EFFICIENT VIDEO DELIVERY
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THE COMPANY

ENENSYS designs and manufactures innovative professional equipment and software enabling Efficient Video Delivery over Broadcast & Telecom Networks.

The ENENSYS team is comprised of highly experienced engineers, gathering expertise across a broad technology base including hardware design, RF, signal processing, real-time software and virtualized and cloud-native applications. The company develops all the technology embedded in its solutions: 90% of the team members own an MSc or a PhD in Information Technology, Software or Electronic and Electrical Engineering.

ENENSYS’ corporate culture is rooted in strong human values such as creativity, empathy and reactivity to anticipate our customer’s needs and achieve customer care excellence.

Focused on innovation, ENENSYS Networks are organized around 2 products lines:

- **Broadcast Networks**: Equipment for Digital Terrestrial TV, Targeted Content Insertion and Switches & IP Transport… Products sit between encoder/multiplexer output and transmitter input, facilitating signal distribution over a wide variety of networks. Covered standards include DVB-T2, ATSC3.0, ISDB-T, …

- **Telecom Networks**: Software for Mobile TV over LTE Broadcast and MCPTT Mission Critical & Public Safety applications. A distributed and scalable virtualized software enables LTE Broadcast capability on existing LTE/4G/5G Networks.

To sum up: it’s all about Efficient Video Delivery.
ENENSYS Broadcast Networks product portfolio

ENENSYS Broadcast Networks solutions are based on products fully imagined and developed by ENENSYS, from the hardware design to the embedded software and Graphical User Interface. These broadcast grade products are deployed in many commercial services supporting a high level of availability.

ENENSYS Broadcast Networks offers a large product portfolio, that could be divided in the 3 following domains:

- Secured SFN
- Network Regionalization
- Single Illumination DTH to DTT
- Content Rebroadcasting
- Local TV/Channel Insertion
- Targeted Ads Insertion
- Targeted News Insertion
- Targeted Emergency Alert
- Seamless switching
- Product and system redundancy
- Multi Link redundancy
- Video / Radio over IP

SERIAL INVENTOR

ENENSYS has a strong IPR portfolio, with more than 25 patents, all dedicated to the Video Delivery sector. Linked to this innovation work, ENENSYS is proud to be the first to introduce new technologies and solutions to support customers in their network optimizations and deployments.
### SOLUTIONS

**DVB-T**
- DVB-T and secure SFN management
- Single Illumination (DVB-T with DTH co-existence)
- Content Rebroadcasting

**DVB-T2**
- DVB-T2 and secure SFN management
- Single Illumination (DVB-T2 with DTH co-existence)
- Content Rebroadcasting

**ISDB-T**
- ISDB-T and secure SFN management
- Single Illumination for ISDB-T (ISDB-T with DTH co-existence)
- Content Rebroadcasting

**ATSC3.0 Digital Terrestrial TV**
DVB-T AND SECURE SFN MANAGEMENT SOLUTION

- Reliable end-to-end SFN solution
- SFN seamless switch-over to avoid TV black-out
- Commercially roll-out in major DVB-T SFN networks

PRODUCTS

1. **MIPDVB DVB-T SFN Adapter** | P.52
2. **SFNguard** Seamless switch-over for DVB-T | P.52
3. **ASIIPGuard** Seamless ASI switch | P.56
4. **IPGuardV2** Seamless IP switch | P.57
**KEY BENEFITS**
- High-grade broadcast equipment
- Complete range of SFN products
- No more black screen
- Uninterrupted service guaranteed
- Flexible solution based on standards
- T2 ready solution

**KEY FEATURES**
- SFN Seamless switch-over
- Unique SFN preservation when distributing over IP networks
- Video over IP distribution for OPEX reduction
- 24/7 monitoring of the network and system
- Dense solution, up to 6 SFN adapters in 1U

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**GigaCasterII** Dense TS over IP Gateway | P. S1
**SatCaster** Standalone DVB-S/S2 demodulator | P. S4
TERRESTRIAL BROADCASTING

SINGLE ILLUMINATION SOLUTION
DVB-T WITH DTH CO-EXISTENCE

- Reduce OPEX cost by delivering content once
- Innovative end-to-end solution for DTH and DVB-T services
- Share satellite capacity between DVB-T SFN distribution and DTH

SINGLE ILLUMINATION SOLUTION
DVB-T WITH DTH CO-EXISTENCE

PRODUCTS

1. TxGateway DVB-T Gateway for DTH | P. S2
2. TxEdge DVB-T Local inserter | P. S3
3. SatCaster Satellite demodulator | P. S4
4. TSDescrambler Professional CA Descrambler | P. S5
**KEY BENEFITS**

- No duplication of content over satellite network (no dual illumination)
- DTH compliant stream
- Backup DTT distribution with DTH
- Transmitter and DVB-T receiver agnostic
- T2 ready

**KEY FEATURES**

- SFN broadcasting compliant
- No modification of A/V services
- Independency from content format (SD/HD/4K, MPEG2/H264, ...)
- PSI/SI update according to the filtered services
- Service selection for DTTi network
- Multiple source support

---

5  ASIIPGuard Seamless ASI switch  |  P.56
6  IPGuardV2 Seamless IP switch  |  P.57
CONTENT REBROADCASTING SOLUTION

- Multi-standard DTT signal rebroadcasting
- Dense solution to deal with all DTT frequencies in 1U
- Applies for Regional Cable head-ends and DVB-T TX sites

PRODUCTS

1. MIPDVB DVB-T SFN Adapter | P.52
2. SFNguard Seamless switch-over for T | P.52
3. ASIIPGuard Seamless ASI/IP switch | P.56
4. IPGuardV2 Seamless IP switch | P.57
**KEY BENEFITS**

- High-grade broadcast equipment
- Lower CAPEX compared to satellite reception
- Optimize spectrum usage by enabling SFN rebroadcasting
- Flexible solution supporting DVB-T/T2/ISDB-T rebroadcasting in the same unit

**KEY FEATURES**

- DVB-T signal rebroadcasting
- Allow parent–child architecture with SFN preservation
- Support up to 24x frequencies the same chassis
- TS processing to enable service/PID filtering
DVB-T2 AND SECURE SFN MANAGEMENT  SOLUTION

➔ Unique end-to-end solution for efficient DVB-T2 broadcasting
➔ Most advanced DVB-T2 solution on the market
➔ Commercial roll-out in largest DVB-T2 networks

PRODUCTS

1. **T2Gateway**  DVB-T2 Gateway  |  P.47
2. **T2Guard**  Seamless switch-over for DVB-T2  |  P.47
3. **ASIIPGuard**  Seamless ASI/IP switch  |  P.56
4. **IPGuardV2**  Seamless IP switch  |  P.57
→ **KEY BENEFITS**
- Field proven and interoperable solution
- Flexible and scalable architectures
- One-stop-shop solution
- Secured investment in DVB-T2 system
- Simplified T2 network administration

→ **KEY FEATURES**
- Full support of DVB-T2/T2-Lite standard
- Uninterrupted service guaranteed
- DVB-T2 regional broadcasting with SFN preservation
- Compliant with full IP architecture

---

5. **SatCaster** Standalone DVB-S/S2 demodulator | P.54
6. **InverTS** T2-MI de-encapsulator | P.48
**SINGLE ILLUMINATION SOLUTION**

**DVB-T2 WITH DTH CO-EXISTENCE**

- Share satellite capacity between DVB-T2 distribution and DTH
- Commercially rolled-out in largest DVB-T2 networks
- Back-up DVB-T2 transmitter distribution with DTH stream

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**PRODUCTS**

1. **TxGateway** DVB-T2 Gateway for DTH  
2. **TxEdge** TS to T2-MI Adapter
**KEY BENEFITS**
- No duplication of content over satellite network
- Regionalization management compatible
- Backup DTT distribution with DTH
- Emergency Warning System compatible
- DVB-T2 transmitter and receiver agnostic

**KEY FEATURES**
- SFN broadcasting compliant
- No modification of A/V services
- Single PLP and Multiple PLP support
- Independency from content format (SD/HD/4K, MPEG2/H264, HEVC, ...)
- Service selection for DTTV network
- PSI/SI update according to filtered services
- Remote configuration and upgrade via in-band signal
- Building DTT MUX from several DTH sources
**CONTENT REBROADCASTING SOLUTION**

- **Unique SFN rebroadcasting solution** for DVB-T2
- **Dense solution** to deal with all DTT frequencies in 1U
- Applies for Regional **Cable head-ends** and **DVB-T2 TX sites**

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### PRODUCTS

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Page</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td><strong>T2Gateway</strong> DVB-T2 Gateway</td>
<td>P.47</td>
</tr>
<tr>
<td>2</td>
<td><strong>T2Guard</strong> Seamless switch-over for T2</td>
<td>P.47</td>
</tr>
<tr>
<td>3</td>
<td><strong>ASIIPGuard</strong> Seamless ASI/IP switch</td>
<td>P.56</td>
</tr>
<tr>
<td>4</td>
<td><strong>IPGuardV2</strong> Seamless IP switch</td>
<td>P.57</td>
</tr>
</tbody>
</table>
TERRESTRIAL BROADCASTING

KEY BENEFITS

- High-grade broadcast equipment
- Lower CAPEX compared to satellite reception
- Optimize spectrum usage by enabling SFN rebroadcasting
- Multiplex sharing capable

KEY FEATURES

- Full support of DVB-T2/T2-Lite standard
- Multiple PLP rebroadcasting capable
- Allow parent-child architecture with SFN preservation
- Support up to 24x frequencies the same chassis
- TS processing to enable service/PID filtering
ISDB-T/Tb AND SECURE SFN MANAGEMENT SOLUTION

- Optimize satellite capacity for ISDB-T distribution
- Unique end-to-end solution for efficient ISDB-T broadcasting
- SFN and MFN capable

PRODUCTS

1. TbGateway TbMarker Generator in OneBeam solution | P.50
2. TbGuard 1+1 seamless change-over | P.50
3. ASIIPGuard 1+1 seamless ASI switch | P.56
4. IPGuardV2 1+1 seamless IP switch | P.57
**KEY BENEFITS**
- Bandwidth optimization to reduce annual OPEX
- Full support of ISDB-T/Tb standards
- Standard MPEG-2 TS delivered over satellite
- ISDB-T/Tb transmitter agnostic

**KEY FEATURES**
- BTS generation from a regular MPTS
- BTS compression/decompression
- Regionalization support
- Multi-Layer support
- Deterministic generation for SFN broadcasting
- Cost effective BTS generator for MFN site
SINGLE ILLUMINATION SOLUTION
ISDB-T WITH DTH CO-EXISTENCE

- Share satellite capacity between ISDB-T distribution and DTH
- Covering DTT black spots with DTH stream
- Back-up feed to DTT transmission sites with DTH stream

PRODUCTS

1. TbGateway ISDB-Tb/DTH Gateway | P.50
2. TbGuard 1+1 TbGateway redundancy | P.50
3. IPGuardV2 Seamless IP switch | P.57
4. ASIIPGuard Seamless ASI/IP switch | P.56
**KEY BENEFITS**

- Bandwidth optimization to reduce annual OPEX
- Very fast Return On Investment (ROI)
- Full support of ISDB-T/Tb standards
- Standard MPEG-2 TS delivered over satellite
- Reuse existing network equipment
- ISDB-T/Tb transmitter agnostic

**KEY FEATURES**

- No duplication of content over satellite
- BTS generation from a regular MPTS
- Selection of DTH services to build the DTT multiplex
- Regionalization support
- Multi-Layer support
- Deterministic generation for SFN broadcasting
CONTENT REBROADCASTING SOLUTION

- Optimize satellite capacity for ISDB-T distribution
- Unique end-to-end solution for efficient ISDB-T broadcasting

PRODUCTS

1. **TbGateway** ISDB-Tb Gateway | P.50
2. **TbGuard** 1+1 TbGateway redundancy | P.50
3. **ASIIPGuard** Basic & Seamless ASI switch | P.56
4. **IPGuardV2** Basic & Seamless IP switch | P.57
**KEY BENEFITS**
- Lower CAPEX compared to satellite reception
- Full support of ISDB-T/Tb standards
- ISDB-T/Tb transmitter agnostic

**KEY FEATURES**
- BTS generation from a regular MPTS
- Multi-Layer support
- Deterministic generation for SFN broadcasting

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5. **TbEdge** TS to BTS Adapter
6. **DTTCaster** ISDB-T rebroadcasting
ATSC3.0 DIGITAL TERRESTRIAL TV SOLUTION

→ World's first ATSC broadcast gateway
→ Reliable end-to-end SFN solution

PRODUCTS
1. ATScheduler Broadcast ATSC 3.0 Gateway | P.60
2. STLGuard 1+1 seamless redundancy | P.60
**KEY BENEFITS**

- High-grade broadcast equipment
- Flexible solution based on ATSC3.0 standard
- Dense solution, up to 3 Broadcast Gateway in 1U
- No TV black-out during change-over
- Uninterrupted service guaranteed

**KEY FEATURES**

- Synchronization and configuration of ATSC3.0 modulators for SFN and MPLP broadcasting
- Multiple PLP support (Up to x8)
- Flexible IP management
- ALP, BB Frames and STL encapsulation
- 1+1 Automatic IP redundancy
- SFN and STL seamless switch-over
TARGETED CONTENT INSERTION

| Local TV/Channel Insertion | Targeted Ads Insertion | Targeted News Insertion | Targeted Emergency Alert |

SOLUTIONS

- DTTV content regionalization
- Targeted Content Insertion
- Regional Emergency Warning Solution
DTTV CONTENT REGIONALIZATION SOLUTION

- Deterministic local TV insertion to enable SFN broadcasting
- Reduce OPEX cost by delivering shared content only once
- Commercial roll-out in largest networks
**KEY BENEFITS**
- Enable local content insertion over DVB-T2 SFN networks
- Field proven and interoperable solution
- Flexible and scalable architectures
- Spectrum efficiency optimization
- Emergency Warning System compatible
- Future proof solution

**KEY FEATURES**
- Distribution network bandwidth optimization
- Full support of DVB-T2 standard
- Uninterrupted service guaranteed
- Regional broadcasting with SFN preservation
- Insertion of targeted advertisement
- Jumbo-T2MI to support higher T2-MI bit rate
TARGETED CONTENT INSERTION SOLUTION

- **Monetize your TV content** and engage your audience
- **Insertion of any local TV content**: Ads, News, Weather,...
- **Targeted TV insertion** for DTT and cable networks

PRODUCTS

1. **MIPDVb DVB-T SFN Adapter**
2. **T2Gateway DVB-T2 Gateway**
**KEY BENEFITS**

- Ad Server and Splicer in a single box
- Ad Splicer & server in a single box
- Generate additional revenues
- Industry-standard SCTE interfaces
- STB or iDTV receiver agnostic
- Multi-standard capable (T/T2/ISDB-T, ATSC, DVB-C)

**KEY FEATURES**

- Insertion upon reception of cue messages SCTE-35
- Multiple PLP support in DVB-T2
- SFN capable for DTT operation
- Various files delivery support to store schedules (SCTE-118-3) and spots (MPEG-2, MPEG-4, HEVC)
- AsRun logs generation and delivery
REGIONAL EMERGENCY WARNING SOLUTION

- Alert to national or regional audience any immediate dangers
- Receiver agnostic solution
- Commercially deployed in DVB-T/T2 SFN networks

PRODUCTS

1. TxGateway DVB-T/T2 Gateway for DTH | P.52
2. T2Gateway DVB-T2 Gateway | P.47
3. EWSCaster EWS trigger generator | P.54
4. ASIIPGuard Automatic ASI/IP switch | P.56
**KEY BENEFITS**

- Uses standard receivers - no specific implementation or middleware required
- Regional alert support
- SFN broadcast support
- Use visual and audio information to reach the largest possible audience
- Can be used as an add-on of the Enensys regionalization or OneBeam solution
- Field proven solution
- Multi-standard applicable (DVB-T/T2)

**KEY FEATURES**

- Video based Emergency Warning System
- Regionalisation support (rEWS™)
- SI/PSI independent to guarantee EWS Alert delivery
- Transmitter agnostic
- Broadcast-grade products
- Straight integration into any NMS
Seamless switching | Product and system redundancy | Multi Link redundancy | Video / Radio over IP

SOLUTIONS

Seamless SFN switch 38
IP Reliability for Equipment and Networks 40
Video and Radio delivery over IP 42
SEAMLESS SFN SWITCH SOLUTION

→ Reliable end-to-end SFN solution
→ SFN seamless switch-over to avoid TV black-out
→ Multi-standard applicable (DVB, ATSC, ISDB)

PRODUCTS

1. ASIIPGuard Basic & Seamless ASI switch | P.56
2. IPGuardV2 Basic & Seamless IP switch | P.57
3. MIPDVB DVB-T SFN Adapter | P.52
4. T2Gateway DVB-T2 Gateway | P.47
KEY BENEFITS
• Avoid TV blackout
• SFN network preservation with seamless switching
• Suitable for any DTT standard
• Ensure 100% service availability
• Synchronize head-ends on different locations

KEY FEATURES
• SFN Seamless switch-over
• 2:1 and 3:1 ASI/IP redundancy
• Peering feature
• Specific criteria for each DTT standard
IP RELIABILITY FOR EQUIPMENT AND NETWORKS SOLUTION

- Suitable solution for DTT, CATV, IPTV environment
- Redundancy of equipment based on advanced audio and video criteria
- Network seamless redundancy

PRODUCT

1. IPGuardV2 Basic & Seamless IP switch
**KEY BENEFITS**
- Manage IP-based equipment outage
- Secure transport over IP links
- Cope with jittered & unreliable network links
- Scalable & evolutive solution

**KEY FEATURES**
- Automatic switch-over between IP-based equipment
- ETR290 1/2/3 and advanced switching conditions
- Seamless switch-over with delayed sources
- IP jitter removal & packet losses recovery
- High density solution
VIDEO AND RADIO DELIVERY OVER IP SOLUTION

- Reliable video and radio content distribution over IP networks
- Uninterrupted service guaranteed
- Easy to setup and more cost effective than traditional solutions

PRODUCTS

1. **IPGuardV2** Basic & Seamless IP switch  | P.57
2. **MIPDVB** DVB-T SFN Adapter  | P.52
3. **T2Gateway** DVB-T2 Gateway  | P.47
4. **GigaCaster DMB** ETI over IP Gateway  | P.58
**KEY BENEFITS**

- Uninterrupted service guaranteed
- SFN Network preservation
- Decrease OPEX efficiently
- Safe Radio over IP transport

**KEY FEATURES**

- Automatic switch-over between IP-based equipment
- Distribution & contribution links securization
- Support EDI and ETI for DAB/DAB+/DMB infrastructures
- SFN preservation with or without external clock reference
- IP jitter removal & packet losses recovery
PRODUCTS
HDc MULTI

The ENENSYS Networks broadcast products run as independent modules in the High Density chassis (HDc) 19” 1RU to provide:

- **HDc-Multi-220V**
- **HDc-Multi-48V**
- **Options HDcMulti-In220VRedundant**
- **Options HDcMulti-In48VRedundant**

**ORDERING CODES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>HDc-Multi-220V</td>
<td>High Density chassis with 220V input</td>
</tr>
<tr>
<td>HDc-Multi-48V</td>
<td>High Density chassis with 48 input</td>
</tr>
<tr>
<td>HDcMulti-In220VRedundant</td>
<td>110V/220V redundant power supply</td>
</tr>
<tr>
<td>HDcMulti-In48VRedundant</td>
<td>48V DC redundant power supply</td>
</tr>
</tbody>
</table>
**T2Gateway** for HDc: DVB-T2 Gateway (T2-base or T2-lite)

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 2x ASI inputs and 2x ASI outputs
- 4x additional ASI inputs (Option)
- Up to 4x Gigabit data ports from the chassis/the module (Option)
- 1x TNC input antenna for internal GPS clock (Option)
- 1x PPS input

**Featuring**
- Encapsulation into DVB-T2 baseband frames
- T2-lite and T2-base support
- L1-post scrambling support
- In-band type A and B signalling
- DVB-T2 SFN Adaption with MISO support
- Relative and absolute timestamp support
- T2MIP generation for SFN rebroadcasting
- Multiple PLP support (2 by default, 4 and 8 as option)
- Individual addressing of T2 transmitters
- Future Extension Frame (FEF) broadcasting
- Powerful 1+1 and N+1 seamless redundancy (T2Guard) over IP (Option)
- Flexible IP inputs/outputs management (Option)
- Possible redundant IP inputs with mirrored IP outputs
- In-band configuration and firmware update delivery
- Generation of T2-MI packets over ASI and IP (Option)
- Validation of D2-T2 transmission parameters
- Full SNMPv2 support

**ORDERING CODES**

<table>
<thead>
<tr>
<th>HDm-T2Gateway</th>
<th>DVB-T2 Gateway module with 2PLP with 2x ASI inputs and 2x ASI outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td>IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)</td>
</tr>
<tr>
<td>T2Gateway-IP</td>
<td>IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)</td>
</tr>
<tr>
<td>T2Gateway-IPc</td>
<td>Management of up to 4 PLP</td>
</tr>
<tr>
<td>T2Gateway-MPLP4</td>
<td>Management of up to 8 PLP</td>
</tr>
<tr>
<td>T2Gateway-MPLP8</td>
<td>4 additional ASI inputs (use one more slot - not compliant with T2Gateway-IP option)</td>
</tr>
<tr>
<td>T2Gateway-4ASI+</td>
<td>1+1 and N+1 seamless redundancy</td>
</tr>
<tr>
<td>T2Guard</td>
<td>In-band configuration and firmware delivery</td>
</tr>
<tr>
<td>T2Gateway-InBand</td>
<td>Enable T2-MI stream with higher bit rate</td>
</tr>
<tr>
<td>T2Gateway-JumboT2MI</td>
<td>Built-in GPS receiver</td>
</tr>
<tr>
<td>NN6-GPSv2</td>
<td></td>
</tr>
</tbody>
</table>
**PRODUCTS**

**T2-MIGen**  
T2-MI Generation for local head-end

### TECHNICAL CHARACTERISTICS

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 2x ASI inputs and 2x ASI outputs
- 2x Gigabit data ports from the chassis (Option)
- 1x TNC input antenna for internal GPS clock (Option)
- 1x PPS input

**Features**
- Encapsulation into DVB-T2 baseband frames
- T2-base support (T2-lite as an option)
- DVB-T2 SFN timestamp generation
- Up to 2 PLP support (Option)
- FEF broadcasting (Option) for T2-lite and T2-base broadcasting
- Generation of T2-MI packets over ASI and IP
- Validation of DVB-T2 transmission parameters
- Easy-to-use web based GUI
- Full SNMPv2 support

### ORDERING CODES

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<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>HDm-T2MIGen</td>
<td>T2-MI Generator with 2x ASI inputs and 2x ASI outputs</td>
</tr>
<tr>
<td>Options</td>
<td>Management of up to 2 PLP (use 2x Gigabit Ethernet data ports of the chassis)</td>
</tr>
<tr>
<td></td>
<td>IP input/output management from the chassis</td>
</tr>
<tr>
<td></td>
<td>FEF generation</td>
</tr>
<tr>
<td></td>
<td>T2-lite support</td>
</tr>
<tr>
<td></td>
<td>Enabling PLP monitoring T2 parameters</td>
</tr>
<tr>
<td></td>
<td>Built-in GPS receiver</td>
</tr>
</tbody>
</table>

**InverTS** for HDc: Reverse DVB-T2 Gateway (T2-MI to TS)

### TECHNICAL CHARACTERISTICS

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 2x redundant ASI inputs
- 1x DVB-S/S2 input (Option)
- 2x Gigabit data ports from the module (Option)
- 2x ASI outputs

**Features**
- De-encapsulation of 1x T2MI stream into up to 8x TS
- Single and Multiple PLP (Option) management
- PLP allocation and L1 signalling monitoring (Option)
- Display TS structure within the T2-MI stream
- ASI inputs/outputs by default
- IP inputs/outputs as option
- Satellite input as option
- Output one or several MPEG-2 TS over ASI and IP
- Easy-to-use web based GUI
- Full SNMPv2 support

### ORDERING CODES

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>HDm-InverTS</td>
<td>Reverse DVB-T2 Gateway with 2x ASI inputs and 2x ASI outputs</td>
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<tr>
<td>HDmSat-InverTS</td>
<td>Reverse DVB-T2 Gateway with 2x ASI input/output and 2x DVB-S/S2 satellite inputs (Up to 32 ASPK) – one active</td>
</tr>
<tr>
<td>Options</td>
<td>Management of up to 2 PLP</td>
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<tr>
<td></td>
<td>Management of up to 4 PLP</td>
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<tr>
<td></td>
<td>Management of up to 8 PLP</td>
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<tr>
<td></td>
<td>IP inputs/outputs (add 2x gigabit Ethernet data port – use one more slot)</td>
</tr>
<tr>
<td></td>
<td>IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)</td>
</tr>
<tr>
<td></td>
<td>Advanced monitoring of T2-MI input</td>
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<tr>
<td></td>
<td>In-band firmware update and configuration</td>
</tr>
<tr>
<td></td>
<td>Add a second T2-MI de-encapsulation</td>
</tr>
<tr>
<td></td>
<td>BISS-1 descrambling</td>
</tr>
</tbody>
</table>
**T2Edge** for HDc: DVB-T2 local adapter

### TECHNICAL CHARACTERISTICS

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- Up to 2x ASI inputs and 2x ASI outputs
- Up to 4x Gigabit data ports from the chassis/the module (Option)
- 2x DVB-S/S2 input (Option)

**Featuring**
- Regional DVB-T2 multiplex creation at the DTT transmitter using PLP substitution (default) or PLP aggregation (option)
- Deterministic PLP multiplexer to enable SFN broadcasting
- EWS solution interoperable with any receivers
- Unmatched DVB-SI processing to update service information related to the local services
- Statistical Multiplexing enables for local content
- Transmitter agnostic
- Bypass mode to guarantee service availability in case of power outage
- Cost-effective solution by integrating DVB-S/S2 satellite input
- DTH to T2-MI adapter ready (OneBeam option)
- In-band configuration and firmware update capable (Option)
- Generation of T2-MI packets over ASI and IP
- Easy-to-use web based GUI
- Full SNMPv2 support

### ORDERING CODES

<table>
<thead>
<tr>
<th>HDm-T2Edge</th>
<th>DVB-T2 local adapter module with PLP substitution with 2x ASI in and 2x ASI out</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDmSat-T2Edge</td>
<td>DVB-T2 local adapter module with PLP substitution with 2x ASI inputs/outputs and 2x DVB-S/S2 satellite inputs (Up to 32 ASPK) - one active</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OptiPLP</td>
<td>Insertion with PLP aggregation</td>
</tr>
<tr>
<td>T2Edge-SIUpdate</td>
<td>Update SI data with new services</td>
</tr>
<tr>
<td>T2Edge-IP</td>
<td>IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)</td>
</tr>
<tr>
<td>T2Edge-IPc</td>
<td>IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)</td>
</tr>
<tr>
<td>T2Edge-DualSat</td>
<td>Second DVB-S/S2 satellite input on HDmSat-T2Edge</td>
</tr>
<tr>
<td>T2Edge-DTH</td>
<td>Upgrade to DTH-T2MI adapter</td>
</tr>
<tr>
<td>T2Edge-EWS</td>
<td>EWS solution management</td>
</tr>
<tr>
<td>T2Edge-Bypass</td>
<td>Bypass to always output main input</td>
</tr>
<tr>
<td>T2Edge-InBand</td>
<td>In-band firmware update and configuration</td>
</tr>
<tr>
<td>T2Edge-JumboT2MI</td>
<td>Enabling T2-MI stream with higher bit rate</td>
</tr>
</tbody>
</table>
**TbGateway** BTS Gateway for ISDB-Tb head-end

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 2x ASI inputs and 2x ASI outputs
- Up to 4x Gigabit Ethernet data ports from the chassis/module (Option)
- 4x additional ASI inputs (Option)
- 1x TNC input antenna for internal GPS clock (Option)
- 1x PPS input

**Featuring**
- BTS generation at the head-end – standalone mode
- BTS generation at the TX site – OneBeam mode (Option)
- Combining DTH and DTT services
- Enabling regionalization
- TbMarkers generation to enable remote BTS generator, TbEdge, broadcasting over SFN
- In-band configuration to fully control TbEdge
- Multi-layer support
- Seamless 1:1 redundancy (patented technology)
- Individual control of transmitters

**ORDERING CODES**

<table>
<thead>
<tr>
<th>HDm-TbGateway</th>
<th>TbGateway module with 2xASI inputs and 2x ASI outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td></td>
</tr>
<tr>
<td>TbGateway-IP</td>
<td>IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)</td>
</tr>
<tr>
<td>TbGateway-IPc</td>
<td>IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)</td>
</tr>
<tr>
<td>TbGuard</td>
<td></td>
</tr>
<tr>
<td>TbGateway-OneBeam</td>
<td>Tb markers and in-band configuration generation to enable remote TbEdge delivering BTS</td>
</tr>
<tr>
<td>NN6-GPSV2</td>
<td>Internal GPS receiver option</td>
</tr>
<tr>
<td>TbGateway-InBand</td>
<td>In-band firmware delivery</td>
</tr>
</tbody>
</table>

---

**TbEdge** BTS generation at the TX site

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- Up to 2x ASI inputs and 2x ASI outputs
- Up to 4x Gigabit Ethernet data ports from the chassis /module (Option)
- 2x DVB-S/S2 input (Option)

**Featuring**
- BTS generation for SFN or MFN broadcasting
- MPTS input and BTS output
- Multi-Layer management
- TMCC and IIP data insertion
- Service filtering and mapping
- PSI/SI update and generation (PAT,PMT, SDT, NIT)
- SFN compliant

**ORDERING CODES**

<p>| HDm-TbEdge     | Local BTS adapter module with 2x ASI inputs and 2x ASI outputs |</p>
<table>
<thead>
<tr>
<th>HDmSat-TbEdge</th>
<th>Local BTS adapter module with 2x DVB-S/S2 Satellite inputs (up to 32 APSK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td></td>
</tr>
<tr>
<td>TbEdge-IP</td>
<td>IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)</td>
</tr>
<tr>
<td>TbEdge-IPc</td>
<td>IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)</td>
</tr>
<tr>
<td>TbEdge-OneBeam</td>
<td>Enable deterministic BTS generation from TbMarkers</td>
</tr>
<tr>
<td>TbEdge-BISS</td>
<td>BISS-1 descrambling</td>
</tr>
<tr>
<td>TbEdge-DualSat</td>
<td>Enable the second DVB-S/S2 satellite input on HDmSat-TbEdge</td>
</tr>
<tr>
<td>TbEdge-InBand</td>
<td>In-band firmware update</td>
</tr>
</tbody>
</table>

---
## GigaCaster II TS over IP Gateway

### Technical Characteristics

**Inputs / outputs**
- 2x Gigabit Ethernet control ports (only one used)
- 2x Gigabit Ethernet data ports (one active port)
- Up to 8x ASI MPEG-2 TS inputs/outputs
- Optional SFP port for Fiber optic distribution
- 1x 10 MHz input
- Dry relays outputs

**Featuring**
- ASI to IP and IP to ASI conversion
- RTP / UDP support
- Unicast and multicast support
- Pro MPEG Forum CoP#3 / SMPTE 2022
- Network jittering removal
- Unique patented SFN preservation with or without 10MHz
- Outstanding packet loss recovery mechanism to maintain SFN
- Bidirectional DVB-ASI ports
- 1+1 automatic redundancy of GigaCasterII (DistriGuard option)
- 1+1 automatic and seamless redundancy of RTP streams (DualIP option)
- IGMP v2/v3 support

### Ordering Codes

<table>
<thead>
<tr>
<th>GigaCaster II-ASI1</th>
<th>Shipped with 4 ASI ports and 1 activated DVB-ASI I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>GigaCaster II-ASI4</td>
<td>Shipped with 4 ASI ports and 4 activated DVB-ASI I/O</td>
</tr>
<tr>
<td>GigaCaster II-ASI8</td>
<td>Shipped with 8 ASI ports and 8 activated DVB-ASI I/O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Options</th>
<th>1+1 redundancy of RTP streams</th>
</tr>
</thead>
<tbody>
<tr>
<td>DualIP</td>
<td>1+1 redundancy of RTP streams</td>
</tr>
<tr>
<td>NN6-SFP</td>
<td>Dual SFP slot hardware. SFP module not provided</td>
</tr>
<tr>
<td>NN6-ASI1-4</td>
<td>License upgrade from 1 port to 4 ports</td>
</tr>
<tr>
<td>NN6-In48V</td>
<td>48V input instead of 110V/220V</td>
</tr>
<tr>
<td>NN6-In220V-Redundant</td>
<td>110/220V redundant power supply</td>
</tr>
<tr>
<td>NN6-In48V-Redundant</td>
<td>48V redundant power supply</td>
</tr>
</tbody>
</table>

## GigaCaster DMB DAB, DAB+, DMB ETI over IP Gateway

### Technical Characteristics

**Inputs / outputs**
- 2x Fast Ethernet control ports (only one used)
- 2x Gigabit Ethernet data ports
- 4x ETI inputs or outputs
- 4x optional redundant ETI outputs or ETI inputs monitoring
- Dry relay alarm contact

**Featuring**
- ETI to EDI or EDI to ETI converter
- Up to 4 simultaneous ETI/EDI streams management
- Stuffing removal
- Forward Error Correction (DCP) management
- Advanced network jittering removal
- SFN preservation
- Unicast or multicast support
- RTP/UDP and IGMP management
- EDI reception over one of the data ports
- ETI delivery over one of the data ports

### Ordering Codes

<table>
<thead>
<tr>
<th>GigaCaster DMB</th>
<th>DAB, DAB+, DMB ETI over IP Gateway</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Options</th>
<th>Redundant ETI output or ETI input monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>NN6-ETI-Redundant</td>
<td>Redundant ETI output or ETI input monitoring</td>
</tr>
<tr>
<td>NN6-ETI-Monitoring</td>
<td>Advanced ETI to IP monitoring</td>
</tr>
<tr>
<td>NN6-In48V</td>
<td>48V input instead of 110V/220V</td>
</tr>
<tr>
<td>NN6-In220V-Redundant</td>
<td>110/220V redundant power supply</td>
</tr>
<tr>
<td>NN6-In48V-Redundant</td>
<td>48V redundant power supply</td>
</tr>
</tbody>
</table>
MIP inserter – Single Frequency Network Adapter

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 2x ASI inputs and 2x ASI outputs
- Up to 4x Gigabit Ethernet data ports from the chassis/the module (Option)
- 1x TNC input antenna for internal GPS clock (Option)
- 1x PPS input

**Featuring**
- MIP packet insertion for broadcasting DVB-T signal over SFN
- T2 ready (firmware upgrade required)
- Bit rate adaptation and PCR restamping
- NIT update
- Optional parameters management
- Powerful 1+1 seamless redundancy over IP (SFNguard Option)
- Flexible IP management supporting IP redundancy and IP mirroring (Option)
- In-band configuration and firmware update delivery
- Real-time monitoring of incoming streams
- Easy to use web-based GUI
- Full SNMP v2 support

**ORDERING CODES**

**HDm-MIPDVB**
SFNAdapter with 2x ASI inputs and 2x ASI outputs

<table>
<thead>
<tr>
<th>Options</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIPDVB-IP</td>
<td>IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)</td>
</tr>
<tr>
<td>MIPDVB-IPc</td>
<td>IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)</td>
</tr>
<tr>
<td>SFNGuard</td>
<td>1+1 seamless redundancy for SFN operation</td>
</tr>
<tr>
<td>NN6-GPSV2</td>
<td>Internal GPS receiver option</td>
</tr>
<tr>
<td>MIPDVB-InBand</td>
<td>Enable to deliver in-band ENENSYS product firmware and configuration</td>
</tr>
<tr>
<td>MIPDVB-T2Gateway</td>
<td>Allow firmware update to DVB-T2 Gateway</td>
</tr>
<tr>
<td>MIPDVB-T2Guard</td>
<td>Updating SFNguard to T2Guard (requires MIPDVB-T2 Gateway) for DVB-T2 MFN and SFN 1+1 seamless switch</td>
</tr>
</tbody>
</table>

**TxGateway** DVB-T/T2 Gateway for OneBeam

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 2x ASI inputs and 2x ASI outputs
- Up to 4x Gigabit Ethernet data ports from the chassis/the module (Option)
- 1x TNC input antenna for internal GPS clock (Option)
- 1x PPS input

**Featuring**
- Insert DTT maker into a live DTT or DTH stream • Full control of remote TxEdge to generate at the TX site the DTT multiplex
- Feed a DTH Multiplexer with the whole DTT stream or only the DTTMarker
- Generate MIP packet and DTT marker for DVB-T broadcasting
- Flexible IP management supporting IP redundancy and IP mirroring (Option)
- SFN broadcasting support
- TxGuard: 1+1 seamless change-over between two TxGateways
- IP output featuring ProMPEG CoP#3
- In-band configuration and firmware update delivery

**ORDERING CODES**

**HDm-TxGateway**
DVB-T/T2 Gateway for OneBeam with 2x ASI inputs and 2x ASI outputs

<table>
<thead>
<tr>
<th>Options</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>TxGateway-IP</td>
<td>IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)</td>
</tr>
<tr>
<td>TxGateway-IPc</td>
<td>IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)</td>
</tr>
<tr>
<td>TxGuard</td>
<td>1+1 seamless redundancy</td>
</tr>
<tr>
<td>TxGateway-InBand</td>
<td>In-band configuration and firmware delivery</td>
</tr>
<tr>
<td>NN6-GPSV2</td>
<td>Built-in GPS receiver</td>
</tr>
</tbody>
</table>
**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 2x ASI inputs and 2x ASI outputs
- Up to 4x Gigabit Ethernet data ports from the chassis/module (Option)
- 1x TNC input antenna for internal GPS clock (Option)
- 1x PPS input

**Featuring**
- Deterministic generation of a DVB-T or DVB-T2 multiplex for SFN operation
- Services filtering and mapping
- Powerful PSI/SI update (PAT, PMT, CAT, BAT, SDT, EIT)
- Dual source support to multiplex 2x DTH feeds into 1x DTT MUX
- MPTS inputs and MPTS output with MIP packet for DVB-T broadcasting
- MPTS input and T2-MI output for DVB-T2 broadcasting
- Support Single PLP and Multiple PLP in DVB-T2
- BISS Mode-1 descrambling (option)
- Regional EWS management to alert for immediate dangers (option)
- Flexible IP management supporting IP redundancy and IP mirroring (Option)
- In-band configuration and firmware update (option)

---

**ORDERING CODES**

**HDm-TxEdge**
TS adapter module with 2x ASI inputs and 2x ASI outputs

**HDmSat-TxEdge**
TS adapter module with 2 x DVB-S/S2 Satellite inputs (up to 32 APSK) - one active and 2x ASI inputs/outputs

**Options**
- **TxEdge-IP**: IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)
- **TxEdge-IPc**: IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)
- **TxEdge-BISS**: BISS-1 descrambling
- **TxEdge-EWS**: Alert for immediate dangers on a regional basis
- **TxEdge-DualSat**: Enable the second DVB-S/S2 satellite input on HDmSat-TxEdge
- **TxEdge-DualSource**: Combine services with an additional DTH source
- **TxEdge-InBand**: In-band firmware update
- **NN6-GSPv2**: Built-in GPS receiver
**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 2x L-band inputs (F-type)
- 2x ASI outputs
- 1x Gigabit Ethernet for data output from the chassis

**Featuring**
- Dual satellite demodulation (DVB-S/S2 to TS)
- C-band and Ku-band support
- Automatic detection of DVB-S/S2 standard
- QPSK, 8PSK, 16ASPK and 32 ASPK support
- 1+1 automatic redundancy of satellite inputs
- Multistream support
- BISS-1 descrambling as an option
- Full SNMPv2 support
- In-band configuration and firmware update (Option)
- Easy-to-use web GUI

**ORDERING CODES**

<table>
<thead>
<tr>
<th>HDm-SatCaster</th>
<th>DVB-S/S2 demodulator module with 2 active DVB-S/S2 Satellite inputs (up to 32 APSK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td>Features</td>
</tr>
<tr>
<td>SatCaster-BISS</td>
<td>BISS-1 descrambling</td>
</tr>
<tr>
<td>SatCaster-InBand</td>
<td>InBand configuration and firmware update</td>
</tr>
</tbody>
</table>

**EWSCaster** EWS trigger inserter

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 2x redundant ASI inputs and 2x ASI outputs
- 2x Gigabit Ethernet data ports from the chassis (Option)

**Featuring**
- Keepalive EWS trigger generation to alert for immediate danger
- Up to 8 triggers can be generated
- Regionalization support (rEWSTM) to trigger different alert per region
- Support up to 80 regions and 255 zones per trigger
- SI independent to guarantee EWS Alert delivery
- In-band or out-of-band delivery of EWS trigger
- Simultaneous triggers generation
- Easy-to-use web based GUI
- Full SNMPv2 support

**ORDERING CODES**

<table>
<thead>
<tr>
<th>HDm-EWSCaster</th>
<th>EWS trigger inserter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option</td>
<td>Features</td>
</tr>
<tr>
<td>EWSCaster-IP</td>
<td>IP input/output management (use 2x Gigabit Ethernet data ports of the chassis)</td>
</tr>
</tbody>
</table>
**DTTCaster** Professional DVB-T/T2/ISDB-T/Tb demodulator

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 1x RF input (N-type female - 50 Ω)
- 4x ASI (BNC) inputs/outputs
- 2x Gigabit data input/output ports from chassis

**Featuring**
- Demodulate up to 4x DVB-T signals
- Demodulate up to 4x DVB-T2 signals
- Demodulate up to 4x ISDB-T/Tb signals
- Support T2-base and T2-lite signals
- Demodulate up to 4x PLP in a DVB-T2 signal
- Output incoming MPEG-2 TS over ASI and IP
- Up to 2x deterministic T2-MI generation based on T2-MIP (Option)
- T2-MI input over ASI or IP to backup RF signals
- Up to 4x ASI outputs and 2x IP
- TS processing (PID filtering...)

**ORDERING CODES**

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTTCaster-T2MI</td>
<td>Deterministic T2-MI output for DVB-T2/SFN rebroadcasting</td>
</tr>
<tr>
<td>DTTCaster-DualT2MI</td>
<td>Dual T2-MI generation</td>
</tr>
</tbody>
</table>

**HDm-DTTCaster** DVB-T/T2/ISDB-T/Tb demodulator module with 1x RF input and 4 ASI outputs

**TDescrambler** Bulk DVB-CSA descrambler

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 2x DVB-CI slots to host ProCAM modules
- 1x Gigabit data port to output descrambled TS over IP (from the chassis)

**Featuring**
- Descrambling MPEG-2 TS encrypted with DVB-CSA algorithm
- TS over IP input and TS over IP output
- Descrambling the whole MPEG-2 TS or part of it (PID filtering)
- Up to 2x ProCAM to be hosted in the module
- Up to 6x TDescrambler in 1U to host up to 12x ProCAM
- Management of up to 64 PID to descramble over 200 TV services in 1U
- Compliant with major CA vendors (NagraVision, Irdeto, Viaccess, ...)
- Process TS from other modules in the chassis or from IP input
- SFN compliant
- Easy-to-use web GUI
- Full SNMP V2 support

**ORDERING CODE**

| HDm-TDescrambler       | Bulk DVB-CSA descrambler                           |
**ASIPGuard** 2:1 or 3:1 Innovative ASI switch with IP I/O option

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit Ethernet for GUI/SNMP (from chassis)
- 2x ASI inputs and 2x ASI outputs
- 1x additional ASI input for switching over 3 feeds
  
  Option ASIPGuard-1ASIIn2ASIOut
  
  - ASI bypass to always output inputs in case of power outage
  
  - Up to 3x Gigabit Ethernet data ports – Option ASIPGuard-IP
  
  - IP bypass for first IP input
  
  - Up to 2x additional ASI outputs – Option ASIPGuard-1ASIIn2ASIOut
    
    (one additional only with ASIPGuard-IP)

**Featuring**
- Automatic switch between 2 or 3 MPEG-2 TS (between 3 as an option)
- Seamless switching between 2 or 3 T2-MI streams (Option)
- Seamless switching between 2 or 3 BTS - Option
- Avoid TV black-out in SFN (and MFN in DVB-T2)
- Seamless switch-over with delayed source
- Up to 6 ASI switches in the same unit
- Switch between ASI feeds and IP feeds
- ETR290 based switching conditions
- MIP, T2-MI, BTS and advanced TS switching conditions
- ATSC switching criteria and PSIP analysis
- Peering mode to synchronize change-over of several ASIPGuard
- Bypass mechanisms for ASI and IP inputs
- Video diagnostic: MPEG-2 or MPEG-4/H.264
- Real-time monitoring of incoming streams

**ORDERING CODES**

**HDm-ASIPGuard**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seamless TS</td>
<td>MFN and SFN seamless TS switch</td>
</tr>
<tr>
<td>Seamless T2-MI</td>
<td>T2-MI MFN &amp; SFN seamless switch</td>
</tr>
<tr>
<td>ASIPGuard-ATSC</td>
<td>ATSC analysis &amp; switching conditions</td>
</tr>
<tr>
<td>ASIPGuard-BTS</td>
<td>BTS seamless switch</td>
</tr>
<tr>
<td>ASIPGuard-IP</td>
<td>Add 3x Gigabit Ethernet ports and 1x ASI output from the module – use one more slot</td>
</tr>
<tr>
<td>ASIPGuard-1Pe</td>
<td>Use the chassis data ports as input or output</td>
</tr>
<tr>
<td>ASIPGuard-1ASIIn2ASIOut</td>
<td>1x additional ASI input and 2x additional outputs from the module – use one more slot (not compliant with ASIPGuard-IP)</td>
</tr>
<tr>
<td>ASIPGuard-3TSIn</td>
<td>Automatic switch over 3 inputs</td>
</tr>
<tr>
<td>ASIPGuard-Peering</td>
<td>Synchronize several ASIPGuard</td>
</tr>
<tr>
<td>ASIPGuard-QoS</td>
<td>SAE/SDE QoS monitoring</td>
</tr>
</tbody>
</table>

**SafeSplitter** Dual 1:3 ASI Splitter with TS monitoring

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 2x Gigabit Ethernet Control ports (only one used)
- 2x Gigabit Ethernet data ports (not used)
- 2x DVB-ASI inputs
- 6x DVB-ASI outputs - with two bypass
- Dry relays output

**Featuring**
- 2x 1:3 ASI Splitter
- Bypass for main output in case of power failure
- ETR290 Level1, Level2 and Level3 monitoring
- Service Availability Error Monitoring (Option)
- Service Degradation Monitoring (Option)
- Service Bit rate monitoring
- TS multiplex monitoring
- T2-MI monitoring
- Full SNMP v2 support (set, get and traps)
- Easy-to-use web based GUI

**ORDERING CODES**

**SafeSplitter**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NN6-QoS</td>
<td>SAE/SDE QoS monitoring</td>
</tr>
<tr>
<td>NN6-In48V</td>
<td>48 V input instead of 110V/220V</td>
</tr>
<tr>
<td>NN6-In1220VRedundant</td>
<td>110V/220V redundant power supply</td>
</tr>
<tr>
<td>NN6-In48VRedundant</td>
<td>48V DC redundant power supply</td>
</tr>
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</table>
**IPGuardV2** Unique 1+1 IP streams redundancy

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit Ethernet for GUI/SNMP
- 2x Gigabit Ethernet data input ports
- 2x mirrored Gigabit Ethernet data output ports
- 4x SFP ports as option to receive TS over Fibber
- Dry relays output

**Featuring**
- Switch-over at stream level or data port level
- Unicast/Multicast (UDP/IP) streams support
- FEC correction and generation (ProMPEG CoP#3 support)
- Transparent network bridge
- Up to 60 IP streams managed
- Up to 6 TSoIP switch and monitoring (Option)
- Manage up to 396 switches in 1U with the DaisyChain option
- TS over IP automatic change-over
- T2-MI over IP automatic change-over (Option)
- Optional Seamless TS and Seamless T2-MI features
- IP, ETR290 and advanced audio & video switching conditions
- Unmatching ATSC3.0/STL switching criteria
- Seamless switch-over between identical RTP streams (SMPTE2022-7)
- Peering mode to synchronize the change-over of several IPGuardV2
- IP Bypass mechanism to always output IP streams
- Real-time monitoring of incoming streams

**ORDERING CODES**

**HDm-IPGuardV2** Smart IP switch with 2x IP inputs and 2x IP outputs with bypass

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<td>MFN and SFN seamless TS switch</td>
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<td>IPGuardV2-SeamlessT2-MI</td>
<td>T2-MI MFN &amp; SFN seamless switch</td>
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<td>IPGuardV2-SeamlessRTP</td>
<td>Seamless switching between identical RTP streams</td>
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<td>IPGuardV2-FEC</td>
<td>FEC generation and modification on the outputs</td>
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<td>IPGuardV2-Peering</td>
<td>Synchronize several IPGuardV2</td>
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<td>IPGuardV2-DaisyChain</td>
<td>Share processing with another IPGuardV2</td>
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<tr>
<td>IPGuardV2-1/2/6TS</td>
<td>Automatic switching between 1/2/6 TSoIP</td>
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<td>IPGuardV2-1/2/6STL</td>
<td>Automatic switching between 1/2/6 STL</td>
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<tr>
<td>IPGuardV2-SFP</td>
<td>Add SFP ports to the module</td>
</tr>
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</table>
**Campaign Manager** AdsEdge files delivery management

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- Up to 2x control ports for GUI/SNMP
- Up to 2x data ports to receive and delivering files

**Featuring**
- Software-based application that runs on a Virtual Machine
- Ease day-to-day operation of Target Content Insertion
- Outstanding dashboard to monitor at once the full operational system
- Control and monitor the files delivery with the AdsEdge
- Out-of-band files delivery over FTP (Push or Pull mode)

**ORDERING CODES**

<table>
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<th>CampaignManager</th>
<th>AdsEdge files delivery management (1 – 20 AdsEdge) – Hardware not included</th>
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<td>Options</td>
<td>Monitor and Control the campaign for up to 100x AdsEdge</td>
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<td>CM-100</td>
<td>CM-100+</td>
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Get at a glance the overall status of your whole Ads insertion system

Check the status of the Ads per service

Google-like map to identify the activities per region and AdsEdge
# AdsEdge: Targeted Regional Content Insertion

## TECHNICAL CHARACTERISTICS

### Inputs / outputs
- 1x Gigabit control port for GUI/SNMP (from chassis)
- Up to 2x ASI inputs and 2x ASI outputs
- 2x Gigabit Ethernet data ports from the module (Option)
- 2x DVB-S/S2 input (Option)

### Featuring
- Insert targeted content of file-based content (Ads, news, weather,...) for DTT or Cable networks
- TS or T2-MI inputs and outputs
- Combining Ad Server and splicing features in one unit
- Splicing with very low latency (few ms)
- Insertion of pre-stored advertisement upon SCTE35 trigger reception
- SCTE-35 Tier-0 and Tier-2 support
- Simultaneous insertion into up to 8 TV services
- Filtering of TV services’ components to insert
- SCTE18-3 compliant for scheduling management and report generation
- AsRun logs generation as a proof of insertion
- Multi-PLP management for DVB-T2 broadcasting
- DTT SFN compliant (DVB-T2, DVB-T, ISDB-T)
- IP passthrough to support Multi-TS over IP for cable environment
- Advanced files management to receive schedules and spots and deliver AsRun Logs
- 120 GB available by default
- Optional bypass on ASI outputs

## ORDERING CODES

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<td>Local Ad Insertion module with 2x ASI inputs and 2x ASI outputs (hardware)</td>
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<tr>
<td>HDmSat-AdsEdge</td>
<td>Local Ad Insertion module with 2x DVB-S/S2 Satellite inputs (up to 32 APSK)</td>
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### Options
- **AdsEdge-Bypass**: ASI hardware passthrough to maintain main stream - Hardware option
- **AdsEdge-Splicing2**: Ad insertion for 2 TV services
- **AdsEdge-Splicing4**: Ad insertion for 4 TV services
- **AdsEdge-Splicing8**: Ad insertion for 8 TV services
- **AdsEdge-IP**: IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)
- **AdsEdge-DualSat**: Enable the second DVB-S/S2 satellite input on HDmSat-AdsEdge
**ATSCheduler** ATSC3.0 Broadcast Gateway

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 4x Gigabit Ethernet data ports from the chassis and the module
- 1x TNC input antenna for internal GPS clock (Option)
- 1x PPS input

**Featuring**
- Encapsulation of ROUTE or MMT IP streams into STLTP
- LMT tables generation and LLS tables delivery
- ALP and BBF frame encapsulation of incoming IP stream
- Multiple PLP support (4 by default, 8 as an option)
- Single and multiple sub-frame management
- Timing information generation for SFN broadcasting
- 1PPS, GPS, PTP or NTP as reference clock
- 1:1 seamless change-over with STLGuard option and IPGuardV2 product
- Individual addressing of ATSC3.0 modulators
- STL generation over IP (STLTP)
- Flexible IP management supporting IP redundancy and IP mirroring
- Real-time monitoring of incoming streams
- Easy to use web-based GUI
- Full SNMP v2 support

**ORDERING CODES**

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<td>NN6-GPSV2</td>
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**ATSCaster** ATSC3.0 files delivery server

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x control port for GUI/SNMP
- 1x data port to receive ISOBMFF and DASH segments and to deliver them over ROUTE or MMT protocols

**Featuring**
- Virtualized files delivery server over Route or MMT
- WebDAV input to receive DASH or ISOBMFF segments
- Encapsulation of live DASH segments over ROUTE protocol
- Encapsulation of live ISOBMFF segments over MMT protocol
- Encapsulation of NRT files into ROUTE protocol
- Up to 50 ROUTE or MMT sessions (5 by default)
- Files delivery over IP multicast
- Highly reliable with 1:1 redundancy
- Real-time monitoring of incoming streams
- HTTP/Rest API to be remotely controlled
- Easy to use web-based GUI
- Full SNMP v3 support

**ORDERING CODES**

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