TANGRAM

SOLVING YOUR PUZZLE

WISI

High Density Video Platform

TANGRAM
The High Performance Headend for Gateway and Edge Applications

Solutions with TANGRAM

CHANNEL PROCESSING

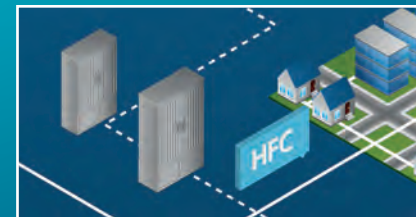Headends for residential, regional and national networks.

RF OVERLAY

Solutions for video services in GPON and Active Ethernet networks.

HOUSING INDUSTRY

Headends for housing complexes, hotels and hospitals.

HFC

From the Headend to the wall-outlet: Everything for the cable network.

TANGRAM

Maximum performance, minimum footprint

The TANGRAM platform is a very highly customizable and offers advanced DVB stream processing in a small footprint 1 RU chassis concept. The TANGRAM chassis can be equipped with 6+1 modules and comes with an integrated GigE Switch.

The integrated switch operates as a configurable switching unit for audio / video streaming via Gigabit Ethernet and managed themodules for the redundancy mechanism. One port of the GT11 provides the management interface.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 / T / T2 Reception

■ Descrambling and Scrambling

■ Remultiplexing and PSI/SI Processing

■ Digital and analogue Edge Modulation

■ QAM, PAL, FM, COFDM

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 (EdgeQAM, EdgePAL, EdgeFM or Edge COFDM) 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. Each module, fans and power supplies are hot swappable.

Advantages at a glance

■ Small footprint in 1RU chassis

■ Fully redundant concept (1+1, n+1)

■ Scrambling and remultiplexing

■ Carrier grade chassis with optional redundant power supplies

■ Combine GT modules for your application

■ Hot swappable fan tray

■ Modular architecture

■ Embedded switch

TANGRAM Software Options

Software options are license files that enable running the functions defined functionalities. The software options can be bought at the same time as the hardware, or alternatively as a separate order. You can add software options to an existing TANGRAM at any time, come need for additional functionality. More information about software options can be found at wisi.de.

Service License Agreement
GTM1/GTM3

The TANGRAM product platform is continuously evolved and developed with new or extended functionalities. To benefit from the development, you can upload new firmware versions in your existing installations. To be allowed to upgrade to a new firmware version, you must have a valid Service License Agreement. All TANGRAMs get a one year SLA from the date of registration on wisiconnect.tv.

Dolby Decoding
GTDOL

The TANGRAM Dolby decoding for analogue output is enabled by the software option GTDOL. The Dolby decoding allows reception of Dolby audio sound and decoding to support the different audio output formats for analogue (PAL and SECAM) modulation. The GTDOL software option requires a Dolby enabled TANGRAM hardware.

IP Forward Error Correction
GTFEC

The TANGRAM GTFEC software option provides an advanced error correction and error protection for IP Streams. For IP SPTS or MPTS streaming reception is FEC useful to correct errors in the packets and improving the quality of service. FEC for output streaming with error protection enables TV operators to deliver high-quality error resistant IP streams from the headend.

Simulcrypt Scrambling
GTSCR

Scrambling in the TANGRAM is enabled by the software options GTSCR (Simulcrypt scrambling). The GTSCR software option allows you to use the TANGRAM as a scrambler for encryption of the output services by connecting to a Conditional Access Server (CAS) via the IP interface.

N+1 Redundancy
GTNRED

The N+1 module redundancy for GT01Wx is enabled by the software option GTNRED. The N+1 redundancy for GT01Wx provides the functionality to set up redundancy group, and assigning TANGRAM modules as "master" or "reserve" or "none" for a group. The "reserve" TANGRAM in a redundancy group is kept "offline" until it needs to be used due to a failure in an operational TANGRAM.

Remultiplexing & PSI/SI
GTMUX, GTPSISI, GTSYMUX

Remultiplexing and PSI/SI handling in the TANGRAM platform and in a system of TANGRAMs are enabled by the software options GTMUX (remultiplexing in a single TANGRAM), GTPSISI (enabling PSI/SI sharing between TANGRAMs), and GTSYMUX (remulti-plexing in a system of TANGRAMs).

IP Input Redundancy
GTRED

IP input redundancy in the TANGRAM is enabled by the sotware options GTRED. The IP input redundancy handles switching between sources carrying identical information, e.g. dual sources for securing operation also for cases where one source fails completely.
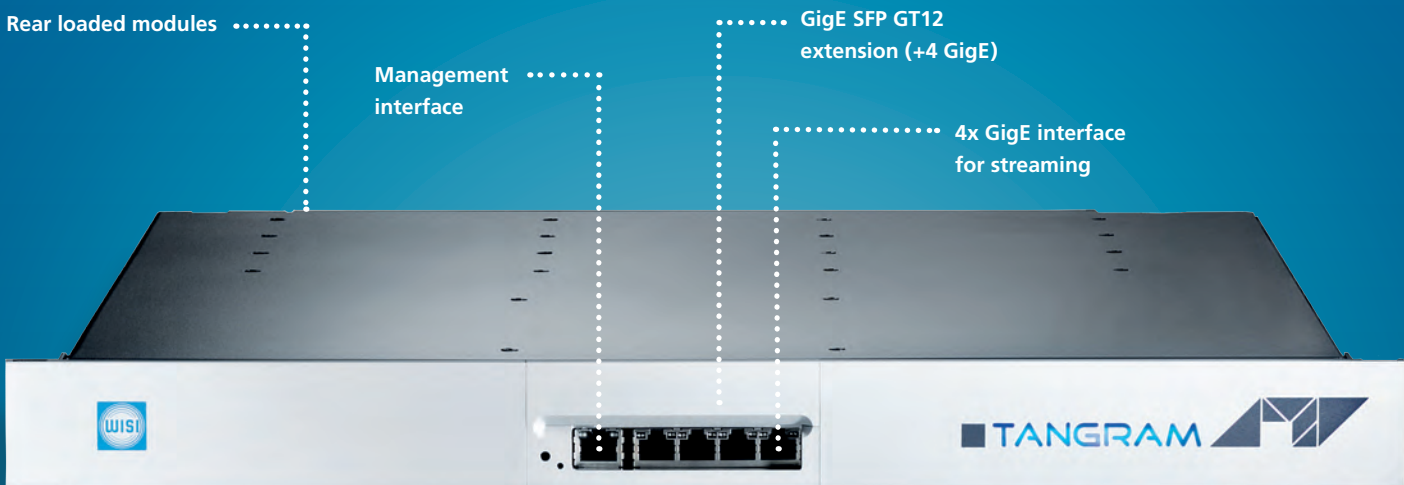
WISI CONFIGURATOR

The WISI Configurator provides an online tool for selecting software options. Once an order has been processed, the entitlement file containing licences for the software options is available for download from the wisiconnect.tv portal.

In order to gain access to the WISI Configurator you need to register as a customer. You can do this at the WISI Configurator website, configurator.wisi.de.

TANGRAM Chassis Overview

The TANGRAM chassis is a 1 RU chassis which can fit up to 6 modules on the backside and 1 module on the front panel. It comes with an embedded switch on the backplane (GT01W, GT11) and a hot swappable fan tray. The GT01W is a carrier grade chassis and supports a fully redundant concept (1+1, n+1).

Rear loaded modules

Management interface

GigE SFP GT12 extension (+4 GigE)

4x GigE interface for streaming

Additional management port for local connection

Any module in any slot

Redundant AC and DC power supply

TANGRAM Modules

The TANGRAM modules are the pieces of the puzzle that you combine to create your professional video headend solution.
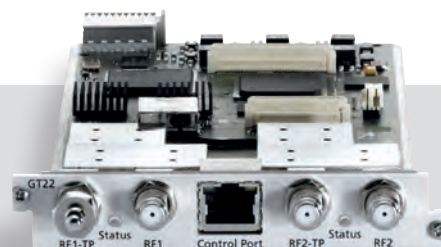
GT21W
EdgePAL

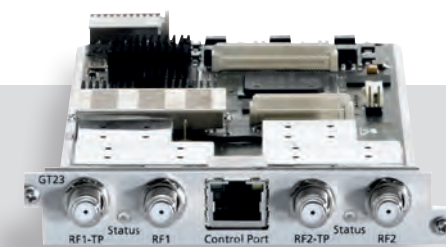| Features |
|---|
| High quality IP to analogue PAL/SECAM/NTSC modulation |
| Up to 6 analogue channels on 2 RF outputs |
| Outstanding signal parameters by direct digital modulation |
| HD to SD downscaling functionality |
| MPEG-2 H.262 and MPEG-4 H.264 decoding (SD & HD) |
| For measurement/monitoring test ports of the output signal |
| Temperature and output level monitoring |
| RTP/IP input streaming with FEC error correction |

GT22C
EdgeFM

Features
High quality IP to analogue FM modulation
Up to 8 FM channels on 1 RF outputs
Advanced MPEG decoding
Outstanding signal parameters by direct digital modulation
High density 48 FM channels in 1 RU
RTP/IP input streaming with FEC error correction
RDS extraction and insertion
For measurement/monitoring test ports of the output signal

GT23W
EdgeQAM

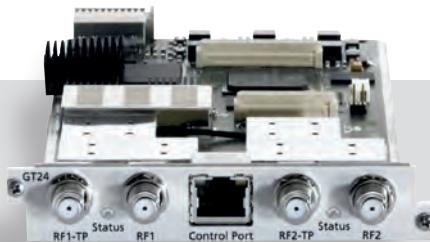| Features |
|---|
| High quality IP to QAM modulation |
| Up to 8 QAM channels on 2 RF outputs |
| High density 48 QAM channels in 1 RU |
| For measurement/monitoring test ports of the output signal |
| DVB CSA Simulcrypt scrambling |
| RTP/IP input streaming with FEC error correction |
| Advanced DVB transport stream processing |
| QAM channels individually switch on/off |

TANGRAM Chassis

GT01W0230

- 19" 1 RU chassis with backplane, 1 power supply (230 VAC), fan tray and integrated GigE switch (GT11)

GT01W0048

- 19" 1 RU chassis with backplane, 1 power supply (48 VDC), fan tray and integrated GigE switch (GT11)

GT24W
EdgeCOFDM

Features
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
Advanced DVB transport stream processing
For measurement/monitoring test ports of the output signal
DVB CSA Simulcrypt scrambling

GT31W
DVB-Gateway

Features
Multi transport stream reception for DVB signals
4x DVB-S/S2/C/T/T2 RF inputs
Advanced DVB transport stream processing
RTP/IP FEC output stream protection
High density reception 24 transponder in 1 RU
Demultiplexing of MPEG-2/4 signals for SPTS transmission
SPTS and MPTS streaming (CBR or VBR)
UDP and RTP MPEG transport stream over IP protocol

GT32W
ASI–IP in/out

NEW module

Features
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
Advanced DVB 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 188byte and 204byte packet size

TANGRAM Power Supplies

GT55W0230

■ **Redundant PSU 230V AC for GT01W**

GT55W0048

■ **Redundant PSU 48V DC for GT01W**

GT41W
IP Processing

NEW module

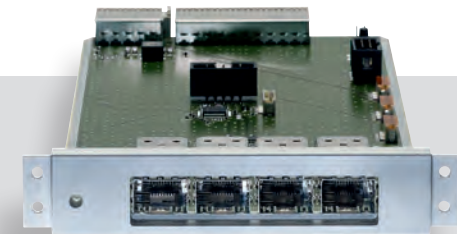| Features |
|---|
| High density MPTS ↔ SPTS IP Gateway |
| DVB Scrambling for IPTV out |
| DVB CSA Simulcrypt scrambling |
| Advanced DVB transport stream processing |
| Supports MPEG-2 H.262 and MPEG-4 H.264 scrambling (SD & HD) |
| SPTS/MPTS streaming and receptions (CBR or VBR) |
| High flexibility scrambling on PID Level |
| Dedicated Ethernet interface for CAS connection |

GT42W
Descrambler
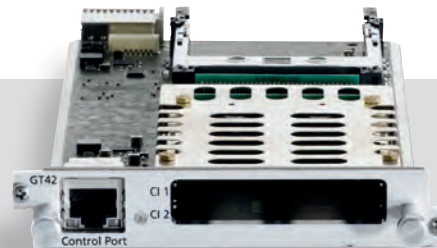
Features
4 Common Interface (DVB-CI) slots per module
CAM watchdog - auto reset on descrambling failures
Support for all major CA systems and CAMs
Advanced DVB transport stream processing
SPTS and MPTS streaming (CBR or VBR)
Demultiplexing MPEG-2/4 signals for SPTS transmission
High density descrambling 24 CA modules per 1RU chassis
FEC output support – IP error protection

GT12W
SFP Switch Extension Board

Features
4x SFP slots for optical or electrical access
High flexibility for bandwidth extension
Port and service redundancy for external connection (main/backup)
Support of standard SFPs
Bandwidth Port Monitoring

TANGRAM Technical Specifications

DVB-T / T2 Receivers (GT31W)

Impedance	75 Ω
Input frequency range	43-1002 MHz
Input level range	39 to 79 dBµV
DVB compliance	DVB-T (EN300744) DVB-T2 (EN302755)
Return loss	>18 dB @ 47 MHz >12 dB @ 862 MHz
Bandwidth (DVB-T) (DVB-T2)	6/7/8 MHz 1.7/5/6/7/8 MHz and ext. bandwidth
FEC inner code	Conv., K=7, G= 1/2, 2/3, 3/4, 4/5, 5/6, 7/8
COFDM spectral	2k and 8k FFT
Guard interval	1/32, 1/16, 1/8, 1/4

DVB-S / S2 Receivers (GT31W)

Impedance	75 Ω
Input frequency range	925-2150 MHz
Input level range	45 to 90 dBµV
DVB compliance	DVB-S (EN300421) DVB-S2 (EN302307)
Return loss	>12 dB
DiSEqC	DiSEqC 1.0. Supporting control of upo to 4 satellite sources
FEC inner code	LDCP (1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10)
LNB voltage / power	13/18 V, 0,4A max.

DVB-C Receivers (GT31W)

Impedance	75 Ω
Input frequency range	43-1002 MHz
Input level range	49 to 90 dBµV (QAM256)
DVB compliance	DVB-C (EN300429/ ITU J.38 Annex A)
Return loss	>18 dB @ 47 MHz >12 dB @ 862 MHz
QAM modulation scheme	16-, 32-, 64-, 128-, 256-QAM
DVB-C symbol rate	1 to 7.2 MBaud

VSB –AM PAL Modulation (GT21W)

Standards	PAL B/G, D/K, L,M, N SECAM D/K, B/G, L NTSC
Sound	Mono, Stereo, Dual NICAM, A2
Modulation video	VSB AM, neg. or pos.
Modulation audio	Audio FM or AM
Output frequency	45-862 MHz
Output level	117 dBµV (1 ch) 113 dBµV (2 ch) 111 dBµV (3 ch)
Video S/N (weighted)	1 channel typ. 64 dB

DVB-C QAM Modulation (GT23W)

QAM mode	16, 32, 64, 128 and 256 QAM
Symbol rate	4.45 - 7.0 MBauds/s
MER (at RF out)	> 45 dB, typ. 46 dB
QAM output frequency	43-1002 MHz
Output level	119 dBµV (1 ch) 115 dBµV (2 ch) 113 dBµV (3 ch) 111 dBµV (4 ch)
DVB compliance	DVB-C (EN 300 429)

CI Multidecryption (GT42W)

Number of CI slots	4 CI slots
Supported bit rates	55/66/72 Mbit/s
DVB Compliance	EN 50221

ASI input/output (GT32W)

Impedance	75 Ω
Frequency range	< 270 MHz
Return loss	> 17 dB (27-270 MHz)
Compliance	EN 50083-9:2002
Packet size Input | Output	188 byte and 204byte | 188 byte
PCR restamping	Yes
Input/Output max. payload bit rate	Typical 200 Mbit/s

WISI Support

When you buy a TANGRAM product you also receive premium support service with access to support forums, FAQ sections, and documentation. All TANGRAMs come with our easy-to-use embedded web UI, which makes configuration effortless.

WISICONNECT.TV

At the start page of the portal, you can request access, or if you already have an account, you can log in. The main functionality of the portal is to provide you with a repository for information about your TANGRAMs. All your registered TANGRAMs will be listed, and you can add textual information such as installation site or the function for each TANGRAM. For each TANGRAM, you also have information about the purchased software options, and you can download the entitlement file (the license file enabling the software options).

Product documentation such as user manuals, release notes etc. are available for download from the portal. All released firmware versions are also available for download.

The FAQ and Forum gives additional help, and allows you to share questions and information with other TANGRAM users.

THE WEB UI

The TANGRAM is configured and managed via a web UI. Each TANGRAM contains an embedded web server, and no propriety control software is needed. To connect to the UI of a TANGRAM, simply start a browser on your computer and type the IP address of the TANGRAM in the address field.

The web UI of TANGRAM is structured to simplify configuration and management. Following the different parts of the UI in order, Inputs, Outputs, Service Management, will take you through all basic settings you need to do to set up a working configuration.

SERVICE LICENSE AGREEMENT

The TANGRAM product platform is continuously enhanced and new functionality both in terms of new software options and as new firmware versions are released. To allow our TANGRAM users to upgrade for added functionality, a Service Licence Agreement (SLA) is included in each purchase of a TANGRAM.

The validity period of the SLA included is one year, and the SLA can be extended at any time. As long as a TANGRAM has a valid SLA, new firmware versions can be uploaded, hence giving the user access to enhancements.

WISI Full Service

Your Comprehensive Business Partner

CONSULTING

WISI consulting and professional services adds value to your business by providing architecture, implementation and integration services to help you to plan, build, improve and innovate your TV and HFC networks solution.

TIMING

We provide you with a complete, time-efficient and tailor-made project plan, and enhance your business with customized products.

Our key account management and broad product portfolio enables you to acquire the complete solution from a single source.

IMPLEMENTING

With our vast experience in building HFC networks and our manufacturing facilities in Germany we can – together with our local partners – accomplish implementations faster without sacrificing quality.

ENGINEERING

With over eight decades of experience in edge and reception technology, WISI develops and engineers highly efficient high density products and solutions with the best quality of service, made in Germany.

Any video from any source to any device

WISI