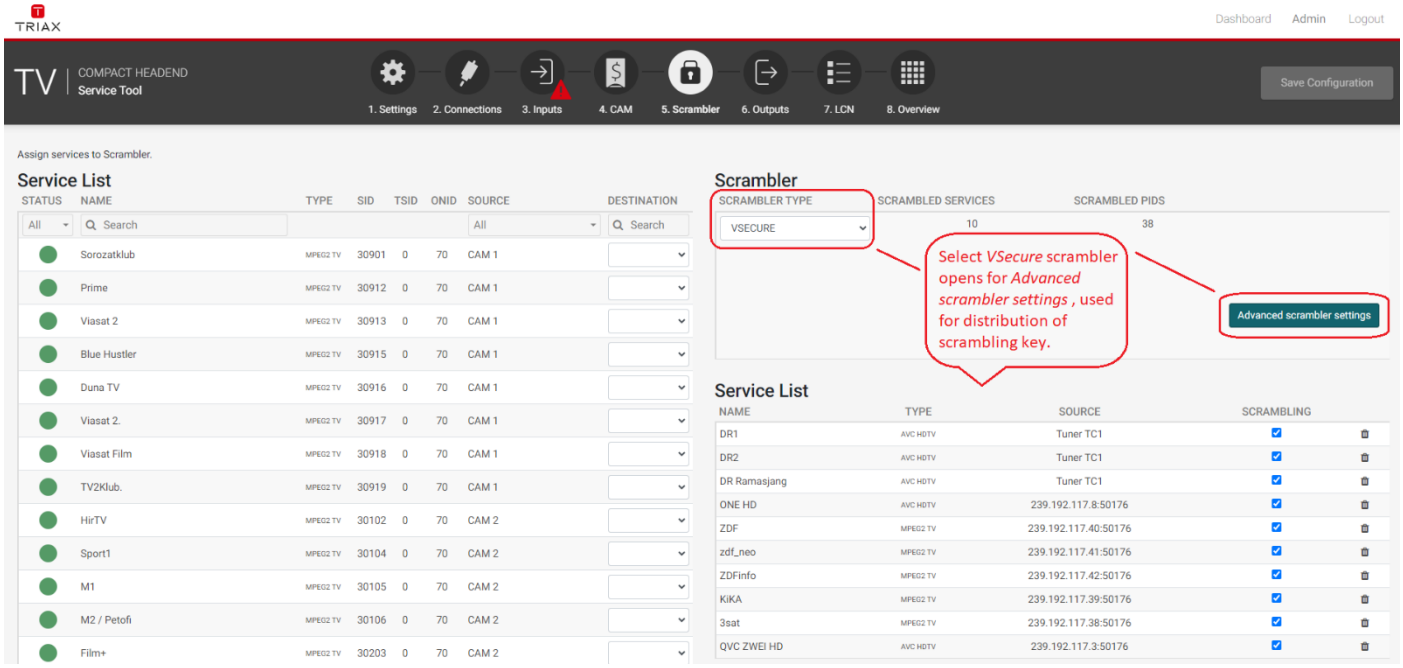


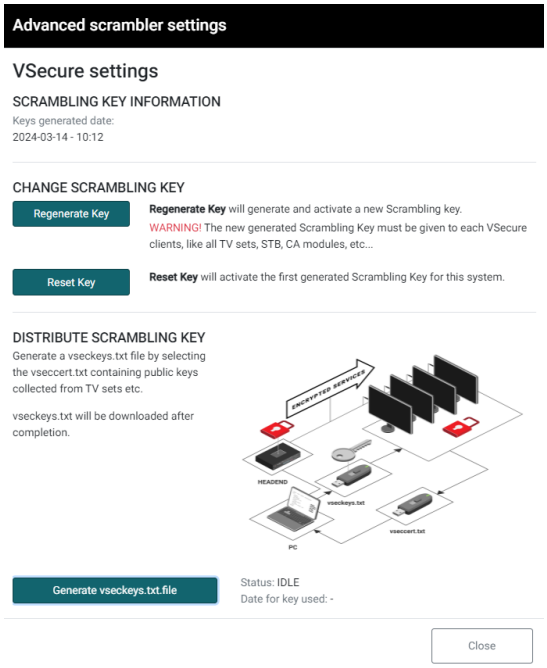
5.15.1 VSecure Scrambler

VSecure Scrambler works with Philips TV sets and VSecure CA modules.
The VSecure Scrambler feature requires a license.

Only TV sets and CA modules with scrambling key are able to descramble. The scrambling key must be distributed to the TV sets and CA modules. This is done via following steps:

1. Collect ID from each TV set in a vseccert.txt file.
2. Upload the vseccert.txt file, containing the collected IDs, to the headend via the “Generate vseckeys.txt file” button in the “Advanced scrambler settings” page reached via the "Advanced scrambler settings” button.
3. Distribute the scrambling key to the TV sets via the vseckeys.txt file.





5.15.2 LYNK Scrambler

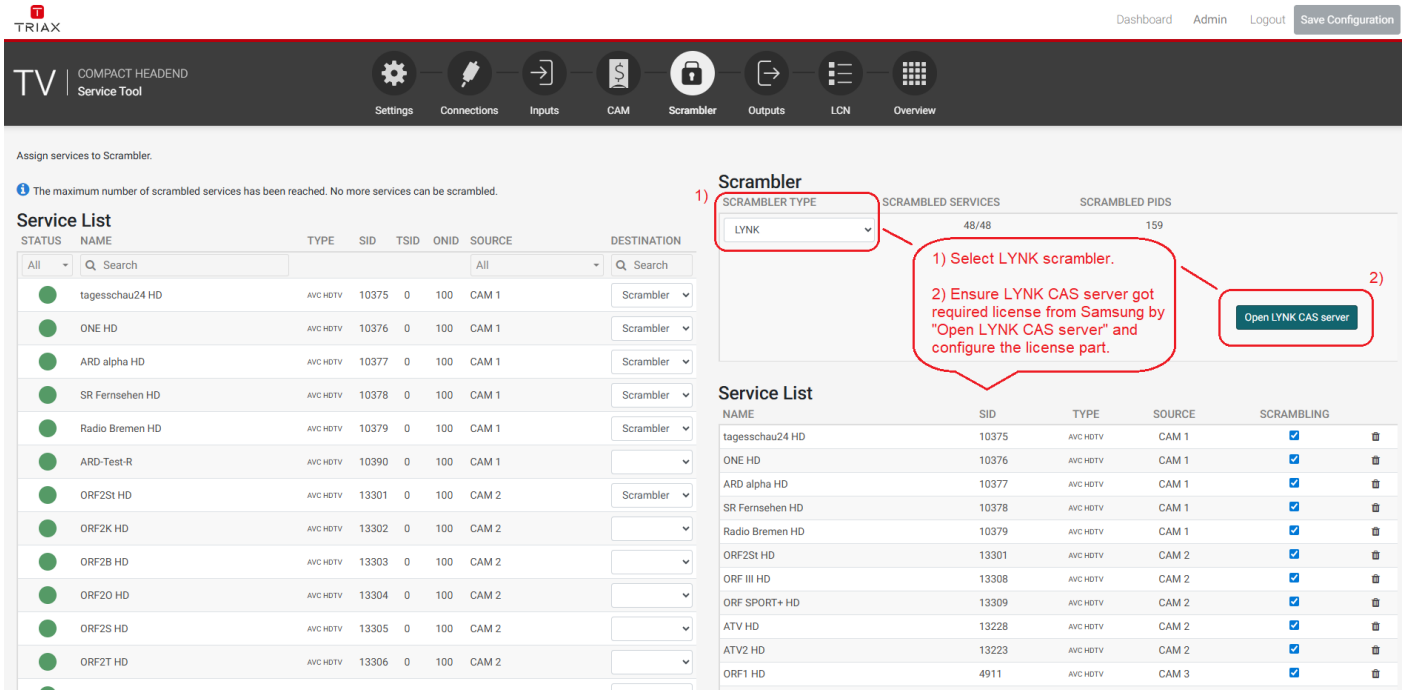
The LYNK Scrambler feature requires a license.

LYNK Scrambler works with Samsung TV sets. Only Samsung TV sets are able to descramble. Thus, other TV sets or devices will not be able to show the content when a service is scrambled via the LYNK scrambler.

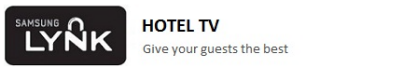
The TDcH/TDmH includes an embedded Samsung LYNK CAS server. This LYNK CAS server requires a license from Samsung to work.

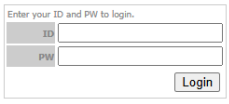
The Samsung LYNK license is entered by doing following steps:

1. Go to the Scrambler page.
2. If not selected, then select “LYNK” as scrambler type.
3. Press the “Open LYNK CAS server” button.

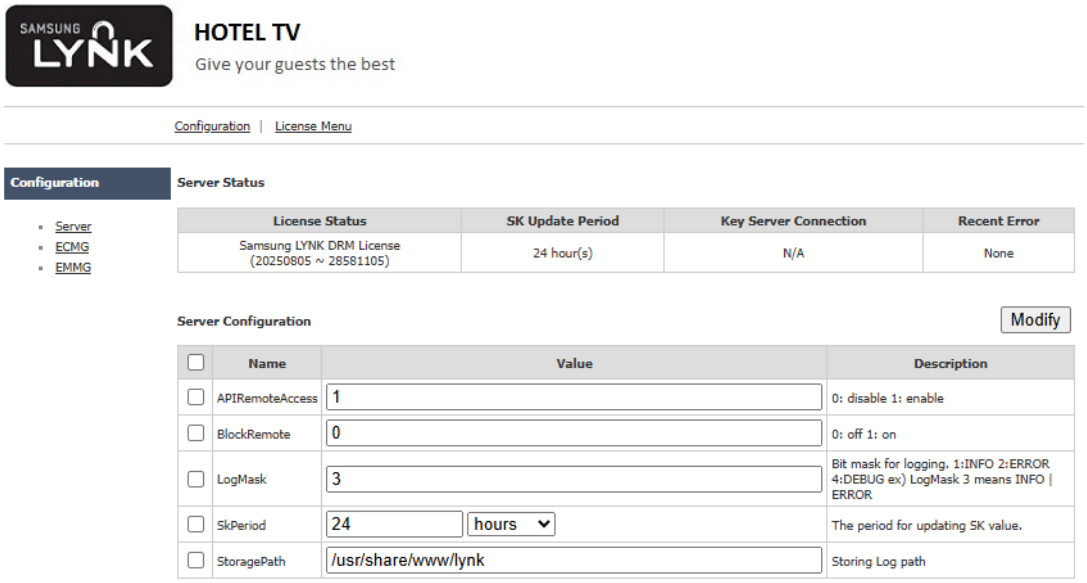


4. A new tab will open in the browser.
5. Log in. If logging in for the first time, then create a password etc.



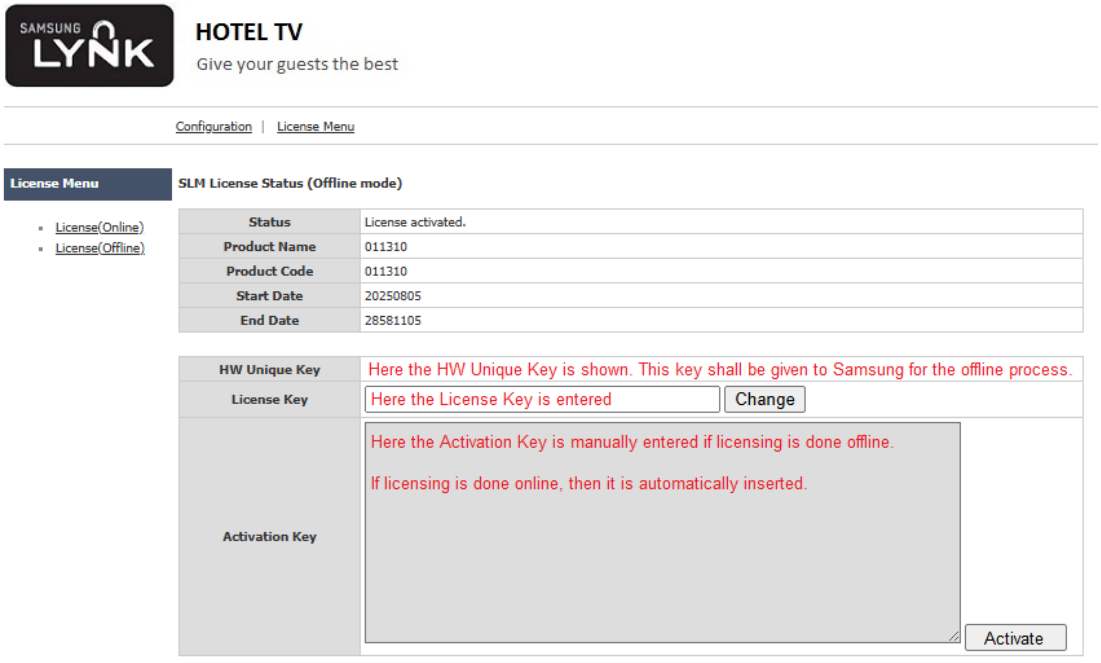


6. Once logged into the Samsung LYNK CAS, below screen is shown.
7. The license status is shown under “Server Status”.
8. To configure the license press “License Menu” at the top.



9. At the License Menu two ways of adding the license exist.
    a. License online.
    b. License offline.

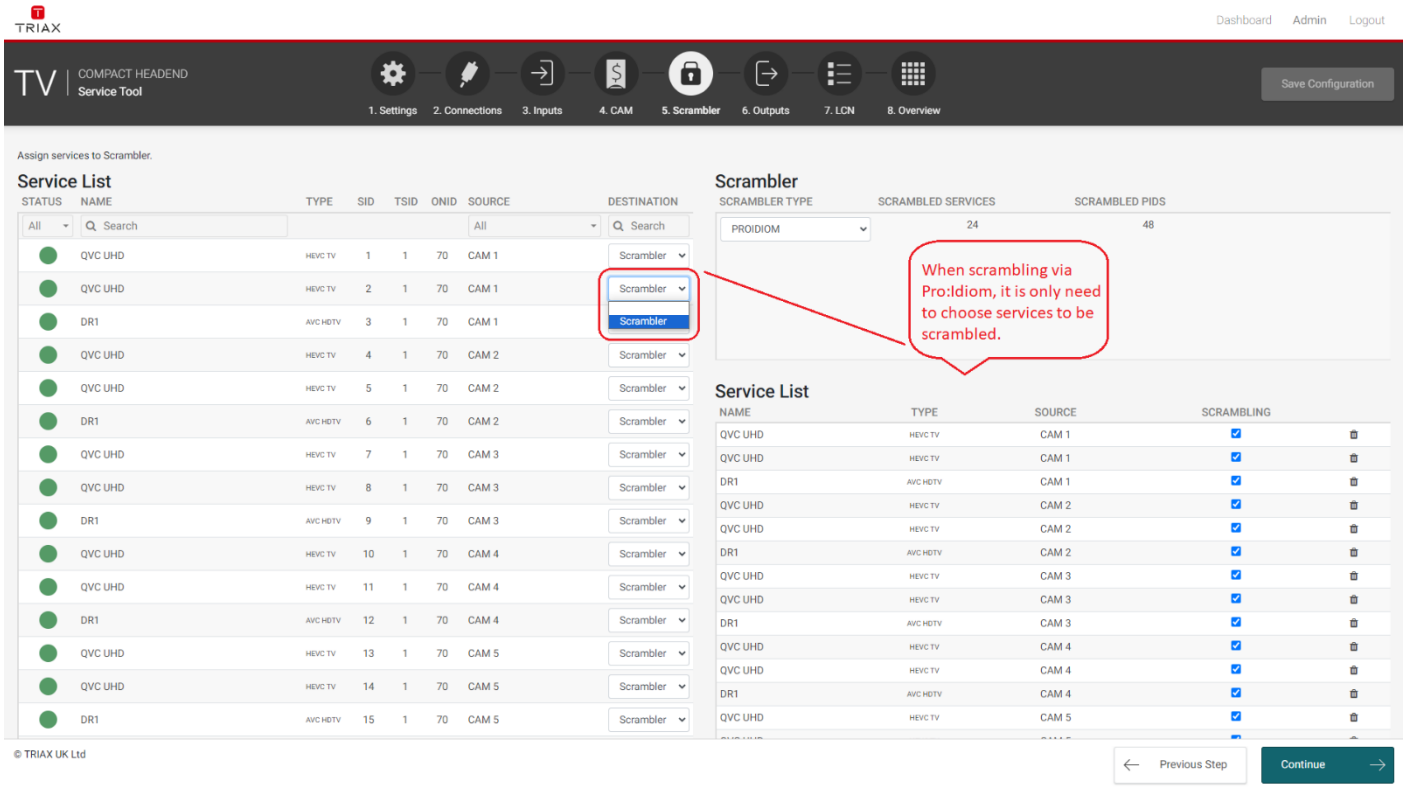
    Both online and offline modes above options are possible in the embedded Samsung LYNK CAS.
10. Contact Samsung to get the license.



Note:
See below section for “No scrambler license”.
Additional notice: If no scrambler license is installed, then pressing the “Open LYNK CAS server” will result in opening a tab at the browser with the text “503 Service Not Available”.

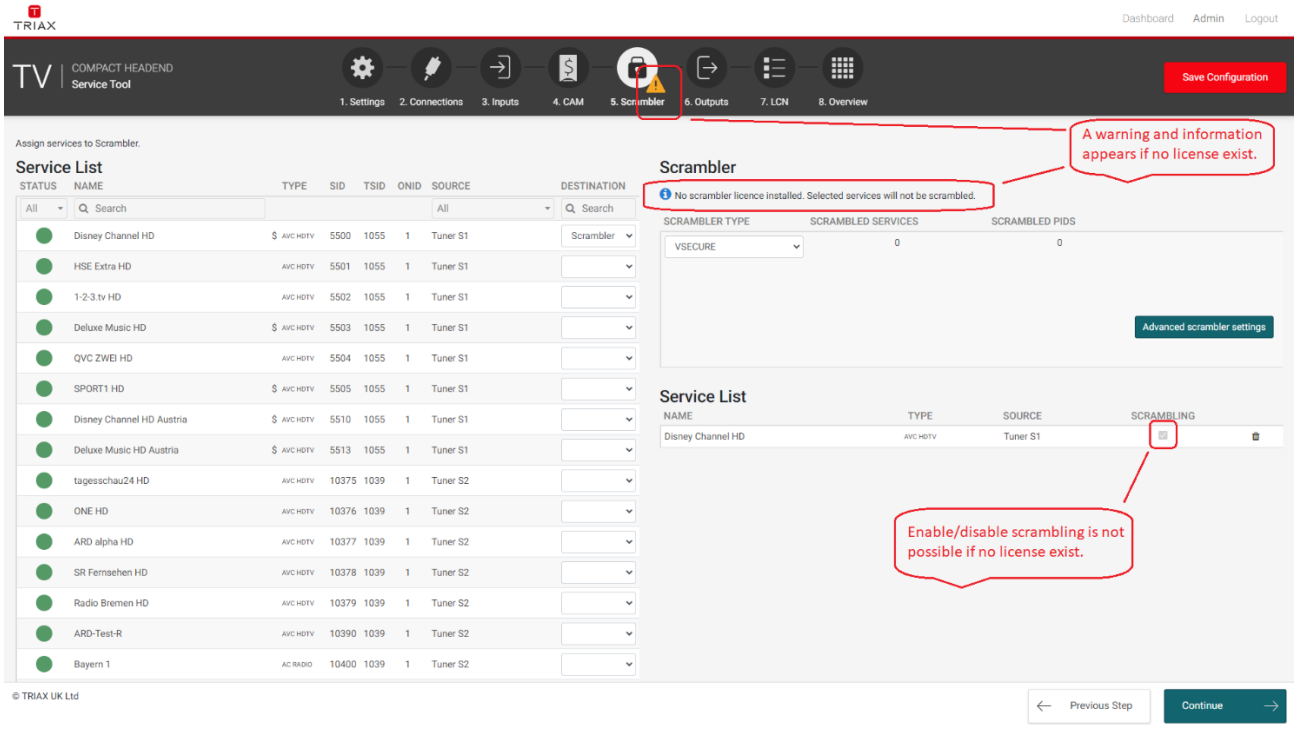
5.15.4 Pro:Idiom Scrambler

Pro:Idiom Scrambler works with LG TV sets. Only LG TV sets, supporting Pro:Idiom, can descramble the scrambled services. Pro:Idiom Scrambler setup is very simple - just select services to be scrambled as described in section 5.15 Scrambl.



5.15.5 No scrambler license

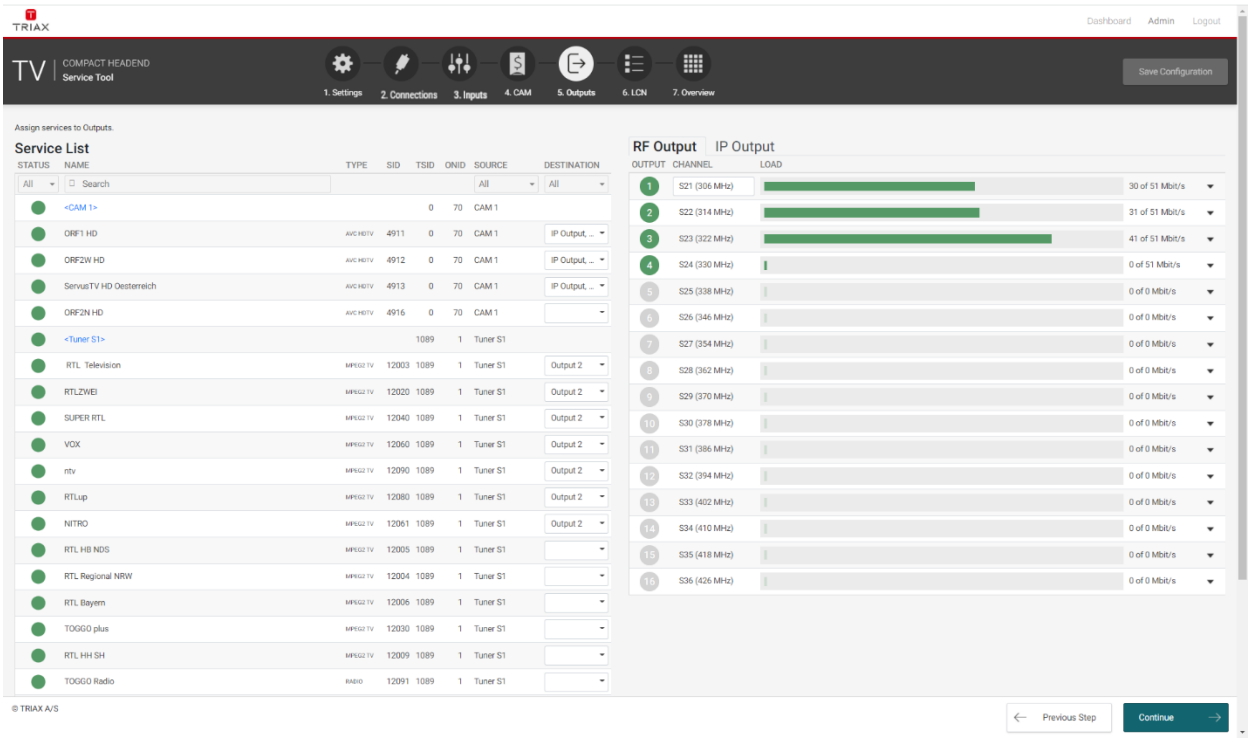
If no scrambler license exist at the system, a waring including information will be issued.



5.16 RF Outputs

The Output Tab is for assigning services to the RF output channels and to the IPTV addresses.

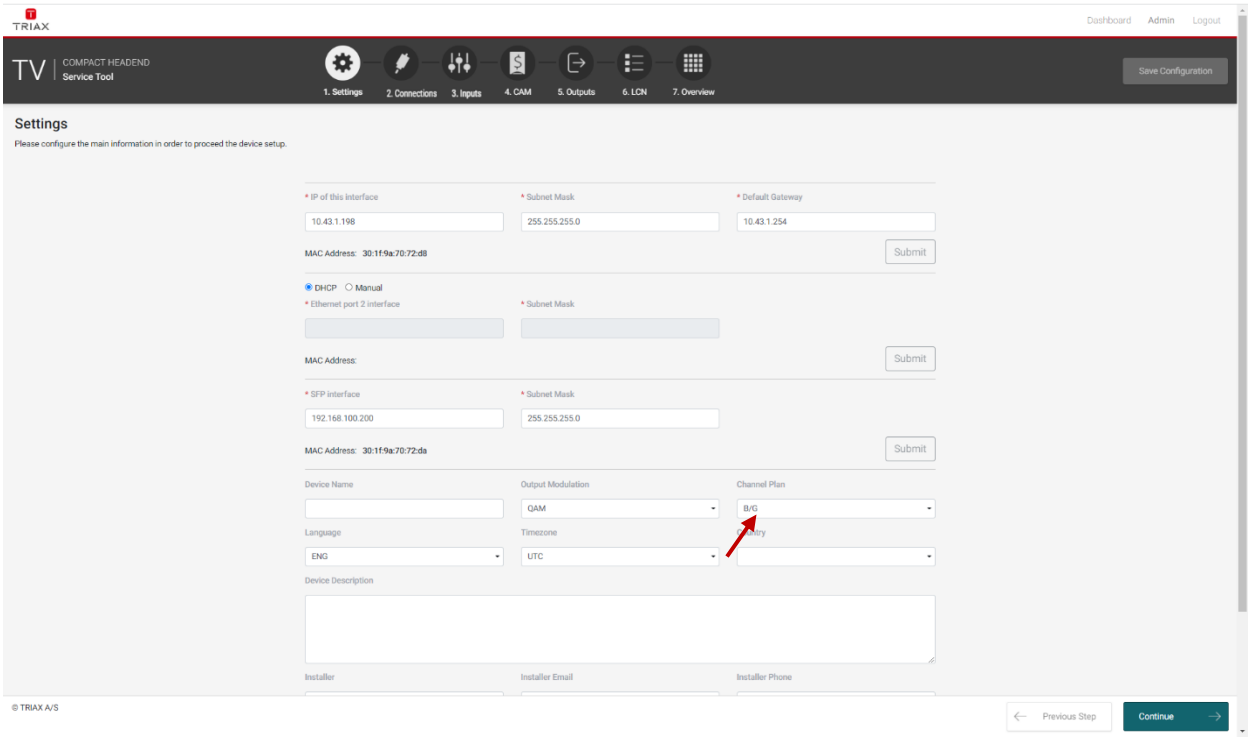
Note:
In most models the output modulation can be changed between QAM and COFDM. Select the required output modulation before you start to configure the TDcH & TDmH.
For changing the output modulation, please see 5.3.6 Output Modulation.



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

5.16.1 Channel plan

Before starting the Output configuration please be sure that the channel plan is set in the Settings folder!



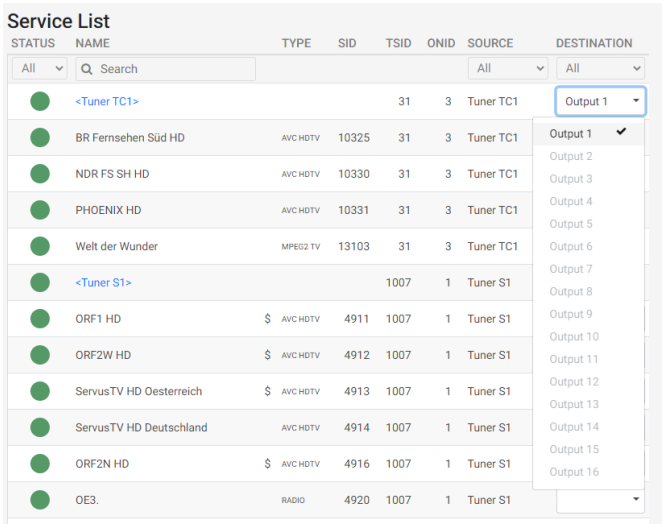
5.16.2 Select service

Note:
Services can be assigned to an output channel in direct conversion or as a new multiplex. In the direct conversion a full input transponder is assigned to an output channel. If a new multiplex is made, single services can be chosen from independent input transponders.

Direct channel conversion / Transparent mode:
Select under DESTINATION for each Input the output you would like to use the direct conversion function.

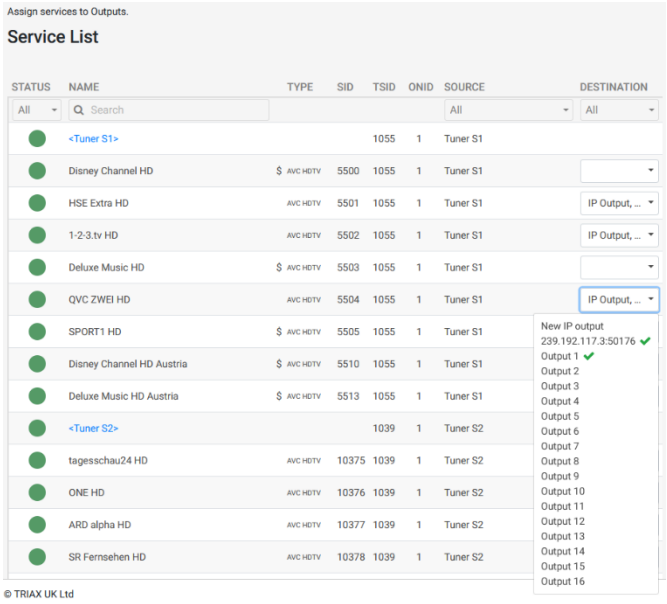
Note:
All services below this input will be shown as assigned to the selected outputs and cannot be used for other outputs!

Please note that services allocated in direct conversion to an output are not shown in the LCN table. Only services allocated in new multiplexes are shown in the LCN list!



New multiplex / Service mode:
If you would like to make a new output multiplex you can select individual services from different inputs for each output.

Note:
Please ensure that in both variations the output bandwidth is not overloaded!



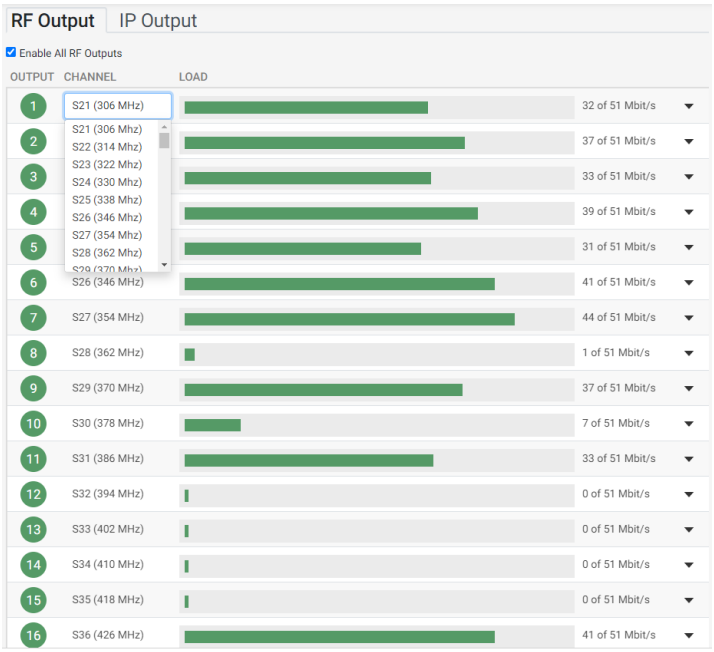
5.16.3 QAM Modulation

Enable All RF Outputs

You can quickly enable or disable all RF outputs by this setting.

QAM output frequency:

You can configure a QAM output frequency by using the specifications of the channel plan or by entering a frequency manually.



Using the channel plan definitions:

Open the drop-down list with the predefined channels and select the channel you want to use.

Note:

The Channel is only needed for Output 1 – all others are set automatically!

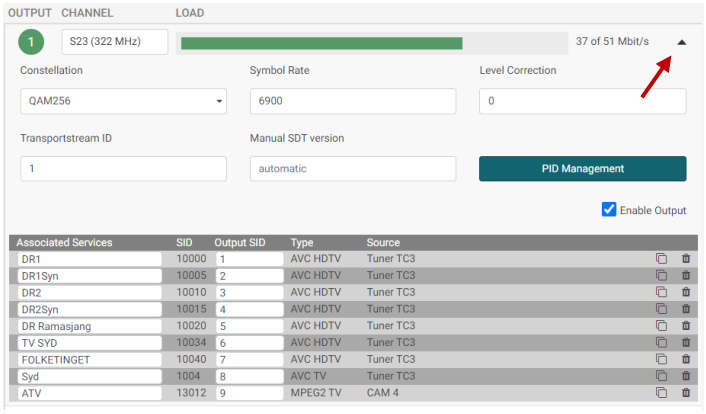
Enter a frequency manually:

Click into the frequency field and enter the frequency directly. Enter the desired frequency in MHz in the Frequency field.

Note:

The Channel is only needed for Output 1 all others are set automatically!

Open the detailed output configuration menu with the extend button.



Constellation:
To select which QAM mode to use, open the dropdown list and select the QAM mode you want to use.

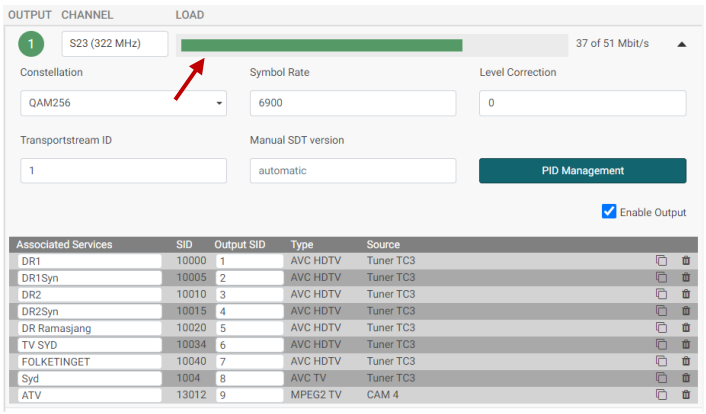
Symbol rate:
Enter the desired symbol rate (from 3150 to 7200 kS) in the Symbol rate field.

Level correction:
RF output level correction can be set in the first output channel for all output channels between 0 and -16 dB.

Enable Output:
If you want to enable this channel, click the Enable Output checkbox.

Note:
If the output is disabled, then there will be no transport stream or carrier present at this output. The services selected for this output will still be seen as configured in the system. The information about the services at this output will still exist via EIT_other, SDT_other and NIT_other!

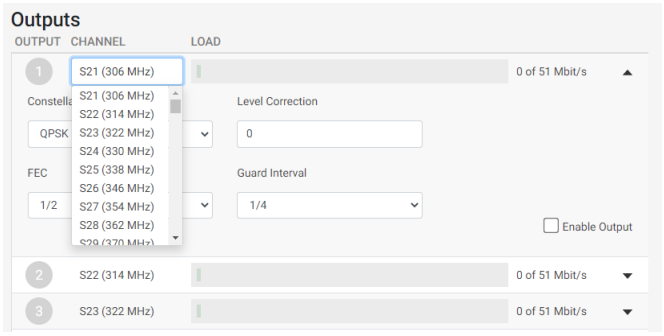
LOAD monitor
The payload monitor is a real time monitor, which visually indicates the amount of data currently being transmitted.



5.16.4 COFDM Modulation

CHANNEL

You can configure a COFDM output frequency by using the specifications of the channel plan or by entering a frequency manually.



Using the channel plan definitions:
Open the drop-down list with the predefined channels and select the channel you want to use.

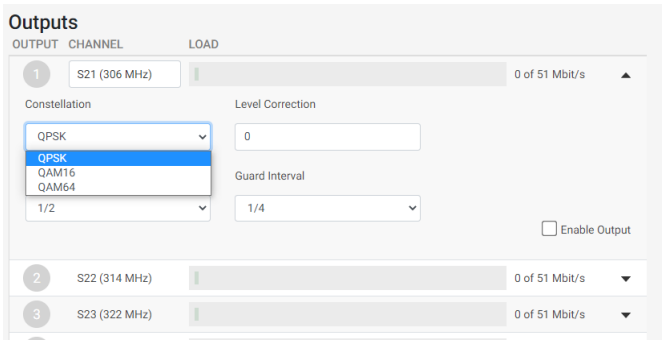
Note:
The Channel is only needed for Output 1 – all others are set automatically!

Enter a frequency manually:
Click into the frequency field and enter the frequency directly. Enter the desired frequency in MHz in the Frequency field.

Note:
The Channel is only needed for Output 1, all others are set automatically!

Constellation
To select which transmission mode to use, click the arrow to the right of the Transmission mode field to open the drop-down list with the modes you can choose from.

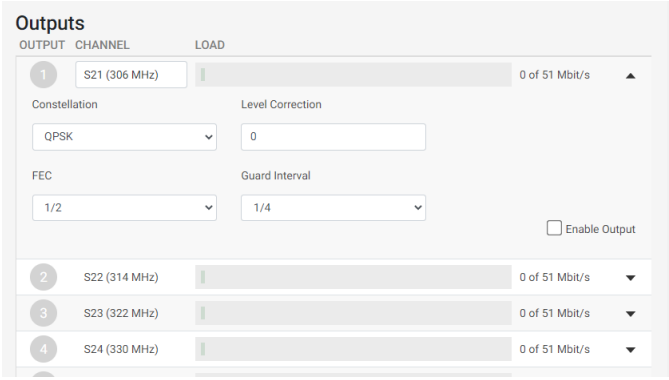
Select the transmission mode you want to use.



Level Correction:
RF output level correction can be set in the first output channel for all output channels between 0 and -16 dB.

FEC
To select which FEC rate to use, click the arrow to the right of the FEC field to open the drop-down list with the FEC rates you can choose from.

Select the FEC rate you want to use.



Guard Interval
To select which guard interval to use, click the arrow to the right of the Guard interval field to open the dropdown list with the intervals you can choose from.

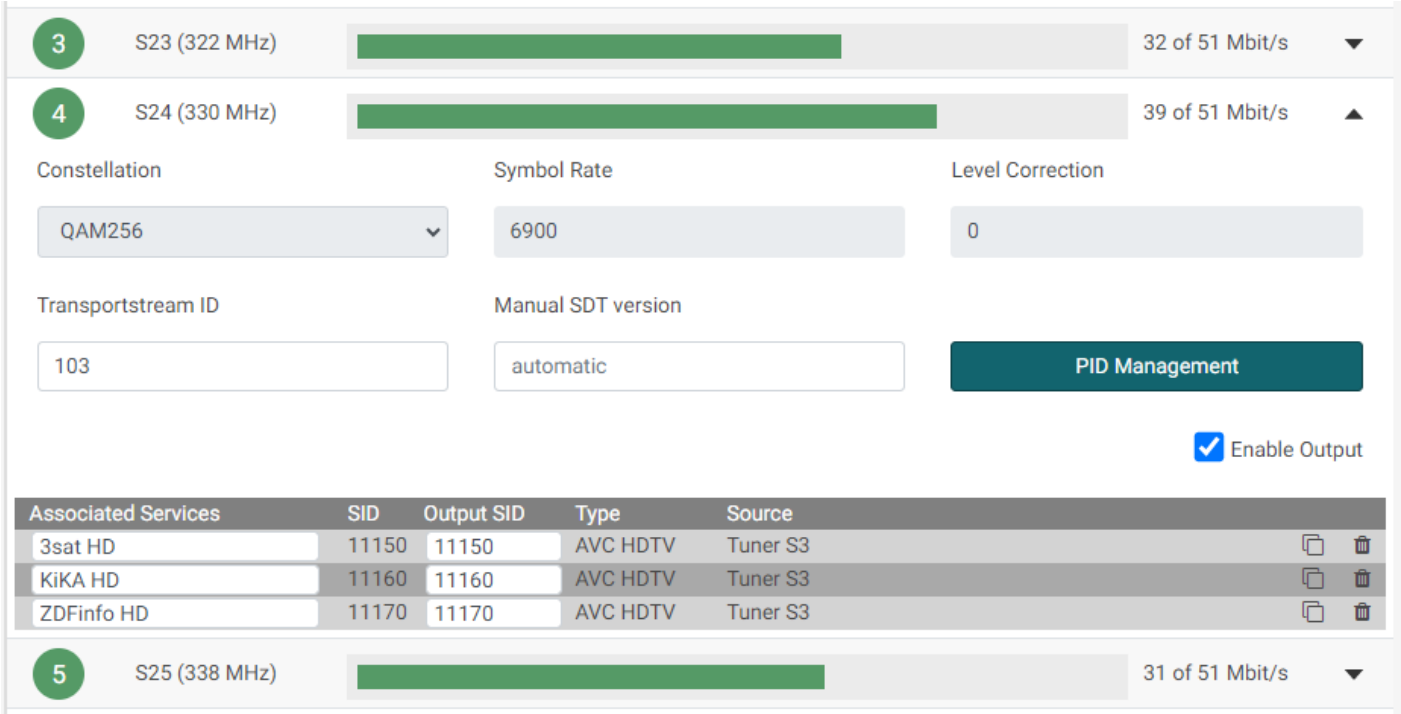
Select the guard interval you want to use.

Enable Output:
If you want to enable this channel, click the Enable Output checkbox.

LOAD monitor
The payload monitor is a real time monitor, which visually indicates the amount of data that is currently being transmitted.

5.16.5 TSID and SID Management – RF Output

Manual SDT version
The SDT version will stay fixed to the configured value if the “Manual SDT version” is set.
The SDT version will automatically be increased by one if this configuration is not set and other configuration changes affect the SDT.



Transport stream ID
In the field Transport stream ID you will find the actual used Transport stream ID.

If you would like to change this you can type a new value into the field.

Note:
If there is a conflict with another Transport stream using the same ID, the field and the ID number will have a red indication!

Output SID
In the field Output SID you will find the actual used Output SID.

If you would like to change this, you can type a new value into the field.

Note:
If there is a conflict with another Output using the same ID, the field and the ID number will have a red indication!

5.16.6 PID Management – RF Output

Pressing the PID Management button opens the PID management menu.

In PID Management window you will find the following information:

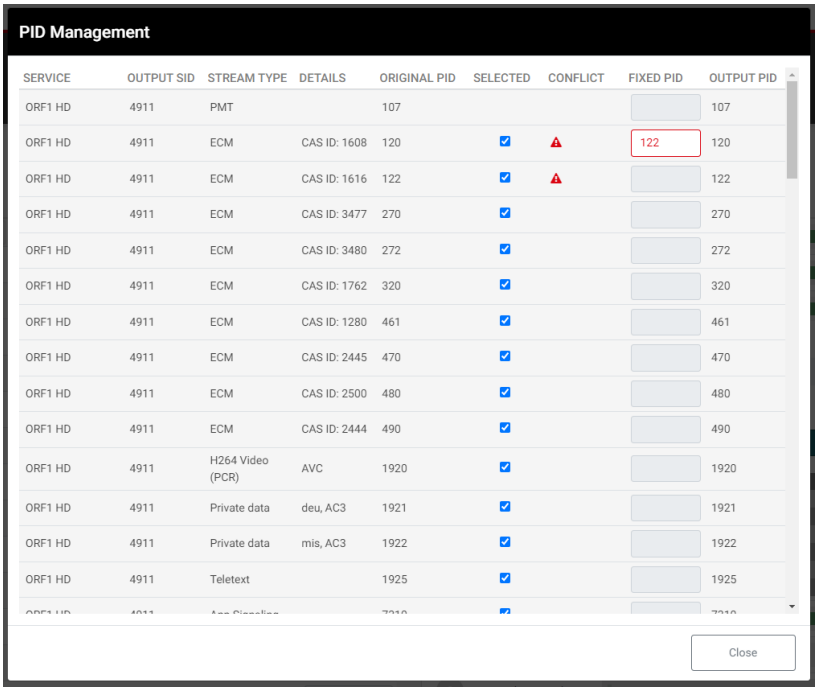
Service Name
Output SID
Stream Type
Details like CAS ID, Audio type, etc.
Original PID
Selected YES/NO
Conflicts
FIXED PID
Output PID

Filter PID's
By deselecting the filter check box you can deselect (filter) PID's.

This can be used if you would like to reduce audio or other information from the service.

Fixed PID
If you enter a PID in the "FIXED PID" field the PID will be changed to this setting.

Note:
If a PID is used twice there will be an error indication shown and the PID with the same value will be highlighted.

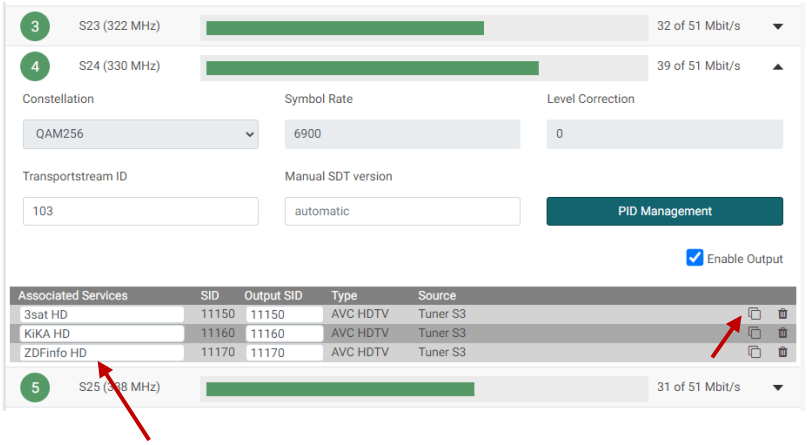


5.16.7 Multiple services – RF Output

The TDcH & TDmH support sending out services multiple times.

This functionality can be used to send out the service with different audio languages.

This has the advantage that the services are available multiple times in the service list, so the customer can choose the service with the desired audio language by simply changing the channel. They do not have to use the audio function of the television.



With this function it is also possible to make language packages in the channel plan so the services with the same languages are in one block in the channel list.

If you press the copy button the service will be added as a copy.

Note:
The common elements will only exist once in the stream, so this is not a one-to-one increase in the payload! Payload is only effected by the extra PMT and different elements like different audio languages.

5.16.8 Rename services – RF Output

The service name for any service, like a duplicated service, can be renamed. A service is renamed via the field below Associated Services.

5.16.9 Configure service type – RF Output

If the service is originating from a stream without SDT from an IP-input, then the service type will be unknown due to the missing SDT. The missing SDT will result in the service name being shown as “Unknown” in the *Type* field and it is possible to configure it. If you are in doubt then set the type to “MPEG 2 TV” for a TV service and “Radio” for a radio service.

5.17 IP Output

5.18 License

IP output licenses need to be purchased from TRIAX to enable the distribution of IP services through the TDcH & TDmH headend system.

Required license numbers:

Item No.:	418740	TDcH IP-out license
Item No.:	418751	TDmH IP-out 48 license

Licenses are activated using License handling in the Administration window.

5.19 Requirements

The TDcH & TDmH streams Multicast UPD/RTP SPTS streams out with 7 transport streams packets per IP packet.

Note:
The TDcH & TDmH headends system must be connected to a Gigabit network switch to receive and deliver IP services. The network switch must support IGMP version 2 / 3 and contain an adequate number of ports.

Cat 5e shielded or better network cables must be used.

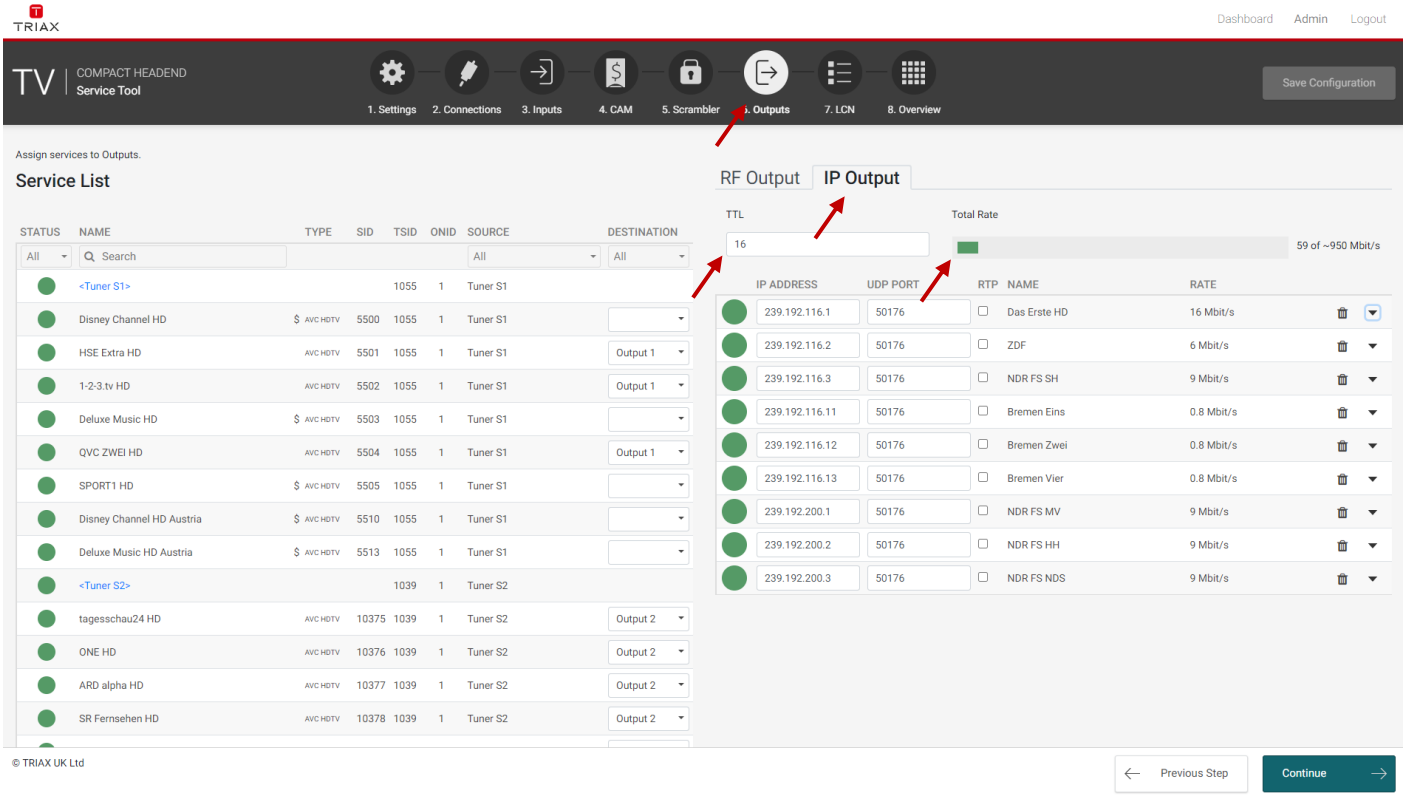
5.20 Hardware

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 separately.

Item No.:	492086	SFP RJ45
Item No.:	492087	SFP Fiber 850nm EOLS-8512-MXX (500m)
Item No.:	492088	SFP Fiber 1310nm EOLS-1324-02XX (2km)

5.21 IPTV out configuration in GUI

Enter the configuration for IPTV out in the GUI by entering the *Output* tab in the panes and the *IP Output* sub-tab.



TTL

Time to live (TTL) or hop limit is a mechanism which limits the lifespan or lifetime of data in a computer or network. TTL may be implemented as a counter or timestamp attached to or embedded in the data. Once the prescribed event count or timespan has elapsed, data is discarded or revalidated. In computer networking, TTL prevents a data packet from circulating indefinitely. In computing applications, TTL is commonly used to improve the performance and manage the caching of data. Standard value is 16.

TOTAL RATE (LOAD monitor)

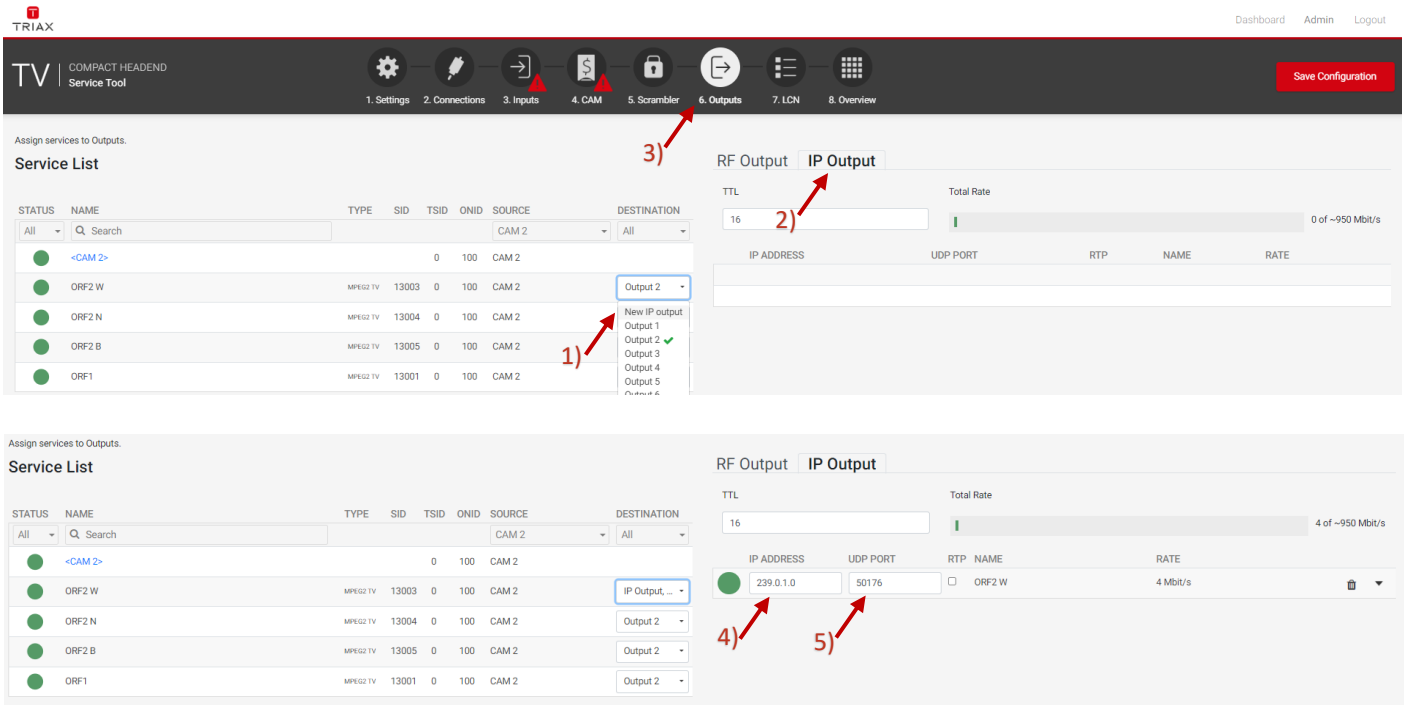
The payload monitor is a real time monitor, which visually indicates the amount of data that is currently being transmitted. The figure shows the total bandwidth of all IP-out services!

Assign service to streaming at IPTV output:

Services can be assigned to an IPTV output.

Receive an IP stream by following the few steps below:

1) Select the *Outputs* tab in the panes.
2) Select the *IP Output* sub-tab.
3) Press the New IP output button for streaming a new IPTV out.
4) Specify the desired IP address and associated UDP port number.
5) System will automatically update the rate [Mbit/s] for the stream plus the total rate.



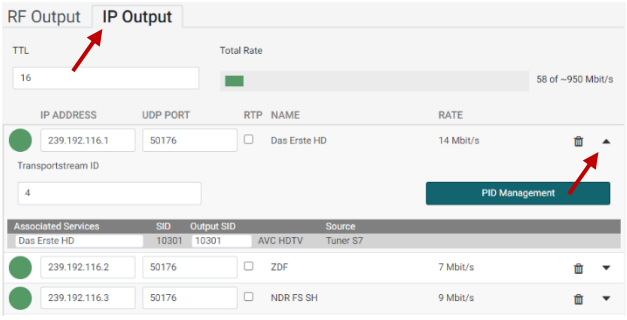
Note:
Start the IP-out configuration by assigning the first services which should be sent out as IPTV service. Administrate the IP address. All following IPTV services will follow the IP address range by increasing the last number by 1.

IP ADDRESS
Specifies the IP Address of an IPTV service. Enter a multicast IP address between 224.0.0.0 and 239.255.255.255 in the IP address field.

UDP PORT
Enter the desired IP port number in the Port field within the range ‘1025 to ‘65535’.

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

Open the detailed output configuration menu with the extend button.



5.21.1 TSID and SID Management – IP Output

Transport stream ID

In the field Transport stream ID you will find the actual used Transport stream ID.
If you would like to change this you can type a new value into the field.

Note:
If there is a conflict with another Transport stream using the same ID, the field and the ID number will have a red indication!

Output SID

In the field Output SID you will find the actual used Output SID.
If you would like to change this, you can type a new value into the filed.

Note:
If there is a conflict with another Output using the same ID, the field and the ID number will have a red indication!

5.21.2 Rename Service – IP Output

Rename Service

The service name for any service can be renamed. A service is renamed via the field below “Associated Services”.

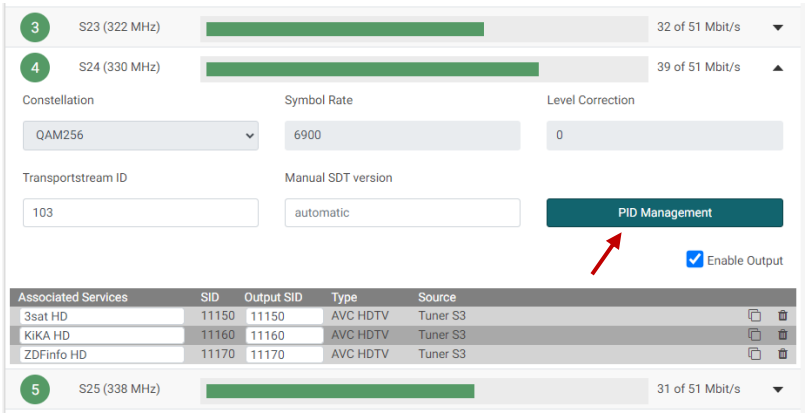
5.21.3 Configure service type – IP Output

If the service has originated from a stream without SDT from an IP-input, then the service type will be unknown due to the missing SDT. The missing SDT will result in the service name being shown as “Unknown” in the *Type* field and it is possible to configure it. If in doubt then set the type to “MPEG 2 TV” for a TV service and “Radio” for a radio service.

5.21.4 PID Management – IP Output

Pressing the PID Management button opens the PID management menu.
In the PID Management window you will find the following information:

- Service Name
- Output SID
- Stream Type
- Details like CAS ID, Audio type, etc.
- Original PID
- Selected YES/NO
- Conflicts
- FIXED PID
- Output PID



Filter PID's
By deselecting the filter check box you can deselect (filter) PID's.
This can be used if you would like to reduce audio or other information from the service.

Fixed PID
If you enter a PID in the "FIXED PID" field the PID will be changed to this setting.

Note:
If a PID is used twice there will be an error indication shown and the PID with the same value will be highlighted.

5.21.5 Multiple services – IP Output

The TDcH & TDmH support sending out IPTV services multiple times.

This functionality can be used to send out the service with different audio languages.

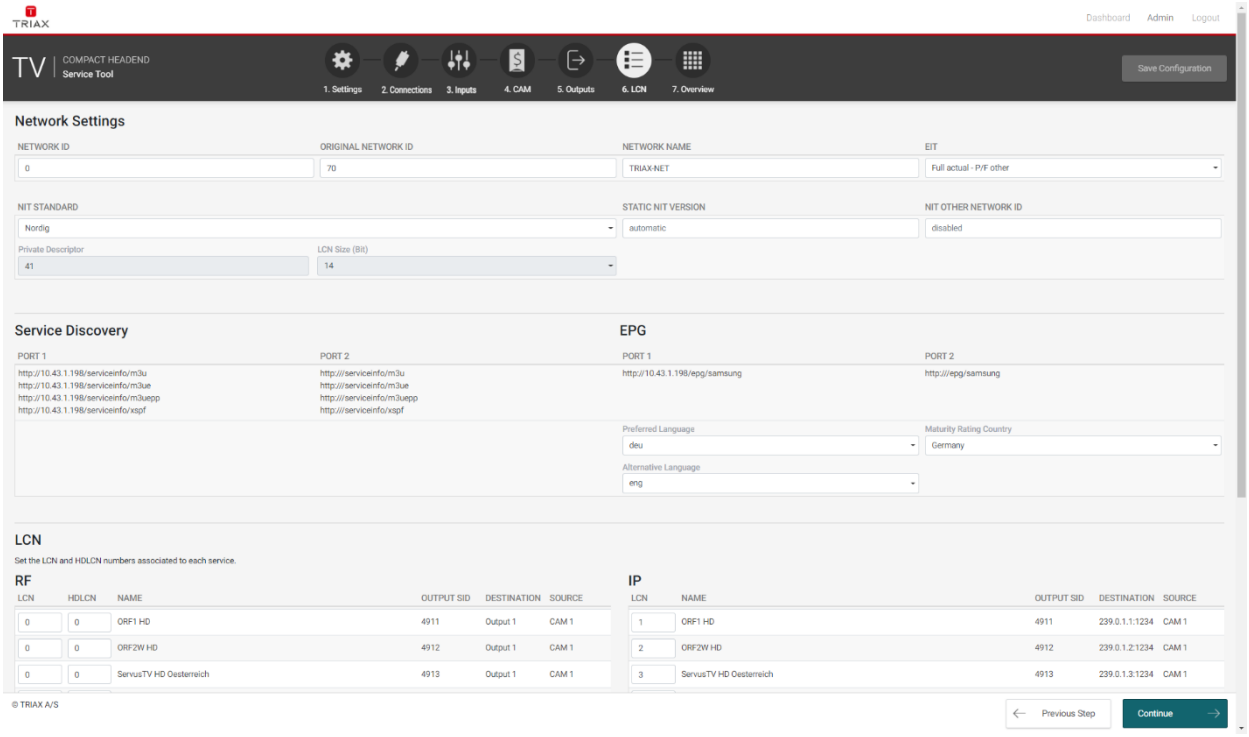
This has the advantage that the services are available multiple times in the service list, so the customer can choose the service with the desired audio language by simply changing the channel. They do not have to use the audio function of the television.

With this function it is also possible to make language packages in the channel plan so the services with the same languages are in one block in the channel list.

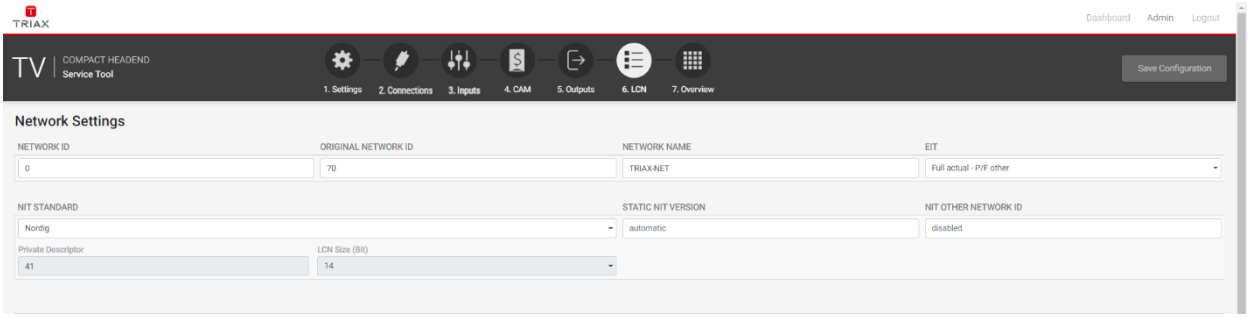
To have a service multiple time as IPTV out select the services and generate a new IP address.

5.22 LCN page

At the LCN page it is possible to set the Network Settings parameters and administer the LCN (Local Channel Number) numbers.



5.22.1 Network Settings



Network ID

Enter the required network ID in the Network ID field. If it is an open network, the network ID must follow the “ETSI TR 101 211” guidelines. If it a closed network you can determine the ID yourself.

ORIGINAL NETWORK ID

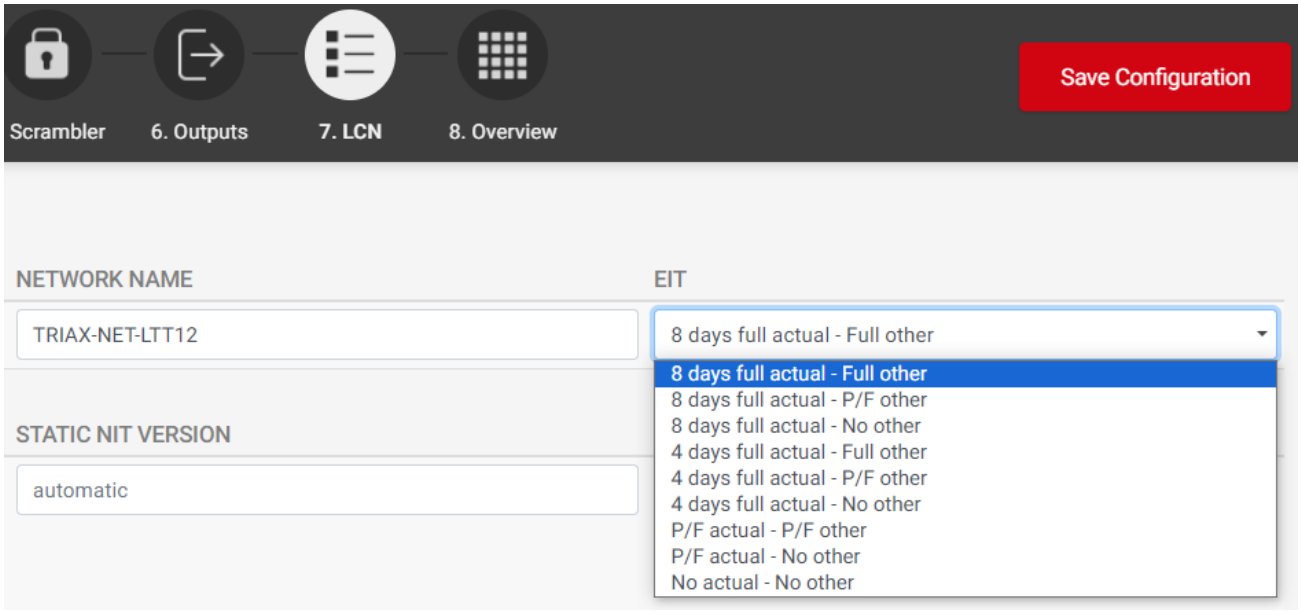
Enter the required original network ID in the Original Network ID field.

NETWORK NAME

Enter a network name in the Network name field. The maximum number of characters you can enter in the field is 255.

EIT (EPG Management)

The Event Information Table (EIT) dropdown list enables you to change the EIT settings for both DVB-T and DVB-C.



***Note*:**

Please note that the TDcH & TDmH EPG management function supports 4 or 8 days EPG information per service independent of whether the EPG is set to “Full” or “P/F”. That the EPG is available at the input source is of course a general requirement.

The following settings can be set up:

- **Full Actual - Full Other (4 or 8 days)**
  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 (4 or 8 days)**
  All outputs will have actual present/following and actual schedule EIT information, but only other present/following EIT information.
- **Full Actual - No Other (4 or 8 days)**
  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.

NIT STANDARD
Select which standard you want to use, DVB or NorDig. By default, DVB is selected.

STATIC NIT VERSION (“Freeze” NIT)

If programs in a transponder change, then the NIT is recreated. In most countries, the end user does not notice, because the receivers automatically read in the new NIT. However, in some countries (ex. France) end users are asked to start a channel search.

If it comes to the case that one or more stations have weak reception, then the NIT changes frequently and the end users are always unnecessarily prompted to start a channel search. In this case, the NIT version can be "frozen" (recommended for use in France).

Under “Static NIT version” enter a version between 1 and 31.

***Note*:**
If the service list really changes, the channel search must be done manually.

NIT OTHER NETWORK ID
Enter the required NIT other network ID in the Network ID field.
In some countries TV’s requires a Network ID in the “NIT OTHER NETWORKD ID” field to support a network search when connected to the local CATV provider. If the headend is used for such TV’s it is also required to send the required NIT OTHER NETWORK ID in the EIT table.

5.22.2 Service Discovery

The TDcH & TDmH support different formats for external devices and end user devices to automatically get the actual service list.
It is possible to get the list of IP Out services in the following formats:

XSPF
M3U
Extended M3U
Extended++ M3U

The service lists are available at Ethernet Port 1 and 2. How to get access to the data is noted in the user interface. To validate the service list, right click at the URL and select “Go to …” and the list will pop up at another window in your browser.

XSPF

Sample:

```
<?xml version="1.0" encoding="UTF-8"?>
<playlist version="1" xmlns="http://xspf.org/ns/0/">
<trackList>
<track><title>DR1</title><location>udp://@239.194.0.1:50172</location>
<extension application="http://www.triax.com"><poolserviceid>4</poolserviceid></extension></track>
<track><title>Syd</title><location>udp://@239.194.0.2:50172</location>
<extension application="http://www.triax.com"><poolserviceid>6</poolserviceid></extension></track>
</trackList>
</playlist>
```

M3U

This service list contains

IP addresses and port numbers

Sample:

```
udp://239.194.0.1:50172
udp://239.194.0.2:50172
```

Extended M3U

This service list is compliant to SAT>IP Protocol Specification (ver. 1.2.2) and is defined as “extended M3U channel list” In the standard under appendix A2.1

This service list contains

- IP address and port number
- Service name
- LCN

Sample:

```
#EXTM3U
#EXTINF:0,1. DR1
udp://239.194.0.1:50172
#EXTINF:0,3. Syd
udp://239.194.0.2:50172
```

Extended++ M3U

This service list is based on the Extended M3U with further extensions.
This service list can be used for TV sets. Panasonic is one TV set vendor that supports this service list as service discovery.

This service list contains

- IP address and port number
- Service name, transport stream ID, original network ID
- LCN
- Service type (1=TV, 2=Radio)

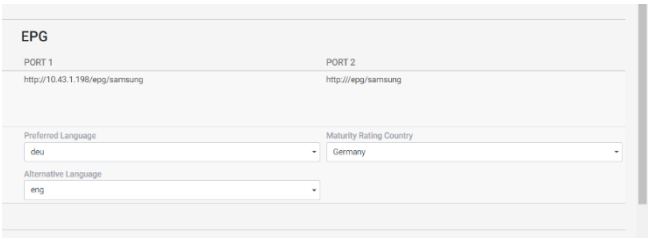
Sample:

```
#EXTM3U
#EXTINF:0,1. DR1
udp://239.194.0.1:50172?stype=1&onid=43962&tsid=0&svcid=4
#EXTINF:0,3. Syd
udp://239.194.0.2:50172?stype=1&onid=43962&tsid=0&svcid=6
```

5.22.3 EPG

EPG for IPTV output can be pulled from the TDcH & TDmH.

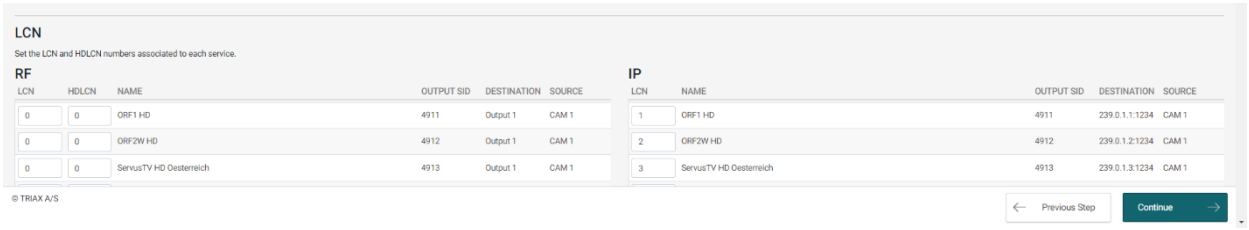
The TDcH & TDmH have an integrated EPG server to support external devices with EPG data. This could be a middleware server or a TV management server or end user devices directly.



The service lists are available at Ethernet Port 1 and 2. How to get access to the data is noted in the user interface.

5.22.4 LCN

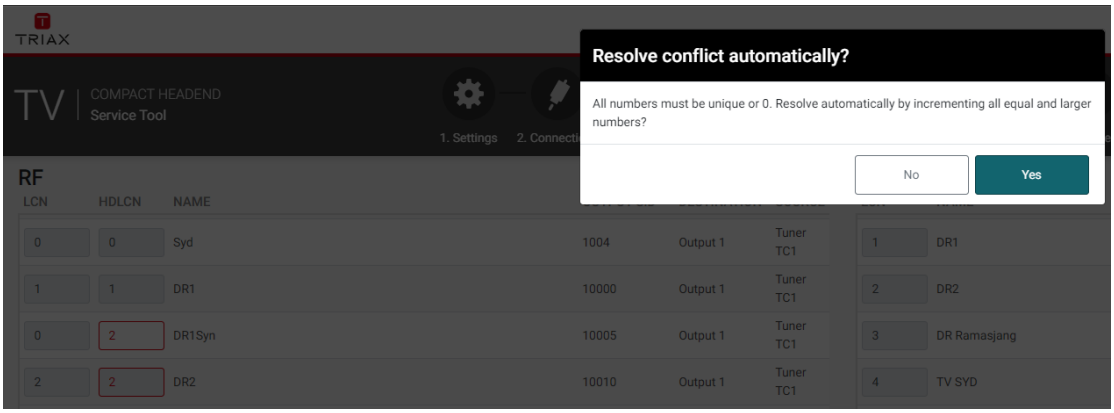
Assign LCN numbers to desired services. LCN and HD-LCN numbers in the range 0 - 1023 can be set.



The LCN numbers can be administered for the RF outputs (QAM and COFDM) on the left side and at the right side for the IPTV services (IP Output).

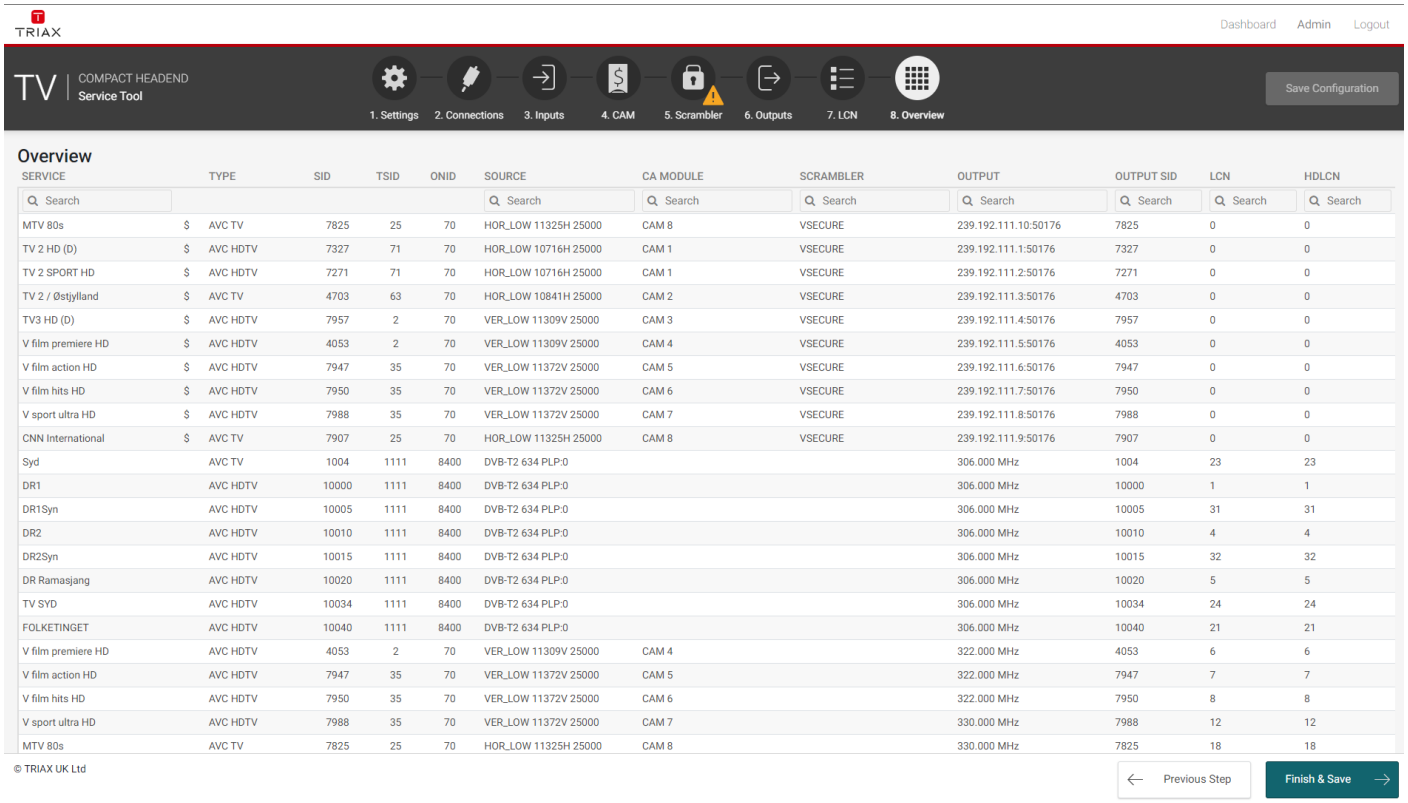
When Continue is pressed, the next menu pane is shown.

LCN auto arrange
When inserting an already existing number, the number automatically increases for that number and all higher values.



5.23 Overview

The overview page is a fast and easy overview with a “sort” and “search” function. By pressing the underlined links there is also the option to navigate direct to specific information and settings if needed. Please see mouse over description below.



SERVICE		TYPE	SID	TSID	ONID	SOURCE	CA MODULE	SCRAMBLER	OUTPUT	OUTPUT SID	LCN	HDLCN
MTV 80s	$	AVC TV	7825	25	70	HOR_LOW 11325H 25000	CAM 8	VSECURE	239.192.111.10:50176	7825	0	0
TV 2 HD (D)	$	AVC HDTV	7327	71	70	HOR_LOW 10716H 25000	CAM 1	VSECURE	239.192.111.1:50176	7327	0	0
TV 2 SPORT HD	$	AVC HDTV	7271	71	70	HOR_LOW 10716H 25000	CAM 1	VSECURE	239.192.111.2:50176	7271	0	0
TV 2 / Østjylland	$	AVC TV	4703	63	70	HOR_LOW 10841H 25000	CAM 2	VSECURE	239.192.111.3:50176	4703	0	0
TV3 HD (D)	$	AVC HDTV	7957	2	70	VER_LOW 11309V 25000	CAM 3	VSECURE	239.192.111.4:50176	7957	0	0
V film premiere HD	$	AVC HDTV	4053	2	70	VER_LOW 11309V 25000	CAM 4	VSECURE	239.192.111.5:50176	4053	0	0
V film action HD	$	AVC HDTV	7947	35	70	VER_LOW 11372V 25000	CAM 5	VSECURE	239.192.111.6:50176	7947	0	0
V film hits HD	$	AVC HDTV	7950	35	70	VER_LOW 11372V 25000	CAM 6	VSECURE	239.192.111.7:50176	7950	0	0
V sport ultra HD	$	AVC HDTV	7988	35	70	VER_LOW 11372V 25000	CAM 7	VSECURE	239.192.111.8:50176	7988	0	0
CNN International	$	AVC TV	7907	25	70	HOR_LOW 11325H 25000	CAM 8	VSECURE	239.192.111.9:50176	7907	0	0
Syd		AVC TV	1004	1111	8400	DVB-T2 634 PLP:0			306.000 MHz	1004	23	23
DR1		AVC HDTV	10000	1111	8400	DVB-T2 634 PLP:0			306.000 MHz	10000	1	1
DR1Syn		AVC HDTV	10005	1111	8400	DVB-T2 634 PLP:0			306.000 MHz	10005	31	31
DR2		AVC HDTV	10010	1111	8400	DVB-T2 634 PLP:0			306.000 MHz	10010	4	4
DR2Syn		AVC HDTV	10015	1111	8400	DVB-T2 634 PLP:0			306.000 MHz	10015	32	32
DR Ramasjang		AVC HDTV	10020	1111	8400	DVB-T2 634 PLP:0			306.000 MHz	10020	5	5
TV SYD		AVC HDTV	10034	1111	8400	DVB-T2 634 PLP:0			306.000 MHz	10034	24	24
FOLKETINGET		AVC HDTV	10040	1111	8400	DVB-T2 634 PLP:0			306.000 MHz	10040	21	21
V film premiere HD		AVC HDTV	4053	2	70	VER_LOW 11309V 25000	CAM 4		322.000 MHz	4053	6	6
V film action HD		AVC HDTV	7947	35	70	VER_LOW 11372V 25000	CAM 5		322.000 MHz	7947	7	7
V film hits HD		AVC HDTV	7950	35	70	VER_LOW 11372V 25000	CAM 6		322.000 MHz	7950	8	8
V sport ultra HD		AVC HDTV	7988	35	70	VER_LOW 11372V 25000	CAM 7		330.000 MHz	7988	12	12
MTV 80s		AVC TV	7825	25	70	HOR_LOW 11325H 25000	CAM 8		330.000 MHz	7825	18	18

Service Name of the TV or Radio Service

Type Type of the Service (HD, SD, TV, Radio, …)

SID Service identifier of the service used at the output

TSID Transport stream identifier used at the output

ONID Original network identifier of the service

SOURCE Location from where the service is received

CA MODULE The CA module used to descramble the service

SCRAMBLER The Scrambler used to scramble the service

OUTPUT Output channel information of a Service

OUTPUT SID SID at the output

LCN Local Channel number of the Services

LCN HD Local Channel number of the HD Services

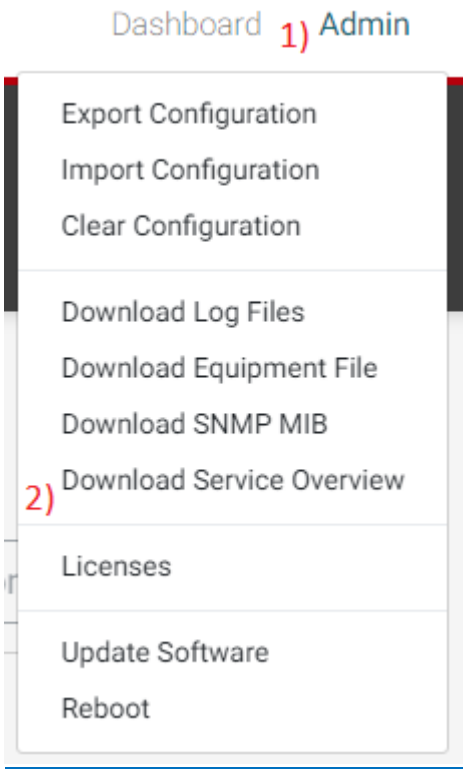
Alphabetic order
With a click on the Column description, for example “SERVICE”, the corresponding column will be sorted in alphabetical order. With a second click the alphabetical order is reversed.

Search
In the Search fields it is possible to search for specific text. Start typing and the list will show only names with the characters included in the same row as in the search field.

Mouseover
Mouseover entries can be clicked to switch to the main table of this entry.

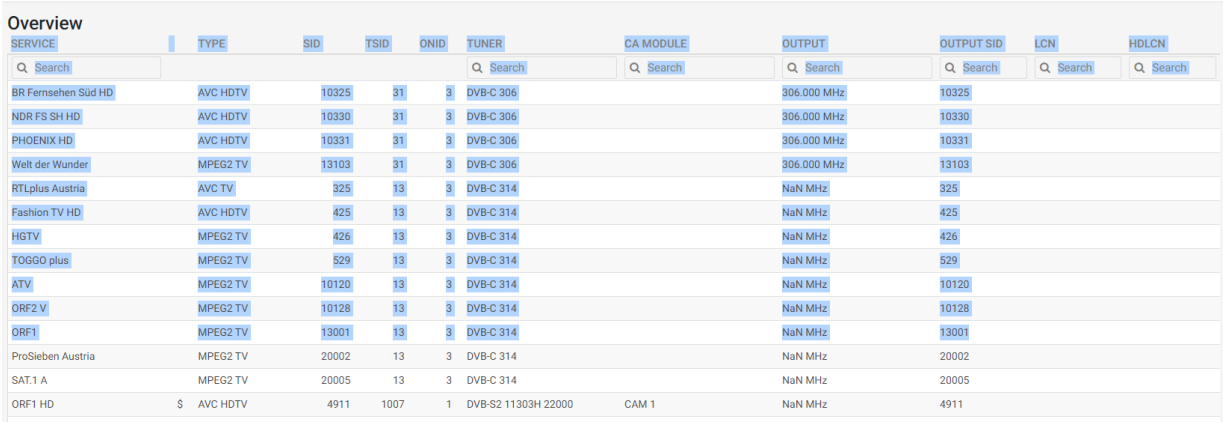
5.23.1 Export to Excel

The service list for all services from the system outputs, can be accessed directly via an URL without login. The URL is x.x.x.x/serviceinfo/overview. This will result in a semicolon “;” separated list. If the list shall be separated by comma “,” then use the URL x.x.x.x/serviceinfo/overview?delim=comma. If the overview shall be download directly to a file, use the URL x.x.x.x/serviceinfo/overviewfile.
This file can also be downloaded in the GUI via *Admin/Download Service Overview*. See below.



As an alternative it is easy to copy the information from the Overview page as shown below.

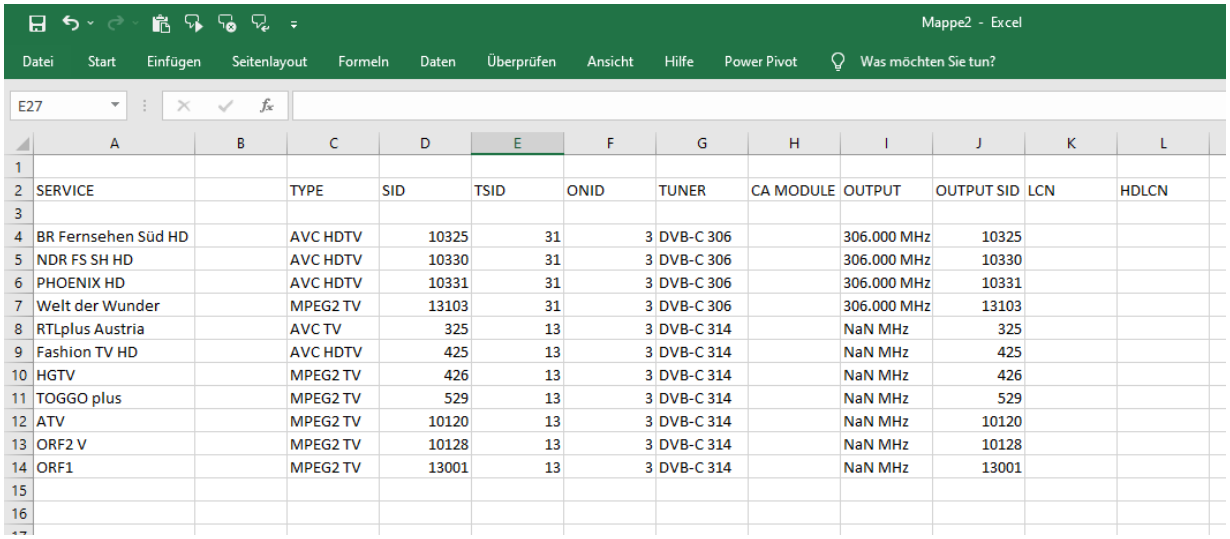
Step 1. Mark the information in the overview and copy the information with Ctrl+C



Overview

SERVICE	TYPE	SID	TSID	ONID	TUNER	CA MODULE	OUTPUT	OUTPUT SID	LCN	HDLCN
Search					Search	Search	Search	Search	Search	Search
BR Fernsehen Süd HD	AVC HDTV	10325	31	3	DVB-C 306		306.000 MHz	10325		
NDR FS SH HD	AVC HDTV	10330	31	3	DVB-C 306		306.000 MHz	10330		
PHOENIX HD	AVC HDTV	10331	31	3	DVB-C 306		306.000 MHz	10331		
Welt der Wunder	MPEG2 TV	13103	31	3	DVB-C 306		306.000 MHz	13103		
RTLplus Austria	AVC TV	325	13	3	DVB-C 314		NaN MHz	325		
Fashion TV HD	AVC HDTV	425	13	3	DVB-C 314		NaN MHz	425		
HGTV	MPEG2 TV	426	13	3	DVB-C 314		NaN MHz	426		
TOGGO plus	MPEG2 TV	529	13	3	DVB-C 314		NaN MHz	529		
ATV	MPEG2 TV	10120	13	3	DVB-C 314		NaN MHz	10120		
ORF2 V	MPEG2 TV	10128	13	3	DVB-C 314		NaN MHz	10128		
ORF1	MPEG2 TV	13001	13	3	DVB-C 314		NaN MHz	13001		
ProSieben Austria	MPEG2 TV	20002	13	3	DVB-C 314		NaN MHz	20002		
SAT.1 A	MPEG2 TV	20005	13	3	DVB-C 314		NaN MHz	20005		
ORF1 HD $	AVC HDTV	4911	1007	1	DVB-S2 11303H 22000	CAM 1	NaN MHz	4911		

Step 2. Open a new Excel Sheet and paste the information with Ctrl+V



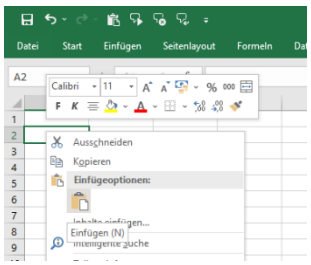
Mappe2 - Excel

Datei Start Einfügen Seitenlayout Formeln Daten Überprüfen Ansicht Hilfe Power Pivot Was möchten Sie tun?

E27

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2	SERVICE		TYPE	SID	TSID	ONID	TUNER	CA MODULE	OUTPUT	OUTPUT SID	LCN	HDLCN
3												
4	BR Fernsehen Süd HD		AVC HDTV	10325	31	3	DVB-C 306		306.000 MHz	10325		
5	NDR FS SH HD		AVC HDTV	10330	31	3	DVB-C 306		306.000 MHz	10330		
6	PHOENIX HD		AVC HDTV	10331	31	3	DVB-C 306		306.000 MHz	10331		
7	Welt der Wunder		MPEG2 TV	13103	31	3	DVB-C 306		306.000 MHz	13103		
8	RTLplus Austria		AVC TV	325	13	3	DVB-C 314		NaN MHz	325		
9	Fashion TV HD		AVC HDTV	425	13	3	DVB-C 314		NaN MHz	425		
10	HGTV		MPEG2 TV	426	13	3	DVB-C 314		NaN MHz	426		
11	TOGGO plus		MPEG2 TV	529	13	3	DVB-C 314		NaN MHz	529		
12	ATV		MPEG2 TV	10120	13	3	DVB-C 314		NaN MHz	10120		
13	ORF2 V		MPEG2 TV	10128	13	3	DVB-C 314		NaN MHz	10128		
14	ORF1		MPEG2 TV	13001	13	3	DVB-C 314		NaN MHz	13001		
15												
16												

Note:
To paste the information into Excel please use the function only Text so that no format is taken over.



5.24 Direct access via URL

Following functions can be accessed directly via an URL:

URL	Function	Description
x.x.x.x/epg/samsung	EPG in Samsung XML format	Offers EPG for all IPTV out services in Samsung XML format
x.x.x.x/serviceinfo/m3u	List of IPTV out services in m3u format.	See section “Service Discovery”
x.x.x.x/serviceinfo/m3ue	List of IPTV out services in m3u extended format.	See section “Service Discovery”
x.x.x.x/serviceinfo/m3uepp	List of IPTV out services in m3u extended++ format.	See section “Service Discovery”
x.x.x.x/serviceinfo/overview	List all services output at the system in CVS format with semicolon as separator.	See section “Export to Excel”
x.x.x.x/serviceinfo/overview?delim=comma	List all services output at the system in CVS format with comma as separator.	See section “Export to Excel”
x.x.x.x/serviceinfo/overviewfile	List all services output at the system as a CVS file with semicolon as separator.	See section “Export to Excel”
x.x.x.x/serviceinfo/overviewfile?delim=comma	List all services output at the system as a CVS file with comma as separator.	See section “Export to Excel”

5.25 Direct file download via URL

Following files can be downloaded directly to browser “Default Download” via an URL:

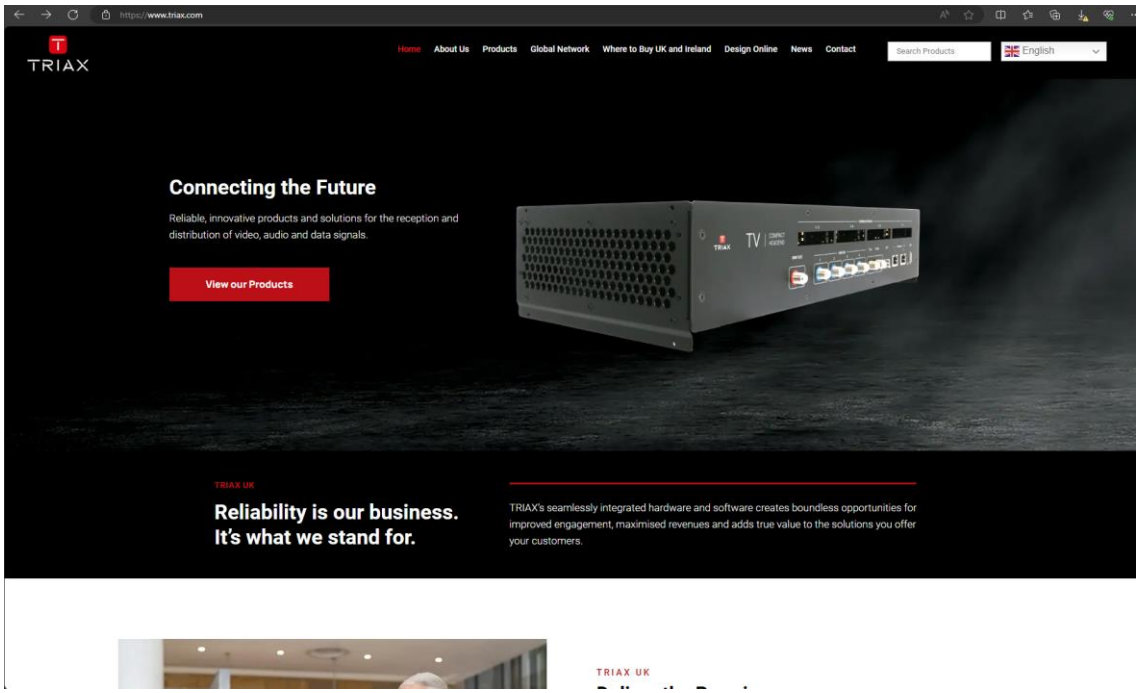
URL	File	Description
x.x.x.x/logfile	tdch_logfile.zip	Zipped log files
x.x.x.x/mib	TRIAX-TDCH_MIB.txt	MIB file as txt file. Some SNMP managers support importing in other file formats like *.mib. If your SNMP manager doesn’t support the txt file, then rename it to e.g. *.mib.

6 Support

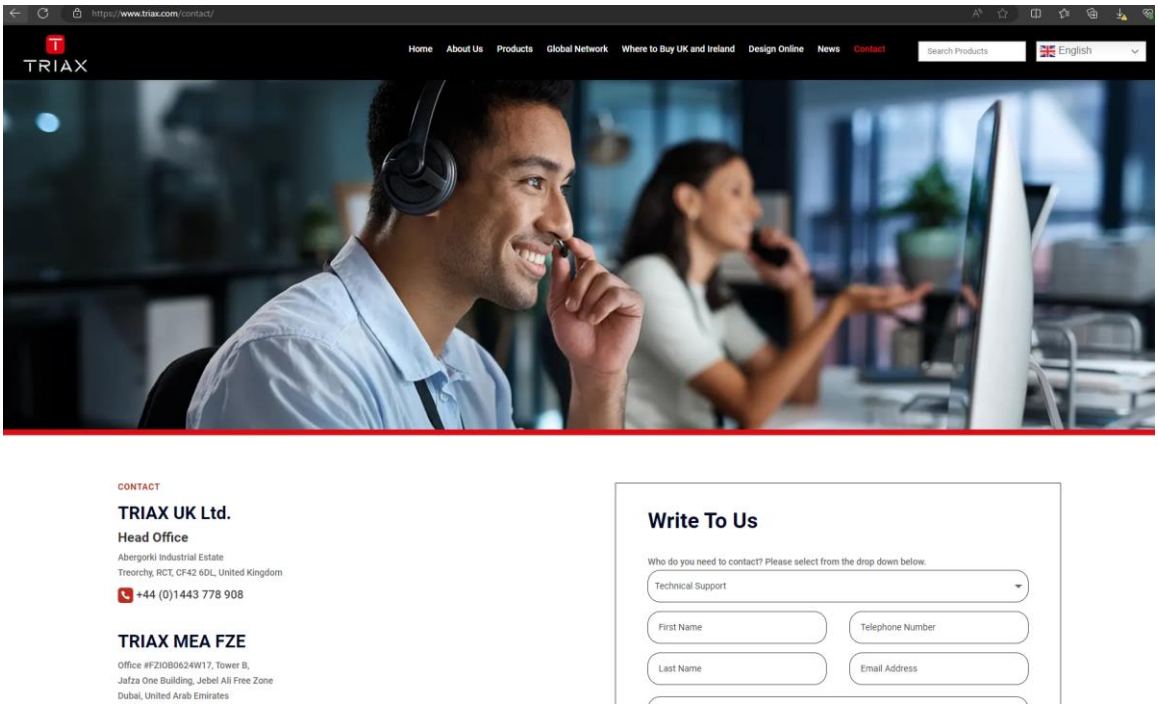
Contact your local sales representative for support information in your language, or alternatively

Go to www.triax.com.

for English support.



Below the *Contact* menu you will find additional help and support information.



7 Terms and Abbreviations

Term	Explanation
TBA	To Be Added
TBD	To Be Determined
PID	Packet Identification; According to standard ISO 13818-1
SID	Service Identification; According to standard ISO 13818-1
TSID	Transport Stream Identification
NIT	Network Identification Table; According to standard ETSI EN 300 468
NID	Network Identification used in NIT; According to standard ETSI EN 300 468
ONID	Original Network Identification used in NIT; According to standard ETSI EN 300 468
STB	Set Top Box; DVB/IP receiver that is connected to a TV set
Receiver	A device that receives a signal from a headend. An example could be a TV-set or a STB.
end-user	A person that uses a TV or receiver.
Installer	A person that installs, deploys, and maintains the headend system
i/f	Interface
TS	Transport Stream; According to standard ISO 13818-1
ES	Elementary Stream; According to standard ISO 13818-1
Service	According to ETSI EN 300 468