About the ENENSYS Technologies

Solutions For Any Networks

ENENSYS Technologies designs and manufactures innovative professional equipment and software enabling Efficient Video Delivery over Terrestrial (ATSC3.0, DVB-T/T2, ISDB-T/Tb, HbbTV...), Satellite (DVB-S/S2/S2X) & Telecom Networks (4G/5G, IPTV, OTT). We also provide Test & Monitoring equipment with the TestTree brand.

We have the solutions and the experience to optimize, secure and monetize any type of Media Delivery Networks.

With the recent acquisition of Expway, a world leader for Mobile Phone and Set Top Box middleware, ENENSYS’ solutions are now covering the entire Media Delivery Chain, from the head-end all the way down to the receiver. Mastering the complete delivery chain creates huge possibilities taking the Network to the next level. The origin of the ENENSYS name proudly means: ENd to ENd SYstems.

Efficient Media Delivery

We Optimize

We have a wide range of solutions to optimize the RF Spectrum (Advanced standards using SFN such as ATSC 3.0 or DVB-T2) or to avoid duplicating similar content over the delivery networks (LTE Broadcast, OneBeam, ...).

We Secure

Viewers are expecting the best quality. We offer advanced seamless switches and QoS/QoE Monitoring solutions to make sure the service is operational 24h a day, 7 days a week.

We Monetize

We will help the Network Operators to bring additional value to the delivered content, by enabling targeted Ad Insertion (more revenue per Ad) or local Ad Insertion (more advertisers), and by enabling hybrid services over their networks.

Our Customers

Thanks to ENENSYS Technologies, more than 1.5 billion people are receiving their video programs, on all types of networks (Terrestrial, Satellite, Mobile or Telecom). All in the best quality.

Our customers are the most prestigious Tier 1 Network Operators in the world:
- Telecom & Mobile Operators: Reliance, Telstra, NTT DoCoMo
- Terrestrial Operators: Sinclair Broadcast Group, TDF, Arqiva, MultiChoice, ThaiPBS, TVS ...
- Satellite Operators: Eutelsat, Globecast...

+1.5 billion people

Our team

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. ENENSYS developed all the technologies embedded in its solutions: 90% of the team members own an MSc or a PhD in Information Technology, Software or Electronic and Electrical Engineering, and 50% of the team works in R&D.

Our locations

With headquarters in France, we have sales, support and professional services offices all around the world, and skilled business partners to guarantee a local presence to our customers.

Serial Inventor

ENENSYS has a strong IPR portfolio, with more than 60 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.
With more than 15 years of technological leadership in the DTT market, we deliver innovative solutions to enable Broadcasters to strengthen their position in a more competitive environment. This covers existing delivery network optimization as well as new service implementations.
Let’s build together efficient DTT media delivery

- Use satellite to extend DTT SFN coverage with OneBeam
- Deploy second generation of DTT with SmartGate
- Secure your network with IPGuard
- Implement IP distribution networks with GigaCaster
- Monetize regional content with AdsEdge & TxEdge
- Upgrade/Recycle your Transmitters with Twister & Vortex

DVB-T, DVB-T2, ISDB-T/Tb, ATSC 3.0, dab+

Head-End

Transmitter 1

Transmitter 2

Transmitter N

We optimize | We secure | We monetize

Use satellite to extend DTT SFN coverage with OneBeam
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Upgrade/Recycle your Transmitters with Twister & Vortex
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

KEY BENEFITS
- High-grade broadcast equipment
- Complete range of SFN products
- No more black screen
- End-To-End SFN Solution
- 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
- Ready for Virtualized Head-End
- Dense solution, up to 6 SFN adapters in 1U

PRODUCTS
1. SmartGate T Hardware based SFN adapter | P.68
2. SmartGate vT Software based SFN adapter | P.68
3. SFNguard Seamless switch-over for DVB-T | P.68
4. ASIPGuard Seamless ASI switch | P.74
5. IPGuard2 Seamless IP switch | P.75
6. Vyper Satellite modulator | P.82
7. Neptune Satellite Demodulator | P.84
8. GigaCaster II Dense TS over IP Gateway | P.73
9. Twister II DVB-T/T2 Modulator/Exciter | P.72
10. EdgeProbe Monitoring | www.test-tree.com
**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

**KEY BENEFITS**
- Standard Based, DVB-SIS, DVB-T
- No duplication of content over satellite network (no dual illumination)
- DTH compliant stream
- Backup DTT distribution with DTH
- Transmitter and DVB-T receiver agnostic
- Smart transition to T2

**KEY FEATURES**
- SFN broadcasting compliant
- No modification of A/V services
- Independency from content format (SD/HD/4K, MPEG2/H264, H265,…)
- PSI/SI update according to the filtered services
- Service selection for DTTV network

**PRODUCTS**

1. SmartGate OneBeam Control Stream Generator | P.71
2. TSDescrambler Professional CA Descrambler | P.70
3. TxEdge DVB-T Local inserter | P.71
4. Vyper Satellite modulator | P.82
5. Neptune Satellite Demodulator | P.84
6. ASIPGuard Seamless ASI switch | P.74
7. IPGuardV2 Seamless IP switch | P.75
8. Twister II DVB-T/T2 modulator/exciter | P.72
9. EdgeProbe Monitoring | www.test-tree.com

**HEAD-END**

**TRANSMITTER #1**

1. Control Stream Generator
2. GPS
3. DTH to TS Adapter
4. Satellite Modulator
5. DTH to TS Adapter Descrambler
6. DVB-T SFN Exciter
7. GPS
8. GPS

**TRANSMITTER #2**

2. GPS
3. DTH to TS Adapter Descrambler
4. Satellite Modulator
5. Satellite Demodulator
6/7. Seamless ASI/IP switch
8. DVB-T SFN Exciter
9. GPS

**SFN Cell**

**DTH consumers**

**DVB-T consumers**

**SFN Cell**

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9. EdgeProbe Monitoring | www.test-tree.com
**CONTENT REBROADCASTING SOLUTION**

- **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

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**DVB-T HEAD-END**

- 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. SmartGate T DVB-T SFN Adapter Hardware based | P.68
2. SmartGate vT DVB-T SFN Adapter Software based | P.68
3. SFNguard Seamless switch-over for T  | P.68
4. ASI/IPguard Seamless ASI/IP switch | P.74
5. IPGuardV2 Seamless IP switch | P.75
6. DTTcaster DVB-T rebroadcasting | P.67
7. Twister III DVB-T/T2 modulator/exciter | P.72
8. EdgeProbe Monitoring | www.test-tree.com

**CABLE HEAD-END**

**CHILD TX SITE**

- DVB-T Rebroadcasting
- GPS
- F2 SFN

**PARENT TX SITE**

- SFNguard
- GPS
- Y/2

**CHILD TX SITE**

- DVB-T Rebroadcasting
- GPS
- F2 SFN

**DVB-T viewers**

**CABLE viewers**
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

**KEY BENEFITS**
- Field proven and interoperable solution
- Reliable end-to-end solution
- 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

**PRODUCTS**
1. SmartGate T2 Hardware based DVB-T2 gateway | P.65
2. SmartGate vT2 Software based DVB-T2 gateway | P.65
3. T2Guard Seamless switch-over for DVB-T2 | P.65
4. ASIPGuard Seamless AS/IP switch | P.74
5. IPGuardv2 Seamless IP switch | P.75
6. Vyper Satellite modulator | P.82
7. Neptune Satellite demodulator | P.84
8. InverTS T2-MI de-encapsulator | P.66
9. Twister III DVB-T/T2 modulator/exciter | P.72
10. EdgeProbe Monitoring | www.test-tree.com

**HEAD-END**
- Multiplexer
- MPEG-2
- MPEG-4
- SD/HD Encoders
- T2-MI
- MPEG2-TS
- T2Guard
- GPS
- DVB-T2 Gateway
- Seamless Switch
- Satellite Modulator

**TRANSMITTERS**
1. TRANSMITTER #1
   - GPS
   - Satellite demodulator
   - Seamless Switch
   - T2-MI
   - DVB-T2 exciter
2. TRANSMITTER #2
   - GPS
   - Satellite demodulator
   - Seamless Switch
   - T2-MI
   - DVB-T2 SFN exciter
3. TRANSMITTER #3
   - GPS
   - Satellite demodulator
   - T2-MI de-encapsulator
   - Multiplexer/Monitoring
   - MPEG2-TS
   - DVB-T2 exciter

**TERRESTRIAL MARKET TERRESTRIAL MARKET**
**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

**KEY BENEFITS**
- Standard Based, DVB-SIS, DVB-T2
- 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

**PRODUCTS**
1. SmartGate OneBeam Control Stream Generator | P. 71
2. Vyper Satellite modulator | P. 68
3. TwEdge OneBeam DTH TS to T2MI Adapter | P. 71
4. Twister II DVB-T/T2 modulator/exciter | P. 72
5. EdgeProbe Monitoring | www.test-tree.com
DVB-T2 NETWORK REGIONALISATION 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

PRODUCTS
1. SmartGate T2 Hardware based DVB-T2 gateway | P:45
2. SmartGate T2MIGen Local T2-MI generator | P:44
3. SmartGate vT2 Software based DVB-T2 gateway | P:45
4. TEdge T2 DVB-T2 local adapter | P:47
5. Twister II DVB-T/T2 modulator/exciter | P:72
6. EdgeProbe Monitoring | www.test-tree.com
**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 (DVBT/T2)

**KEY FEATURES**

- Video based Emergency Warning System
- Regionalisation support (rEWSTM)
- SI/PSI independent to guarantee EWS Alert delivery
- Transmitter agnostic
- Broadcast-grade products
- Straight integration into any NMS

**REGIONAL EMERGENCY WARNING SOLUTION**

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

**PRODUCTS**

1. SmartGate OneBeam Control Stream Generator | P.71
2. SmartGate T2 Hardware based T2 Gateway | P.65
3. EWSCaster EWS trigger generator | P.70
4. ASIPGuard® Automatic ASIP switch | P.74
5. IPGuardV2® Automatic IP switch | P.75
6. Twister II DVB-T/T2 modulator/exciter | P.72
7. EdgeProbe Monitoring | www.test-tree.com
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

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

PRODUCTS
1. SmartGate T2 DVB-T2 Gateway
2. SmartGate vT2 DVB-T2 Gateway
3. T2Guard Seamless switch-over for T2
4. ASIPGuard Seamless ASI/IP switch
5. IPGuardV2 Seamless IP switch
6. DTTCaster DVB-T2 rebroadcasting
7. Twister III DVB-T/T2 modulator/exciter
8. EdgeProbe Monitoring

Unique SFN rebroadcasting solution for DVB-T2
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3. T2Guard Seamless switch-over for T2
4. ASIPGuard Seamless ASI/IP switch
5. IPGuardV2 Seamless IP switch
6. DTTCaster DVB-T2 rebroadcasting
7. Twister III DVB-T/T2 modulator/exciter
8. EdgeProbe Monitoring
ISDB-T AND SECURE SFN MANAGEMENT SOLUTION

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

**ISDB-T/Tb**

**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
- Emergency Warning Broadcast System support
- Cost effective BTS generator for MFN site

**PRODUCTS**
1. SmartGate ISDB (ISDB-T/Tb) Gateway  | P.26
2. TbGuard 1+1 seamless change-over  | P.26
3. ASIFGuard 1+1 seamless ASI switch  | P.26
4. IPOnetV2 1+1 seamless IP switch  | P.26
5. Vyper Satellite modulator  | P.26
6. TxEdge ISDB BTS adapter  | P.26
7. Twister II ISDB-T/Tb exciter  | P.26
8. EdgeProbe Monitoring  | www.test-tree.com
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

ISDB-T/Tb

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
- ISDB-T/Tb transmitter agnostic
- Deliver differentiated content per Region

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
- Local remultiplexing from two input streams
- Multi-Layer support
- Deterministic generation for SFN broadcasting

PRODUCTS
1. SmartGate ISDB ISDB-T/Tb Gateway | P.69
2. TbGuard™ 1+1 TbGateway redundancy | P.69
3. IPGuardV2 Seamless IP switch | P.75
4. ASIPGuard Seamless ASIP switch | P.74
5. Vyper Satellite modulator | P.82
6. TSDescrambler Professional CA Descrambler | P.70
7. TxEdge ISDB BTS Adapter | P.69
8. Twister III ISDB-T/Tb exciter | P.72
9. EdgeProbe Monitoring | www.test-tree.com

ISDB-Tb HEAD-END

TRANSMITTER #1
- MPTS + TbMarkers
- ISDB-Tb Exciter
- BTS
- ISDB-Tb consumers

TRANSMITTER #2
- MPTS + TbMarkers
- ISDB-Tb Exciter
- BTS
- ISDB-Tb consumers

TRANSMITTER #3
- MPTS + TbMarkers
- ISDB-Tb Exciter
- BTS
- ISDB-Tb consumers

REGION #1
- SFN Cell
- ISDB-T consumers

REGION #2
- SFN Cell
- ISDB-T consumers

Monitoring
CONTENT REBROADCASTING SOLUTION

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

ISDB-T/Tb

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

PRODUCTS
1. SmartGate ISDB ISDB-T/Tb Gateway  | P.30
2. TbGuard 1+1 TbGateway redundancy  | P.31
3. ASIIPGuard Seamless ASI switch  | P.74
4. IPGuardV2 Seamless IP switch  | P.75
5. TxEdge ISDB TS to BTS Adapter  | P.69
6. DTTCaster ISDB-T rebroadcasting  | P.67
7. Twister II ISDB-T/Tb SFN Exciter  | P.72
8. EdgeProbe Monitoring  | www.test-tree.com
**ATSC 3.0 DIGITAL TERRESTRIAL TV SOLUTION**

- **Key Benefits**
  - Comprehensive ATSC 3.0 solution
  - Full support of ATSC 3.0 standard
  - Scalable & secure architecture
  - No more black screen
  - Spectrum efficiency optimization

- **Key Features**
  - Full virtualized ATSC 3.0 Head-End
  - Redundancy of two distribution paths with seamless switching
  - 24/7 monitoring of the network and system

**Contents**

- Live services
- Encoders
- Web Server
- Ad server
- ATSC 3.0 STLTP
- Broadband
- DASH/MPU
- AEA server
- DataCasting
- Video services
- Software update
- 3rd party applications
- NRT
- ESG server
- ROUTE/MMTP
- Delivery & signaling server
- TX SITE#1
- TX SITE#2
- SFN Cell
- Broadcast Gateway
- GlobalViewer
- ATSC 3.0 Monitoring
- ATSC 3.0 Analyzer
- ATSC 3.0 Recorder & Player
- RF Catcher
- GlobalViewer

**Products**

1. MediaCast: Broadcast ATSC 3.0 Gateway
2. SmartGate ATSC 3.0 Gateway
3. VCC Virtualized modulator
4. IPGuardV2: Seamless STL switch
5. Vertex II: ATSC 3.0 exciter
6. Tearex: ST2L 2.0 exciter
7. EdgeProbe: ATSC 3.0 Monitoring
8. StreamProbe: ATSC 3.0 Monitoring
9. ReFeree 3: ATSC 3.0 Analyzer
10. RF Catcher: ATSC 3.0 Recorder & Player
11. GlobalViewer: Centralized Network Quality & Service Availability

**Reliable end-to-end SFN solution**

- SFN seamless switch-over to avoid TV black-out
- Most advanced end-to-end ATSC 3.0 solution on the market
DIGITAL RADIO DELIVERY CONTENT SOLUTION

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

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

Reliable radio content distribution over IP or Satellite networks

Easy to setup and more cost effective than traditional solutions

PRODUCTS
1. GigaCaster DMB ETI over IP Gateway | P. 48
2. IPGuardV2 Automatic IP change-over | P. 55
3. Vyper Satellite modulator | P. 82
4. Neptune Satellite Demodulator | P. 84
5. Twister DAB DAB modulator/exciter | P. 82
6. EdgeProbe DAB/DAB+ Monitoring | www.test-free.com

SFN Cell

GPS

Monitoring
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)

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

PRODUCTS
1. ASIPGuard Automatic ASI Redundancy switch | P.74
2. IPUserV2 Automatic IP Redundancy switch | P.77
3. SmartGate T2/T2 V2 DVB-T Gateway (Hardware based or Virtual Appliance) | P.85
4. SmartGate-T2/T2 V2 DVB-T2 Gateway (Hardware based or Virtual Appliance) | P.85
5. GigacasterII TS over IP Gateway | P.72
6. Vyper Satellite modulator | P.82
7. Neptune Satellite Demodulator | P.84
8. Twister II DVB-T/T2 modulator/exciter | P.72
IP RELIABILITY FOR EQUIPMENT AND NETWORKS SOLUTION

- Best-in-class redundancy solution for OTT, CATV, DTH, IPTV/OTT environment
- Redundancy of equipment based on advanced audio and video criteria
- Network Seamless Redundancy

KEY BENEFITS
- Manage IP-based equipment outage
- Secure transport over IP links
- Cope with jittered & unreliable network links
- Interconnect networks with stream securisation

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

CABLE

STUDIO #1
- Encoder
- 1 stream
- IP redundancy switch

STUDIO #N
- Encoder
- 1 stream
- IP redundancy switch

CATV HEAD-END
- Up to 800Mbps Multiplexers

REGION #1
- Non-seamless IP switch
- DVB-C Modulator

OTT & MULTICAST ABR

IPTV/OTT HEAD-END
- Origin Server
- Main
- 6x IPGuardV2 modules
- Seamless IP Switch

OTT EDGE PACKAGERS
- OTT Edge Servers
- Seamless IP Switch
- CDN

PRODUCTS
1. IPGuardV2 Basic & Seamless IP switch
2. StreamProbe Monitoring Probe

TERRESTRIAL MARKET

IP RELIABILITY FOR EQUIPMENT AND NETWORKS SOLUTION

TERRESTRIAL MARKET

PRODUCTS
1. IPGuardV2 Basic & Seamless IP switch
2. StreamProbe Monitoring Probe

TERRESTRIAL MARKET

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TERRESTRIAL MARKET

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TERRESTRIAL MARKET
KEY BENEFITS
• Uninterrupted service guaranteed
• SFN Network preservation
• Decrease OPEX efficiently

KEY FEATURES
• Automatic switch-over between IP-based equipment
• Distribution & contribution links securization
• SFN preservation with or without external clock reference
• IP jitter removal & packet losses recovery

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

VIDEO DELIVERY OVER IP SOLUTION
### Key Benefits
- Ad Server and Splicer 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)
- Centralized Ad Server Manager

### 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
- Free to air and PayTv support

---

**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**

<table>
<thead>
<tr>
<th>Product</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SmartGate T/T2 DVB-T SFN Adapter</td>
<td>P.48</td>
</tr>
<tr>
<td>SmartGate ISDB-T/Tb Gateway</td>
<td>P.69</td>
</tr>
<tr>
<td>Campaign Manager AdsEdge Asset Management</td>
<td>P.76</td>
</tr>
<tr>
<td>AdsEdge Targeted TV content insertion</td>
<td>P.77</td>
</tr>
</tbody>
</table>

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**Diagram**

- AD AGENCIES
- BROADCASTER
- DTT HEAD-END
- DTT NETWORK OPERATOR
- REGION #1
- REGION #2
- CABLE OPERATOR
- REGIONAL HEAD-END #1
- REGIONAL HEAD-END #2
With very high efficiency products, we are optimizing your payload and designing your new services (HTS, OTT, IoT, Wideband, ...) for better revenues.
GET THE BEST FOR YOUR SATELLITE TRANSMISSION

- Up to date solutions fully compliant to DVB-S2X
- Multistream & Multichannel solutions
- IP Encapsulation included (MPE & GSE)
- Manual & Automatic satellite precorrection (ESP & A-ESP)
- Ultra wideband solution for HTS satellite (480 Mbaud)
- High efficiency up to 256 APSK Constellation
- Redundant system 1+1 & N+1
- Multistream & Multichannel solutions
- IP Encapsulation included (MPE & GSE)
- Manual & Automatic satellite precorrection (ESP & A-ESP)
- Ultra wideband solution for HTS satellite (480 Mbaud)
- High efficiency up to 256 APSK Constellation
- Redundant system 1+1 & N+1

WE OPTIMIZE | WE SECURE | WE MONETIZE
**KEY BENEFITS**

- Enhancing QoS with unequalled RF performances
- Versatile solution to allow any modulation/input modes
- CAPEX & OPEX saving using Multistream
- Multi-standard support

**KEY FEATURES**

- S/DSNG/S2/S2X support
- DVB-CID insertion
- High throughput, up to 80 Mbauds
- Roll-Off from 5 to 35% (1% steps)

---

**CONTRIBUTION/DSNG SOLUTION**

- End-to-end efficient video delivery over satellite
- Applicable to any DSNG Use Cases
- Flexible, compact and reliable solution
**KEY BENEFITS**
- Reliable solution based on broadcast-grade products
- Enhancing QoS with unequalled RF performances
- Cost-effective solution avoiding additional multiplexers
- Powerful dejittering solution for smooth output

**KEY FEATURES**
- DVB-S2/S2X support
- DVB-CID insertion
- High throughput, up to 80 Mbauds
- Roll-Off from 5 to 35% (1% steps)
- Management of up to 8 MPTS
- Deterministic latency
- 1+1 & N+1 redundancy schemes

**PRODUCTS**
1. SmartGate T DVB-T Gateway | P.45
2. SmartGate T2 DVB-T2 Gateway | P.45
3. SmartGate ISDB SFN adapter | P.49
4. Vyper Broadcast Satellite modulator | P.84
5. RF Switch 1+1 Switching Unit | P.82
6. Neptune Broadcast Satellite demodulator | P.84
7. Twister II DVB-T/T2/ISDB modulator/exciter | P.72
8. EdgeProbe Monitoring | www.test-tree.com

**SATELLITE MARKET**

**DTT MULTISTREAM - DISTRIBUTION SOLUTION**

- End-to-end DTT/SFN solution over satellite
- OPEX saving by using a single carrier
- Compliant with DVB-T, DVB-T2, ISDB-T/Tb
EDI/RADIO OVER SATELLITE SOLUTION

- **End-to-End DAB/DAB+ solution** for the delivery of digital radio over satellite
- **Efficient satellite distribution** of digital radio content with video content

**KEY BENEFITS**
- Cost-effective solution avoiding additional multiplexers
- Enhancing QoS with unequalled RF performances
- Efficient satellite distribution based on GSE-HEM

**KEY FEATURES**
- GSE-HEM/MPE support
- DVB-S2/S2X standards compliant
- DVB-CID insertion
- Roll-Off from 5 to 35% (1% steps)
- Multistream included
- 1+1 & N+1 redundancy schemes

**PRODUCTS**
1. IPGuardV2 IP redundancy switch | P.79
2. Typer Broadcast Satellite modulator | P.83
3. RF Switch 1+1 Switching Unit | P.82
4. Neptune Broadcast Satellite demodulator | P.84
5. Twister DAB/DAB+ modulator/exciter | P.72

**CENTRAL HEAD-END**
- DAB Multiplexer
- DAB Multiplexer
- IP redundancy switch
- DAB Modulator
- RF Switch
- Satellites Modulator

**TRANSMISSION SITE**
- GPS
- Satellite Demodulator
- IP network
- Monitoring probe
- RF Switch
- Satellites Modulator
- DAB Modulator
**KEY BENEFITS**

- No video glitches thanks to a seamless IP switching
- Cost-effective solution avoiding additional multiplexers
- Enhancing QoS with unequalled RF performances
- High density solution with N+1 redundancy

**KEY FEATURES**

- DVB-S/S2/S2X support
- SMPTE-2022-7 for seamless features
- DVB-CID insertion
- Roll-Off from 5 to 35% (1% steps)
- 1+1 & N+1 redundancy schemes

---

**DTH BROADCASTING SOLUTION**

- Delivering Digital TV services over satellite based on DVB-S/S2/S2X standards
- Seamless redundancy solution compliant with SMPTE 2022/7

**PRODUCTS**

1. **ASIIPGuard** ASI/IP redundancy switch | P.74
2. **IPGuard** High density IP redundancy switch | P.75
3. **Vyper** Broadcast Satellite modulator | P.82
4. **RF Switch 1+1 Switching Unit** | P.82
5. **EdgeProbe** Monitoring | www.test-tree.com
OTT OVER SATELLITE SOLUTION

- Watch your TV content anytime anywhere on any device
- Straight forward integration into existing infrastructure
- End-to-end standard-based solution

**KEY BENEFITS**

- Easy setup to engage more your audience
- Provide service continuity of your linear TV content
- Monetize you content with targeted advertising
- Agnostic to legacy STB
- Ultra-low latency on satellite distribution

**KEY FEATURES**

- Multistream based solution
- MPE/GSE encapsulation
- Standard-based mABR solution
- PSI/SI management for compliancy with DTH STB

**PRODUCTS**

1. Expway BMSC | www.expway.com
2. SmartGate IP/Ethernet Satellite Gateway | www.expway.com
3. Expway Broadcast Middleware | www.expway.com
OTT CONTRIBUTION/BACKHAULING SOLUTION

- Efficient delivery of OTT services using satellite broadcasting
- Unique end-to-end solution from the head-end to the devices
- Standard-based solution

KEY BENEFITS
• Offer OTT services with high QoS (no rebuffering, fast zapping)
• Offload your telecom network
• Address black spot area with no or limited telecoms coverage
• Enable advanced services (Startover, filecasting,...)

KEY FEATURES
• High throughput (Up to 250Mb/s)
• Standard based multicastABR solution
• Low latency on satellite distribution

HEAD-END

1. Origin Server
2. Unicast
3. Multicast ABR server
4. IP-Ethernet Satellite Gateway
5. Monitoring

PRODUCTS
1. Expway BMSC | www.expway.com
2. SmartGate IP/Ethernet Satellite Gateway | P.84
3. Neptune Broadcast Satellite demodulator | P.84
4. Expway Broadcast Middleware | www.expway.com
5. EdgeProbe Monitoring | www.test-tree.com

LTE/5G BACKHAUL

RESORT ISLAND

PUBLIC AREAS
- Mall, Airport, Railway station, Hospital

SATELLITE MARKET
Efficient delivery of OTT services using satellite broadcasting
Unique end-to-end solution from the head-end to the devices
Standard-based solution

SATellite Market
Efficient delivery of OTT services using satellite broadcasting
Unique end-to-end solution from the head-end to the devices
Standard-based solution
**IP TRUNKING SOLUTION**

- Enable Mobile networks backhauling
- Provide Telecom network trunking
- End-to-end bidirectional IP delivery over satellite

**KEY BENEFITS**
- Broadcast-grade based solution
- Low CAPEX compared to VSAT system
- Offer high quality internet connectivity with high availability of satellite network
- Address telcos black spot areas

**KEY FEATURE**
- Layer 2 or Layer 3 mode
- GSE encapsulation
- DVB-S2/S2X support
- VL-SNR modes for harsh environments & mobility

---

**PRODUCTS**

1. Vyper2Way Point-to-Point Satellite Modem

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**CORE NETWORK**

1. Satellite Modem

**RADIO ACCESS NETWORK**

1. Satellite Modem

**CORPORATE REMOTE SITE**

1. Satellite Modem

**RURAL, ISOLATED AREAS**

1. Satellite Modem

---

**SATELLITE MARKET**

Enable Mobile networks backhauling
Provide Telecom network trunking
End-to-end bidirectional IP delivery over satellite
The ENENSYS Networks broadcast products run as independent modules in the High Density chassis (HDc) 19” 1RU to provide:

- **HDc-Multi-220V**: High Density chassis with 220V input
- **HDc-Multi-48V**: High Density chassis with 48V input
- **Options**: HDc-Multi-In 220V Redundant, HDc-Multi-In 48V Redundant

### HDc Multi

- **DENSITY**: Up to 6 products in the same chassis
- **MODULARITY**: Combining different kind of products (T2Edge, TxE, ASIPGuard, NHMod) in the same chassis
- **STRAIGHT FORWARD MAINTENANCE**: All products are hot swappable and may be automatically configured
- **SCALABILITY**: Start with one product and upgrade with additional products later
- **RELIABILITY**: Hot plug and independent products with redundant power supply in 220V or 48V

### HDm-SmartGate-T2

**DVB-T2 Gateway module with 2xPLP with 2x ASI inputs and 2x ASI outputs**

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- 2x ASI inputs and 2x ASI outputs
- 4x additional ASI inputs (Option)

**Feature**
- Encapsulation into DVB-T2 baseband frames
- T2-lite and T2-base support
- L1-post scrambling support
- In-band type A and B signaling
- DVB-T2 SFN Adapt. with MISO support
- Relative and absolute timestamp support
- T2MP generation for SFN rebroadcasting
- Multiple PLP support (2 by default, 4 as option)

**ORDERING CODES**

<table>
<thead>
<tr>
<th>HDm-SmartGate-T2</th>
<th>DVB-T2 Gateway module with 2xPLP 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></td>
<td>IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)</td>
</tr>
<tr>
<td></td>
<td>Management of up to 4 PLP</td>
</tr>
<tr>
<td></td>
<td>Management of up to 8 PLP</td>
</tr>
<tr>
<td></td>
<td>4 additional ASI inputs (use one more slot – not compliant with T2Gateaw-IP option)</td>
</tr>
<tr>
<td></td>
<td>1+1 and N+1 seamless redundancy</td>
</tr>
<tr>
<td></td>
<td>In-band configuration and firmware delivery</td>
</tr>
<tr>
<td></td>
<td>Enable T2-MI stream with higher bit rate</td>
</tr>
<tr>
<td></td>
<td>Built-in GPS receiver</td>
</tr>
</tbody>
</table>

### SmartGate vT2

**Broadcast Gateway software for DVB-T2**

**Inputs / outputs**
- 1x Ethernet interface for control and PTP clock synchronisation
- MPESU-TS input, 1x Ethernet interface for incoming RTP/UDP streams
- T2M output, up to two Ethernet interfaces for RTP/UDP output streams

**Feature**
- Virtual appliance running on standard servers
- Based on a PTP clock reference
- Encapsulation into DVB-T2 baseband frames
- T2-lite and T2-base support
- L1-post scrambling support
- In-band type A and B signaling
- DVB-T2 SFN Adapt. with MISO support
- Multiple PLP support (2 by default, 4 as option)
- Future Extension Frame (FEF) broadcasting
- vGuard™, seamless switch-over between 1+1 and N+1 SmartGate DVB
- Possible redundant IP inputs with mirrored IP outputs
- Validation of DVB-T2 transmission parameters
- Easy to use HTML-5 GUI
- Full SNMPv2 support

**ORDERING CODES**

<table>
<thead>
<tr>
<th>SmartGate-vT2</th>
<th>Broadcast Gateway software for DVB-T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td>T2MP generation for SFN rebroadcasting</td>
</tr>
<tr>
<td></td>
<td>Multiple PLP support (2 by default, 4 as option)</td>
</tr>
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<td></td>
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<tr>
<td></td>
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<tr>
<td></td>
<td>Validation of DVB-T2 transmission parameters</td>
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<tr>
<td></td>
<td>Easy to use HTML-5 GUI</td>
</tr>
<tr>
<td></td>
<td>Full SNMPv2 support</td>
</tr>
</tbody>
</table>
**SmartGate 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)

- **Feature**
  - TMC input antenna for internal GPS clock (Option)
  - 1x PPS input

- **ORDERING CODES**
  - Multi-PLP-2
  - Multi-PLP-6
  - Multi-PLP-10
  - Multi-Asym-10
  - Multi-Asym-20
  - Multi-Asym-40
  - Multi-Asym-60
  - Multi-Asym-100
  - Multi-Asym-200

**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

- **Feature**
  - Up to 2x ASI inputs/output (Option)
  - Full SNPV2 support

- **ORDERING CODES**
  - InverTS-DualMP
  - InverTS-SingleMP
  - InverTS-IP
  - InverTS-Asym-10
  - InverTS-Asym-20
  - InverTS-Asym-40
  - InverTS-Asym-60
  - InverTS-Asym-100
  - InverTS-Asym-200

**TxEdge T2**  
**for Hdc: DVB-T2 local adapter**

**TECHNICAL CHARACTERISTICS**

- **Inputs / outputs**
  - Up to 2x ASI inputs and 2x ASI outputs

- **Feature**
  - DVB-T2 local adapter module with PLP substitution with 2x ASI in and 2x ASI out

- **ORDERING CODES**
  - DualMP
  - SingleMP
  - IP
  - Asym-10
  - Asym-20
  - Asym-40
  - Asym-60
  - Asym-100

**DTTCaster**  
**Professional DVB-T/T2/ISDB-T/Tb demodulator**

**TECHNICAL CHARACTERISTICS**

- **Inputs / outputs**
  - Up to 4x ASI outputs and 2x DVB-S/S2 satellite inputs

- **Feature**
  - 1x RF input (K-type female - 50 Ω)
  - 4x ASI (BNC) inputs/outputs

- **ORDERING CODES**
  - DualMP
  - SingleMP
  - IP
  - Asym-10
  - Asym-20
  - Asym-40
  - Asym-60
  - Asym-100
**SmartGate T** 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/module (Option)

**Features**
- MIP packet insertion for broadcasting DVB-T signal over SFN
- T2 ready (hardware upgrade required)
- Bit rate adaptation and PCR restamping
- NIT update
- Optional parameters management

**ORDERING CODES**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SmartGate-T-IP</td>
<td>IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)</td>
</tr>
<tr>
<td>SmartGate-T-IPc</td>
<td>IP input/output from the chassis (lue 2x Gigabit Ethernet data ports of the chassis) environment option</td>
</tr>
<tr>
<td>SmartGate-vT</td>
<td>1+1 seamless redundancy for SFN operation</td>
</tr>
<tr>
<td>SmartGate-vT-SYS</td>
<td>Internal GPS receiver option to allow firmware update to DVB-T2 Gateway</td>
</tr>
</tbody>
</table>

**SmartGate vT** Software based MIP inserter

**Single Frequency Network Adapter**

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Ethernet interface for GUI
- 1x Ethernet interface for PTP clock synchronisation
- 1x Ethernet interface for incoming RTP/UDP streams
- 1x Ethernet interface for PTP synchronization

**Features**
- 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**

<table>
<thead>
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<th>Option</th>
<th>Description</th>
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<tr>
<td>SmartGate-vT-IP</td>
<td>IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)</td>
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<td>SmartGate-vT-IPc</td>
<td>IP input/output from the chassis (lue 2x Gigabit Ethernet data ports of the chassis) environment option</td>
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<td>SmartGate-vT-SYS</td>
<td>1+1 seamless redundancy for SFN operation</td>
</tr>
<tr>
<td>SmartGate-vT-SYS-SYS</td>
<td>Internal GPS receiver option to allow firmware update to DVB-T2 Gateway</td>
</tr>
</tbody>
</table>

**SmartGate ISDB** 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)

**Features**
- BTS generation at the head-end – standalone mode
- BTS compression for DVB-S/S2 distribution
- BTS generation at the TX site – standalone mode (Option)
- Combining D11 and D12 services
- Enabling regionalization
- Multi-Layer management
- TRMC and IP data insertion
- Service filtering and mapping
- PSI/SI update and generation (PAT, PMT, SDT, NIT)
- SFN compliant

**ORDERING CODES**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SmartGate-ISDB-IP</td>
<td>IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)</td>
</tr>
<tr>
<td>SmartGate-ISDB-IPI</td>
<td>IP input/output from the chassis (lue 2x Gigabit Ethernet data ports of the chassis) environment option</td>
</tr>
<tr>
<td>SmartGate-ISDB-OneBeam</td>
<td>1+1 seamless redundancy option for SmartGate-ISDB-MFN and SFN</td>
</tr>
<tr>
<td>SmartGate-ISDB-BTSCompression</td>
<td>BTS compression support</td>
</tr>
<tr>
<td>SmartGate-ISDB-Inband</td>
<td>In-band firmware delivery</td>
</tr>
<tr>
<td>SmartGate-ISDB-IPc</td>
<td>IP input/output from remote TX sites with TxEdge (use 2x Gigabit Ethernet data ports of the chassis)</td>
</tr>
</tbody>
</table>

**TxEdge ISDB** BTS generation at the TX site

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
- 1x Gigabit control port for GUI/SNMP (from chassis)
- Up to 3x ASI inputs and 2x ASI outputs
- Up to 4x Gigabit Ethernet data ports from the chassis/module (Option)

**Features**
- BTS generation for SFN or MFN broadcasting
- BTS compression support
- BTS generation at the TX site – standalone mode (Option)
- Multi-Layer management
- TRMC and IP data insertion
- Service filtering and mapping
- PSI/SI update and generation (PAT, PMT, SDT, NIT)
- SFN compliant

**ORDERING CODES**

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<tr>
<td>TxEdge-ISDB-IP</td>
<td>IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)</td>
</tr>
<tr>
<td>TxEdge-ISDB-IPI</td>
<td>IP input/output from the chassis (lue 2x Gigabit Ethernet data ports of the chassis) environment option</td>
</tr>
<tr>
<td>TxEdge-ISDB-OneBeam</td>
<td>1+1 seamless redundancy option for SmartGate-ISDB-MFN and SFN</td>
</tr>
<tr>
<td>TxEdge-ISDB-BTS</td>
<td>BTS compression support</td>
</tr>
<tr>
<td>TxEdge-ISDB-Descrambler</td>
<td>Enable the interface with HDm-TSDescrambler module to descramble incoming h264 streams</td>
</tr>
<tr>
<td>TxEdge-ISDB-OneBeam</td>
<td>Enable the second DVB-S/S2 satellite input on HDmSat-TxEdge</td>
</tr>
<tr>
<td>TxEdge-ISDB-Inband</td>
<td>Enable firmware update to DVB-T2 Gateway</td>
</tr>
<tr>
<td>TxEdge-ISDB-IPc</td>
<td>Enable the interface with HDm-TSDescrambler module to descramble incoming h264 streams</td>
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**PRODUCTS**

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<td>SmartGate-ISDB-IPI</td>
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</tr>
<tr>
<td>SmartGate-ISDB-OneBeam</td>
<td>1+1 seamless redundancy option for SmartGate-ISDB-MFN and SFN</td>
</tr>
<tr>
<td>SmartGate-ISDB-BTSCompression</td>
<td>BTS compression support</td>
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<tr>
<td>SmartGate-ISDB-Inband</td>
<td>In-band firmware delivery</td>
</tr>
<tr>
<td>SmartGate-ISDB-IPc</td>
<td>IP input/output from remote TX sites with TxEdge (use 2x Gigabit Ethernet data ports of the chassis)</td>
</tr>
</tbody>
</table>

**PRODUCTS**

[www.enensys.com](http://www.enensys.com)
**EWSCaster EWS trigger inserter**

**Technical Characteristics**

- **Inputs / Outputs**
  - 1x Gigabit control port for GUI/SNMP (from chassis)
  - Up to 80 regions and 255 zones per trigger
  - Regionalization support (rEWSTM) to trigger different alert per region
  - Up to 8 triggers can be generated
  - Keepalive EWS trigger generation to alert for immediate danger

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

- **Features**
  - Simultaneous triggers generation
  - Easy-to-use web based GUI
  - Full SNMPv2 support
  - Up to 6x TSDescrambler in 1U to host up to 12x ProCAM
  - Up to 2x ProCAM to be hosted in the module
  - Up to 32x PID / ProCAM
  - Descrambling the whole MPEG-2 TS or part of it (Service selection)
  - TS over IP input and TS over IP output
  - Descrambling MPEG-2 TS encrypted with DVB-CSA algorithm
  - Management of up to 384 PID to descramble over 192 TV services in 1U

**Ordering Codes**

- HDm-EWSCaster
- EWSCaster-IP

---

**SmartGate OneBeam DVB-SIS Gateway for DTT/DTH Combination**

**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)
  - 1x PPS input and 1x TNC input for internal GPS clock (Option)

- **Inputs / Outputs**
  - IP input/output from the chassis/module (add 2x Gigabit Ethernet data ports - use one more slot)
  - IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)

- **Features**
  - Single Ignition System compliant – DVB-SIS
  - BISS Mode-1 descrambling (option)
  - Support Single PLP and Multiple PLP in DVB-T2
  - BISS Mode-1 descrambling (option)
  - Regional EWS management to alert for immediate dangers (option)

**Ordering Codes**

- HDm-SmartGate-OneBeam
- DVB-T2 Gateway for OneBeam with 2x ASI inputs and 2x ASI outputs

- Options
  - SmartGate-OneBeam-IP
  - SmartGate-OneBeam-PPC
  - SmartGate-OneBeam-MPLP-4
  - SmartGate-OneBeam-MPLP-8
  - SmartGate-OneBeam-IPc
  - SmartGate-OneBeam-MPLP-4
  - SmartGate-OneBeam-MPLP-8

---

**TxE EDGE OneBeam DTH to DTT Adapter for DVB-SIS**

**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)
  - 1x PPS input and 1x TNC input for internal GPS clock (Option)

- **Features**
  - Single Ignition System compliant – DVB-SIS
  - DVB-SIS Gateway for DTT/DTH
  - Built-in GPS receiver
  - In-band configuration and firmware update delivery

**Ordering Codes**

- HDm-TxEdge-OneBeam
- HDm-TxEdge-OneBeam-MPLP-4
  - T5 adapter module with 2x DVB-S/S2 satellite inputs (up to 32 APSK) – one active and 2x ASI inputs/outputs

- Options
  - TxE EDGE-OneBeam-IP
  - TxE EDGE-OneBeam-PPC
  - TxE EDGE-OneBeam-BISS
  - TxE EDGE-OneBeam-TSDescrambler
  - TxE EDGE-OneBeam-EM
  - TxE EDGE-OneBeam-SF
  - TxE EDGE-OneBeam-AN
  - TxE EDGE-OneBeam-OneBeam
  - TxE EDGE-OneBeam-OneBeam

---

**TSDescrambler 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)

- **Features**
  - Descrambling MPS2-2 TS encrypted with DVB-CSA algorithm
  - Descrambling the whole MPS2-2 TS or part of it (Service selection)
  - Up to 2x PPS / ProCAM
  - Up to 2x ProCAM to be hosted in the module
  - Up to 6x TSDescrambler in 1U to host up to 12x ProCAM

- **Ordering Code**
  - HDm-TSDescrambler

---

**NN6-GPSv2**

- **Features**
  - Dual source support to multiplex 2 DTH feeds into 1 DTT MUX
  - Powerfull PSI/SI update (PAT, PMT, CAT, BAT, SDT, EIT)
  - Services filtering and mapping
  - Single Illumination System compliant – DVB-SIS

**TCube**

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

**Ordering Codes**

- HDm-TxCube-OneBeam
- HDm-TxCube-OneBeam-MPLP-4

---

**IPc**

- **Features**
  - In-band configuration and firmware update delivery
  - IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)

---

**TxGuard**

- **Features**
  - In-band configuration and firmware update delivery
  - IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)

---

**TxDescrambler**

- **Features**
  - IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)
  - IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)

**Ordering Codes**

- HDm-TxDescrambler
- HDm-TxDescrambler-MPLP-4

---

**BIS**

- **Features**
  - In-band configuration and firmware update delivery
  - IP input/output from the chassis (use 2x Gigabit Ethernet data ports of the chassis)

---

**TxEdge-OneBeam-InBand**

- **Features**
  - In-band configuration and firmware update delivery
  - IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)

---

**TxEdge-OneBeam-DualSource**

- **Features**
  - In-band configuration and firmware update delivery
  - IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)

---

**TxEdge-OneBeam-EWS**

- **Features**
  - In-band configuration and firmware update delivery
  - IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)

---

**TxEdge-OneBeam-IPc**

- **Technical Characteristics**
  - Built-in GPS receiver
  - In-band configuration and firmware update delivery
  - IP output featuring ProMPEG CoP#3

---

**TxGuard**

- **Features**
  - In-band configuration and firmware update delivery
  - IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)

---

**Built-in GPS receiver**

- **Features**
  - In-band configuration and firmware update delivery
  - IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)

---

**Built-in GPS receiver**

- **Features**
  - In-band configuration and firmware update delivery
  - IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)

---

**Built-in GPS receiver**

- **Features**
  - In-band configuration and firmware update delivery
  - IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)

---

**Built-in GPS receiver**

- **Features**
  - In-band configuration and firmware update delivery
  - IP input/output from the module (add 2x Gigabit Ethernet data ports - use one more slot)
### Twister II DVB-T/T2 / DTMB / ISDB-T/Tb / DAB Exciter

**ORDERING CODES**

- DTT Transmitter
- Options NN6-ETI-Monitoring
- Options NN6-In48V-Redundant
- Options NN6-In220V-Redundant
- Options DualIP
- Options SeamlessPFT

**TECHNICAL CHARACTERISTICS**

- **For DVB-T2 / DTMB / ISDB-T/Tb standards**
  - 4x ETI output, DAB, onboard GPS and CTRL port
  - 2x RF feedback inputs for linear and non-linear adaptive precorrections
  - 2x RF inputs for reflected and forward powers measurement and AGC control
  - 1x RF monitoring, -30dB compare to main output
  - 1x RF output, UHF / VHF Band I & III, 0dBm max. (3000 model) or +14dBm max (4000 model)
  - 1x RF input/output, 5x10MHz input, 1x 10MHz output

- **For DAB standard**
  - DAB TWISTER exciter - +14dBm VHF Band III output, DAP, onboard GPS
  - DAB TWISTER exciter - +14dBm UHF Band III output, DAP
  - Automatic Gain Control software license for Twister II DAB
  - SNMP client software license for Twister II DAB
  - EDI/IP input streaming software license for Twister II DAB

### GigaCaster II High Density TS over IP Gateway

**ORDERING CODES**

- DTT Transmitter
- Options NN6-ETI-Redundant
- Options NN6-In48V-Redundant
- Options NN6-In220V-Redundant
- Options NDM
- Options Seamless EDI switch-over

**TECHNICAL CHARACTERISTICS**

- **For DAB / DAB+ / DMB**
  - 48V input instead of 110V/220V
  - Advanced ETI to IP monitoring
  - Forward Error Correction (FEC) management
  - VLANs management
## ASIIPGuard Innovative ASI and IP Redundancy switch

### Technical Characteristics

**Inputs / Outputs**
- 1x Gigabit Ethernet for GUI/SNMP
- 2x ASI inputs and 2x ASI outputs
- 1x additional ASI input for switching over 3 feeds (Option ASIIPGuard-1ASIIn2ASIOut)

**ASI Bypass**
- Always output inputs in case of power outage

**Features**
- Automatic switch between 2 or 3 MPEG-2 TS (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

### Ordering Codes

**HDm-ASIIPGuard**
- Seamless TS
- Seamless T2-MI
- ASIIPGuard-ATSC
- ASIIPGuard-ATSC-BTS
- ASIIPGuard-AI
- ASIIPGuard-ATSC-BTS
- ASIIPGuard-ATSC-3TSIn
- ASIIPGuard-Peering
- ASIIPGuard-QoS

### Technical Characteristics

**Inputs / Outputs**
- 1x Gigabit Ethernet for GUI/SNMP
- 2x Gigabit Ethernet data input ports
- 2x mirrored Gigabit Ethernet data output ports

**Features**
- Real-time monitoring of incoming streams
- TS over IP automatic change-over
- Seamless switch-over between identical RTP streams (compliant to and extending SMPTE2022-7)
- T2-MI over IP automatic change-over (Option)
- Optional Seamless TS and Seamless T2-MI features
- IP, ETR290 and advanced audio & video switching conditions
- Switch-over at stream level or data port level

### Ordering Codes

**HDm-IPGuardV2**
- 1+1 Smart IP Redundancy Switch

**Options**
- IPGuardV2-Seamless TS
- IPGuardV2-Seamless TS
- IPGuardV2-1/2/4/6TS
- IPGuardV2-Seamless RTP
- IPGuardV2-ETR290
- IPGuardV2-DaisyChain
- IPGuardV2-SFP

**Features**
- Seamless switch over between identical MPEG2-TS streams - Requires IPGuardV2-xTSoIP license
- Up to 4 10G streams managed
- Manage up to 256 switches in 1U
- Transparent network bridge
- Unmatching ATSC3 STS switching criteria
- Peering mode to synchronize the change-over of several IPGuardV2
- IP Bypass mechanism to always output IP streams

### Technical Characteristics

**Inputs / Outputs**
- 1x Gigabit Ethernet for GUI/SNMP
- 2x Gigabit Ethernet data input ports
- 2x mirrored Gigabit Ethernet data output ports

**Features**
- Real-time monitoring of incoming streams
- TS over IP automatic change-over
- Seamless switch-over between identical RTP streams (compliant to and extending SMPTE2022-7)
- T2-MI over IP automatic change-over (Option)
- Optional Seamless TS and Seamless T2-MI features
- IP, ETR290 and advanced audio & video switching conditions
- Switch-over at stream level or data port level

### Ordering Codes

**HDm-IPGuardV2**
- 1+1 Smart IP Redundancy Switch

**Options**
- IPGuardV2-Seamless TS
- IPGuardV2-Seamless TS
- IPGuardV2-1/2/4/6TS
- IPGuardV2-Seamless RTP
- IPGuardV2-ETR290
- IPGuardV2-DaisyChain
- IPGuardV2-SFP

**Features**
- Seamless switch over between identical MPEG2-TS streams - Requires IPGuardV2-xTSoIP license
- Up to 4 10G streams managed
- Manage up to 256 switches in 1U
- Transparent network bridge
- Unmatching ATSC3 STS switching criteria
- Peering mode to synchronize the change-over of several IPGuardV2
- IP Bypass mechanism to always output IP streams
**Campaign Manager** Targeted Content Insertion Management

**Technical Characteristics**

- Cloud-based application
- 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)
- In-band files delivery using FDP protocol
- Enable to create, update and duplicate regional playlists to enable regional targeted content insertion
- User Authentication to restrict the access to the Campaign Manager
- Retrieve the AsRun logs from the AdsEdge to analyse the content insertion
- Content checking (codec, spots files format, playlist compliance with SCTE118-3 standard) before delivery
- On request playlist conversion to SCTE118-3 standard format
- Ingest mode to allow providers to upload content and playlist
- Automatic or manual splicing control per SFN area to guarantee SFN broadcasting

**Ordering Codes**

- 76 77
- www.enensys.com

**AdsEdge** Targeted Regional Content Insertion

**Technical Characteristics**

- 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
- Insertion of pre-stored advertisement upon SCTE125 trigger reception
- SCTE118-3 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**

- HDmII-AdsEdge
- HDmIISat-AdsEdge
- AdsEdge-Bypass
- AdsEdge-Options1
- AdsEdge-Options2
- AdsEdge-Options3
- AdsEdge-Options4
- AdsEdge-Options5
- AdsEdge-Options6
- AdsEdge-Options7
- AdsEdge-Options8
- AdsEdge-Options9
- AdsEdge-Options10

**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-S2 input (Option)

- Google-like map to identify the activities per region and AdsEdge
SmartGate ATSC ATSC 3.0 Broadcast Gateway

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
1. Ethernet interface for SmartGate ATSC management (GUI & SNMP)
2. Ethernet interface to receive ROUTE/MMTP input streams
3. Ethernet interface to deliver STLTP output streams

**Featuring**
- Software-based & virtualized broadcast gateway
- ALP & BB frame encapsulation
- All ATSC3.0 modulation modes support
- Insertion of Timing packet to enable SFN broadcasting
- Multiple Subframes & PLP management
- Preamble generation to configure ATSC3.0 modulators

**ORDERING CODES**
- SmartGate ATSC: ATSC 3.0 Broadcast Gateway including single subframe & 4 PLP management
- Options:
  - SmartGate ATSC-STLGuard: 1+1 seamless change-over with STLGuard option and IPGuardV2 product
  - SmartGate ATSC-HighDataRate: Support of MSG, MMD, & Channel bonding modes
  - SmartGate ATSC-AdvPhysLayer: Multi-SLT aggregation & insertion
  - SmartGate ATSC-MultipleSTL: Multi-SLT outputs up to 6
  - SmartGate ATSC-AdvSignaling: Multi-PLP & Multi-Subframe management

MediaCast Delivery & Signaling server for ATSC 3.0

**TECHNICAL CHARACTERISTICS**

**Inputs / outputs**
1. Ethernet interface for MediaCast management (GUI & SNMP)
2. Ethernet interface to receive DASH/MPU segments and to deliver over ROUTE/MMTP protocols

**Featuring**
- Virtualized ROUTE/MMTP Delivery and Signaling Server
- LLS & SLT Tables generation and delivery
- SLS fragments generation and delivery
- Aggregate up to 20 Live and NRT contents towards IP Multicast outputs
- WebDAV input to receive DASH or ISOBMFF segments
- Encapsulation of live DASH segments over ROUTE protocol
- Encapsulation of live ISOBMFF segments over MMT protocol
- Files delivery over IP Multicast
- Easy to use web-based GUI
- Full SNMP v3 support

**ORDERING CODES**
- MediaCast: ATSC 3.0 Delivery & Signaling server, including 5 MMTP or ROUTE services
- Options:
  - MediaCast-10sessions: Management of up to 10 Route or MMTP sessions
  - MediaCast-20sessions: Management of up to 20 Route or MMTP sessions
Vortex II ATSC 3.0 / ATSC 1.0 Exciter

**Technical Characteristics**

**Inputs / Outputs**
- 2x GbE input ports for DVB/S/S2 (in front panel)
- 2x RJ45/IEEE 1394 inputs and 1x S/PDIF output (Vortex II: DVB-T2)
- Up to 6x GbE Ethernet data ports (Vortex 3.0: DVB-T2)
- 1x Satellite input, DVB-S2 compliant (x402 model)
- 1x input antenna for internal GPS clock
- 1x PPS input/output, 1kHz input, 1kHz output

**Features**
- Non-linear adaptive precorrections with GAP® option
- Linear adaptive precorrections, specific mode for Sharp Filter profiles
- ATSC 1.0: A/53, A/54, A/64

**Ordering Codes**

<table>
<thead>
<tr>
<th>Options</th>
<th>Code</th>
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<tbody>
<tr>
<td>XTTO-TRX0-REDU</td>
<td>Redundancy software license</td>
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<td>XTTO-TRX0-SNMP</td>
<td>SNMP client software license</td>
</tr>
<tr>
<td>XTTO-TRX0-AGC0</td>
<td>AGC (Automatic Gain Control) software license</td>
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<tr>
<td>XTTO-TRX0-EGAP</td>
<td>GAP (Enhanced DAP) software license</td>
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<td>XTTO-TRX0-ST2P</td>
<td>ST2L 2.0 Premium Mode Input SW License</td>
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<td>XTTO-TRX0-ST2A</td>
<td>ST2L 2.0 Premium Mode Output license</td>
</tr>
</tbody>
</table>

VCC Virtualized ATSC 3.0 Modulator

**Technical Characteristics**

**Inputs / Outputs**
- 1x Ethernet interface for control (DVB-S & SNMP)
- 1x Ethernet interface to receive ST2LTP input streams

**Features**
- Software-based & virtualized ATSC 3.0 modulator
- ST2L 2.0: ST2L2.0:2017, ST2L2.0:2018 (STL)
- Up to 8 PLP and 2 sub-frames management
- Clever stream input redundancy management
- Transmission modes: MFN, SFN (relative and absolute)
- NTP synchronization

**Ordering Codes**

<table>
<thead>
<tr>
<th>Options</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>XTTO-VKX2-2002</td>
<td>ATSC 1.0/3.0 rack modulator (6dBm) with VHF I &amp; III and UHF output, DAP and onboard GPS</td>
</tr>
<tr>
<td>XTTO-VKX2-5002</td>
<td>ATSC 1.0/3.0 rack modulator (500mW) with VHF I &amp; II and UHF output, DAP and onboard GPS</td>
</tr>
</tbody>
</table>

Tearex ST2L 2.0 Exciter

**Technical Characteristics**

**Inputs / Outputs**
- 2x GbE input ports for DVB/S/S2 (in front panel)
- 2x RJ45/IEEE 1394 inputs and 1x S/PDIF output (ST2L 2.0)
- Up to 6x GbE Ethernet data ports (ST2L 2.0)
- 1x input antenna for internal GPS clock
- 1x PPS input/output, 1kHz input, 1kHz output
- 1x RF output, UHF / VHF Band (I & II), 0dBm max. (5000 model) or +20dBm max. (6000 model)

**Features**
- Automatic Gain Compensation (AGC) option

**Ordering Codes**

<table>
<thead>
<tr>
<th>Options</th>
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<tr>
<td>XTTO-TRX0-AGC0</td>
<td>AGC (Automatic Gain Control) software license</td>
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<td>XTTO-TRX0-EGAP</td>
<td>GAP (Enhanced DAP) software license</td>
</tr>
<tr>
<td>XTTO-TRX0-ST2P</td>
<td>ST2L 2.0 Premium Mode Input SW License</td>
</tr>
<tr>
<td>XTTO-TRX0-ST2A</td>
<td>ST2L 2.0 Premium Mode Output license</td>
</tr>
</tbody>
</table>

www.enensys.com
**Vyper Broadcast Satellite Modulator**

**Technical Characteristics**

**Inputs/Outputs**
- 2x Gigabit Ethernet control ports
- 2x Gigabit Ethernet data ports
- 4 x ASI MPEG-2 TS inputs
- 1 ASI MPEG-2 TS output
- RF output (Max Monitoring): L-Band frequency range: 150-2150 MHz
- Switchable 10MHz Insertion & 100µs power 24VDC option

**Features**
- Multistream (ASI & IP) according to EN 302 307 standard
- Linear & Non-Linear pre-correction
- Up to 64 embedded profiles
- SNMP v1, v2c
- Embedded GUI (Easy to use)

**Ordering Codes**
- XSSR-TYG0-GSCR
- XSSR-TYG0-BISE
- XSSO-V2W0-256AM
- XSSO-V2W0-128AM
- XSSO-V2W0-32AM

**Tyger WideBand Satellite Modulator**

**Technical Characteristics**

**Inputs/Outputs**
- 2x Gigabit Ethernet control ports
- 2x Gigabit Ethernet data ports
- 1 ASI MPEG-2 TS input
- RF input: L-Band frequency range: 150-2150 MHz

**Features**
- Multistream (up to 8 streams) according to EN 202 307 standard
- Time Ticking up to 8 streams according to EN 202 207 standard Annex M
- BB Frame over Ethernet input
- Multi Rock Reference (MRR)

**Ordering Codes**
- XSSR-TYD0-3000

**Vyper2Way DVB-S2/S2x Satellite Modem**

**Technical Characteristics**

**Inputs/Outputs**
- 2x Gigabit Ethernet control ports
- 2x Gigabit Ethernet data ports
- 1 ASI MPEG-2 TS input

**Features**
- Symbol Rate up to 480 MBauds
- DVB-S2/S2X standards
- Symbol Rate up to 36 MBauds

**Ordering Codes**
- XSSR-TYD0-3000

**ORDERING CODES**
- XSSR-TYD0-3000: WideBand DVB-S2/S2x Modulator - GSE-Lite - 10GigE - L-Band output - 1U Rack
- Options XSSO-V2W0-16AM
- Symbol Rate up to 36 MBauds
- 16APSK constellations
- Multistream (up to 8 streams) according to EN 302 307 standard
- Symbol Rate from 0.05 to 72 Msps
- DVB-S2/S2X - ETSI EN 302 307-1
- Symbol Rate up to 80 Msps
- DVB-S2 - ETSI EN 302 307-2
- Symbol Rate up to 128 Msps
- ETSI Encapsulation with GSE-Lite profiles
- 16/32/64/128/256APSK constellations
- Linear & Non-Linear pre-correction
- Multistream (up to 8 streams) according to EN 202 307 standard Annex M
- BB Frame over Ethernet input
- Multi Rock Reference (MRR)
- Linear & Non-Linear pre-correction
- Support for 64 embedded profiles
- Data rates up to 200 Mbps
- Multi Rock Reference (MRR)
- 1+1 redundancy solution
- Supports 64 embedded profiles
- Data rates up to 200 Mbps
- 1+1 redundancy solution

**ORDERING CODES**
- XSSR-TYD0-3000

**ORDERING CODES**
- XSSR-TYD0-3000: WideBand DVB-S2/S2x Modulator - GSE-Lite - 10GigE - L-Band output - 1U Rack
- Options XSSO-V2W0-16AM

**PRODUCTS**

**Tyger WideBand Satellite Modulator**

**Vyper2Way DVB-S2/S2x Satellite Modem**
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