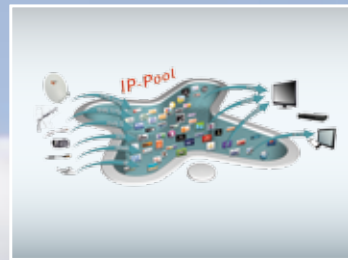




Setting new standards with flexible pool technology

| TDX and TDH 800 Headend systems



your ultimate connection

The flexible headend systems

| ideal for any application

Innovative and versatile

The TDX and TDH 800 headend systems from TRIAX have turned everything in the headend world on its head. The market-leading IP-pool technology from TRIAX radically simplifies the construction and management 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 (depending on headend type), 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 (depending on headend type), and because the input signals are not fixed to any particular outputs, an input signal can be assigned to several output modules. The range of options leaves no wish unfulfilled.

So, whether you want to provide smaller residential facilities with television or want to provide a much larger districts with IP-television - with the two TRIAX Headends TDX and TDH 800 you are prepared for all eventualities.

- quite simply a revolution





User-friendly technology

- Fully configurable: all implementation variants are possible with significantly fewer modules than a standard headend, thereby reducing costs for acquisition, service and warehousing
- Browser-based user interface configuration without additional software than the Silverlight plug-in, in your browser
- Infinite variety of programs thanks to the revolutionary IP-pool technology, that makes these two headends uniquely flexible, efficient and economical

Future-proof

- IPTV offers video on demand, time-shifted television, many additional services for hoteliers, trade shows and much more (TDX)
- No re-programming of the TV sets when a channel changes
- Energy-saving and durable



Perfect service for installers

- New modules are automatically recognized and configured
- No downtime for TV customers, as modules can be replaced during operation (hot swap)
- Supplied ready to fit in the desired configuration
- Halved installation times due to easy programming and elaborate system properties

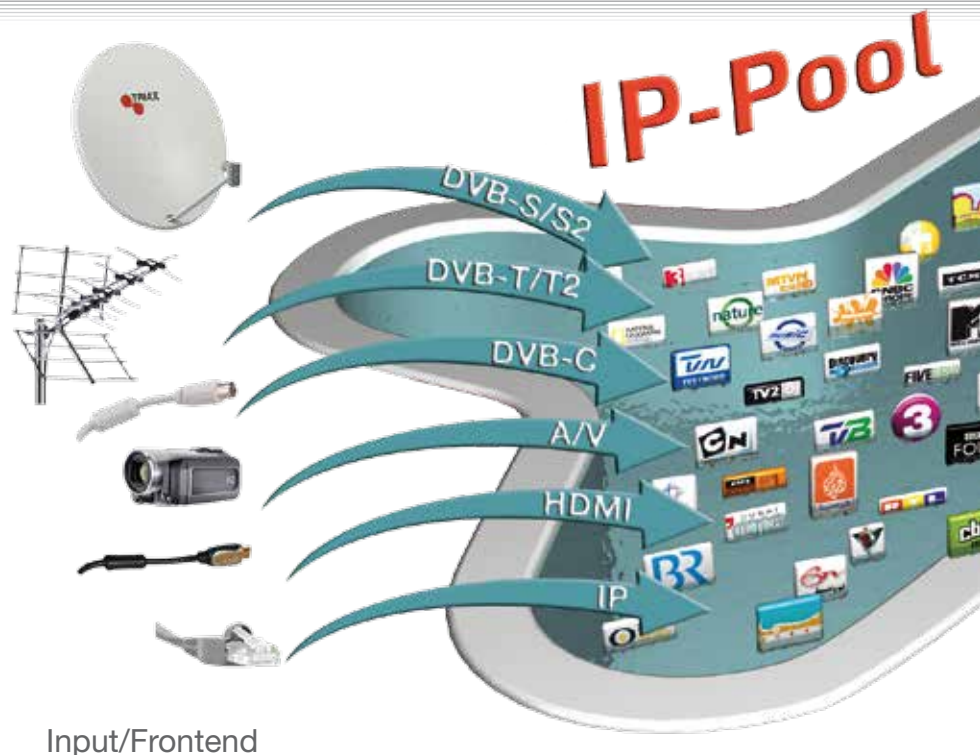
Flexibility makes the difference

| TRIAX IP-pool technology

The TDH 800 range includes a minor series of the most popular in- and output modules.

If you need additional features and/or modules, then please select the TDX headend.

Get the complete overview of the modules on the last pages



Input/Frontend

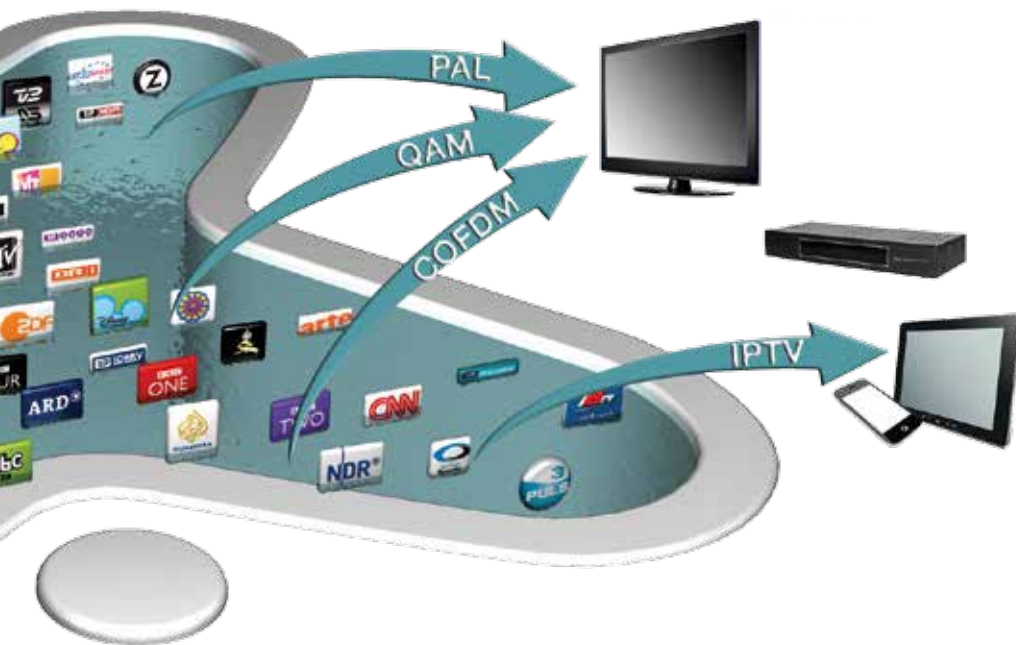
Invest in technology that already meets the digital demands and requirements of tomorrow, such as HD, MPEG 4, CI/CAM, transport stream processing (MUXing, NIT, PID, stuffing). Put your money in a system that merges the highest level of efficiency with reliability, and benefit from the advantages provided by one of Europe's largest manufacturers of headends. The innovative pool technology is an integral part of both the TDX and TDH 800 headend systems. With TRIAX you can always rely on fast customised assistance and consultancy for tendering, planning, installation, configuration and maintenance.

The future is programmable - thanks to TRIAX IP-pool technology

The innovative TRIAX IP-pool technology makes your headend system free of coercion assignments of the input and output modules. All incoming signals initially enter the TDX IP-pool. From this pool they can be converted into any required output signals and then simultaneously fed to several output modules.

This makes TDX and TDH 800 uniquely flexible, efficient and economical. For example, a single satellite signal can be modulated and can be output in both PAL, in QAM and COFDM or in TDX as IP output signals.

The once selected assignments between the input and output signals can of course be changed at any time.



Output/Backend

Reliable reception without any noise

System planning is performed quickly and reliably via the browser-based user interface configuration without any additional software than the Silverlight plug-in, in your browser. Simply use the program to specify the desired inputs and outputs and the software does everything else. Not only does it optimally select the components for the system, it also programs the desired system configuration as an XML file. At the same time it calculates the maximum permissible bandwidth for each channel, preventing overloading of the output signal and ensuring a noise-free and clear reception. The signal quality, e.g. Video S/N in PAL or typical MER value for QAM, is available in the technical specification, at the end of this brochure.

Easy to install. Easy to use.

The completed XML file from the headend system is transferable to any laptop and can quickly be transferred to the TDX to perform the installation.

In close collaboration with installers, TRIAX has optimised system handling: Installation and commissioning is very easy, and operating the system is very friendly for both users as well as service staff.



For every application and budget

| Flexible headend systems TDX and TDH 800

TDX

The professional TDX headend is cutting edge technology for those who place the highest demands on flexibility, performance and comfort. Ideal for the supply of all TV signals and opportunities.

Perfect care for

- Neighborhoods, small towns
- Hotels, large apartment buildings
- CATV systems and CATV Islands
- Settlements

The most important features

- Individual IPTV solutions
- More program channels by multiplexing
- More languages and programs through multi-unit (up to 3 headends connected together)
- Simple remote monitoring



TDH 800

The TDH 800 headend is the ideal solution for those looking for a flexible, compact and reliable solution.

Perfect care for






- Hotels
- Large multi-family houses
- Small settlements

The most important features

- Fully configurable thanks to pool technology
- More program channels by multiplexing
- Configuration via web interface



Compare of the systems and their capabilities

System technology		TDX	TDH 800
	IP-pool technology	✓	✓
	Multiplexing	✓	✓
	Hot Swap technology	✓	x
Frontends	DVB-S/S2	✓	✓
	DVB-T-T2	✓	✓
	DVB-C	✓	x
	AV	✓	✓
	HDMI	✓	x
	Backends	PAL	✓
	PAL CI	✓	✓
	PAL-HD	✓	x
	PAL-HD CI	✓	x
	QAM	✓	✓
	QAM CI	✓	✓
	COFDM	✓	✓
	COFDM CI	✓	✓
	IP Backend	✓	x
	CI only	✓	✓
	Additional hardware	Redundant PSU	✓
Functionality	IP-in IP-out	✓	x
	Multi Unit	✓	x
	SID remapping	✓	✓
	Common NIT	✓	x
	LCN HD	✓	✓
	PLP (DVB-T2)	✓	x
	Alternative EIT input	✓	x
	EIT management	✓	x
	Network ID setting	✓	✓
	Network name	✓	✓
	Original network ID	✓	✓
	Nit standard DVB, NorDig	✓	✓
	CAT remove	✓	✓
	FranceSAT NIT	✓	✓
	Transport stream ID setting	✓	✓
	Services	Software updates	✓
	Software for IP-in and IP-out	✓	x

TDX digital headend

| a true IP headend with revolutionary technology

Integrated cable management

- The connection cables are easily accessible and hidden behind the removable metal cover
- With lockable door for undisturbed operation

Multi-Unit for more power

- Up to three TDX-Headends can be combined as one system
- Up to 72 PAL, QAM or COFDM channels are possible (around 280 HD-programs or 570 SD-Programs)
- High output level at 103 dB μ V for interference free reception

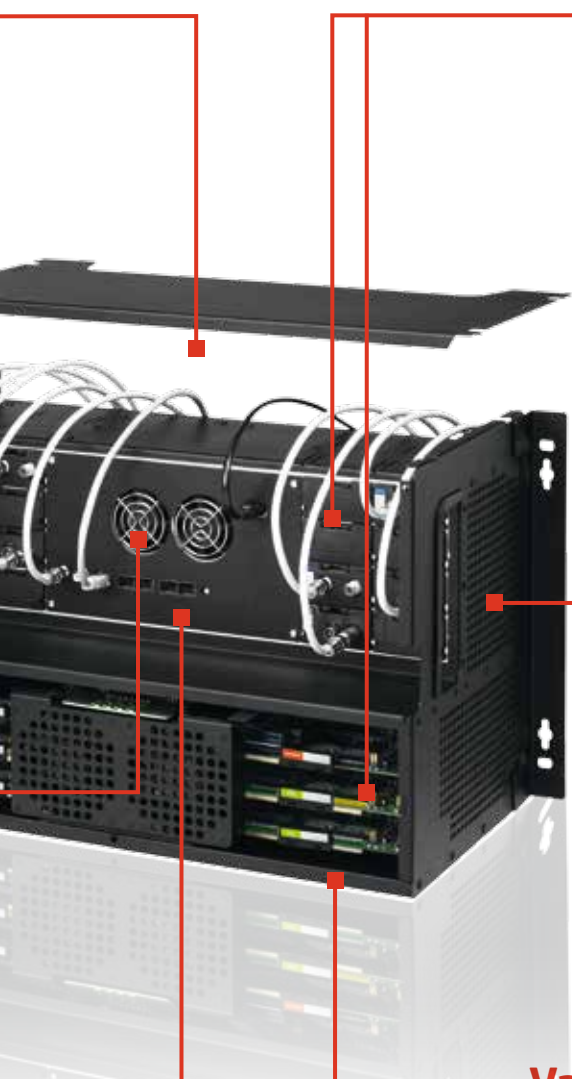
Energy-saving and long-term reliability

- A fully loaded headend with 16 input and 6 outputs consumes only 280 watts
- Intelligent cooling system with integrated fans - increases the life of the equipment and allows a 19" rack mounting.

Easy installation and configuration

- Can easily be installed on a wall or a 19" cabinet
- All inputs and outputs modules and cables can be accessed and operated easily from the front
- Browser-based user interface configuration without additional software than the Silverlight plug-in, in your browser
- Simple and intuitive step-by-step configuration
- MUX bandwidth monitoring to avoid overfilling MUX
- DiSEqC-compatible when using a multi-switch as for input distribution





■ IP Pool and Multiplex technology

- IP Pool-Technology - Input- and Output modules are independent of each other.
- Future proof, full compatibility with CAS systems, middleware, PMS, VOD services, EPG server, etc.
- UP to 16 inputs modules in a combination of DVB-S/S2, DVB-T/T2, DVB-C, AV, HDMI and IP-in.
- Up to 6 Quad-output modules for up to 24 channels in any combination of PAL, QAM, COFDM and IP out, with or without CI-slot.
- Output modules can support up to 12 CAM modules.
- More program locations by use of multiplex technology (unused program will be placed in the pool for later release).

■ Maintenance and Service have never been easier

- HOT SWAP service
- Log file on all TDX activity
- Easy on-site or remote access to the TDX for the installer and/or the Triax support
- LEDs for indication of functionality or errors on each module
- Fewer modules - allows easy spare part handling

■ Valuable additional features

- Thanks to SID Remapping you need no re-programming of the TV sets when you make channel changes
- Thanks to LCN (logic channel numbering) it is possible to create individual program list and save it as SD and HD program
- Manage and customize EPG data.
- The Adjust TPS-ID function transport stream ID - required if different. For Satellite same ID's are used

TDH 800 digital headend

| a solution designed for distributing basic TV services.

Energy-saving - long-term reliability

- 16 tuners and 6 backends fully loaded
- only 280 W power consumption
- Intelligent cooling system with integrated fans
- increases the service life of the equipment and allows installation in 19-inch cabinets

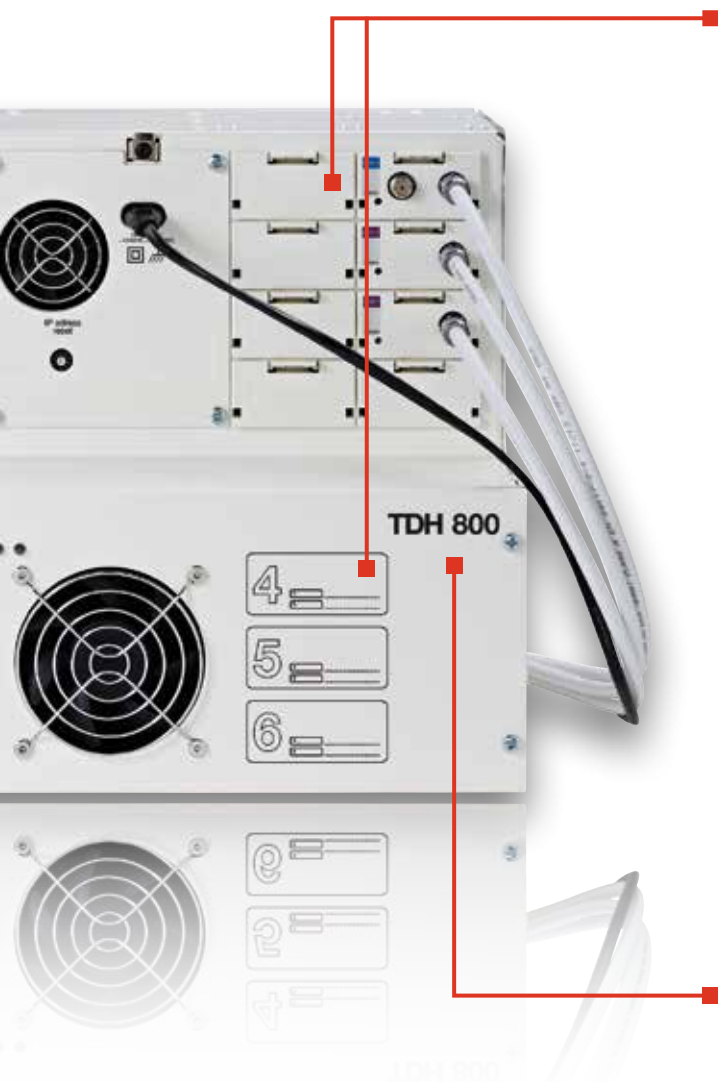
Easier service handling

- Fewer modules – allows easy spare part handling
- Log file on all TDH 800s
- On-location access to the TDH for installer and/or TRIAX support

Easy setup and configuration

- Browser-based user interface configuration without additional software than the Silverlight plug-in, in your browser
- MUX bandwidth monitor to ensure that the MUX is not overloaded
- The four adjacent output channels can be freely selected across the full frequency range
- LED to indicate operation and errors on each module
- Easy, intuitive step-by-step configuration





IP Pool and Multiplex technology

- IP Pool-Technology - Input- and Output modules are independent of each other.
- Up to 16 input modules in a combination of DVS-S/S2, DVB-T/T2, AV in.
- Up to 6 Quad-output modules for up to 24 channels in any combination of PAL, QAM, COFDM, with or without CI-slot.
- Output modules can support up to 12 CAM modules.
- More program locations by use of multiplex technology (unused program will be placed in the pool for later release).

Easy installation

- Input modules are independent of output modules, resulting in a smaller number of modules overall
- Saves time on installation
- DiSEqC 1.0 functionality
- Housing designed to accommodate up to 16 input and 6 quad output modules, making it possible to support 12 CAM modules
- Can easily be installed on a wall or a 19" cabinet
- All inputs and outputs modules as well as all cables can be accessed and operated easily from the front
- Input and output modules identified via TRIAX supplied labels

TDX 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

Type	TDH 800 main unit	
Art. No	492090	
Frequency range (tv out)	MHz	47-862
Impedance (RF out):	Ohm	75
Return loss (RF out):	dB	> 14 at 47 MHz (-1.5 dB/octave; min. 10 dB)
Testpoint	dB	-20
Output level max @ 60 dB IMD 24 combined PAL channels:	dB μ V	103
Power Supply:		
Operating voltage	VAC	190-260 50/60 Hz
Power consumption, max	W	280
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

DVB S/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	QPSK and 8PSK demodulator	
Art. No	492020	
Frequency range	MHz	950-2150
Input level	dB μ V	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/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	DVB-T/T2	
Art. No	492023	
Frequency range	MHz	177.5 - 226.5 / 474 - 858
Input level	dB μ V	35...75
Input impedance	Ohm	75
Input return loss	dB	> 6
Loop through gain	dB	-
Demodulator mode	QPSK, 16QAM, 64QAM 256QAM / 1k 2k 8k 16k 32k	
Bandwidth	MHz	7 / 8
Input connector	F - male	
Output connector (loop through)	-	

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	DVB-C	
Art. No	492024	
RF		
Frequency range	MHz	114-858
Input sensitivity		
QAM256	dB μ V	45...75
QAM64	dB μ V	45...75
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	Video / Audio stereo modulator	
Art. No.	492080	
Video level	Vpp	1
Video impedance	Ohm	75
Video S/N ratio	dB	> 52
Video input standards	PAL, Secam	
Audio level	Vpp	2.5
Audio impedance	kOhm	10
Video input connector	15 pol high density sub-D	
Audio input connector	15 pol high density sub-D	
Remarks	Use high quality cable art. no 153420	

TDX 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	HDMI	
Art. No	492030	
Input	1 x HDMI	
Output	MPEG transport stream	
Embedded Audio	2ch LPCM in, AAC or MP2 out	
Video Codec	MPEG2, MPEG4	
BW settings	Mbps	3-13
Remarks	Use high speed HDMI cable art. no 153420	
HDCP Compliant, blocks content protected		

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	FTA modulator / CI modulator	
Art. No	492055 / 492056	
Output frequency range	MHz	50.5-858
Spurious 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		l = 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	100
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	FTA modulator / CI modulator	
Art. No	492060 / 492061	
Output frequency range	MHz	50.5-858
Spurious signals	dB	> 60
QAM modes		16 QAM, 64 QAM, QPSK
Bandwidth	MHz	6, 7 or 8
Carriers supported		2k
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	100
Output level adjustment	dB	+3 / -17 (0.5 dB step)
CI slots		0/2

2xCI slots module

The 2 x CI backend module takes several services (depending on CAM module) from the IP Pool, decrypts them and loops them back in decrypted form to the pool.

2XCI SLOTS OUTPUT MODULE (BACK-END)

Type	2xCI modulator
Art. No	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		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
Differential gain	%	< 8	< 8
Differential 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



OUTPUT SFP PLUGS

SFP MODULES (small form factor pluggable)

Type		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	upto 550 m with 50/125 µm MMF	2 km
Packing size	Pcs	1	1	1
Application		Gigabit Ethernet over cat 5e cable	Gigabit Ethernet over fibre	Gigabit Ethernet over fibre
Transport stream payload	max. MBps	720	-	-
Protocols		UDP with RTP optional	-	-



ACCESSORIES

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

Type	TDX Redundant Power Supply
Art. No	492006



TDX Modules

| IP technology & software

TRIAX TDX-headend technology that is oriented towards the needs of users. All incoming signals initially enter the IP-Pool. As a result, this technology allows unlimited possibilities 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.

TRIAX IP BACKEND

Triax IP backend is an output module for transmission of digital video, audio and miscellaneous data, encapsulated within one or more MPEG2/DVB single program transport streams. Besides the backend module the package consists of a AUX-TS-Loop module and a SFP RJ45 (small form factor pluggable) module

Features:

- IP transmission of up to 96 MPEG2/DVB SPTS.
- Configurable ratio of 3-7 TS packets / MTU.
- Configurable output priority for each output SPTS.
- RTP option.
- 2 x CI slots complying to EN 50 221.
- Hot swapp able in TDX system

Art. No.	Type
492072	TDX IP Backend 3-7 TS 1 UDP package



IP IN & IP OUT LICENSE

Software for the TDX IP-in and IP-out in different package sizes. The number of IP services can be expanded as required with additional 4 or 12 IP-in and out services.

Type	TDX-IP4-in	TDX-IP12-in	TDX-IP+4-in	TDX-IP+12-in
Art. No.	418047	418045	418048	418046
Description	IP-in Startpack 4 IP services	IP-in Startpack 12 IP services	IP-in Extra 4 IP services	IP-in Extra 12 IP services
Type	Software	Software	Software	Software
Remarks	For the award of the license code is the serial number. and the ID-No. the TDX needed			

Type	TDX-IP4-out	TDX-IP12-out	TDX-IP+4-out	TDX-IP+12-out
Art. No.	418042	418040	418043	418041
Description	IP-out Startpack 4 IP services	IP-out Startpack 12 IP services	IP-out Extra 4 IP services	IP-out Extra 12 IP services
Type	Software	Software	Software	Software
Remarks	For the award of the license code is the serial number. and the ID-No. the TDX needed			

TDH 800 basic unit

| technical specifications



TECHNICAL SPECIFICATIONS

TDH 800 basic unit

- for supporting 16 input modules and 6 quad output modules.

CABINET

Type	TDH 800 main unit	
Art. no..	692890	
Frequency range (tv out)	MHz	47-862
Impedance (RF out):	Ohm	75
Return loss (RF out):	dB	> 14 at 47 MHz (-1.5 dB/octave; min. 10 dB)
Testpoint	dB	-20
Output level max @ 60 dB IMD 24 combined PAL channels:	dB μ V	93.0
Power Supply		
Operating voltage	VAC	190-260 50/60 Hz
Power consumption, max	W	280
Max. LNB control	mA	4 x 305
Connectors:		
AC Power in (1.8 m)	IEC320 (cable)	
Ext. TV-OUT	F-connector	
Ext. Testpoint	F-connector	
PC	RJ 45	
Environment		
Temperature, operating	$^{\circ}$ C	-10...+50
Temperature, storage	$^{\circ}$ 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 265
Dimensions cardboard packaging (L x W x H)	mm	546 x 316 x 374
Weight - net	kg	9.8
Weight - gross	kg	11.4

Input modules

| technical specifications



TECHNICAL SPECIFICATIONS INPUT MODULES

TDH 811 frontend - DVB-S/S2 [QPSK/8PSK] module

SD and HD satellite receiver module. Multiplex transmission and routing of all programmes into the TDH 800 pool.



DVB-S/S2 INPUT DEMODULATOR MODULE (FRONT-END)

Type	TDH 811 frontend - DVB-S/S2 module	
Art. no..		692820
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-connector
Output connector (loop through)		F-connector

TDH 813 frontend - DVB-T/T2 [COFDM] module

SD and HD terrestrial receiver module. Multiplex transmission and routing of all programmes into the TDH 800 pool.



DVB-T/T2 (1 TUNER) INPUT DEMODULATOR MODULE (FRONT-END)

Type	TDH 813 frontend - DVB-T/T2 module	
Art. no..		692823
Frequency range	MHz	177.5 - 226.5 / 474 - 858
Input level	dBμV	35...75
Input impedance	Ohm	75
Input return loss	dB	> 6
Loop through gain	dB	-
Demodulator mode		QPSK, 16QAM, 64QAM 256QAM / 1k 2k 8k 16k 32k
Bandwidth	MHz	7 / 8
Input connector		F-connector
Output connector (loop through)		-

TDH 814 frontend - AV encoder module

Converting analogue audio/video signal into an MPEG2 or MPEG4 stream and forwarding to the TDH 800 pool.



AV ENCODER MODULE (FRONT-END)

Type	TDH 814 frontend - AV encoder module	
Art. no..		692880
Video level	Vpp	1
Video impedance	Ohm	75
Video S/N ratio	dB	> 52
Video input standards		PAL, Secam
Audio level	Vpp	< 2.4
Audio impedance	kOhm	10
Video input connector		15 pol high density sub-D
Audio input connector		15 pol high density sub-D
Remarks		Use high quality cable art. no 153420

Output modules

| technical specifications

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

COFDM OUTPUT MODULE (BACK-END)		
Type	TDH 843 FTA / TDH 844 CI	
Art. no..	692860 / 692861	
Output frequency range	MHz	50.5-858
Spurious signals	dB	> 60
QAM modes	16 QAM, 64 QAM, QPSK	
Bandwidth	MHz	6, 7 or 8
Carriers supported	2k	
Guard interval	1/32, 1/16, 1/8, 1/4	
Error correction	Viterbi FEC Reed Solomon	1/2, 2/3, 3/4, 5/6, 7/8 204 byte mode
MER	dB	≥35
Output level (system)	dBμV	90.0
Output level adjustment	dB	+3 / -17 (0.5 dB step)
CI slots	0/2	



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

QAM OUTPUT MODULE (BACK-END)		
Type	TDH 845 FTA / TDH 846 CI	
Art. no..	692855 / 692856	
Output frequency range	MHz	50.5-858
Spurious 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	>35
Output level (system)	dBμV	90.0
Output level adjustment	dB	+3 / -17 (0.5 dB step)
CI slots	0/2	



Analogue / PAL module - Quad-PAL modulator, adjacent channels, available as FTA or CI variant.

PAL OUTPUT MODULE (BACK-END)		
Type	TDH 841 FTA / TDH 842 CI	
Art. no..	692850 / 692851	
TV standard	Pal/SEcam B/G, I, L, D/K	
TV system	VSB VHF/UHF/mono/A2/Nicam	
Output frequency range	MHz	47-862
Picture carrier stability	kHz	< ±30
Spurious signals ref picture carrier	dB	> 60
Output level system	dBμV	93.0
Output level adjusting	dB	+3.0...-17.0 (0.5 dB step)
Output impedance	Ohm	75
Return loss	dB	> 10
Differential gain	%	< 8
Differential phase	degrees	< 8
Crominance/luminance delay	ns/m	< 80
Luminance non-linearity	%	< 8
Video S/N ratio (typical)	dB	54
CI slots	pcs	0/2



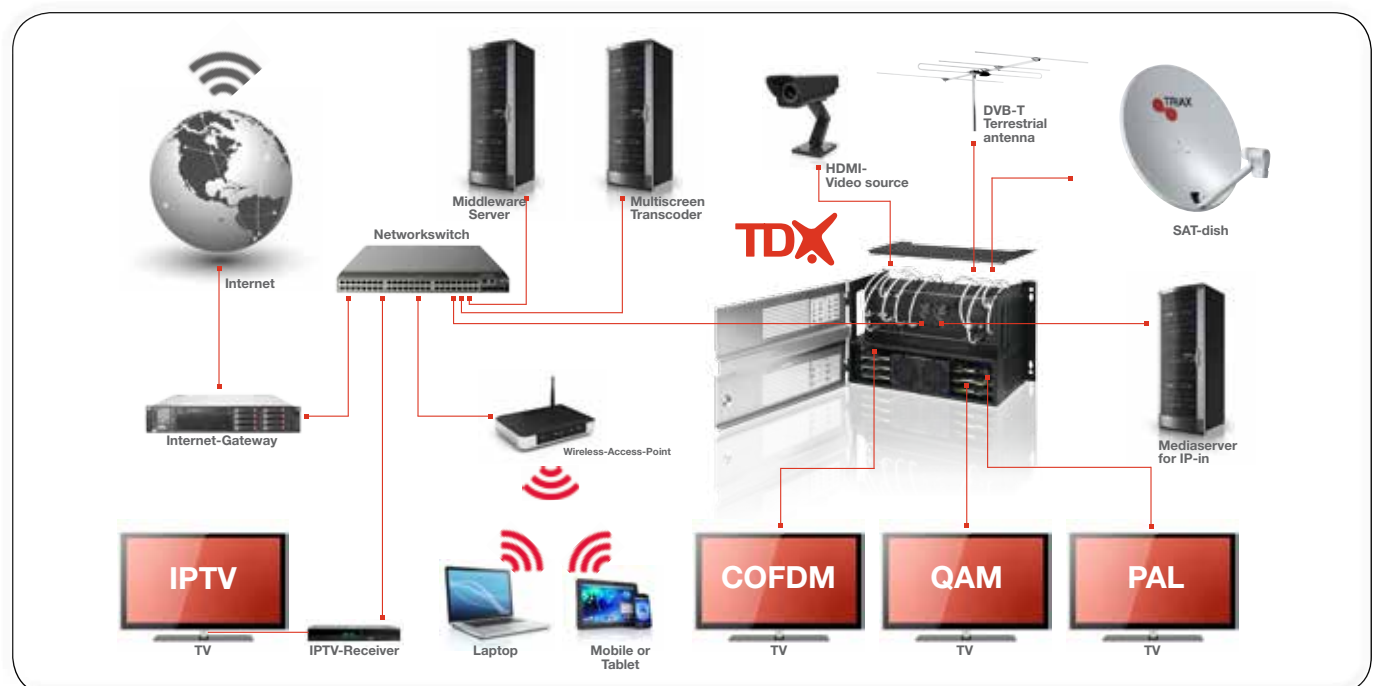
TDX Solutions

| one product - many applications

IPTV middleware as central administration platform of your IPTV system



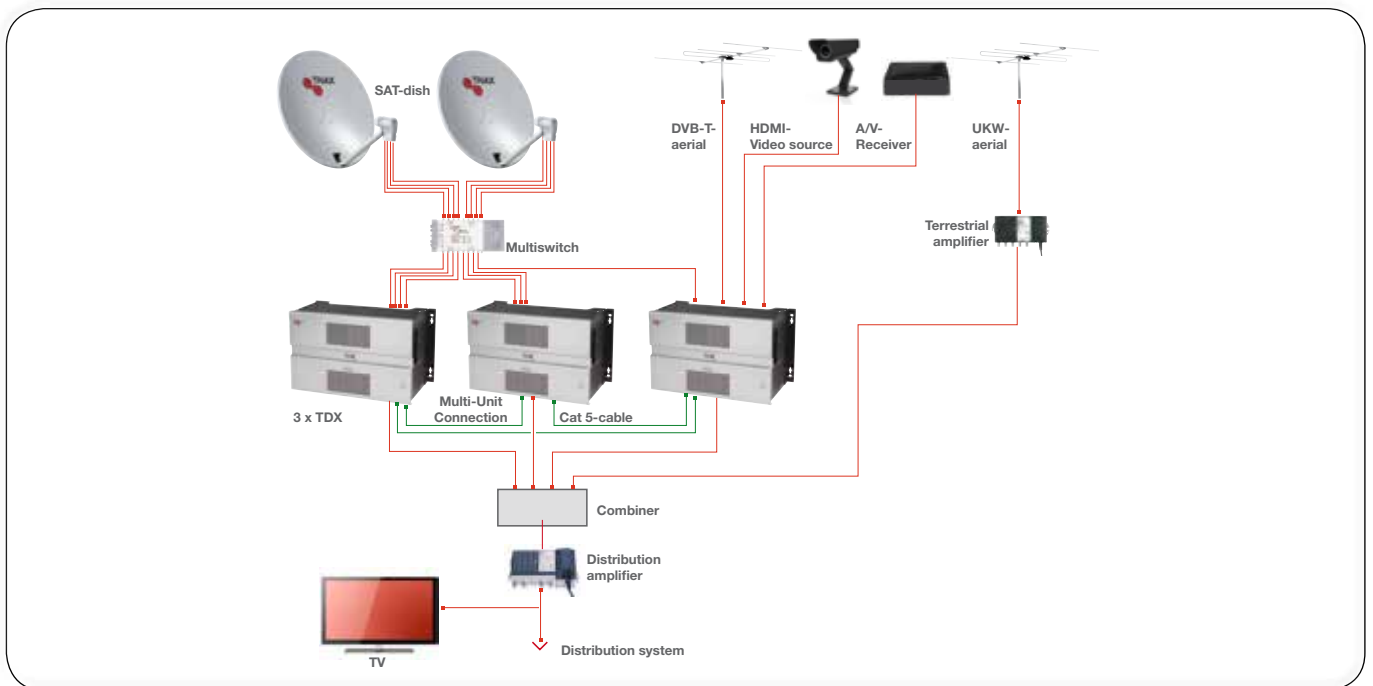
What you find behind the desk - example on a IPTV system with middleware



TDX Solutions

| combining of more units

Multi-unit system with up to three head-end



Can be used as an Internet Service Provider in hotels, fairs, businesses, schools and clinics

- Devices independently (receiver, PCs, smartphones, tablets, etc.)
- Multilingual
- Easy administration
- Menus in your own corporate design
- Additional advertising platform

And it benefits the end user

- Huge choice of programs - including local channels
- Value-added services available interactively
- Video on Demand and Pay TV
- Time-shifted TV (Time Shift)
- Internet: e-mail, chat and surf right on your TV
- Electronic Program Guide (EPG) for better overview and more program information

TDX Redundant Power Supply



- The TDX Redundant power supply provides you with a high degree of power assurance in connection with your TDX headend system.
- The redundant power supply uses two identical TDX Power supplies mounted in a mechanical frame. This means only one power supply on stock to support TDX and redundant power supply installations. Both are active and supports the TDX with power. If one power supply unit breaks down the other unit instantly takes over the full load and thereby prevents an interruption of the supply of power. The damaged power supply can be changed without disconnecting the working unit from the power.

TDX Solutions

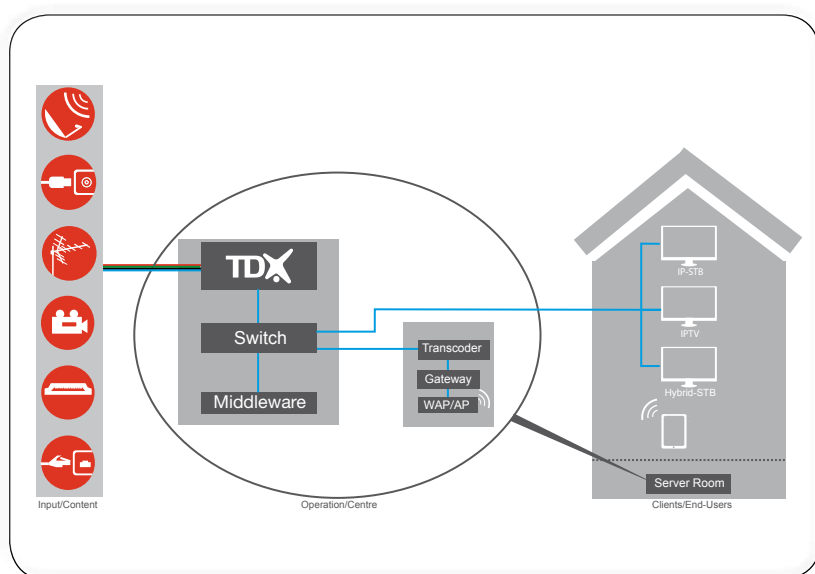
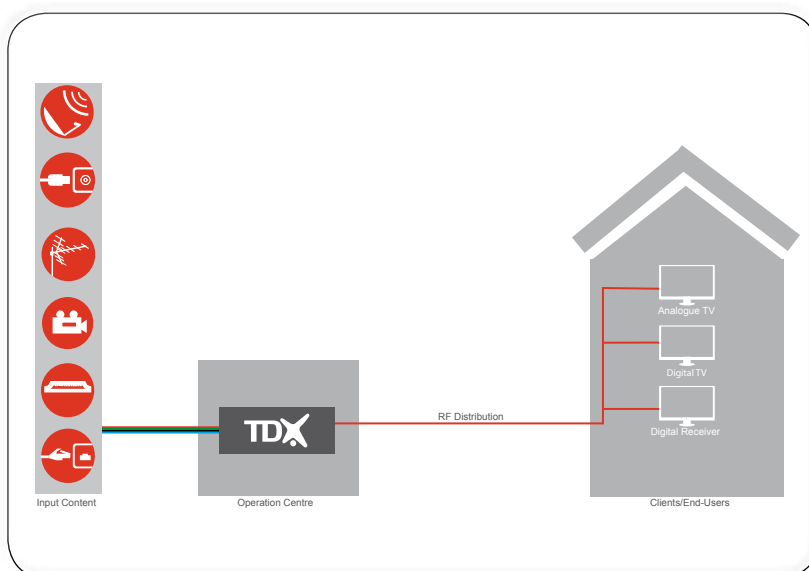
| analogue / digital mirror

The TDX IP pool technology enables output of the existing services in the pool with different output modulation forms.

As a result, the hardware can be minimized because each transponder is received 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 the output module



IPTV as a distribution technology

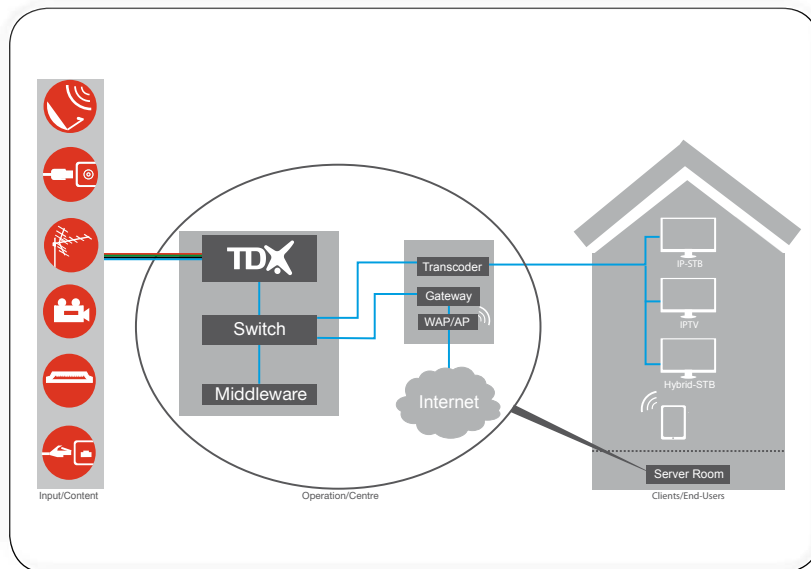
In closed buildings, there is a growing requirement for distribution of TV signals over CAT 5 cables. This requires a headend to receive the signals and transform them into IP services and also a middleware to administrate the IP receivers. In addition the used network structure must be designed to the 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 a transcoder server it is possible to support different end-user devices

TDX Solutions

| example on fibre distribution and IPTV system



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

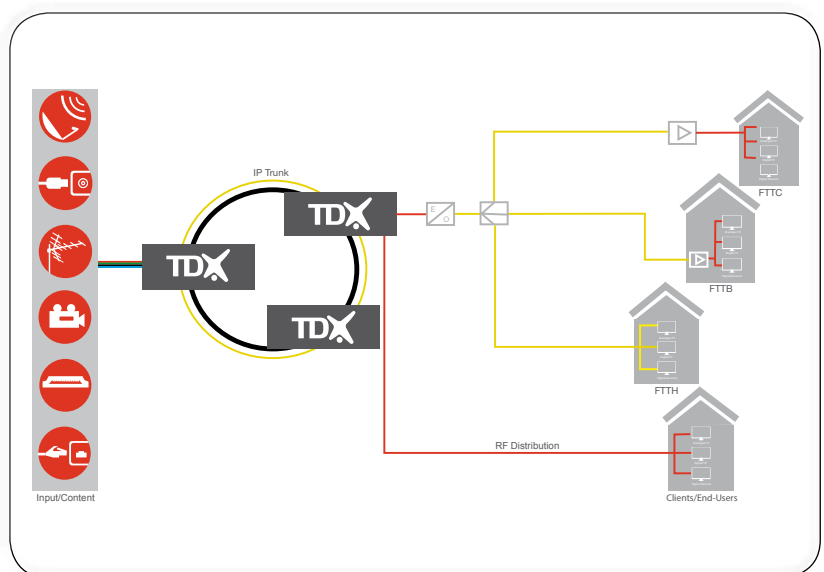
- Easy signal handling and management.
- Independent RF distribution per cell.
- Smaller RF-distribution cells.
- Redundancy systems with lower investments.

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





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