



## GT 01W Tangram with GT21 Edge-Decoder ( IP to PAL )



**GT 01** *WISI Tangram* chassis

## GT 21 WISI Tangram PAL module



### **Features:**

The GT21 module is part of the Tangram product portfolio.

WISI Tangram is an FPGA technology based Headend for use in FTTx and HFC networks. The Tangram platform shows very high density and is highly flexible for all kinds of networks use.

- Gigabit Ethernet MPEG-TS to analogue PAL /SECAM Decoder
- MPEG-2 & MPEG-4 h.264 decoding (SD & HD downscaling)
- Up to 6x PAL outputs (SD)
- Test ports for the output signal
- Outstanding signal parameters by direct digital modulation & adapted output filter
- User friendly configuration via standard Webbrowser
- Low electrical power consumption

This page is intended to be empty



## Table of contents

|        |   |    |
|--------|---|----|
| 1      | Safety instructions .....                                       | 6  |
| 1.1    | ESD protection .....  | 6  |
| 2      | Technical data / Mechanical overview .....                      | 7  |
| 2.1    | GT 21 Module Front view .....                                   | 7  |
| 3      | Installation, configuration and maintenance .....               | 8  |
| 3.1    | Module installation .....                                       | 8  |
| 3.2    | Tangram Front IP Ports .....                                    | 10 |
| 3.2.1  | IP / Ethernet Ports at the Front of Tangram .....               | 10 |
| 3.3    | Tangram RF / Video Modules Slots .....                          | 11 |
| 3.3.1  | Chassis slots GT01 .....  | 11 |
| 3.3.2  | GT21 Modules ports .....  | 11 |
| 3.4    | Configuration of Tangram .....                                  | 12 |
| 3.4.2  | Connecting to the default Management IP address: .....          | 13 |
| 3.4.3  | SETTINGS Tab: Changing the IP address to your own Network ..... | 13 |
| 3.5    | Tangram GT11 / 12 Switch modules / Main Control Page .....      | 14 |
| 3.5.1  | Main Status GT11- Control .....                                 | 14 |
| 3.5.2  | Future GT11 main updates / upgrades .....                       | 14 |
| 3.6    | Tangram GT11 / 12 internal Switch / Control tab .....           | 15 |
| 3.6.1  | Modules tab .....   | 15 |
| 3.6.2  | Module Status and Settings .....                                | 15 |
| 3.6.3  | n+1 Module Redundancy .....                                     | 15 |
| 3.6.4  | Module Redundancy status .....                                  | 15 |
| 3.7    | Tangram Front IP Port Groups .....                              | 16 |
| 3.7.1  | IP / Ethernet Ports Groups (using internal VLAN IDs) .....      | 16 |
| 3.8    | Configuration of Modules .....                                  | 17 |
| 3.8.1  | Connecting to the Modules: .....                                | 17 |
| 3.8.2  | Adding additional IP addresses to the modules (optional) .....  | 17 |
| 3.9    | Tangram & SW options .....                                      | 18 |
| 3.9.1  | Connect to WISI portal & activating the output Modules: .....   | 18 |
| 3.11   | Configuring Inputs .....  | 19 |
| 3.11.3 | Redundant Input Sources .....                                   | 22 |

|  |    |
|--|----|
| Managing the Tangram modules .....                                       | 31 |
| 3.14.2 Setting up the Module Operation Mode .....                        | 31 |
| 4. GT21 Module Status Information .....                                  | 40 |
| 5. GT21 Module LEDs & Alarms.....  | 41 |
| 5.1 GT21 master board.....   | 41 |
| 5.5.1 Status LED states .....  | 41 |
| 5.5.2 Status LED indication .....  | 42 |
| 5.6 GT21 slave board LEDs (only informational use – internal LEDs) ..... | 43 |
| 5.6.1 Status LED states .....  | 43 |
| 5.6.2 Status LED indication.....   | 43 |

## Document Revision Information

| Date finished | Document Rev. | GT 21 SW Version | Description                   | Name     |
|---------------|---------------|------------------|-------------------------------|----------|
| 2011-12-22    | 0.1- 0.9      | 0.9              | Versions for Pre-GT           | PK , a2b |
| 2012-08-22    | 1.0           | 1.0              | Adapted for GT in PP          | HP,KD    |
| 2012-09-04    | 1.1-1.3       | 1.0              | WISI doc. design, Updates     | KD       |
| 2012-09-11    | 1.4-1.47      | 1.1              | GT11 TDG Updates              | KD       |
| 2012-11-05    | 1.48-1.49     | 1.2              | Module Updates                | KD       |
| 2012-12-03    | 1.50-1.51     | 1.3              | TDG Inputs, Updates           | KD       |
| 2012-12-16    | 1.52          | 1.4              | TDG Inputs, Updates           | KD       |
| 2013-01-07    | 1.53          | 1.4.1            | Three Modi, DualMono, Updates | KD       |



## **1 Safety instructions**

### **1.1 ESD protection**

This product contains electrostatic sensitive devices. These devices can be damaged or effectively destroyed by electrostatic discharge (ESD) during unpacking, installation, removal, storage, or shipment if incorrectly handled. Please note that discharge might go unnoticed by a user. Always take normal static precautions when handling the equipment!

## 2 Technical data / Mechanical overview

### 2.1 GT 21 Module Front view



RF Test-output 1  
(-20 dB)

RF output 1

RJ45 control  
port for module

RF Test-output 2  
(-20 dB)

RF output 2

GT21 module view

For best performance please always terminate the Test-points ( $z = 75 \text{ Ohms}$ ).

### 3 Installation, configuration and maintenance

#### 3.1 Module installation

The GTxx modules are single function modules. The modules are hot-swappable and can be plugged into the chassis from the back. On the front side there are the switch modules plus the power supplies and the removable fan tray behind the panel.

The physical Installation of GTxx modules, Power supplies & Fan modules into Tangram GT01 chassis is described in detail in the GT01 & GTxx Installation Quick Guides, please refer to them in case you have to put or remove a module.



Quick Guide

GT 01W Tangram Basic unit



Quick Guide

GT 21W Tangram Module IP Stream to PAL





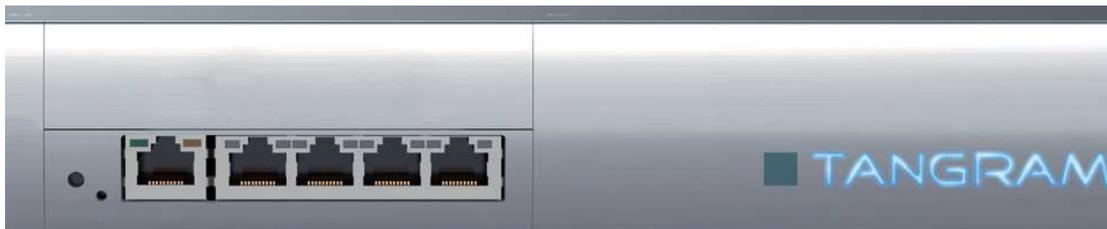
This page is intended to be empty



### 3.2 Tangram Front IP Ports

#### 3.2.1 IP / Ethernet Ports at the Front of Tangram

Tangram has up to 9x GigE ports at the front side, 5x RJ-45 100/1000T with GT11 and optionally additional 4x SFP ports with GT12 at the upside position (Slot 8).



Tangram with GT11 Switch module (Slot 7)



Tangram equipped with GT11 & GT12 Switch modules

The numbering on Tangram is always from down to up and from left to right, the first lower Port on GT11 left is determined for out-of-band Management.

**GT11 Port Group-Member settings:**

|           | RJ 45 |
|-----------|-------|-------|-------|-------|-------|
| Port :    | MAN   | 1     | 2     | 3     | 4     |
| Group ID: |       | A ▾   | B ▾   | C ▾   | D ▾   |

Cancel Save

Port numbering on GT11 & GT12

**GT12 Port Group-Member settings:**

|           | RJ 45 | RJ 45 | RJ 45 | RJ 45 |
|-----------|-------|-------|-------|-------|
| Port :    | 1     | 2     | 3     | 4     |
| Group ID: | E ▾   | E ▾   | E ▾   | E ▾   |

Cancel Save

### 3.3 Tangram RF / Video Modules Slots

#### RF Modules and Ports at the Rear of Tangram

##### 3.3.1 Chassis slots GT01

Tangram has up to 6 module slots on the rear side.



Tangram rear view (Example)



The numbering on Tangram modules is always from down to up and from left to right, the first lower Module on the left (seen from the back) is the first, second is above.

##### 3.3.2 GT21 Modules ports



RF Test-output 1 (-20 dB)

RF output 1

RJ45 control port for module

RF Test-output 2 (-20 dB)

RF output 2

GT21 module view

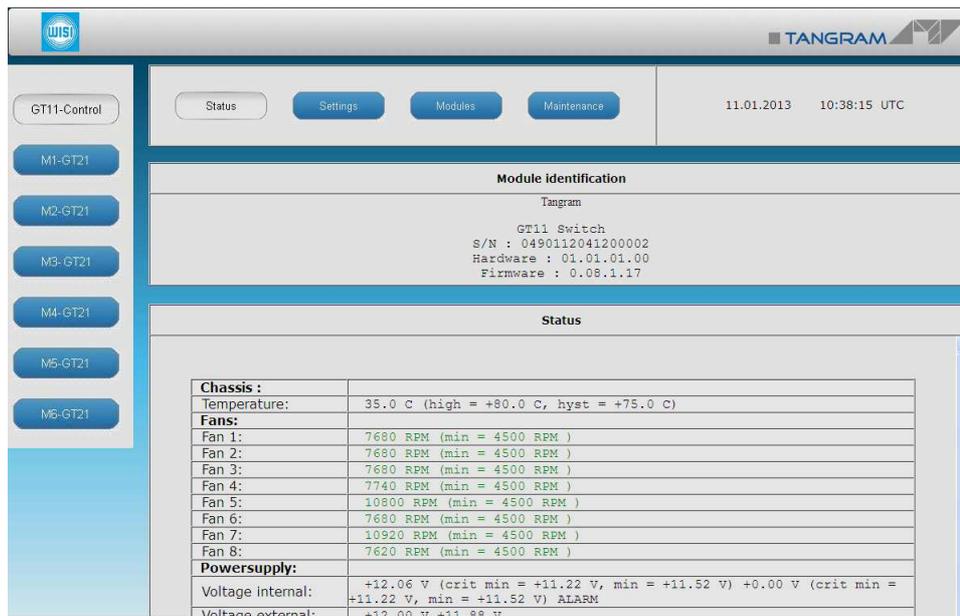
The numbering of Ports on the RF modules is again from left to right, starting with the Test-point of the first RF output. To get best level detection accuracy please always terminate the Testpoints with the 75 Ohms terminator delivered or comparable.

### 3.4 Configuration of Tangram

#### 3.4.1 Connecting to the Tangram Web UI (GUI)

##### - Connecting with web browser

Use a standard web browser on your computer to connect by typing the IP address (default = 192.168.1.20) of the Tangram in the address field.



#### Supported web browsers

The Tangram web interface is verified for Firefox version 9 and higher. Other web browsers might work, too - but the functionality cannot be guaranteed.

#### General information about the web interface structure

The web UI is designed to get a logical structure for the user/ installer, and an overview of the device via the side tabs and module details via the top tabs.

The main **SETTINGS** tab contains setting about the switch such as Networking, Headend System Management, Operation Mode, Common Interface, SW and Entitlement Upgrade, Maintenance, and Log. The CAM menu, if available, is also displayed in the Common Interface menu under the **SETTINGS** tab.

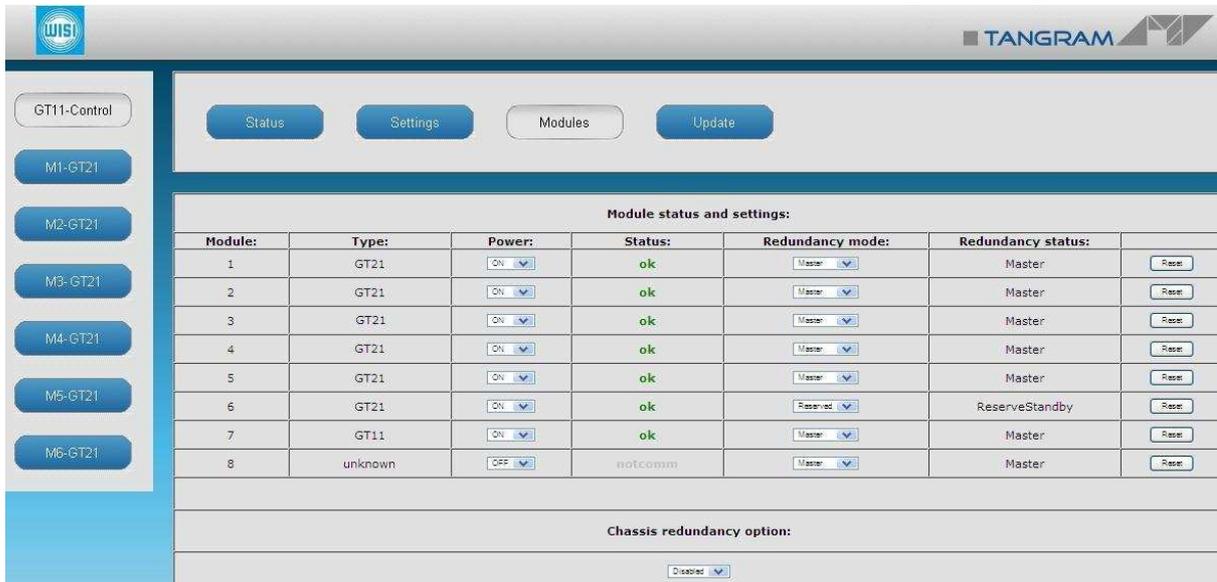
The main interface while managing services within the modules is the **SERVICE MANAGEMENT** tab. Here, you will have an overview of the configured inputs and outputs, and you will also manage the service selection and decryption.

Before you start managing the services on the modules, you should add and configure the inputs and configure the outputs in their respective tabs.



### 3.4.2 Connecting to the default Management IP address:

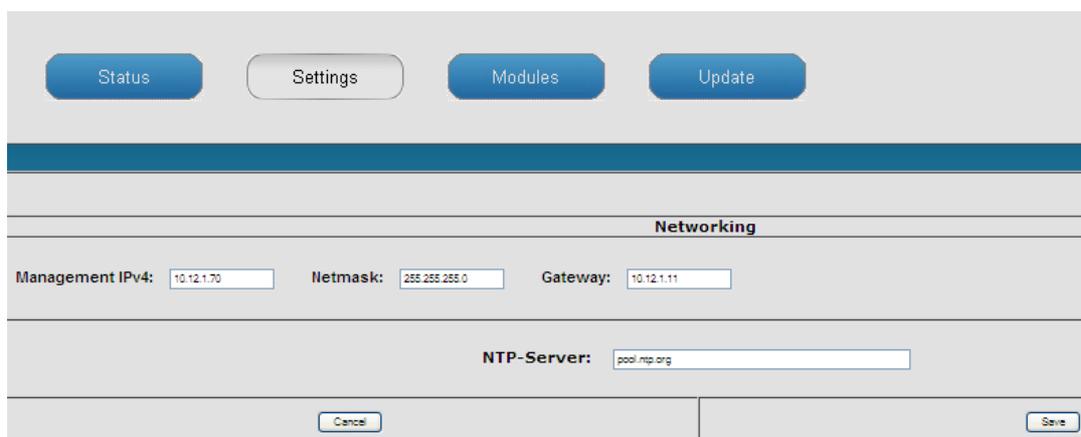
The Tangram default IP address on the left front management port is 192.168.1.20 (GT11 SW rel. <0.8.1.5 : 192.168.0.11)



To access the Tangram Web- Interface please set the IP address on your PC or Network adaptor to an address in the same address subnet & use same network mask.

### 3.4.3 SETTINGS Tab: Changing the IP address to your own Network

It is recommended to change the IP to a unique IP address in your network. Please change the IP address under SETTINGS / NETWORKING.



Please always remove completely & newly configure Network- Addresses, the Netmask plus the default gateway. A known NTP Server source can be used for the time of day sync. When you are finished with your changes please press the "Save" button.



### 3.5 Tangram GT11 / 12 Switch modules / Main Control Page

#### 3.5.1 Main Status GT11- Control

On the Tangram GT11-Control Status Tab you can monitor overall stats like Alarms, Fans, Power, Temperature, Serial Number and main SW- Version of Tangram .

| Chassis :         |  |
|-------------------|--|
| Temperature:      | 35.0 C (high = +80.0 C, hyst = +75.0 C)  |
| Fans:             |  |
| Fan 1:            | 7680 RPM (min = 4500 RPM )   |
| Fan 2:            | 7680 RPM (min = 4500 RPM )   |
| Fan 3:            | 7680 RPM (min = 4500 RPM )   |
| Fan 4:            | 7740 RPM (min = 4500 RPM )   |
| Fan 5:            | 10800 RPM (min = 4500 RPM )  |
| Fan 6:            | 7680 RPM (min = 4500 RPM )   |
| Fan 7:            | 10920 RPM (min = 4500 RPM )  |
| Fan 8:            | 7620 RPM (min = 4500 RPM )   |
| Powersupply:      |  |
| Voltage internal: | +12.06 V (crit min = +11.22 V, min = +11.52 V) +0.00 V (crit min = +11.22 V, min = +11.52 V) ALARM |
| Voltage external: | +12.00 V +11.88 V  |

In the left field you can see the GT Modules / Slots identified by the Chassis.

#### 3.5.2 Future GT11 main updates / upgrades

In future there may be additional functionality added to Tangram.

Firmware- Update or Upgrade for the main switch are applied via the Maintenance Tab.

IP- Adresses set & Group membership survive a Main Firmware Update as long not stated differently in the release notes.

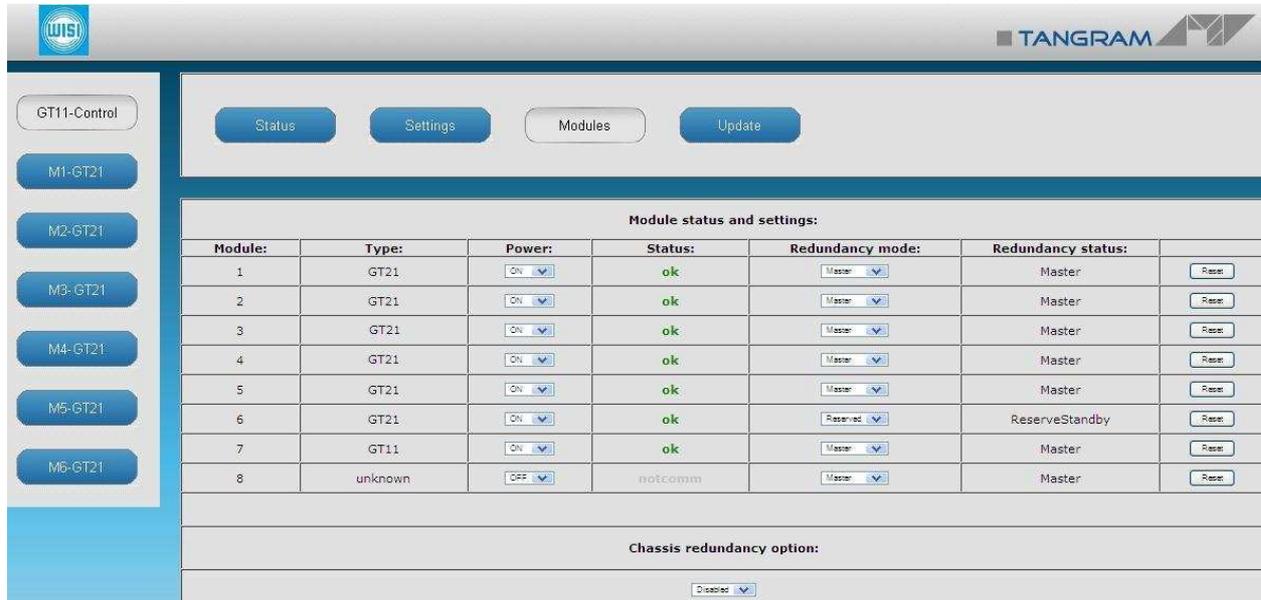
File to upload:



### 3.6 Tangram GT11 / 12 internal Switch / Control tab

#### 3.6.1 Modules tab

On the Tangram GT11 Control Tab you can maintain the modules:



In the left field there are the Modules / Slots identified by the Chassis / Switch.

#### 3.6.2 Module Status and Settings

You can check and set the Modules on the Modules tab. You can switch them on /off and can reset them remotely. Additionally you can configure Module Redundancy (n+1):

#### 3.6.3 n+1 Module Redundancy

You can check and set the Modules Redundancy mode of a module by choosing the Redundancy mode (Master or Reserved) within that 'Modules' Tab column.

A module which should be secured has to be in 'Master' mode, the module which should take the redundancy in case one of the Master modules fails has to be set to 'Reserved'. There is no mixing of different module types allowed / possible to apply Module redundancy. If a problem is detected on a "Master" module the power is automatically switched off and the 'Reserved' module is activated simultaneously with the Master config.

To revert the redundancy you have to switch on Power again for the replaced Module by hand in this tab. The reserved module will go to reserved mode again and switch off its own outputs when the new Module comes up again.

#### 3.6.4 Module Redundancy status

You can see the Status of Module redundancy within the Redundancy status column.



### 3.7 Tangram Front IP Port Groups

#### 3.7.1 IP / Ethernet Ports Groups (using internal VLAN IDs)

There are **Port Groups** to easily distribute video traffic of exceeding 1 Gbit:

##### GT11/ 12 reserved Groups (VIDs 10 & 16)

- GT11 MGMT Port 0: Connection to GT switch and module web UI.  
Internal Management net uses VID=16: internal use reserved.

- Internal Streaming net I (VID=10) is connected to GT modules slot 1 to 6

**Default Port Group Member settings** from factory: (This are defaults and not applicable for Tangram Chassis already customized and configured)

##### GT11 internal Jumper J2 not set (factory default 1):

- GT11 Port 1 to 4: Connection to GT streaming net A (VID=2)
- GT12 Port 1 to 4: Connection to GT streaming net E (VID=6)
- Streaming net A (VID=2) is connected to GT modules slot 1 to 6.
- Streaming net E (VID=6) is connected to GT modules slot 1 to 6, too

GT11 Port Group-Member settings:

|           | RJ 45 |
|-----------|-------|-------|-------|-------|-------|
| Port :    | MAN   | 1     | 2     | 3     | 4     |
| Group ID: |       | A     | B     | C     | D     |

Cancel Save

GT12 Port Group-Member settings:

|           | RJ 45 | RJ 45 | RJ 45 | RJ 45 |
|-----------|-------|-------|-------|-------|
| Port :    | 1     | 2     | 3     | 4     |
| Group ID: | E     | E     | E     | E     |

Cancel Save

GT11 & 12 Port Group- Member settings in the Main Setting Tabs

##### GT11 internal Jumper J2 set (factory default 2):

- GT11 Port 1: Connection to GT streaming net A (VID=2)
  - GT11 Port 2: Connection to GT streaming net B (VID=3)
  - GT11 Port 3: Connection to GT streaming net C (VID=4)
  - GT11 Port 4: Connection to GT streaming net D (VID=5)
  - GT12 Port 1: Connection to GT streaming net E (VID=6)
  - GT12 Port 2: Connection to GT streaming net F (VID=7)
  - GT12 Port 3: Connection to GT streaming net G (VID=8)
  - GT12 Port 4: Connection to GT streaming net H (VID=9)
- 
- Streaming net A (VID=2) is connected to GT modules slot 1 and 2.
  - Streaming net B (VID=3) is connected to GT modules slot 3 and 4.
  - Streaming net C (VID=4) is connected to GT modules slot 5.
  - Streaming net D (VID=5) is connected to GT modules slot 6.
  - Streaming net E (VID=6) is connected to GT modules slot 1 and 2.
  - Streaming net F (VID=7) is connected to GT modules slot 3 and 4.
  - Streaming net G (VID=8) is connected to GT modules slot 5.
  - Streaming net H (VID=9) is connected to GT modules slot 6..



### 3.8 Configuration of Modules

#### 3.8.1 Connecting to the Modules:

The Tangram modules GT2x can be accessed through the front management port by just choosing the module on the left column in the Web UI.

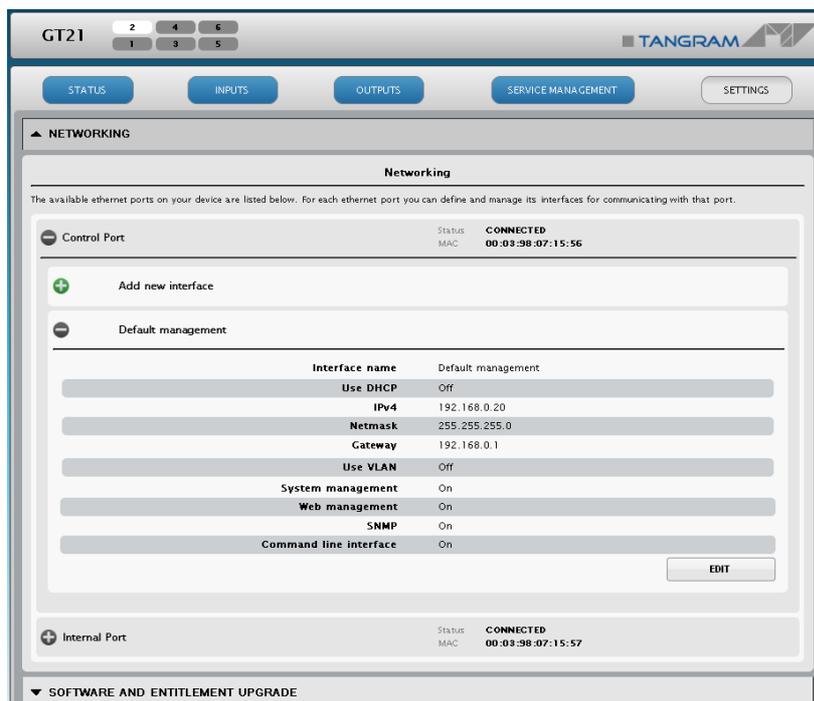
( to access all modules with the same Management IP- address through the Switch please make sure that the IP ports 80 to 86 are opened with your Firewalls )

#### 3.8.2 Adding additional IP addresses to the modules (optional)

As an option you can put an unique IP management address to every module available through the Switch Management Port (e.g. Main address +1,+2, etc.). This can be used e.g. to get SNMP- traps directly from the Modules.

You can edit the IP address of a Module under SETTINGS / NETWORKING.

Please always remove & newly configure network- address, the netmask plus the default gateway. If you don't want to specify put in 0.0.0.0 as gateway address.



(as an further alternative or to recover a problem you may use the backup control port on the back of module with default address 192.168.1.20 netmask 255.255.255.0. Use again a standard web browser to connect by typing the IP address in the address field. )

If the address setting is unknown or lost you can recover on the module control port by using the WISI / a2b IP Supporter tool - you can download it from the WISI portal.



## **3.9 Tangram & SW options**

### **3.9.1 Connect to WISI portal & activating the output Modules:**

The Tangram modules GT2x (not the chassis itself and GT11) must be registered at the WISI portal & activated through an entitlement file when they are shipped with the factory default setup. You can get / download that from WISI Web-Portal:

### **The WISI Tangram portal**

**Portal URL: <http://wisiconnect.tv>**

Connect to the Tangram portal using the URL: <http://wisiconnect.tv>

(in case [wisiconnect.tv](http://wisiconnect.tv) is down / not available temporarily you can use <http://chameleonconnect.tv> in the meantime which offers the same functionality and data.

### **3.9.2 Serial- number / Linking to the Modules:**

The Tangram module to be activated can be accessed through the main management by just choosing the module on the left column. Please copy / write down the Serial Number out of the Status tab of the module to be activated.

### **3.9.3 Requesting access to the [wisiconnect.tv](http://wisiconnect.tv) portal**

If you do not have yet a password for access to the portal, please click the [Request access to WISI Tangram portal](#) link.

### **3.9.4 Login to the [wisiconnect.tv](http://wisiconnect.tv)**

Enter your e-mail address and password, and click Login. Only with the first module you have to register once for the Portal. Then after some time to generate your account or if you have forgotten your password & clicked the [Reset password](#) link, an e-mail will be sent to the entered e-mail address. The e-mail contains a hyper-link that you should follow to confirm the request for a new password.



### 3.10 Registering Tangram modules to the WISI Tangram portal

If you do not have yet a password for access to the portal, please refer to chapter 3.9.3

#### 3.10.1 Registering modules

Please copy / write down the Serial Number out of the Status tab of the module to be activated

#### Register new Tangram

|   |                      |
|---|----------------------|
| Serial number:                          | <input type="text"/> |
| Module name:                            | <input type="text"/> |
| Firmware version:                       | <input type="text"/> |
| Vendor:                                 | <input type="text"/> |
| Description:                            | <input type="text"/> |
| <input type="button" value="Register"/> |                      |

#### 3.10.2 Downloading SW options

##### (entitlement file) to your PC

Go to the tab My Tangrams & enter the serial number of your Tangram module.

[My Tangram list](#)

Click the **Register Tangram** tab to start registering the Tangram GT2x module.

Enter the Serial number of your module. Optionally, also enter Module name, Vendor, and Description (these fields are intended for your own use, to be able to track and maintain your installed base). The fields for SLA status and SW options are filled out automatically from the information stored in the WISI Unit Data Base. Click the **Register** button to register the Tangram.

Go to the tab **My Tangrams**, and click the serial number for the module to download SW options (entitlement file) for. In the Edit Tangram view, click Download file. Save the file to your computer

After login & choosing Register Tangram tab number for the module to download SW options (entitlement file). In the Edit Tangram view, click Download file.

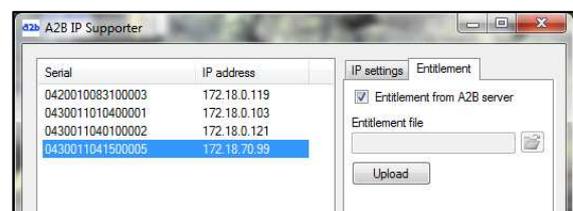
#### 3.10.3 Uploading SW options (entitlement file) to your Tangram module GT2x

( via Tangram Web GUI )

Under **SETTINGS / SOFTWARE AND ENTITLEMENT UPGRADE**, browse for the entitlement file you previously downloaded to your computer. Click Upload, and reboot the module when the upload is ready.

#### 3.10.4 Using the IP Supporter Tool

With the Tangram connected to your computer, and your computer connected to Internet, you can upload the entitlement file directly. Select your Tangram GT2x module, and check the Entitlement from WISI / a2b server, and click Upload.



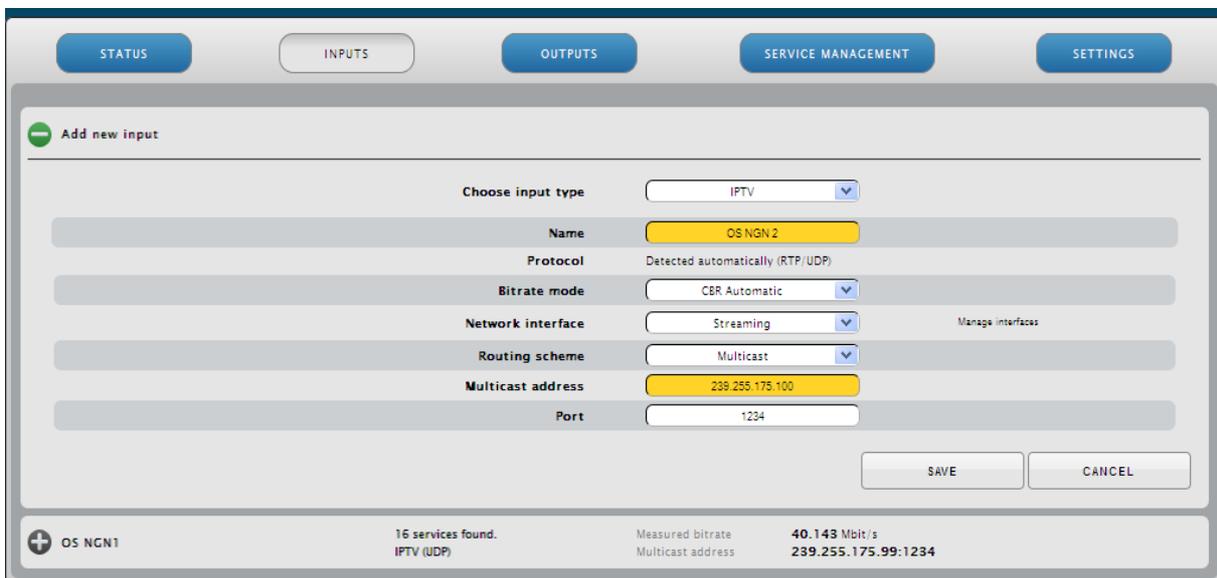
## 3.11 Configuring Inputs

Every GT21 module can decode up to six MPEG-2 or h.264 program streams. \*)

### 3.11.1 Defining / adding IP Stream inputs

#### Add input

1. Click the INPUTS tab, and *Add new input*.
2. Type or select the appropriate parameters and settings.
3. Click the SAVE button.



The screenshot shows the 'Add new input' form with the following fields:

- Choose input type:** IPTV
- Name:** OS NGN 2
- Protocol:** Detected automatically (RTP/UDP)
- Bitrate mode:** CBR Automatic
- Network interface:** Streaming
- Routing scheme:** Multicast
- Multicast address:** 239.255.175.100
- Port:** 1234

Buttons: SAVE, CANCEL

Footer information:

- + OS NGN1
- 16 services found. IPTV (UDP)
- Measured bitrate: 40.143 Mbit/s
- Multicast address: 239.255.175.99:1234

#### Status information

After clicking *Save*, the status of the input will be shown.

The status includes information about the interface (tuner etc.), and about services found.



The status bar shows the following information:

- + OS NGN1
- 16 services found. IPTV (UDP)
- Measured bitrate: 39.88 Mbit/s
- Multicast address: 239.255.175.99:1234

#### Add more inputs

Re-iterate the "Add input" process.

- ) *Up to 3 HD Video services can be decoded and downscaled to SD.*

*As a restriction of the Videoprocessor of GT21 up to 3 programmms can be decoded and downscaled from HD to SD simultaneously per module. Audio decoding on the remaining 3 instances is still possible. As a further result the HD input services have to be choosen for output channel 1, 3 or 5 of the module!*

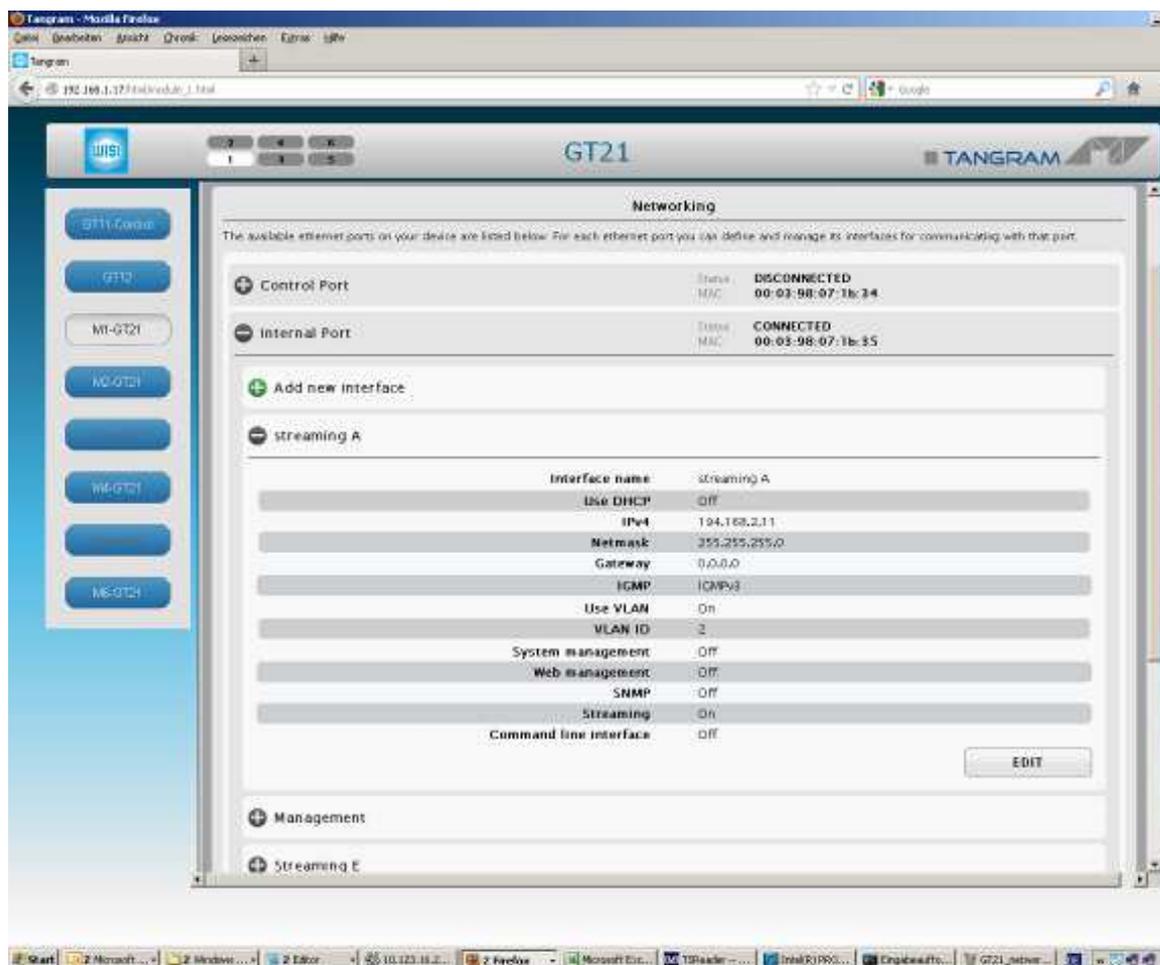
### 3.11.2 Configure Input paths & Input redundancy

#### IGMP & Redundant Inputs

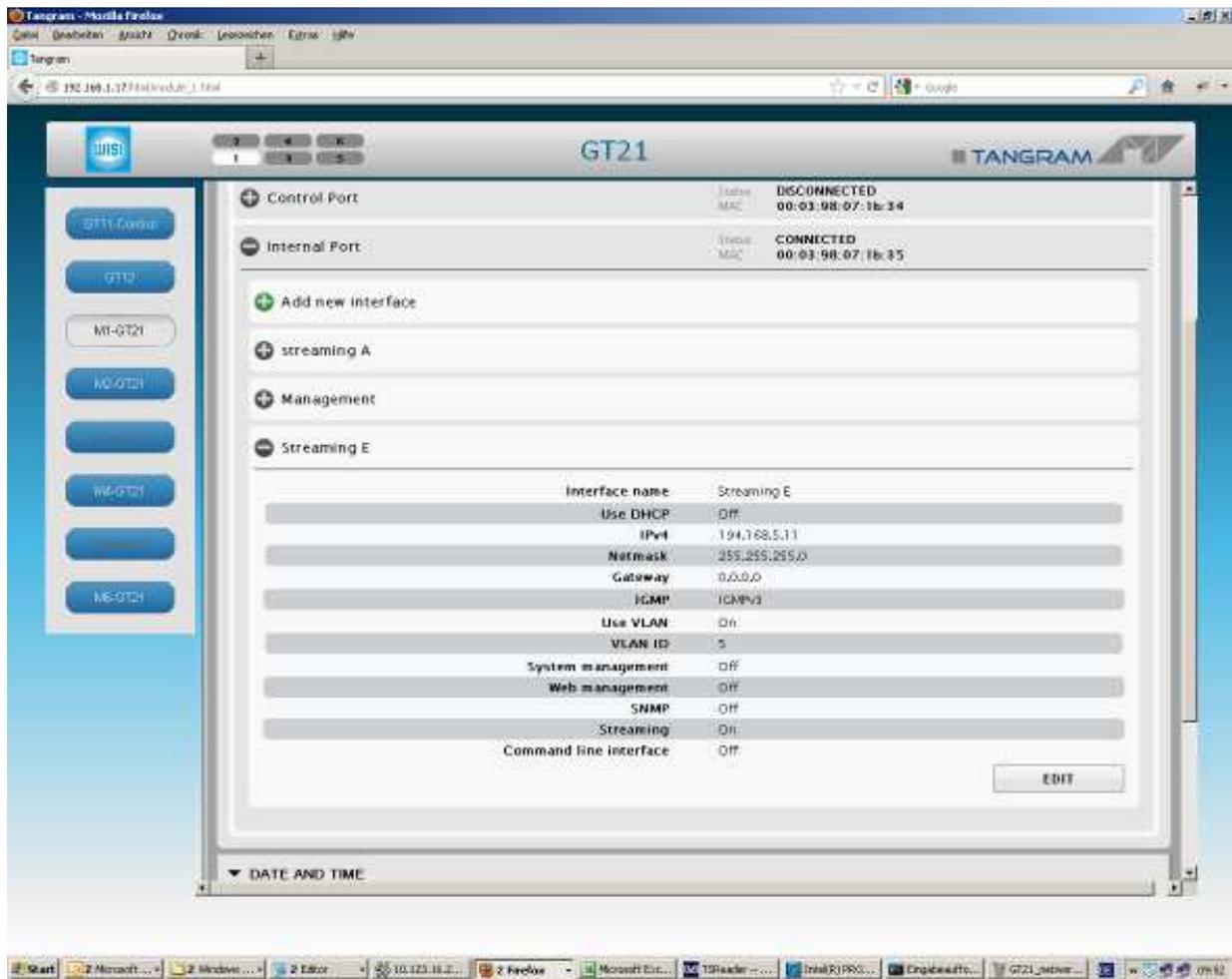
The Edge modules of Tangram request the IP multicasts over the IGMPv2 or v3 protocol on routers / switches.

For each IP multicast address a Primary and Secondary source (IGMPv3) or destination address and optionally an A- and B-path path for redundancy can be configured. A and B and even more sources (C,D,E ...) can be configured on the WISI Tangram integrated switch and afterwards chosen on the Tangram modules via the internal streaming net ( Net A-> VID2 = VLAN ID 2, see 3.7.1).

The Tangram switch has 4 x 1 GbE RJ45 to supply up to 4 Gb / s multicast e.g. over one path distributed to 4 internal VLANs and another 4 x 1 GbE SFPs with optional GT12 for the supply of multicast over secondary and additional paths.



Alternative Streaming paths – example Streaming primary path using VID2



Alternative Streaming paths – example redundant Streaming path using VID5= E

### 3.11.3 Redundant Input Sources

#### Alternative Inputs

The Tangram modules search for a valid input signal always in the following order:

**Primary -> Alternative 1 -> Alternative 2 -> Alternative 3**

- Search for a valid input signal starts always with the logical input position 'Primary'
- GTxx module checks during Latency Time (3sec) the input signal.
- if a valid signal is detected within Latency Time -> 'operation completed' and new logical input position is found.
- if a valid signal is not detected within Latency Time -> switching to next logical input position.



This process continues until a valid input signal is detected. The “Linger time” (=waiting period) is the time the Tangram GTxx module waits with a detected signal failure at the current logical input position in order to decide whether action is needed (t >Linger time, then switch to next alternative) **or** only a brief interruption of signal has appeared at the entrance and no action is needed, to prevent continuous input flapping.

|  |  |   |  |
|--|--|---|--|
| - OS DVB-C1  |  | 0 services found.<br>IPTV   | Measured bitrate 0 Mbit/s<br>Multicast address 239.255.175.99:1234 |
| Name   | OS DVB-C1                                    |   |  |
| Protocol   | N/A  |   |  |
| Bitrate mode   | CBR Automatic                                |   |  |
| Network interface  | Streaming                                    |   |  |
| Routing scheme   | Multicast                                    |   |  |
| Multicast address  | 239.255.175.99                               |   |  |
| Port   | 1234   |   |  |
| Source address   | 0.0.0.0                                      |   |  |
| Active configuration   | Primary                                      |   |  |
| Linger time  | 0  |   |  |
| Latency  | 0  |   |  |
| <input type="button" value="EDIT"/>                            |  |   |  |
| <input type="button" value="+ Add alternative configuration"/> |  |   |  |
| - TWO  |  |   |  |
| Priority   | TWO  |   |  |
| Network interface  | <input type="text" value="Streaming"/>       | <input type="button" value="Manage interfaces"/>                          |  |
| Routing scheme   | <input type="text" value="Multicast"/>       |   |  |
| Multicast address  | <input type="text" value="239.255.175.100"/> |   |  |
| Port   | <input type="text" value="1234"/>            |   |  |
| <input type="button" value="REMOVE"/>                          |  | <input type="button" value="SAVE"/> <input type="button" value="CANCEL"/> |  |

Alternative Streaming address – example: redundant Input source

### 3.12 Configure outputs

#### 3.12.1 Edit output

1. Click the OUTPUTS tab, and *choose output*.
2. Select the output by clicking on the +
3. Click on EDIT an type or select parameters & settings.



#### 3.12.2 Edit more outputs

Re-iterate the “Edit output” process

#### 3.12.3 Edge Decoder adjustments

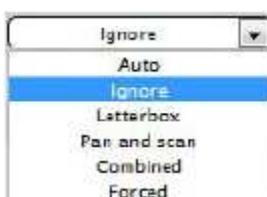
- Give a name for the output
- Select decoder instance (“One”, “Two”, ....)
- Select the service in the Services drop down list.



- Select TV standard in the Video

Choose in the standard drop down list

- Optional: select video conversion in the drop down list



### 3.12.3 Configure outputs (cont.)

- Optional: Select audio language (or automatic)

#### Subtitling and Teletext

If subtitling is used, select subtitling “ON”, and set the subtitling parameters:

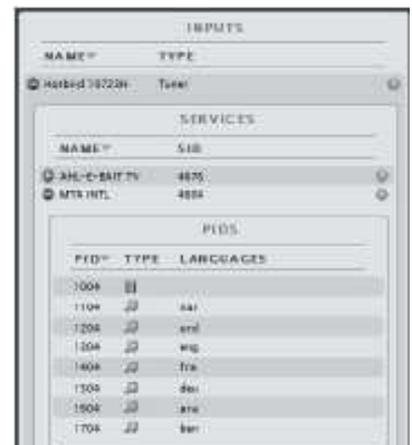
- Subtitling language
- Subtitling priority (DVB or Teletext)
- Subtitle type (Normal or Hearing impaired)
- Teletext codepage
- Subtitle conversion (None, Auto, 14:9, 16:9)
- WSS subtitle configuration (Auto, In picture, Out of picture)
- Set the WSS parameters (Auto, Off, Forced 4:3 / 14:9 / 1 6:9)
- Optional: for VPS signalling\*), select the VPS signalling source (from Teletext or from EIT), and enter the CNI code.

#### Language selection for audio language and subtitling

For audio language, use default language or select the language from the drop down list, or manually enter the 3 letter language code according to ISO 639-2.

When you use the manual settings, you can find the PID number in the Service Management, on the input side, when expanding to service level.

For subtitle language, you can select language from the drop down list, or enter the ISO 639-2 code.



\*)VPS (Video Programming System) is used on terrestrial channels in some European countries (e.g. Czech Republic, Germany) and also on several channels on the Astra satellite system.

### 3.12.4 Configure outputs (cont.)

- Optional: Specific Audio Settings:

#### Dual mono output out of different PIDs

It is possible to set up one analogue output with dual mono sound (e.g. different languages left/right) out of different Input PIDs

- Create 2 analogue outputs, either on decoder 1+2 or 4+5 (3+4 are on different domains)
- Set up both decoders with the same service but different audio languages / PIDs
- Select Stereo mode: Dual mono (Decoder settings)
- Deactivate the second analogue output (Output enabled = OFF)
- In the Modulator settings, select Audio system A2 Dual mono or NICAM Dual mono
- Select Dual mono source: Both decoders
- Save Configuration



*\*) Dual-Mono from different PIDs reduces output channel capacity. The Videoprocessor of GT21 has a limited amount of MPEG decoders. Generating a dual mono audio out of 2 stereo audio PIDs requires double decoders and will lead in loss of use of an output channel..*

### 3.12.5 More Modulator settings

- Select the TV standard (B/G, B/H, D/K, I, L, M/N)
- Select the Video bandwidth (4.2, 5.0, 6.0)
- Set the Picture carrier modulation depth (from 80% to 90%)
- Set the Video group delay pre-correction (None, BG general, D/K GOST 20532-75, M)
- Chose to enable or disable test lines (Test lines ON or OFF)
- Select audio system (NICAM, A2, A2\*, Mono)
- Use the sliding button for setting of Dual mono ON/OFF
- Set the Audio deviation level (-6dB to 6dB in 1 dB steps)
- Set the Mono & Stereo subcarrier level (Auto, Off, -10dBc to -30dBc in 1 dB steps)
- Select frequency table (CCIR, OIRT)
- Enter the output frequency, as a channel number, or manually in MHz
- Set output carrier level



**GT21** TANGRAM

STATUS INPUTS OUTPUTS SERVICE MANAGEMENT SETTINGS

**RF Output #1**

Analog 1 Bayerisches FS Nord PAL 625 Channel 471.25 (E21) MHz Video type MPEG2 Status Decoder running Audio type MPEG1

Output enabled On  
Name Analog 1

| Decoder settings           |                                    | Modulator settings               |              |
|----------------------------|------------------------------------|----------------------------------|--------------|
| Decoder instance           | One                                | TV standard                      | B/G          |
| Service                    | 239.255.175.99:Bayerisches FS Nord | Video bandwidth (MHz)            | 5.0          |
| Video standard             | PAL 625                            | Picture carrier modulation depth | 90%          |
| Video conversion           | Auto                               | Video group delay pre-correction | B/G general  |
| WSS configuration          | Auto                               | Test lines                       | Off          |
| Audio language             | Default                            | Audio system                     | A2 Stereo    |
| Stereo mode                | Dual mono                          | Audio deviation                  | 0 dB         |
| Subtitling                 | Off                                | Mono subcarrier level            | Auto         |
| WSS subtitle configuration | None                               | Stereo subcarrier level          | Auto         |
| VPS signaling              | Off                                | Frequency table                  | CCIR         |
|                            |                                    | Frequency                        | 471.25 (E21) |
|                            |                                    | Carrier level (dBuV)             | 111          |

EDIT

Click "SAVE" after setting changes are done

Note: Most detail settings can be left with the default settings for most applications.

### 3.13.1 Service management

Click on the SERVICE MANAGEMENT tab to see available inputs and outputs.

Service IDs and PIDS of received Input services are shown and can be checked.

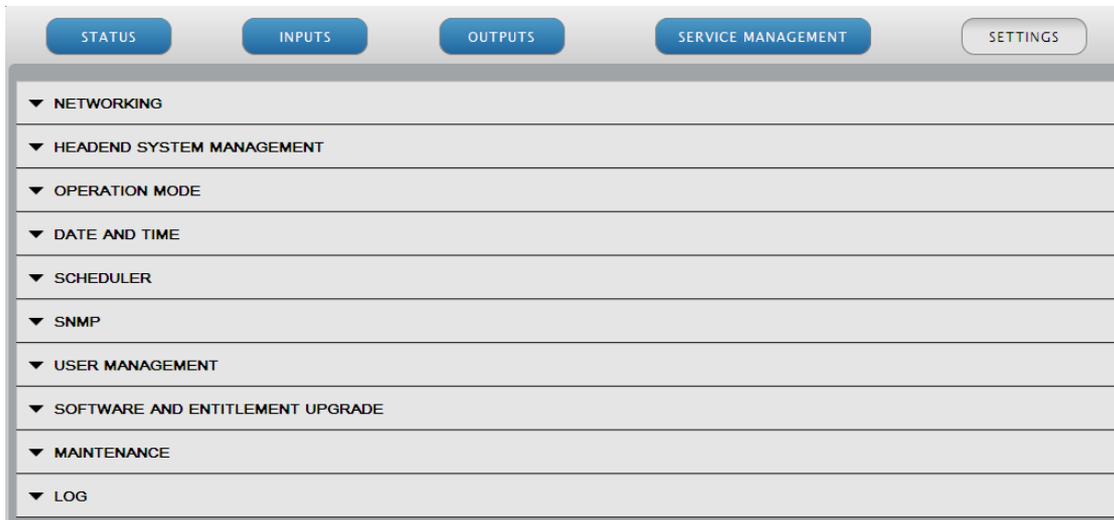


Service IDs shown in the Module SERVICE MANAGEMENT

The INPUTs and their PIDs are shown starting from INPUT 0 to INPUT n, depending on how many Inputs are configured and received.

### 3.14 Managing the Tangram module

Under the **SETTINGS tab** - module specific settings are managed:

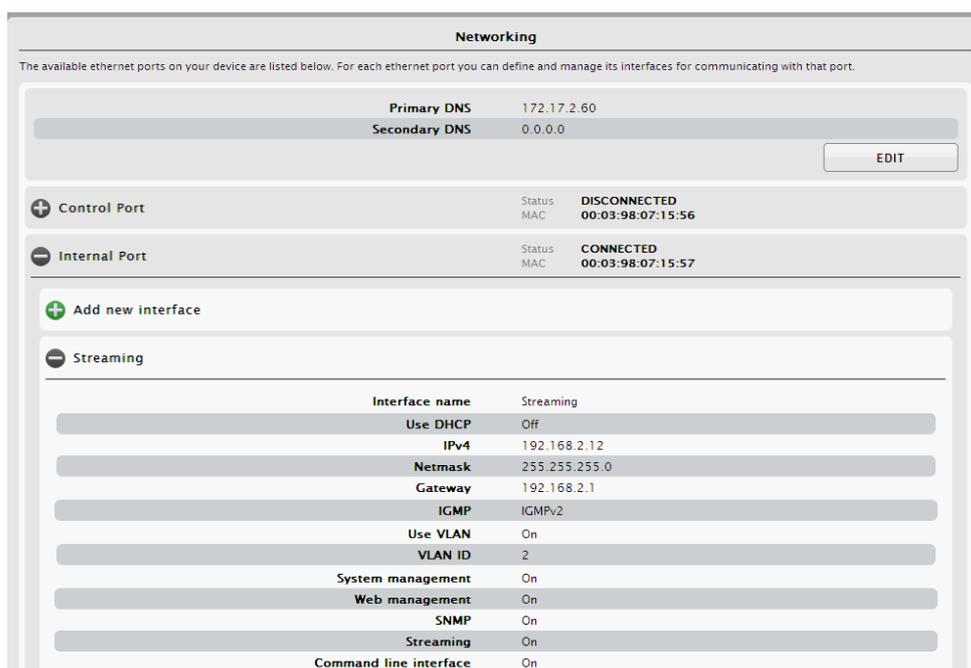


#### NETWORKING

Networking settings for defining and configuring IP interfaces, and for setting the capabilities for the defined IP interfaces.

*Note:* Every Tangram module has an extra IP port on the Tangram back for separate 10/100 Ethernet management (“Control Port”, default IP 192.168.1.20/24), the module internal GigE port is switched through GT11 switch for streaming & main management.

There are no IP addresses defined for the GigE streaming per default and they have to be set accordingly to customer network.



Example of Networking setup



## Managing the Tangram module

### 3.14.1 Add and configure Network interfaces

1. Click on NETWORKING in the **SETTINGS** tab
2. Click Add new interface
3. Type a name for the interface
4. Enter the IPv4 address, the Netmask and the Gateway
5. Select the capabilities needed for the interface (e.g. Streaming)

(Defaults work best in the majority of installations - Please don't change the internal VLAN + System/Web Management settings if you aren't sure, you may lose connection to the module)

6. Click SAVE

The screenshot shows a web-based configuration interface for an 'Internal Port'. At the top right, the status is 'CONNECTED' with MAC address '00:03:98:07:1f:98'. Below this is a '+ Add new interface' button. A dropdown menu is open, showing a configuration for a 'Streaming Interface'. The configuration fields are as follows:

| Field                  | Value               |
|------------------------|---------------------|
| Interface name         | Streaming Interface |
| Use DHCP               | OFF                 |
| IPv4                   | 192.168.2.20        |
| Netmask                | 255.255.255.0       |
| Gateway                | 0.0.0.0             |
| Use VLAN               | OFF                 |
| VLAN ID                | 2                   |
| System management      | OFF                 |
| Web management         | OFF                 |
| SNMP                   | OFF                 |
| Streaming              | OFF                 |
| Command line interface | OFF                 |

At the bottom of the configuration panel, there are three buttons: 'REMOVE', 'SAVE', and 'CANCEL'. Below the configuration panel is a '+ Management' button.



## Managing the Tangram modules

### 3.14.2 Setting up the Module Operation Mode

With the **OPERATION MODE tab** – some specific modes are managed:

Some features like PAL-525 lines (60Hz) of the GT21 module can only be configured if you switch the Module to the correct Operation Mode.

#### Operation Mode of Tangram GT21

There are three modes of operation you can choose:

##### **PAL-625 / SECAM FEC mode**

For PAL-625 and SECAM outputs with FEC inputs. (Standard Mode)

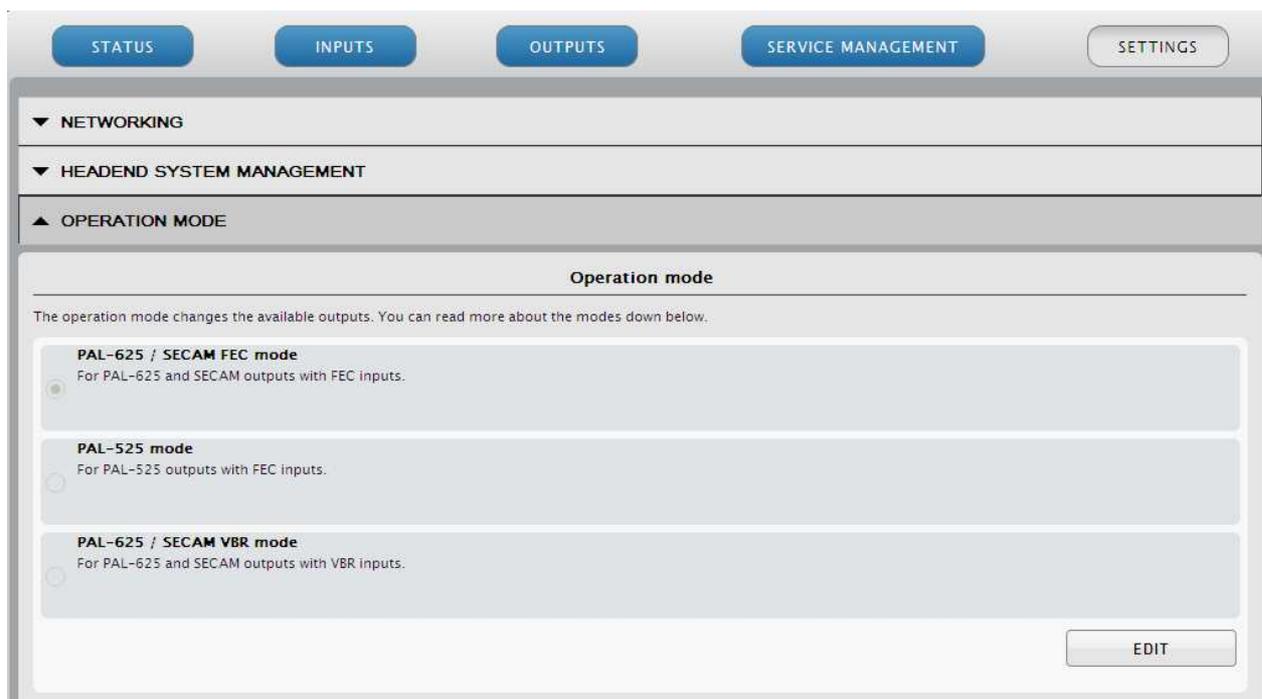
##### **PAL-525 mode**

For PAL-525 outputs with FEC inputs. (Use this Mode for PAL- M)

##### **PAL-625 / SECAM VBR mode**

For PAL-625 and SECAM outputs with VBR inputs. (Use this mode if you don't need FEC but want to decode SPTS & MPTS VBR inputs)

Note: Operation mode should not be changed in a live environment, as it could result to service loss. Some of the features / configuration are not available in all modes. Please always backup your configuration if you want to get back to the original mode later.



OPERATION Mode setup

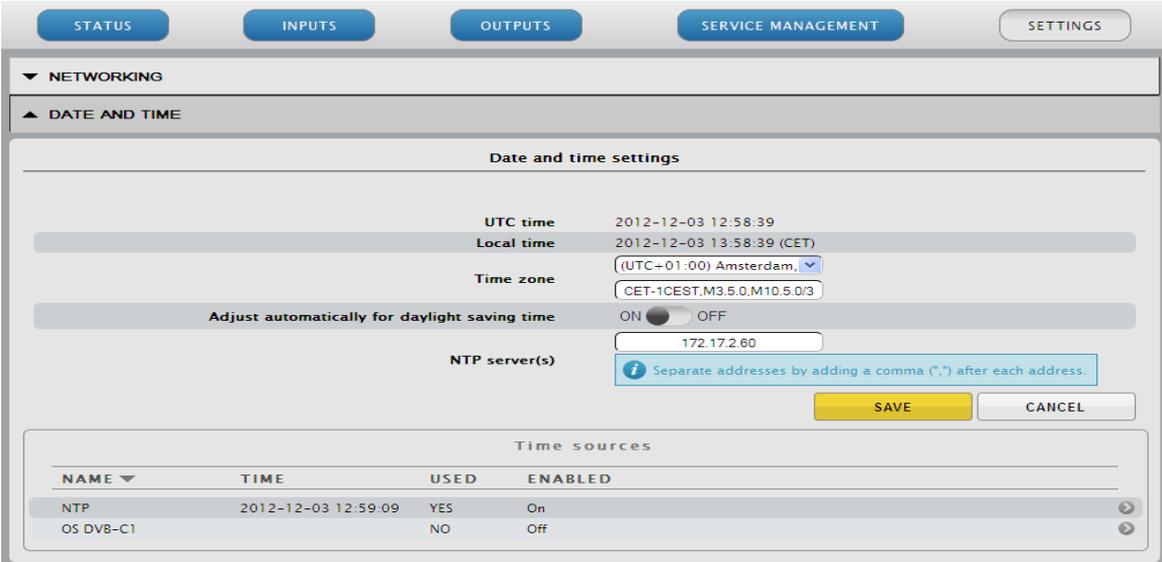
## Managing the Tangram module

### 3.14.3 Setting up DATE AND TIME

To synchronize Tangram modules with a time source you can either use NTP protocol through the IP interfaces or Time information delivered by the received MPTS- Streams.

1. Click on DATE AND TIME in the **SETTINGS** tab
2. Click EDIT
3. Select the Time zone, automatic or manual daylight saving timer and the reachable NTP servers (separate by adding a comma after each address)
4. Click SAVE
5. If no NTP is available/ configured a Stream source including that information can be used to synchronize the date & time of Tangram modules

(Note: NTP servers can be connected from the modules external or internal GigE ports and switched through GT11 switch. There are no IP addresses defined for the internal Interface for NTP use per default and they and the gateway have to be set for every module accordingly to customer management network. )



The screenshot shows the 'DATE AND TIME' settings page. At the top, there are tabs for STATUS, INPUTS, OUTPUTS, SERVICE MANAGEMENT, and SETTINGS. The 'DATE AND TIME' section is expanded, showing 'Date and time settings'. The settings include:

- UTC time: 2012-12-03 12:58:39
- Local time: 2012-12-03 13:58:39 (CET)
- Time zone: (UTC+01:00) Amsterdam, (dropdown menu)
- Adjust automatically for daylight saving time: ON (radio button selected), OFF (radio button)
- NTP server(s): 172.17.2.60

Below the settings is a 'Time sources' table:

| NAME      | TIME                | USED | ENABLED |
|-----------|---------------------|------|---------|
| NTP       | 2012-12-03 12:59:09 | YES  | On      |
| OS DVB-C1 |                     | NO   | Off     |

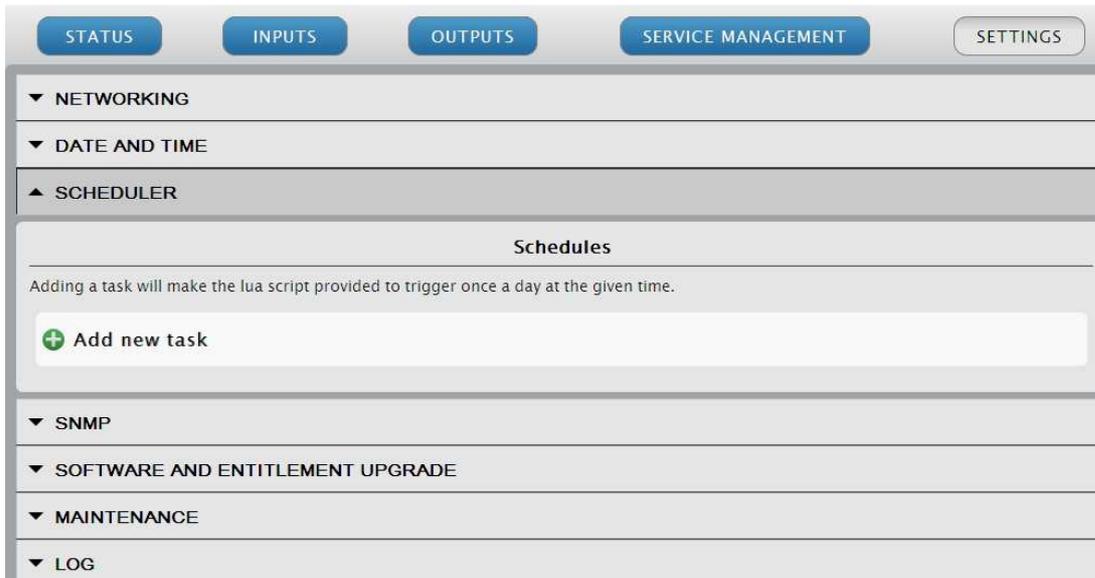
Example of a Date & time setting using a NTP server

## Managing the Tangram module

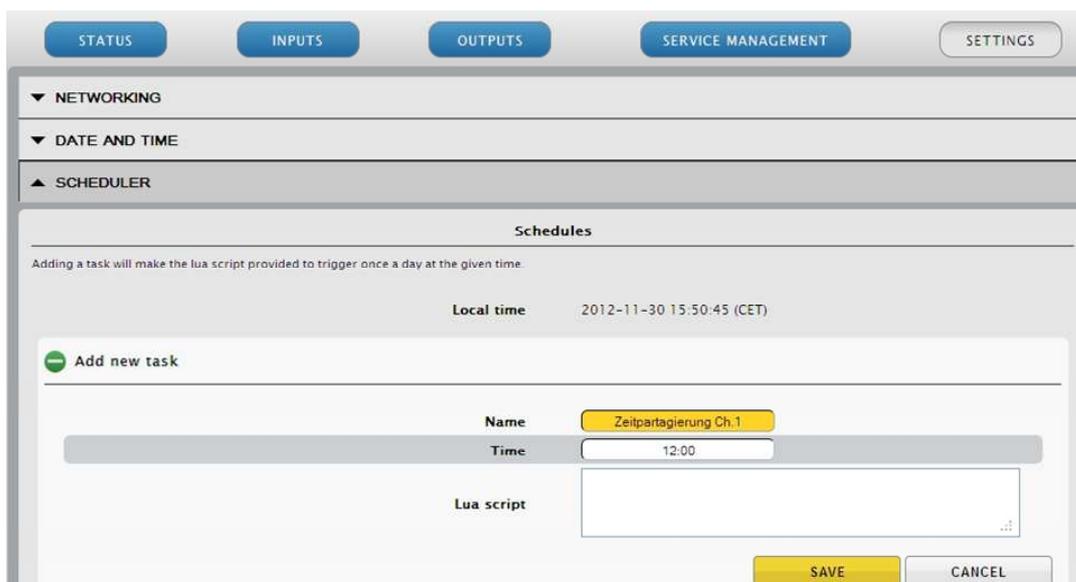
### 3.14.4 Time scheduling of Output Channels

Click on the Module SETTINGS tab and choose the SCHEDULER

Existing tasks are shown and new ones can be added:



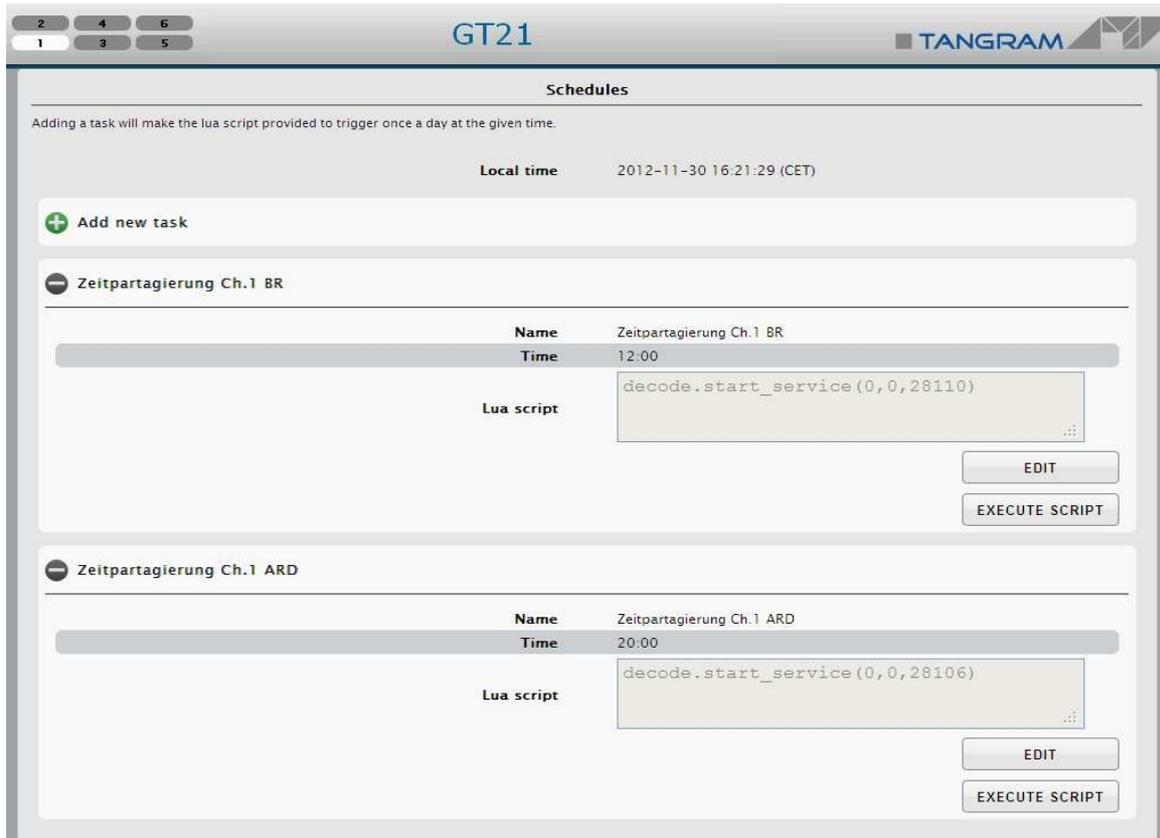
Check first, that the time is set correctly (-> Settings: Date & Time) on the module and choose a Name for the scheduling action to be programmed:



## Managing the Tangram module

### 3.14.4 Time scheduling (cont.)

After choosing the Time of day and the action to be executed click the "SAVE" button to apply:



The screenshot shows the 'Schedules' section of the GT21 TANGRAM interface. At the top, it says 'Adding a task will make the lua script provided to trigger once a day at the given time.' The local time is 2012-11-30 16:21:29 (CET). There is an 'Add new task' button. Below, two tasks are listed:

- Zeitpartagierung Ch.1 BR**: Name: Zeitpartagierung Ch.1 BR, Time: 12:00, Lua script: `decode.start_service(0,0,28110)`. Buttons: EDIT, EXECUTE SCRIPT.
- Zeitpartagierung Ch.1 ARD**: Name: Zeitpartagierung Ch.1 ARD, Time: 20:00, Lua script: `decode.start_service(0,0,28106)`. Buttons: EDIT, EXECUTE SCRIPT.

**Time schedules are programmed via "Lua" Script commands:**

The script command consists of:

**`decode.start_service(<decode_instance>,<input_instance>,<service_id>)`**

where the variables stand for:

<decode\_instance> = Instance of Decoder, starting with 0 (= Instance "One")

<input\_instance> = Inputstream no, starting with 0, -> see 3.13.1

<service\_id> = Service-ID (SID) of the program

**The command can be tested & executed with "EXECUTE SCRIPT" button!**



## Managing the Tangram modules

### 3.14.5 SNMP, Simple Network Management Protocol / Traps

With the **SNMP tab** – SNMP(v2) specific settings like alarm Traps are managed:

SNMP can be used for monitoring alarms (traps/notifications) or to read (Get) or write (Set) information from/ to a Tangram module. To use SNMP, you can use a NMS (Network Management System) that is connected to Tangram.

#### External Monitoring of Tangram using SNMP

SNMP settings can be edited for defining and configuring SNMP interface, and for setting the Agent port (=UDP listen port), the community strings (read & set “passwords”, defaults are “public” & “private”) and the Trap destination port and receiver address of the NMS.

The SNMP agent has to be enabled for every module.

*Note:* Module Traps are send from the modules external or internal GigE ports and switched through GT11 switch. There are no IP addresses defined for the internal Interface for SNMP per default and they have to be set for every module accordingly to customer management network.

| SNMP                         |             |
|------------------------------|-------------|
| Enable agent                 | On          |
| Agent port                   | 161         |
| Agent community read string  | public      |
| Agent community write string | private     |
| Enable traps                 | On          |
| Traps address                | 172.17.2.60 |
| Traps port                   | 162         |
| Traps community string       | public      |
| Traps SNMP Version           | SNMPv2c     |

Example of SNMP Network setup

**MIB, MIB structure and NMS integration:** Please ask WISI support or your WISI representative for the most recent MIB- Definition files for Tangram.

## Managing the Tangram module

### 3.14.6 USER MANAGEMENT

#### Account Management for User authentication & access to the modules

The USER MANAGEMENT allows settings of user authentication for the module UI.

You can add users, and create passwords for each user:

#### Adding a user and password

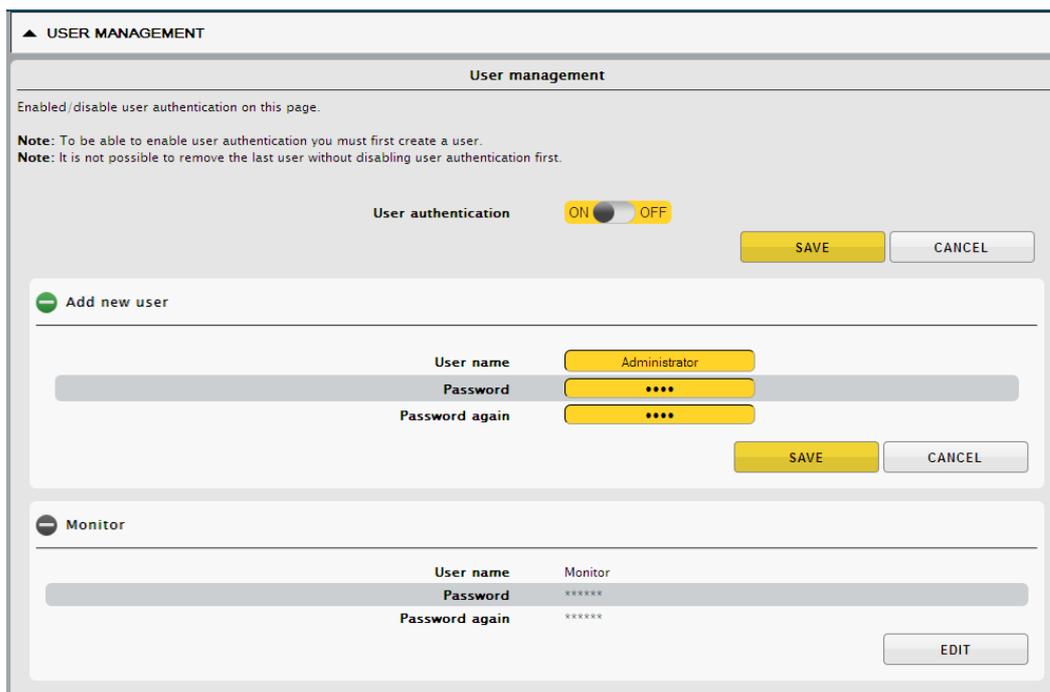
- Click Add new user, or the green plus 
- Enter a user name & Enter a password
- Confirm the password by entering it again ( There is a warning if they are not the same )
- Click SAVE

#### Enabling password control

- Select User authentication ON
- Click SAVE

The web UI will respond with a “Authentication Required” from now where you should enter user name and password

*Note: Make sure not to loose your user accounts and passwords! Factory reset will be needed to recover!*



The screenshot shows the 'USER MANAGEMENT' interface. At the top, there is a toggle for 'User authentication' set to 'ON'. Below this, there are two sections for user management. The first section, 'Add new user', has a green plus icon and contains three input fields: 'User name' (with 'Administrator' entered), 'Password' (with four dots), and 'Password again' (with four dots). The second section, 'Monitor', has a minus icon and contains three input fields: 'User name' (with 'Monitor' entered), 'Password' (with six dots), and 'Password again' (with six dots). Both sections have 'SAVE' and 'CANCEL' buttons.

Example of User management setup

## Managing the Tangram module

### 3.14.7 Module Software and SW options (Entitlement)

If a module is shipped from factory it has no License / Entitlement for operation. Both FW and SW options are uploaded via SOFTWARE AND ENTITLEMENT UPGRADE in the **SETTINGS** tab. Additionally, there is status information available about the running software version, and if a new software is uploaded, also about the latest uploaded (not yet running) software version.

#### Uploading software options / Entitlement



- Click **UPLOAD**. Click “Browse” in the pop-up to browse for the software options file (\*.ent) for this specific Tangram module

*Note:* The SW options file will have the format <serial number>.ent. If you need to, you can download the entitlement file from the Tangramconnect.tv portal or please ask your WISI representative

- Locate the software options file on your PC, and select it
- Click the Upload button



#### Uploading new Firmware

- Click **UPLOAD**. Click “Browse” in the pop-up, and select the software file (\*.bin file) to be uploaded from your PC
- Click the Upload button
- Wait for the upload complete message before rebooting the module
- Reboot the module in your maintenance window

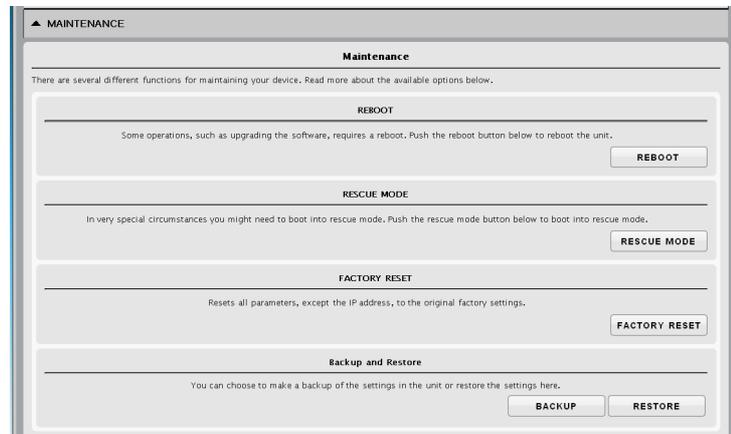
## Managing the Tangram module

### 3.14.8 Module maintenance

Module maintenance functions

are available within the

Maintenance tab:



#### Reboot of the module

Some operations, such as upgrading the software, require a reboot to get it active.

Click the **Reboot** button to reboot the unit.

During the rebooting process, “Rebooting” will be shown.

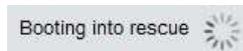


After rebooting, the web GUI will go automatically to the **STATUS** tab.

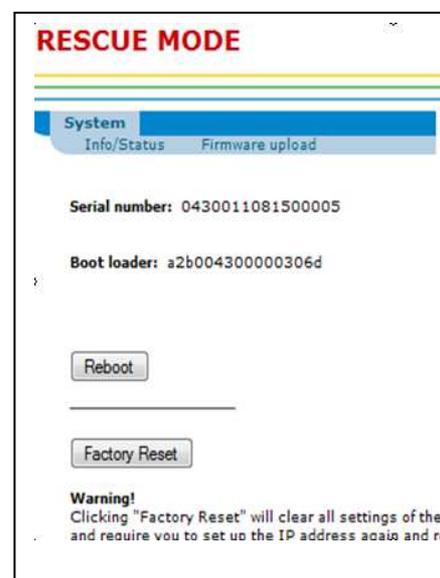
#### Rescue mode

In very special circumstances you might need to boot into rescue mode. If you are sure push the **Rescue mode** button to boot into rescue mode.

During the rebooting process, Booting into rescue will be shown.



In the rescue mode, you can access basic functionality via web interface, and upload new software and software options. In some cases you may have to connect via the backside control port to get access again.



#### Returning to normal mode

Click the **Reboot** button in the rescue mode to return to normal mode. *Note:* re-enter the IP address of your Tangram in the address field of you browser to access the normal mode web GUI.

### 3.14.9 Factory reset & Backup / Restore

#### Factory reset

The Tangram module can be reset to the same status as when delivered from the factory. Go to the SETTINGS tab, and MAINTENANCE.

Before you Click on FACTORY RESET please always do a backup of your last configuration as described below ! It may help you to save time & effort to get back to your original setup.



#### Factory reset from the rescue interface

There is a factory reset button in the rescue mode UI.

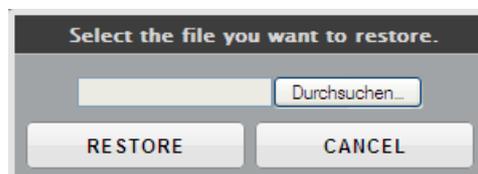
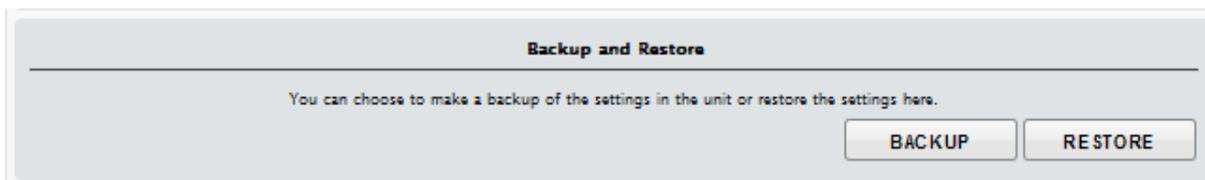
**WARNING!** Factory reset from the rescue mode will remove all settings, remove the entitlement file enabling the SW options, and will reset the IP address to the default.



#### Backup and restore (saving & restoring configuration)

The backup and restore functionality gives you the possibility to save the complete configuration of a Tangram / module to your PC. The stored config file is in readable xml format.

The backup file can be used for e.g. copying /clone configurations between different installations, or keeping a possibility to upload back the original configuration to a module after a change.



## 4. GT21 Module Status Information

The **STATUS** tab gives a general overview over the Tangram module. This page is also the starting page for the Module UI.



| MODULE IDENTIFICATION               |                  |
|-------------------------------------|------------------|
| Serial                              | 0460112052200006 |
| Hardware revision                   | 1000             |
| Name                                |                  |
| Location                            |                  |
| Description                         |                  |
| <input type="button" value="EDIT"/> |                  |

| CONFIGURATION    |   |
|------------------|---|
| Software version | 1.0rc2  |
| Software options | GT21 HW, GTIPIN, GT6VMOD<br>Default development entitlement |

| STATUS      |         |
|-------------|---------|
| Uptime      | 1m 8s   |
| Temperature | 32.0 °C |

| SERVICE LICENSE AGREEMENT (SLA) |            |
|---------------------------------|------------|
| Registered                      | Yes        |
| Expires                         | 2012-11-30 |

### MODULE IDENTIFICATION

Serial number and the HW version is shown. Further, there are three editable fields; Name, Location and Description. Choosing **EDIT** below the box enables you to save your own selected information about this Tangram module.

### CONFIGURATION

The configuration box shows you the Operation mode, the Software version, and the enabled SW options. A warning will be shown if no operation mode is selected.

### STATUS

Uptime (from last reboot), and current module temperature.

### SERVICE LICENCE AGREEMENT

Shows if the Tangram is registered at the WISI portal, and the expiry date of the service level agreement.



## **5. GT21 Module LEDs & Alarms**

### **5.1 GT21 master board**

The GT21 master has 2 status LEDs. LED1 is located between RF1-TP and RF1, LED2 is located between RF2-TP and RF2. Both LEDs are bi-colour (green and red). Switching on both LEDs results in a yellow /orange tone color.

New revision GT21 master board will have an further green internal 'heartbeat' LED3 on board. The firmware uses this LED to indicate it's heartbeat.

#### **5.5.1 Status LED states**

The following LED states are supported by software. Not all states are used.

- Off
- Red
- Red blinking (250 ms off, 250 ms on)
- Red flashing (875 ms off, 125 ms on)
- Green
- Green blinking
- Green flashing
- Yellow
- Yellow blinking
- Yellow flashing
- Alternating (red / green)

LED blinking: (250 ms off, 250 ms on)

LED flashing: (875 ms off, 125 ms on)

LED alternating: 250 ms red, 250 ms green



### 5.5.2 Status LED indication

| LED1            | LED2            | LED3           | Description  |
|-----------------|-----------------|----------------|--|
| Off             | Off             | Off            | No power supply  |
| Yellow          | Yellow          | Off            | Board has power, no software running (e.g. empty flash)                  |
| Red             | Red             | Off            | Bootloader started or rescue bootloader start complete                   |
| Off             | Red             | Off            | Bootloader failed to boot into firmware/rescue bootloader, board stopped |
| Red blinking    | Red blinking    | Off            | Rescue bootloader started  |
| Green blinking  | Red blinking    | Off            | Rescue bootloader FPGA booting   |
| Red flashing    | Red             | Off            | Rescue bootloader secret function: Reset board                           |
| Green flashing  | Red             | Off            | Rescue bootloader secret function: Clean config                          |
| Yellow blinking | Yellow blinking | Off            | Firmware started   |
| Green blinking  | Yellow blinking | Off            | Firmware FPGA booting  |
| Alternate       | Off             | Off            | Automatic update of slave board CPU1 active                              |
| Off             | Alternate       | Off            | Automatic update of slave board CPU2 active                              |
| Green           | Green           | Green blinking | Firmware start complete  |



## 5.6 GT21 slave board LEDs (only informational use – internal LEDs)

The GT21 module mainboard has a slave board mounted for additional functions. The slave board has 2 internal status LEDs. They are used to show status of the slave board similar to LED 1 of the master board. The first “bootloader LED 1” is the one closer to the RF connectors. The second shows the internal Firmware started properly.

### 5.6.1 Status LED states

The LED states are the same as defined for the master board.

### 5.6.2 Status LED indication

| LED                      | Description   |
|--------------------------|---|
| Off                      | No power supply or Bootloader failed to boot into firmware/<br>rescue bootloader, board stopped |
| Yellow                   | Board has power, no software running (e.g. empty flash)   |
| First LED<br>Red/Green 1 | Bootloader started or rescue bootloader start complete  |
| First LED<br>blinking    | Rescue bootloader started   |
| Yellow blinking          | Firmware started  |
| Second LED<br>blinking   | Firmware start complete. Module ready   |



## **6. Support and further information**

For further information and help, please contact our support organisations:

E-mail: [support\\_headend@wisi.de](mailto:support_headend@wisi.de)

Telephone: +49 (0)7233 / 66-621

### **User manual and installation guide updates**

Updates to the user manual and the installation guide are available at the Website [www.wisi.de](http://www.wisi.de) and through the tangramconnect Portal.



**WISI Communications GmbH & Co. KG**

Empfangs- und Verteiltechnik

Wilhelm-Sihn-Straße 5-7

75223 Niefern-Oeschelbronn, Germany

Tel.: +49 7233 - 66-292, Fax: 66-320,

E-mail: [info@wisi.de](mailto:info@wisi.de), <http://www.wisi.de>

*excellence in digital ...*

Technische Änderungen und Druckfehler vorbehalten!  
Technical Modifications reserved. WISI cannot be held  
liable for any printing error.