

Tangram
High Density
Video Platform

For Cable TV, IPTV and OTT solutions



Tangram

Maximum Performance, Minimum Footprint

The TANGRAM platform is highly customizable and offers advanced DVB stream processing in a small footprint 1 RU chassis concept. The TANGRAM chassis can be equipped with 6 modules and offers 10 Gbps streaming connections.

The GT10 chassis offers in total four 10 Gbps ports for streaming applications and an additional port for management. The six rear loaded modules have different functionalities and can perform all necessary signal processing functions.

The WISI TANGRAM video platform is a high-density digital TV headend for contribution of digital TV via IP networks and end-to-end IPTV solutions such as video-on-demand, connected TV and OTT (Over The Top) or Web TV. The TANGRAM platform can be used in a central or distributed headend architecture and provides the following processing functions in a central location:

- DVB-IP Gateway for DVB-C/S/S2/S2X/T/T2, ATSC and ISDB-T Reception
- ABR (Adaptive Bitrate) reception
- Remultiplexing and PSI / SI Processing
- Digital and analog Edge Modulation
- HDMI and HD/SDI Encoder
- T2-MI de-encapsulation and PLP management
- Supports MPEG-2, MPEG-4 and HEVC

In decentralized architecture with regional hubs, the modulation is done at the hub sites. The aggregated digital TV streams are transported via an IP network (Backbone) to the hub site and are terminated on the Edge equipment (Edge QAM, Edge PAL, Edge FM, Edge COFDM or Edge ISDB-T) for modulation and transmission in the HFC networks.

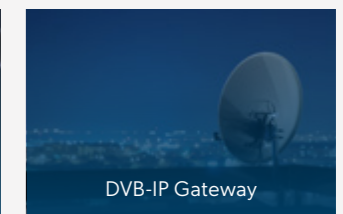
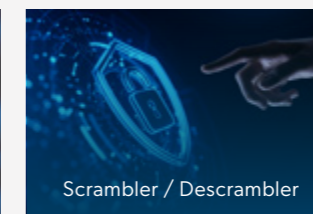
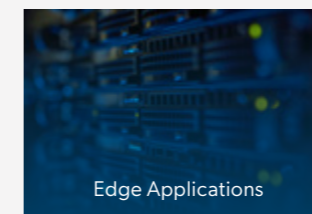
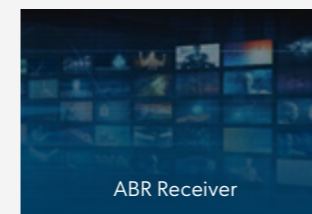
The TANGRAM chassis can optionally be equipped with two load sharing redundant power supplies (DC or AC) and contains high performance monitored fans for cooling. All modules, fans and power supplies are hot swappable.

Tangram Features

- ✓ Excellent cost-performance by highest density and low power consumption
- ✓ High level of reliability by full redundancy concept and hot swappable fan bay & PSUs
- ✓ Maximum flexibility and simplicity by modular architecture and easy to operate via web UI
- ✓ Great variety for building your future-proof TV network. IP, ABR, QAM, ASI, DVB-T/T2/S/S2/S2X, DVB-T2-MI, PAL, NTSC, SECAM, FM, ISDB-T, ATSC



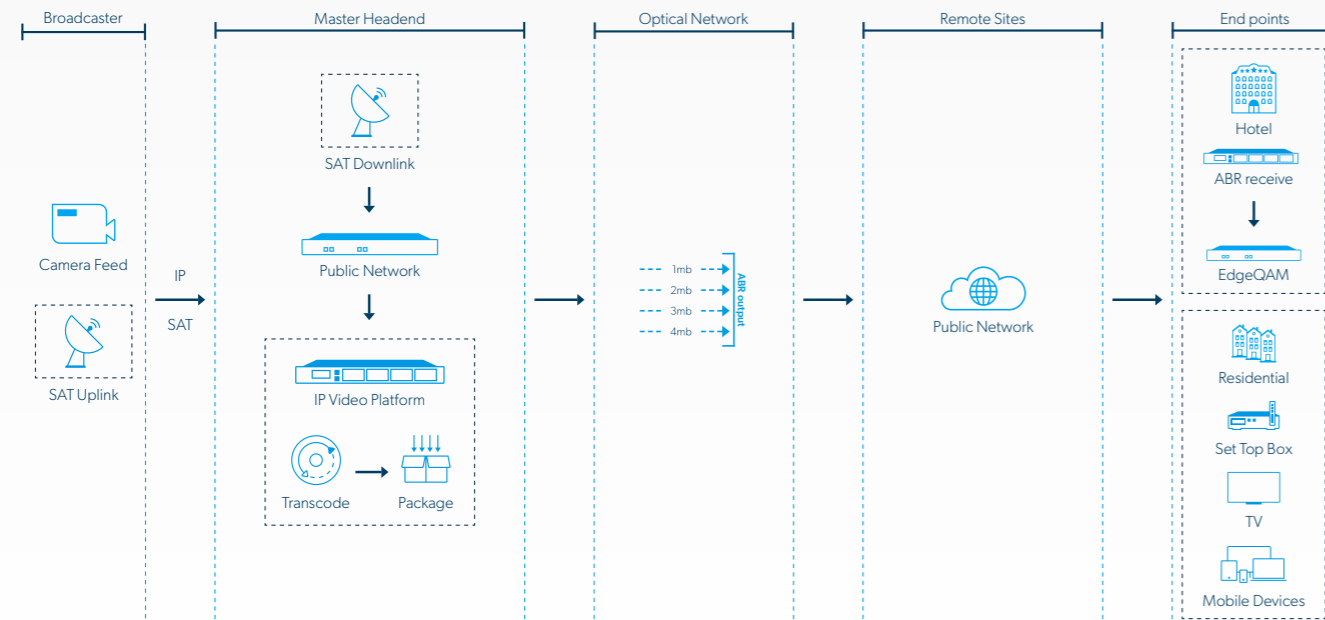
Solutions with tangram



Tangram Applications

ABR Receiver

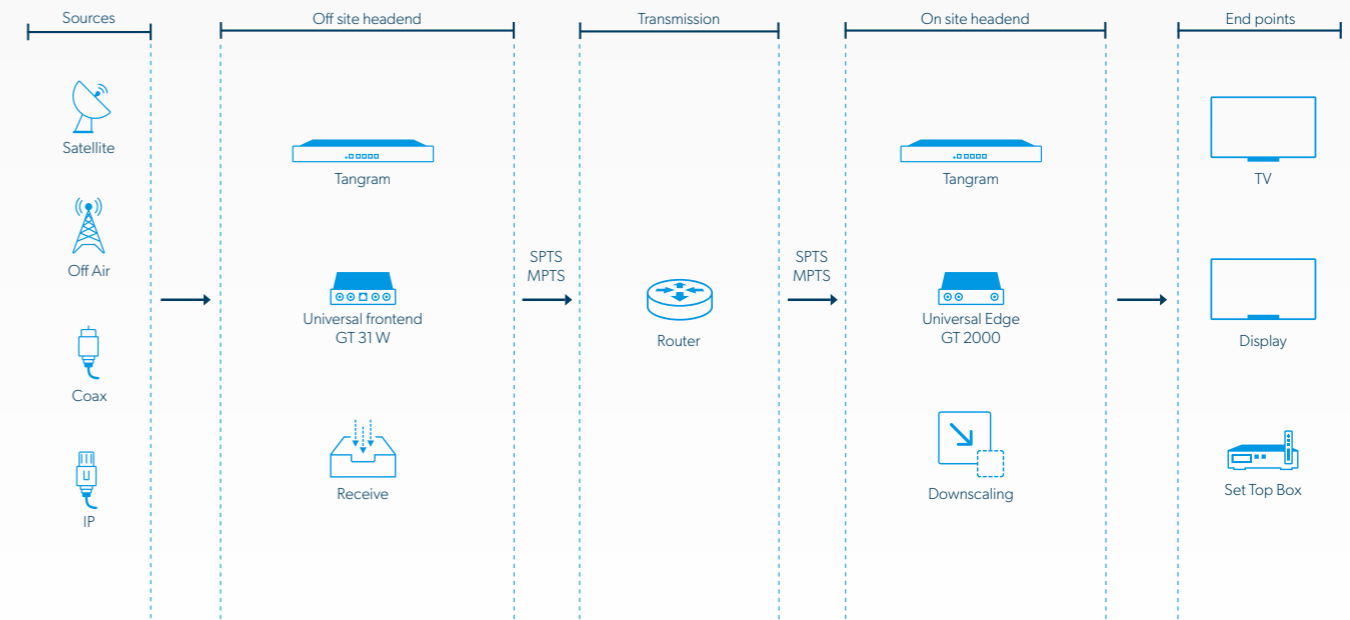
The TANGRAM ABR Receiver allows operators to receive and decrypt ABR (Adaptive Bitrate) streams for business applications. Operators with an existing ABR solution for end customers can reuse these streams to connect hospitality and MDU networks. The integration of MPEG-DASH, the Widevine DRM system and a connector for EPG insertion, as well as flexible IPTV and QAM output, makes this solution the most powerful and universal ABR Receiver on the market.



Tangram Applications

IP to Edge QAM/COFDM/ISDB-T/ PAL/NTSC/SECAM/FM

The TANGRAM edge solutions open the doors to establishing and operating analog and digital cable TV services. It supports a full range of different analog and digital standards like PAL, NTSC, SECAM, QAM, COFDM and ISDB-T. The solution with TANGRAM and OPTOPUS offers high flexibility for building a cable and optical headend, as all functions are performed by individual units that can be added to the system when needed.



Tangram Applications

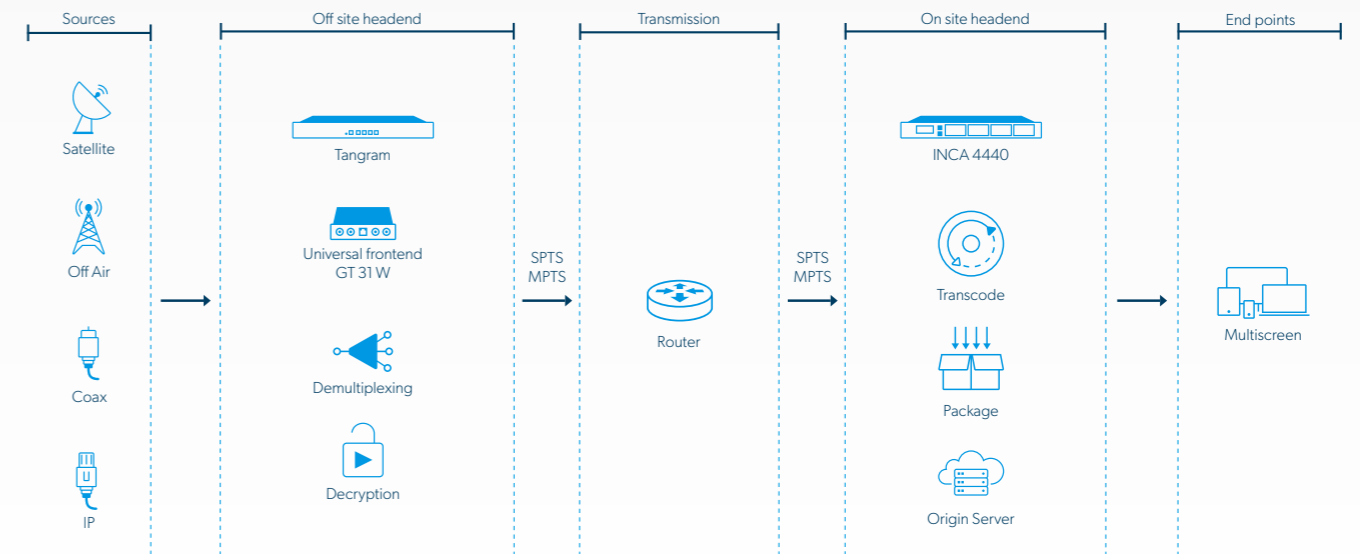
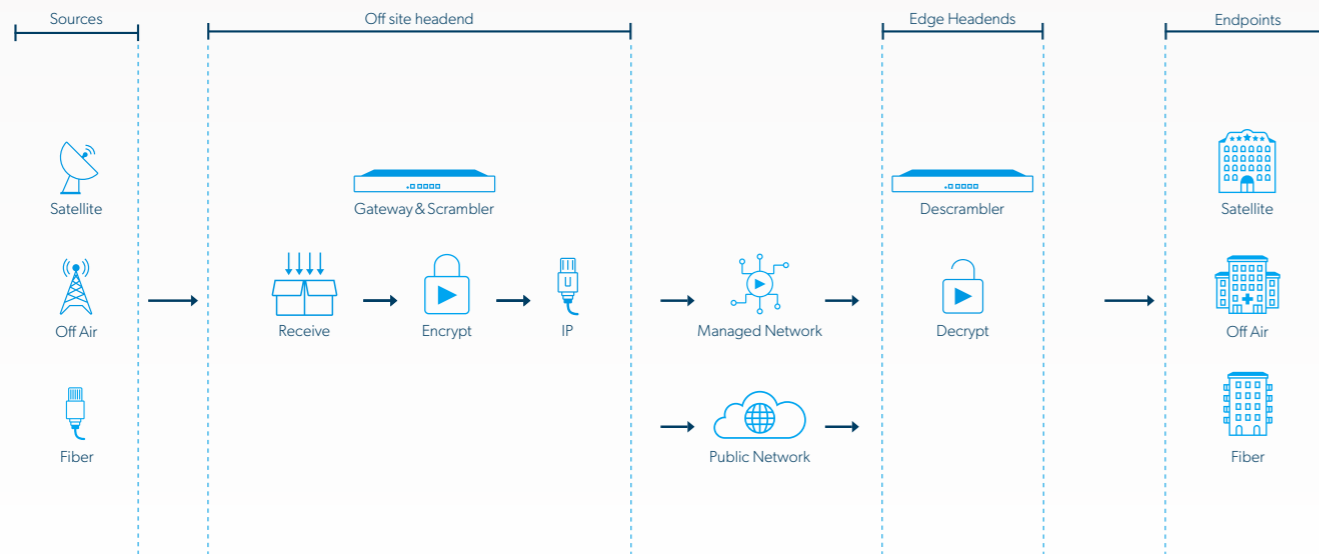
Scrambler / Descrambler

The TANGAM scrambler and descrambler are designed to protect content from unauthorized access. Broadcasters and operators can rely on the latest scrambling technologies such as DVB-AES, BISS1, BISS2, BISS2-CA, DVB-CSA and Verimatrix for use in central headend scramblers. Descrambling at the receiver side ensures legal access and transmission in edge locations. LYNK, VSecure and Pro:Idiom are supported for re-encryption in hospitality projects.

Tangram Applications

DVB - IP Gateway

The TANGAM receivers provide a best-of-class gateway platform for Cable and IPTV operators. The receivers enable flexible receiving of streams and IP encapsulation for different formats of DVB-S/S2/S2X, DVB-T/T2, DVB-C, DVB-ASI, ISDB-T, ATSC, and T2-MI de-encapsulation. The gateway solution is the basis for providing the digital TV content for IP distribution and for all kinds of different applications, like multiscreen transcoding or edge modulation.



Tangram

Product Benefits



High Reliability

The base unit provides a carrier grade chassis and supports a fully redundant concept (1+1, n+1). The intelligent redundant concept guarantees a high system availability and reduces maintenance outages.

- | | |
|---------|---|
| Chassis | <ul style="list-style-type: none"> · Redundant power supply · Hot pluggable fan bay · Gigabit Ethernet port redundancy |
| Module | <ul style="list-style-type: none"> · N+1, 1+1 redundancy · Input transport stream redundancy |



Maximum Flexibility

The modular concept of the TANGRAM platform allows combining the GT modules for your application. You can mix different applications in a single system.

Inputs	<ul style="list-style-type: none"> · IP · MPEG-DASH · SRT · ASI 	<ul style="list-style-type: none"> · DVB-S/S2/S2X · DVB-T/T2 · DVB-C · HDMI 	<ul style="list-style-type: none"> · ISDB-T · ATSC · HD/SDI
Outputs	<ul style="list-style-type: none"> · QAM · COFDM · ISDB-T 	<ul style="list-style-type: none"> · PAL · NTSC · SECAM 	<ul style="list-style-type: none"> · ASI · IP
Processing	<ul style="list-style-type: none"> · Multiplexing · Demultiplexing · Descrambling 	<ul style="list-style-type: none"> · Scrambling · T2-MI de-encapsulation 	<ul style="list-style-type: none"> · EPG regeneration · PSI/SI regeneration



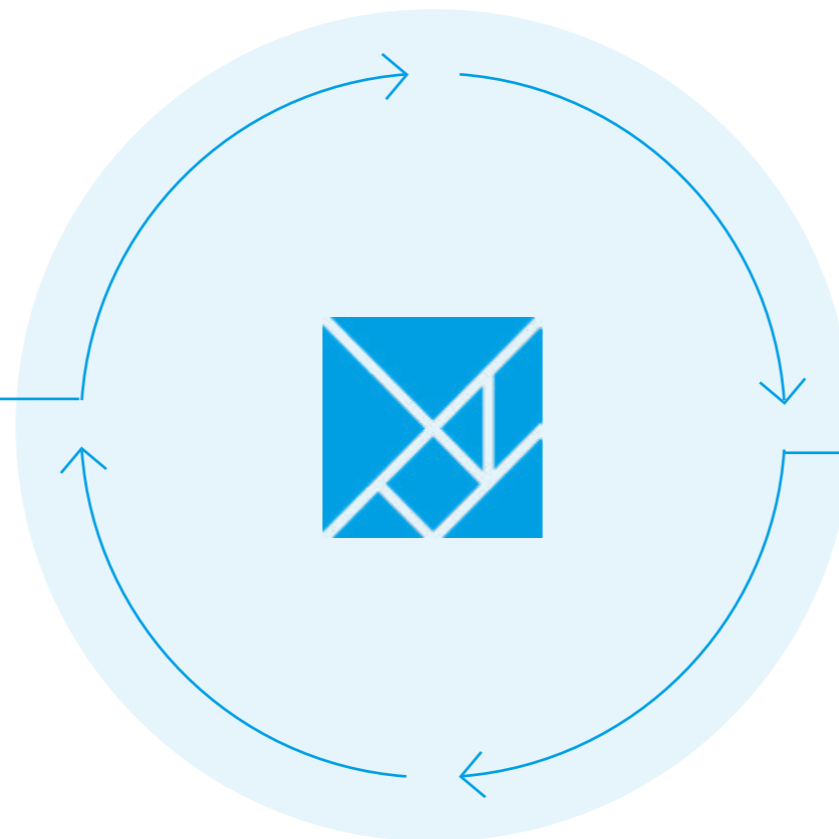
Excellent Cost Performance

The high density Edge modules, the DVB-Gateway with multi tuner support and low power consumption reduces the costs per channel or transponder reception.



Simplicity

TANGRAM is optimized for easy mounting and initial operation. The web UI of TANGRAM is structured to simplify configuration and management, and supports you step by step in getting a running system.



Tangram Chassis Overview

The TANGRAM GT10 base unit is a 1 RU chassis which can fit up to 6 modules at the backside and offers 2x Rj45 + 2x SFP+ streaming interfaces at the front panel. It is available in three different PSU versions, 48V DC, 110V AC and 230V AC. The chassis supports a fully redundant module concept and a hot swappable fan tray.



① 2x SFP+ interfaces with 10 Gbps bandwidth for streaming applications

③ Optional IP input redundancy with up to 3 backup sources

① Additional local management port

③ High reliability by redundant AC and DC power supply

② 2x RJ45 interfaces with up to 10 Gbps bandwidth for streaming applications

④ Easy configuration of the complete platform via 1 management Port

② Flexible Installation
Any module in any slot

④ Hot swappable fan tray

Tangram Chassis



GT10 0230

GT10 0110

GT10 0048

19" 1RU chassis, 1 power supply (230V/AC) and fan tray integrated

19" 1RU chassis, 1 power supply (110V/AC) and fan tray integrated

19" 1RU chassis, 1 power supply (48V/DC) and fan tray integrated

Tangram Power Supplies



GT55E0230

GT55E0110

GT55E0048

Redundant PSU 230V AC for GT10

Redundant PSU 110V AC for GT10

Redundant PSU 48V DC for GT10

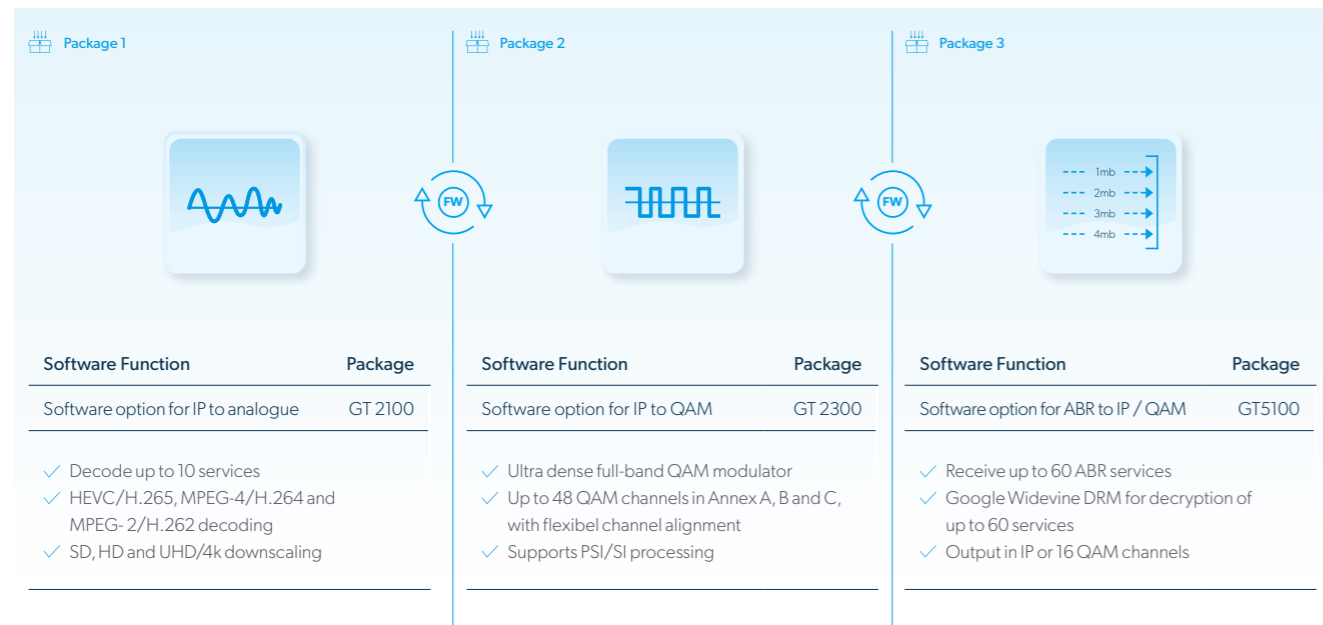


TANGRAM Evolution

Tangram Universal Module IP to Edge



Software Packages for the enhanced module platform GT2000

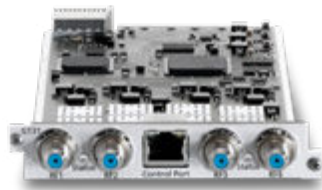


Functionality	Software option	Description
Decoding	GTEDOL	Dolby Digital audio decoding
	GTEBTS	MTS+SAP (BTSC) audio modulation for PAL-M and NTSC
	GTEHEVCD	HEVC Decoding of 1 service
Descrambling	GTEDRM001	Customer specific DRM integration
	GTEWW20	Widevine DRM for 20 services
Management	GTEAPI	REST-API activation
	GTEAUTH	External Access Control
Monitoring	GTEMON	Basic TS Monitoring and Logging
	GTEASE	Basic transport stream monitoring and INCA ASE integration
Redundancy	GTERED	IP input stream redundancy
	GTENRED	N+1, 1+1 module redundancy
	GTECASRED	CAS input redundancy
RF output	GTEQAM8	Additional 8 QAM channels
	GTEABR20	Extension of ABR input by 20 streams
Streaming	GTESTRX	Extension of IP streaming by 128x in- and outputs
	GTESRT	SRT reception and transmission (1 connection)
	GTESRT25	SRT reception and transmission (25 connections)
SUA	GTESUA1	Additional 1 year SUA
	GTESUA3	Additional 3 years SUA
TS Processing	GTEFEC	IP streaming with FEC (Forward error correction)
	GTESYMUX	System wide multiplexing and PSI/SI sharing
	GTEGC	Guide Channel Insertion

Tangram

Input & Encoder Modules

The TANGRAM modules are the pieces of the puzzle that you combine to create your professional video headend solution.



GT31W

DVB-Gateway

- ✓ Multi transport stream reception for DVB signals
- ✓ Up to 4 DVB-S/S2/S2X/C/T/T2/ISDB-T RF inputs
- ✓ DVB/ARIB transport stream processing
- ✓ RTP/ IP FEC output stream protection
- ✓ Demultiplex MPEG-2/MPEG-4 signals for SPTS transmission
- ✓ SPTS and MPTS streaming (CBR or VBR)
- ✓ UDP and RTP MPEG transport stream over IP protocol
- ✓ Transmission of up to 4 SRT streams *(GTSRT)



GT32W

ASI-IP in/out

- ✓ 4x ASI input or output, each BNC port configurable as input or output
- ✓ PID remapping and filtering
- ✓ RTP/ IP input streaming with FEC error correction
- ✓ DVB/ARIB transport stream processing
- ✓ Demultiplexing from MPTS to SPTS
- ✓ High density 24 ASI in or out in 1 RU
- ✓ Supports IP input and output streaming (CBR or VBR)
- ✓ Supports 188 byte and 204 byte packet size
- ✓ Transmission of up to 4 SRT streams *(GTSRT)



GT34

8x/16x DVB-S/S2/S2X - IP Gateway

- ✓ DVB-S/S2/S2X - IP gateway for IPTV, CATV and multiscreen solutions
- ✓ Reception of up to 16x DVB-S/S2/S2X satellite transponders via 4 RF-inputs
- ✓ For saving cabling costs integrated SAT multiswitch
- ✓ Professional DVB transport stream processing
- ✓ SPTS and MPTS streaming (CBR or VBR)
- ✓ UDP and RTP MPEG transport stream over IP protocol
- ✓ High-density reception of 96 transponders in 1 RU



GT35

HD/SD Encoder with 4x HDMI

- ✓ HD/SD MPEG-4 (AVC, H.264) and HD/SD MPEG-2 video encoding
- ✓ Up to 4 HDMI inputs per module
- ✓ Professional multiplexer integrated
- ✓ SPTS and MPTS streaming (CBR or VBR)
- ✓ Supports PSI/SI processing
- ✓ Integrated into the TANGRAM System-Management
- ✓ Control and management via web-UI
- ✓ Transmission of up to 4 SRT streams *(GTSRT)



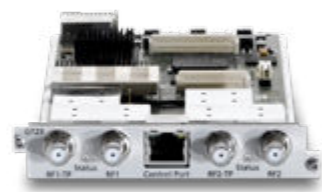
GT36

HD/SD Encoder with 4x SDI or A/V inputs

- ✓ HD/SD MPEG-4 (AVC, H.264) and HD/SD MPEG-2 video encoding
- ✓ Up to 4 HDMI inputs per module
- ✓ Professional multiplexer integrated
- ✓ SPTS and MPTS streaming (CBR or VBR)
- ✓ Supports PSI/SI processing
- ✓ Integrated into the TANGRAM System-Management
- ✓ Control and management via web-UI
- ✓ Transmission of up to 4 SRT streams *(GTSRT)

Tangram Edge Modules

The TANGRAM modules are the pieces of the puzzle that you combine to create your professional video headend solution.



GT21W

Edge PAL/NTSC/SECAM

- ✓ High quality IP to analog PAL/SECAM/NTSC modulation
- ✓ Up to 6 analog channels on 2 RF outputs*
- ✓ Outstanding signal parameters by direct digital modulation
- ✓ HD to SD downscaling functionality
- ✓ MPEG-2 H.262 and MPEG-4 H.264 decoding (SD & HD)
- ✓ RTP/ IP input streaming with FEC error correction
- ✓ Supports the reception of SRT (*GTSRT)

GT23W

Edge QAM

- ✓ High quality IP to QAM modulation
- ✓ Up to 12 QAM channels on 2 RF outputs
- ✓ High density 72 QAM channels in 1 RU
- ✓ For measurement / monitoring test ports of the output signal
- ✓ DVB CSA Simulcrypt scrambling
- ✓ RTP/ IP input streaming with FEC error correction
- ✓ DVB/ARIB transport stream processing
- ✓ QAM channels individually switchable on/off
- ✓ Supports the reception of SRT (*GTSRT)

GT24W

Edge COFDM

- ✓ High quality IP to COFDM modulation
- ✓ Up to 8 COFDM channels on 2 RF outputs
- ✓ Outstanding signal parameters by direct digital modulation
- ✓ RTP/ IP input streaming with FEC error correction
- ✓ High density 48 COFDM channels in 1 RU
- ✓ DVB/ARIB transport stream processing
- ✓ DVB CSA Simulcrypt scrambling
- ✓ Supports the reception of SRT (*GTSRT)

GT26

Edge ISDB-T

- ✓ High quality IP to ISDB-T modulation
- ✓ Up to 4 ISDB-T channels on 2 RF outputs
- ✓ Outstanding signal parameters by direct digital modulation
- ✓ RTP/ IP input streaming with FEC error correction
- ✓ DVB/ARIB transport stream processing
- ✓ Output detection for alarming and redundancy switching
- ✓ Up to 24 ISDB-T channels in 1 RU
- ✓ Supports the reception of SRT (*GTSRT)

*Up to 6 for SD or up to 3 HD to SD and 3 SD

Tangram

Switch Extension & Processing Modules

The TANGRAM modules are the pieces of the puzzle that you combine to create your professional video headend solution.



GT41W

IP Processing

- ✓ High density MPTS & SPTS IP Gateway
- ✓ Scrambling for IPTV out (CSA, AES, Philips VSecure, Pro:Idiom, Samsung LYNK)
- ✓ DVB CSA Simulcrypt and BISS scrambling
- ✓ Advanced DVB transport stream processing
- ✓ Supports MPEG-2/H.262, MPEG-4/H.264 and HEVC/H.265 scrambling (SD & HD)
- ✓ SPTS/MPTS streaming and receptions (CBR or VBR)
- ✓ Verimatrix bulk decryption
- ✓ Dedicated Ethernet interface for CAS connection



GT42W

Descrambler

- ✓ 4x Common Interface (DVB-CI) slots per module
- ✓ CAM watchdog - auto reset on descrambling failures
- ✓ Support for all major CA systems and CAMs
- ✓ Advanced DVB transport stream processing
- ✓ SPTS and MPTS streaming (CBR or VBR)
- ✓ Demultiplexing MPEG-2/4 signals for SPTS transmission
- ✓ High density descrambling 24 CA modules per 1RU chassis
- ✓ FEC output support – IP error protection

For more technical informations, please visit:

[katalog.wisi.de](https://www.katalog.wisi.de)

Tangram

Software Options

Software options are licence files that enable the defined functionalities. The software options can be bought at the same time as the hardware, or as a separate order. You can add software options to an existing TANGRAM at any time, when you want more functionality. More technical info can be found at katalog.wisi.de

Functionality	Software option	Description
Decoding	GTDOL	Dolby Digital audio decoding
	GTFMADV	Decoding of HE-AAC audio for FM radio outputs
	GTBTS	MTS+SAP (BTSC) audio modulation for PAL-M and NTSC
Descrambling	GTBISS	BISS descrambler for 8 services
	GTVMX	Verimatrix Bulk descrambler for 32 services
	GTVMXX	Verimatrix Bulk descrambling extension by 96 services
Management	GTEAPI	REST-API activation
	GTEAUTH	External Access Control
Monitoring	GTMON	Basic TS Monitoring and Logging
	GTASE	Basic transport stream monitoring and INCA ASE integration
Others	GTOS2	8 additional DVB-S/S2/S2X tuners
	GTXMLTV	EIT to XMLTV export
Redundancy	GTRED	IP input stream redundancy
	GTNRED	N+1, 1+1 module redundancy
	GTCASRED	CAS input redundancy
Streaming	GTSTRX	Extension of IP streaming up to 128x in- and outputs
	GTSTRXL	Extension of IP streaming up to 256x in- and outputs
	GTSRT	SRT reception and transmission
SUA	GTM1	Additional 1 year SUA
	GTM3	Additional 3 years SUA

Functionality	Software option	Description
Scrambling	GTSCR	DVB-Simulcrypt scrambler 32 services
	GTSCRX	DVB-Simulcrypt scrambling extension by 96 services
	GTSCRXL	DVB-Simulcrypt scrambling extension by 128 services
	GTSCRPROX	DVB-CSA scrambling Proxy-System
	GTPISCR8	Pro:Idiom scrambler for 8 services
	GTPISCR16	Pro:Idiom scrambler for 16 services
	GTPISCR24	Pro:Idiom scrambler for 24 services
	GTLYNK	Samsung LYNK scrambler for 32 services
	GTLYNKX	Samsung LYNK scrambler extension by 96 services
	GTAES	Simulcrypt AES-128 scrambler for 32 services
	GTAESX	Simulcrypt AES-128 scrambling extension by 96 services
	GTVSEC	Philips Vsecure scrambler for 32 services
	GTVSECX	Philips Vsecure scrambling extension by 96 services
	GTFC	IP streaming with FEC (Forward error correction)
	GTMUX	Enabling the multiplexer
TS Processing	GTPSISI	PSI/SI sharing and regeneration
	GTSYMUX	Multiplexing and PSI/SI sharing
	GTT2MIDE	1x T2-MI de-encapsulation pf 2 PLPs
	GTD2MIDE	2x T2-MI de-encapsulation pf 2 PLPs
	GTQT2MIPL	Extract 4 additional PLPs

100 years at the forefront of technological development.

As a global pioneer in reception and distribution technology, WISI looks back on a century of innovation. Since 1926, we have evolved into a leading system provider for CATV, mobile communication, and high-frequency connectors. Over the past 100 years, we have mastered the art of turning visions into pioneering, high-quality products. As converging media and broadband services require intelligent transport channels, this remains our core business. As a technology supplier for key communication sectors, we remain dedicated to innovation as we embark on our second century.

