TRIAX

TDX Headend

Quite simply a revolution

Your ultimate connection

Technology

That turns everything on its head

Forget everything you know about headends. With TRIAX TDX you move into a completely new world. TRIAX's revolutionary IP Pool technology simplifies the setting up and handling of headends. This technology makes the input and output modules mutually independent. All input signals, regardless of whether they are received via satellite, terrestrial, cable, audio/video or via the Internet, can be flexibly and independently distributed from a "pool" to each and every output module. Each of these input signals can be converted to any output signal: PAL, QAM, COFDM or IP, and because the input signals are not fixed to any particular outputs, an input signal can be assigned to several output modules.

It's that simple.

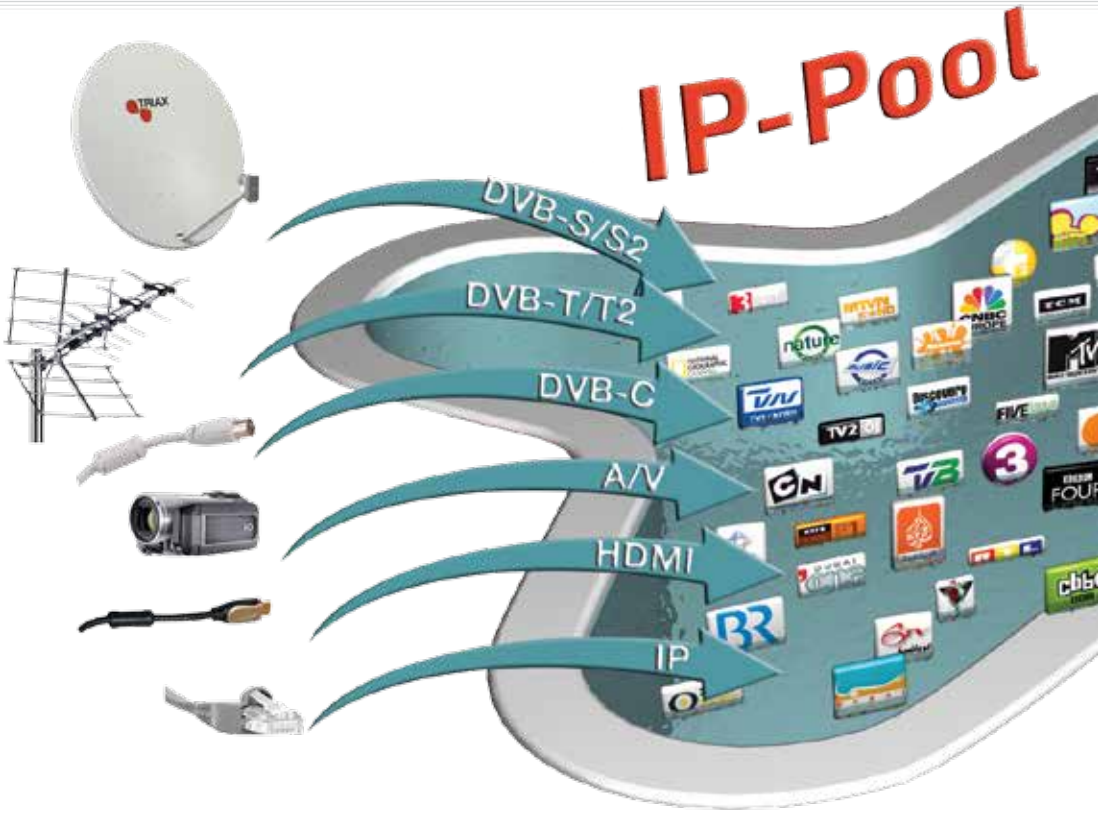
TDX receives the technology that turns everything on its head

Content

TDX headend - quite simply a revolution

TDX IP Pool

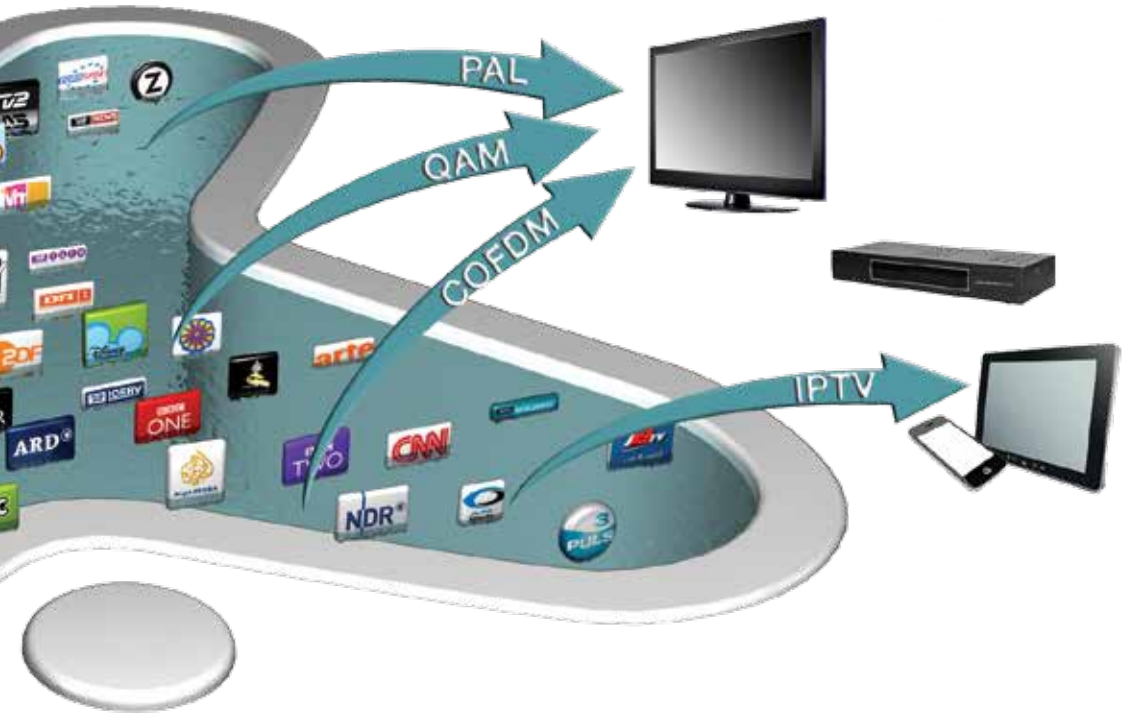
Revolutionary technology



TDX

The IP-based headend solution made for the future.

Invest in technology that meets the requirements of tomorrow, and still makes it possible to take any type of input signals received from satellite, terrestrial, cable, AV, HDMI or via the Internet, and convert them to any type of output signal - so put your money in a system that merges the highest level of efficiency with reliability, and benefit from the advantages provided by one of Europe's largest manufacturers of headends. With TRIAX you can always rely on fast customised assistance and consultancy for tendering, planning, installation, configuration and maintenance.



TRIAX TDX IP-Pool technology:

Immerse yourself in tomorrow's technology

In close collaboration with planners, installers and operators, TRIAX has developed a new headend technology that is orientated towards the needs of users. The new TRIAX TDX IP-Pool technology allows the customers to assign the input and output signals freely. The classical module assignment of input demodulator and output modulator is no longer given. All incoming signals initially enter the IP-Pool. As a result, this technology allows an unlimited possibility to multiplex the services for each output modulation and to use simultaneously one service for different modulation types. All assignments between input to output signals can be readily changed at any time. This makes TDX uniquely flexible, efficient and economical.

TDX

Reasons to buy

Energy friendly - long-term reliability

- 16 tuners full loaded 250 W power consumption
- Intelligent cooling system with integrated fans - increases the life of the equipment - and allows installation in 19“ cabinets

Easier service handling

- HOT SWAP service
- Fewer modules - allows easy spare part handling
- Log file on all TDX activity
- Remote access to the TDX for the installer and/or the Triax support

Easy setup and configuration

- HTML based user interface means no special software for managing the system
- Mux bandwidth monitor to ensure that the mux is not over-loaded
- The respective four adjacent output channels can be freely selected across the full frequency range
- LED to indicate operation and errors on each module
- Intuitive and easy configuration where you are led through the configuration step by step

Better and stronger performance

- Up to three headends can be combined in a multi unit system
- Up to 72 PAL, QAM or COFDM channels

A true IP headend

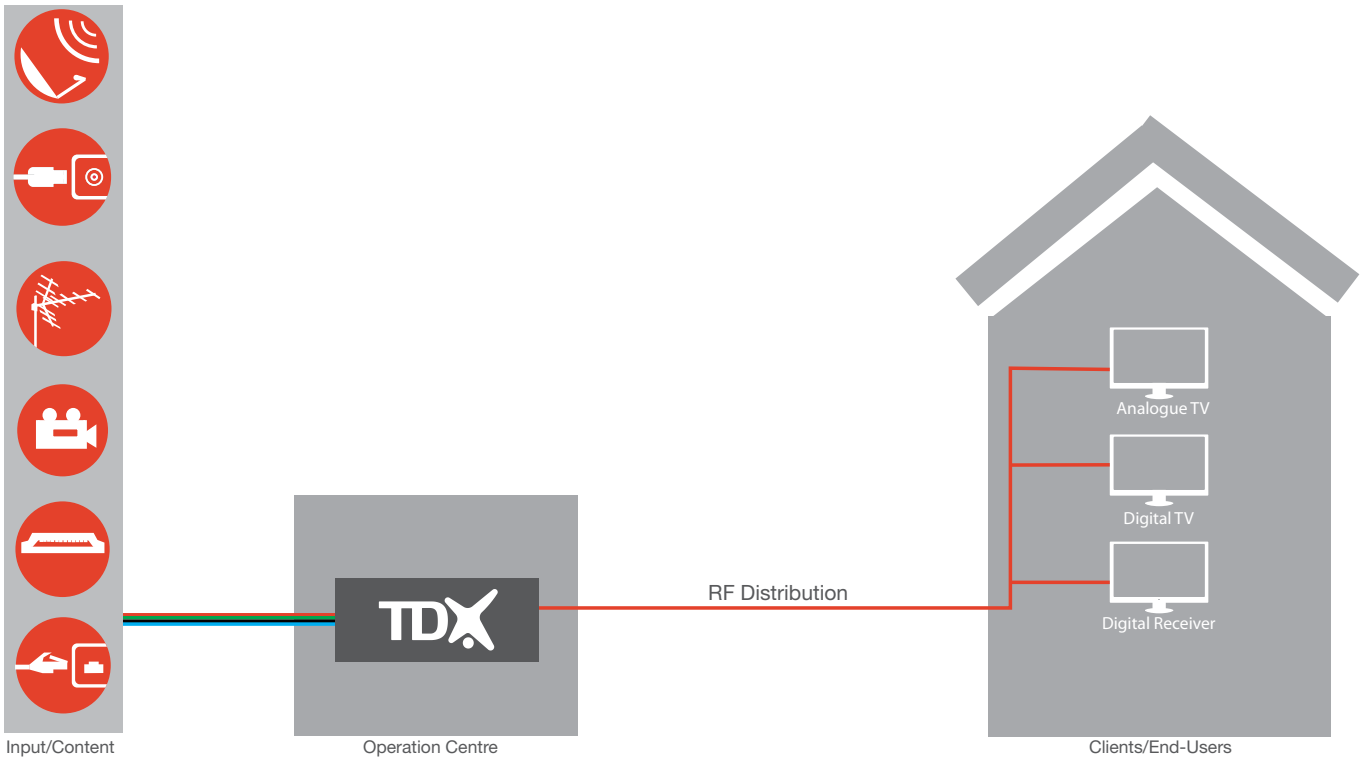
- Muxing technology
- IP in to any output
- IP out from any input
- Future proof with full compatibility with CAS systems, middleware, PMS, VOD services, EPG server, etc...

Easy installation

- Input modules are independent of output modules which gives fewer modules in total
- Faster installation
- DiSEqC 1.1 functionality
- The housing is designed to accommodate up to 16 input and 6 the output modules provides the possibility to support 12 CAM modules
- Can easily be installed on a wall or a 19“ cabinet
- All inputs and outputs as well as all modules and cables can be accessed and operated easily from the front
- The 22 modules are numbered so their respective allocations are always immediately clear
- Cabinet lock system
- Cable management on top, left and right

Solutions

One product many applications

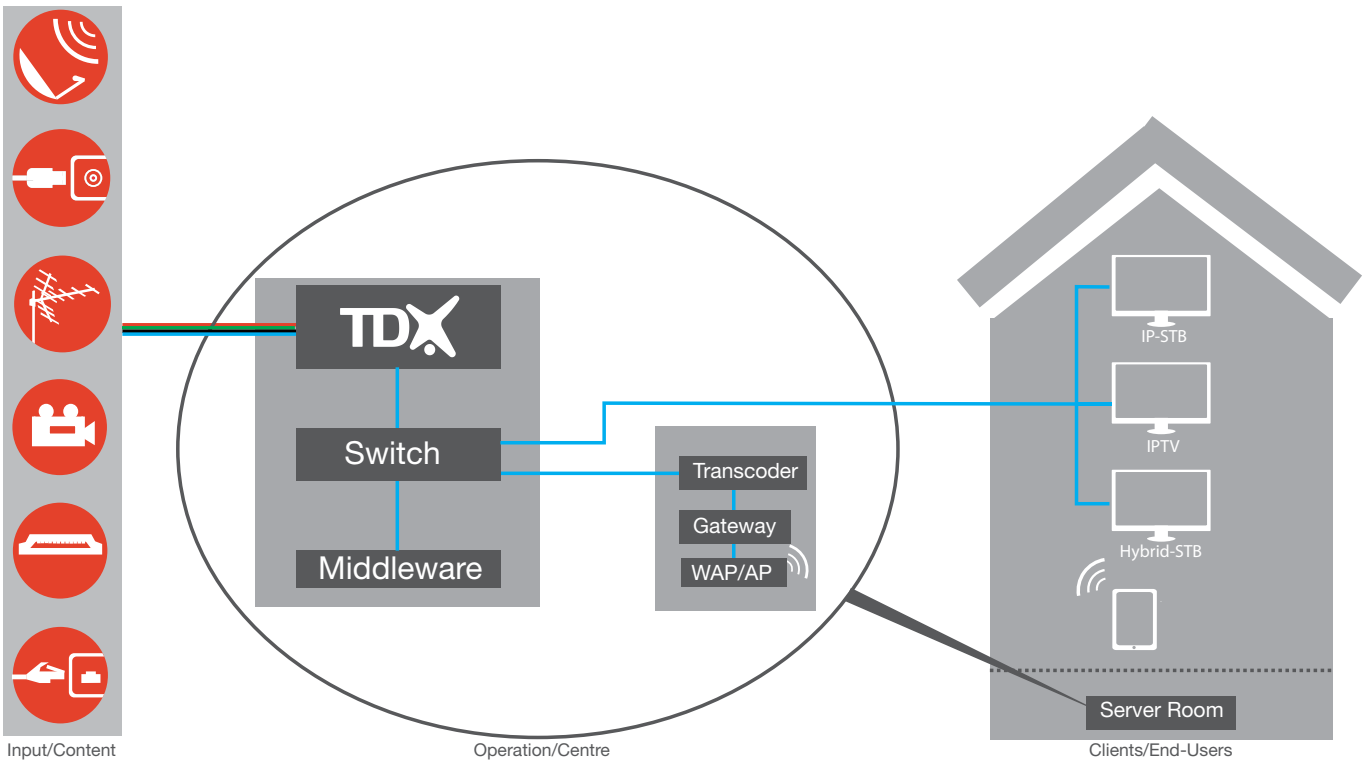


Analogue / digital Mirror

The TDX IP pool technology enables output the existing services in the pool at different output modulations. As a result, the hardware can be minimized because each transponder has to receive only once. This provides the TDX as an optimal solution for the simultaneous transmission of analogue and digital services in a CATV network. The high signal-to-noise ratio allows support of large networks with multiple amplifiers in cascade.

Your benefits

- Only one receiver (tuner) per transponder
- All services of a transponder can be fed into the IP pool
- Encrypted services must be decrypted only once and can be used for simultaneous digital (QAM/COFDM) and analog (PAL) transmission
- The headend can be easily changed from analog to digital by changing only the output module



IPTV as a distribution technology

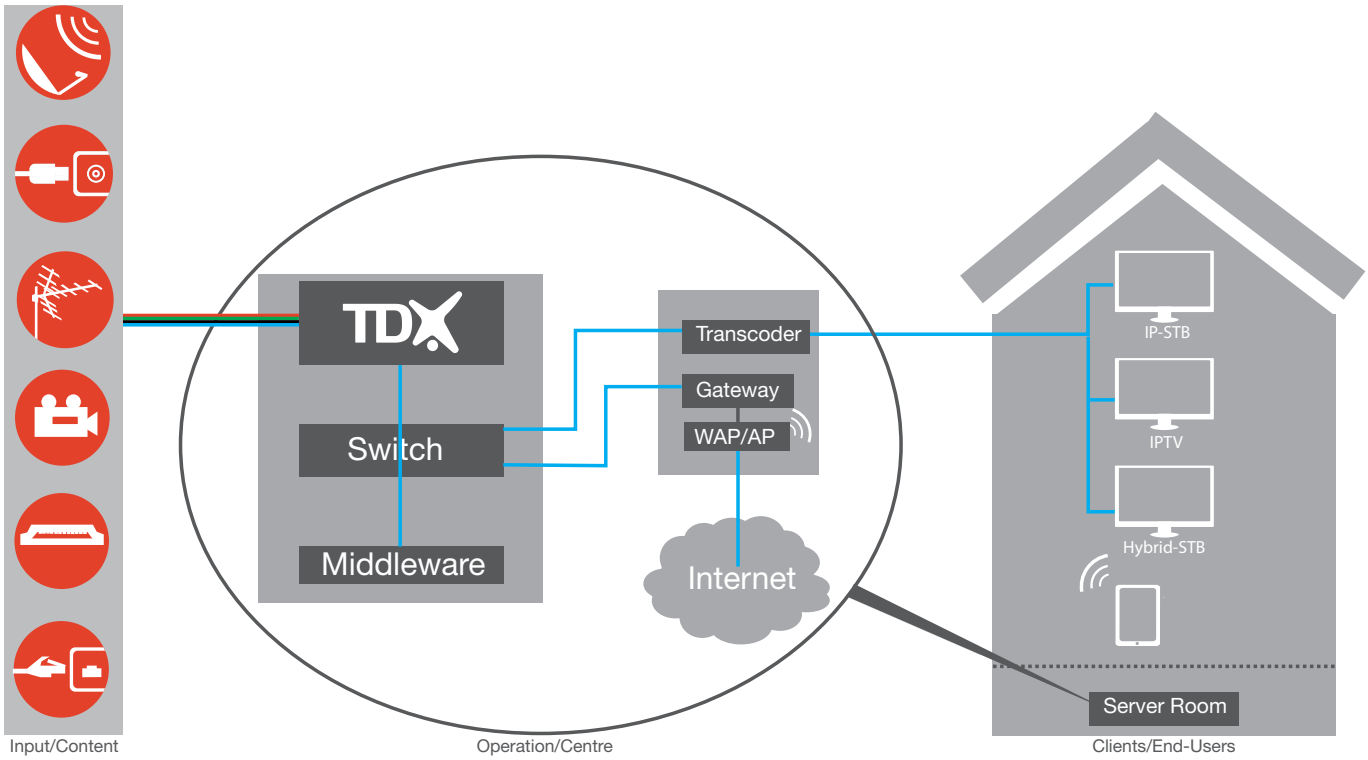
In closed building structures, there is a growing requirement for distribution of TV signals over CAT 5 cables. This requires a headend to receive the signals and transform them into IP services and also a middleware to administrate the IP receivers. The used network structure must be designed in addition to the requirements for IPTV transmission. This relates specifically to the used routers and switches which must support layer 3 and IGMP standard.

Your benefits

- Only one type of cabling in the building necessary
- WIFI transfer to the end-user device
- With the use of transcoder server it is possible to support different end-user devices

Solutions

One product many applications

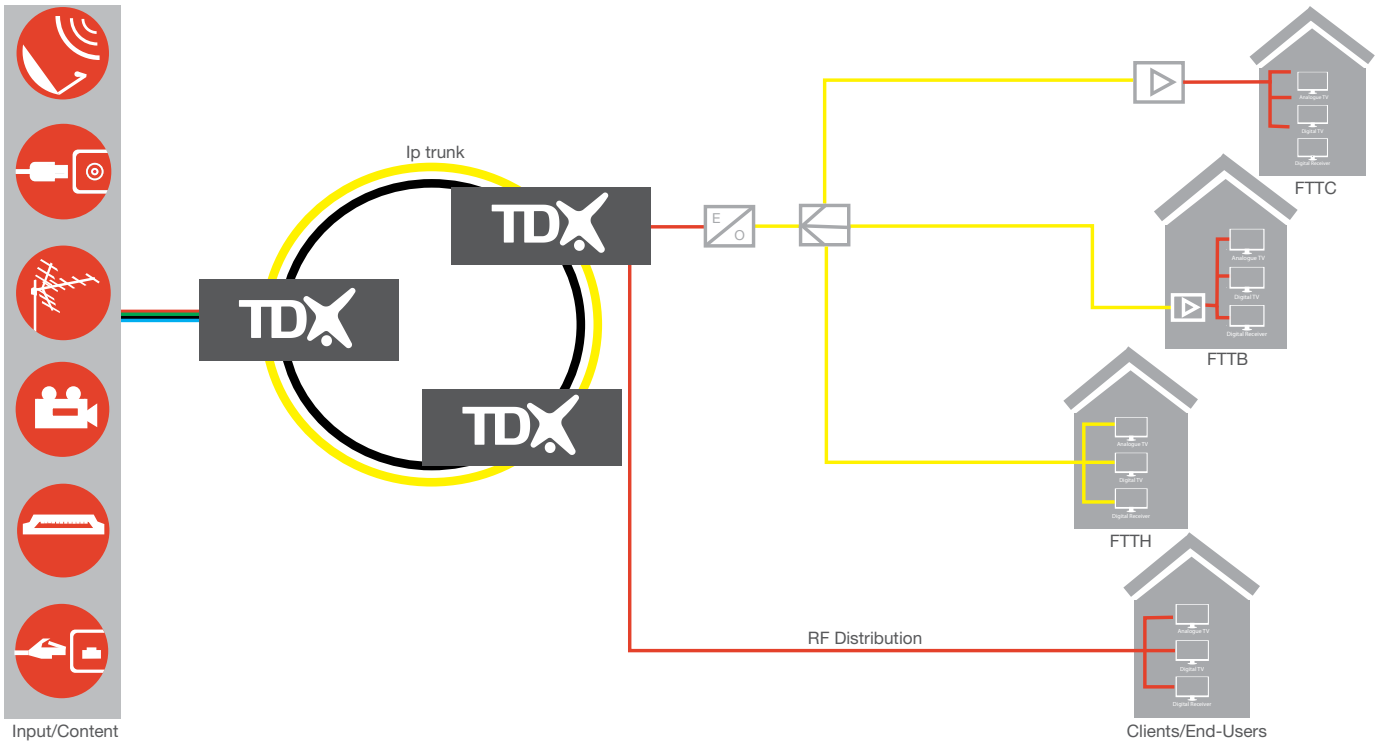


Full middleware solution

The combination of an IP headend and middleware addresses the fundamental needs of IPTV and Internet access for hotels, hospitals, cruise ships etc. To increase the revenue per guest a vast range of options for the multi-media promotion of different products and services are readily available. In cooperation with our partners we offer a wide range of IPTV solutions in this area.

Your benefits

- Tablet solution for remote control and live TV streaming
- Meeting / Conference room solution: Connect, present, browse, control!
- Hotel Info-Channel
- Time shift
- PVR – Personal Video Recorder
- Internet on TV
- And many more



TDX as part of a fibre distribution

Increasingly, the existing optical CATV fibre networks (maybe in the past distributing analog modulated TV signals) are more and more used to transmit IP TV Services between the central headend and sub headend. Also the distribution cells in new system architectures are planned smaller. One reason for this is the feed-in of Internet services and providing bandwidth for Internet services to the end customer.

These distribution cells can be built up as an RF distribution network or as an optical distribution network. There are different technologies for building up the system in terms of optical distribution. FTTC (Fibre to the curb), the optical distribution ends at the street cabinet. FTTB (Fibre to the block), the fibre reaches the boundary of the building. FTTH (Fibre to the Home), the fibre reaches the living room.

Your benefits

- Easy signal handling and management
- Independent RF distribution per cell possible
- Smaller distribution cells mean that the signal quality is not as important as before
- Redundancy systems with lower investments possible

Modules

Technical specifications

TECHNICAL SPECIFICATIONS CABINET

Cabinet

TDX basic device with IP-pool technology for supporting 16 input modules and 6 Quatro output modules.

CABINET		
Frequency range (tv out)	MHz	47-862
Impedance (TV OUT/ MODULE RF IN):	Ohm	75
Return loss (TV OUT / MODULE RF IN):	dB	> 10
Testpoint	dB	-20
Output level max @ 60 dB IMD 24 combined channels:	dBµV	103
Power Supply:		
Operating voltage	VAC	190-260 50/60 Hz
Power consumption, max	W	250
Max. LNB control	mA	4 x 305
Connectors:		
AC Power in (1.8 m)		IEC320 (cable)
Ext. TV-OUT		F-con
Ext. Testpoint		F-con
PC		RJ 45
SFP cage		4 x expansion
Environment:		
Temperature, operating	°C	-10...+50
Temperature, storage	°C	-20...+70
Humidity, operating	%	20...80
Humidity, storage	%	10...90
Mechanical data:		
Dimensions product (L x W x H)	mm	440 x 240 x 290
Dimensions carton (L x W x H)	mm	546 x 316 x 374
Weight - net	kg	10.5
Weight - gross	kg	12.1

TECHNICAL SPECIFICATIONS INPUT MODULES

DVBS/S2 module

SD and HD Satellite receiver module. Multiplex transmission and routing of all programs into the TDX Pool.

DVB-S/S2 INPUT DEMODULATOR MODULE (FRONT-END)		
Type **Art. No**		**QPSK and 8PSK demodulator** **492020**
Frequency range	MHz	950-2150
Input level	dBµV	42-82
Input impedance	Ohm	75
Input return loss	dB	> 10
Loop through gain	dB	0 - 6
LNB control DiSEqC		1.1
LNB control V/H	V/mA	0-13-18 / 300
Input connector		F - con
Output connector (loop through)		F - con

DVB-T, DVB-T/T2 module

SD or HD Terrestrial receiver module. Multiplex transmission and routing of all programs into the TDX Pool.

DVB-T/T2 (1 TUNER) INPUT DEMODULATOR MODULE (FRONT-END)			
Type **Art. No**		**DVB-T** **492022**	**DVB-T/T2** **492023**
Frequency range	MHz	177.5 - 226.5 / 474 - 858	177.5 - 226.5 / 474 - 858
Input level	dBµV	45...75	45...75
Input impedance	Ohm	75	75
Input return loss	dB	> 6	> 6
Loop through gain	dB	-3...+3	-3...+3
Demodulator mode		QPSK, 16QAM, 64QAM / 2k 8k	QPSK, 16QAM, 64QAM 256QAM / 1k 2k 8k 16k 32k
Bandwidth	MHz	7 / 8	7 / 8
Input connector		IEC - male	F - male
Output connector (loop through)		IEC - female	-

DVB-C module

SD and HD cable receiver module. Multiplex transmission and routing of all programs into the TDX Pool

DVB-C INPUT MODULE (FRONT-END)		
Type **Art. No**		**DVB-C** **492024**
RF		
Frequency range	MHz	114-858
Input sensitivity QAM256 QAM64	 dBm dBm	 -61...-31 -65...-35
Input impedance	Ohm	75
Input return loss	dB	>7.0
Noise figure	dB	<7.0
Bandwidth	MHz	8
Demodulator		
Type		QAM
QAM mode	DVB-C	16QAM, 64QAM, 128QAM, 256QAM
Symbol rates supported	Msym/s	1.8 to 7.2
Mechanical data		
Input connector		F-female

AV encoder module

Converting analogue audio/video signal in an MPEG4 stream and forwarding to the TDX Pool.

AV ENCODER MODULES (FRONT-END)		
Type **Art. No.**		**Video / Audio stereo modulator** **492080**
Video level	Vpp	1
Video impedance	Ohm	75
Video S/N ratio	dB	> 52
Video input standards		PAL, Secam
Audio level	mV	500
Audio impedance	kOhm	10
Video input connector		15 pol high density sub-D
Audio input connector		15 pol high density sub-D

Modules

Technical specifications

HDMI module

Converting analogue audio/video signal in an MPEG4 stream and forwarding to the TDX Pool.

HDMI INPUT MODULE (FRONT-END)		
Type **Art. No**		**HDMI** **492030**
Input		1 x HDMI
Output		MPEG transport stream
Embedded Audio		Stereo or AC3 pass through
Video Codec		MPEG4
Video Codec settings	Mbps	≤ 11.0
Remarks		Use high speed HDMI cable art. no 153420

TECHNICAL SPECIFICATIONS OUTPUT MODULES

QAM module

Quad-QAM modulator, adjacent channel operation, automatic multiplexing, available as FTA or CI variant.

QAM OUTPUT MODULE (BACK-END)		
Type **Art. No**		**FTA modulator / CI modulator** **492055 / 492056**
Output frequency range	MHz	50.5-858
Spourious signals	dB	> 60
QAM modes	QAM	16, 32, 64, 128, 256
Symbol rate	Mbps	2-40 (SCPC/MCPC)
Viterbi decoder		1/2, 2/3, 3/4, 5/6, 7/8
Reed Solomon decoder		204, 188, t=8
Deinterleaver		I = 12
Output spectrum		Normal, Inverted Random
Symbol rate	Mbaud	3.5-7200
Roll-off factor	%	15
FEC block code		RS 204, 188
MER	dB	>38
Output level (system)	dBµV	93
Output level adjustment	dB	+3 / -17 (0.5 dB step)
CI slots		0/2

COFDM module

Quad-COFDM modulator, adjacent channel operation, automatic multiplexing, available as FTA or CI variant.

COFDM OUTPUT MODULE (BACK-END)		
Type **Art. No**		**FTA modulator / CI modulator** **492060 / 492061**
Output frequency range	MHz	50.5-858
Spourious signals	dB	> 60
QAM modes		16 QAM, 64 QAM, QPSK
Bandwidth	MHz	6, 7 or 8
Carriers supported		2k, 8k
Guard interval		1/32, 1/16, 1/8, 1/4
Error correction	Viterbi FEC	1/2, 2/3, 3/4, 5/6, 7/8
	Reed Solomon	204 byte mode
MER	dB	≥36
Output level (system)	dBµV	93
Output level adjustment	dB	+3 / -17 (0.5 dB step)
CI slots		0/2

2xCI slots module

The s x CI backend module enables you to take several services depending on CAM module from the TDX pool, decrypt them and loop them back in decrypted form to the pool.

2XCI SLOTS OUTPUT MODULE (BACK-END)	
Type Art. No	2xCI modulator 492070
CI slots	2

PAL and PAL HD modules

Quad-PAL modulator, adjacent channels, available as FTA or CI variant
PAL with HD downscale function. For programs received only in HD, or processed as digital HD and analog SD signal.

PAL OUTPUT MODULE (BACK-END)			
Type Art. No		PAL FTA modulator / PAL CI modulator 492050 / 492051	PAL HD FTA modulator / PAL HD CI modulator 492052 / 492053
TV-norm		Pal/SEcam B/G, I, L, D/K	Pal(B/G, I, L, D/K), Secam
TV system		VSB VHF/UHF mono A2 Nicam	VSB VHF/UHF mono A2 Nicam
Output frequency range	MHz	47-862	47-862
Picture carrier stability	kHz	< ±30	< ±30
Spurious signals ref picture carrier	dB	> 60	> 60
Output level system	dBµV	103	103
Output level adjusting	dB	+3.0...-17.0 (0.5 dB step)	+3.0...-17.0 (0.5 dB step)
Output impedance	Ohm	75	75
Return loss	dB	> 10	> 10
Differentiel gain	%	< 8	< 8
Differentiel phase	degrees	< 8	< 8
Crominance/luminance delay	ns/m	< 80	< 80
Luminance non-linearity	%	< 8	< 8
Video S/N ratio (typical)	dB	58	57
CI slots	pcs	0/2	0/2

IP AND SOFTWARE

SFP MODULES (small form factor pluggable)				
Type Art. No		EOLT - C12 - 02 (copper - SFP) 492086	EOLT - 8512 MXX (fibre - SFP) 492087	EOLT - 1324 - 02xx (fibre - SFP) 492088
Type		Copper SFP(RJ45)	Fibre LC - 850 nm	Fibre LC - 1310 nm
Data rate	MBps	1000	1000	1000
Reach	m	100	100	100
Packing size	Pcs	1	1	1
Application		Gigabit Ethernet over cat 5 cable	Gigabit Ethernet over fibre	Gigabit Ethernet over fibre
Transport stream payload	max. MBps	720		
Protocols		UDP with RTP optional		

IP in & out

Start and extension license packages for 12 IP-In and out services.

IP IN AND OUT				
Type Art. No	IP IN start 418045	IP IN expand 418046	IP OUT start 418040	IP OUT expand 418041

ACCESSORIES

Type Art. No	TDX fan kit 775276	TDX power supply 492005	SD card 492084

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