



### Applications

- Interactive TV:
  - Non-linear TV like Catch Up TV and Push VOD with DRM
  - Home Automation & e-Health
  - Betting/Voting Applications
- Multiscreen viewing
- Backhauling for IoT (Internet-of-Things) terrestrial networks
- Direct M2M communications
- Content Delivery Network (CDN) for Multiscreen Video Services

### Description

SmartGate is a state-of-the-art of satellite modulator dedicated to IP applications over satellite. It combines, in a 1U rack, both powerful IP/Ethernet encapsulation capabilities and Satellite modulation in full compliance with the DVB-S2 and DVB-S2X standards.

Installed on the hub side, SmartGate provides backhauling of data for various IP applications such as Interactive TV, IoT, M2M, with high efficiency and effectiveness. It enables operators to serve a large population of terminals with an optimized use of the satellite band, thanks to efficient traffic management and ACM multiqueuing.

SmartGate can be fully configured remotely by SNMP and can be easily and seamlessly integrated into most existing systems to improve network efficiency (IPv6, GSE, DVB-S2X) and flexibility (ACM multiqueuing). The product can also be fully controlled by the user-friendly Embedded Web Browser.

The platform offers two 1GigE and two 10GigE Ethernet interfaces for input data traffic. The incoming Ethernet frames can be filtered using MAC addresses, IP addresses and VLANs. The L2 or L3 MultiProtocol encapsulation is then applied in accordance with the ETSI EN 301192 standard. SmartGate is able to service up to 1000 PIDs with full management of the PSI/SI tables. Moreover, the product optimizes bandwidth utilization through the support of section packing and a superior traffic management system which includes minimum guaranteed bandwidth, maximum peak bandwidth and designated priorities.

With respect to the modulation process, SmartGate integrates the core technology required to perform high quality modulation based on the DVB-S2 and DVB-S2X standards. It can deal with CCM and VCM/ACM modes in a seamless manner to optimize the transmission depending on the reception conditions. It is also able to generate an NCR (Network Clock Reference) for frequency synchronization in case of multiple receivers applications. It caters for a maximum useful bitrate of 200 Mbit/s and achieves an ultra-low latency in the datapath.

SmartGate covers the full L-Band spectrum range (950/2150 MHz) with a Symbol Rate from 0.05 to 72 MBaud and roll off factor from 5 to 35% (1% steps). This RF output constitutes a best in class performance, providing a high SNR value, excellent shoulder levels and lowest phase noise. Additionally, Static Linear and/or Non-Linear Pre-correction tools are available to further increase the transmission quality.

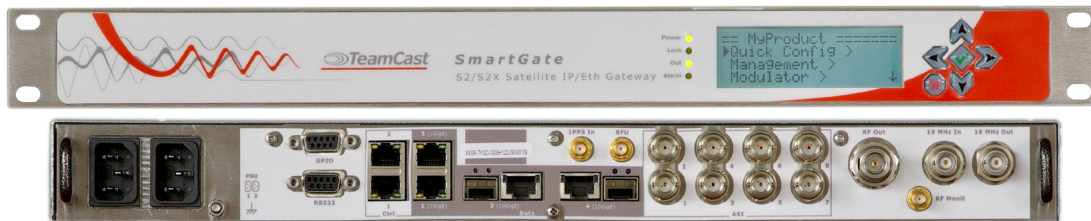
SmartGate can be integrated effectively into high quality of service systems thanks to its redundancy solution based on the Virtual Router Redundancy Protocol (VRRP) and a dry contact connector to drive an RF switch.

Note that SmartGate is also able to deal with MPEG-TS streams through ASI I/O or Ethernet interfaces. Hence it can be used as a single IP encapsulator or a single Satellite modulator, as required.

### Key features:

- Data Inputs: 2x1GigE + 2x10GigE + ASI
- Ultra-low latency
- Powerful IP/Ethernet filtering
- Optimized Multiprotocol Encapsulation (MPE)
- Full management of PSI/SI tables
- Network Clock Reference (NCR)
- Optimal bandwidth management
- DVB-S2/S2X standards
- Seamless ModCod switching
- Symbol Rate: up to 72 Mbaud
- DVB Carrier ID according to the ETSI TS 103 129 standard
- Full redundancy management with VRRP
- Linear & Non-Linear pre-correction
- Roll-off from 5 to 35%
- Up to 8 embedded profiles
- Dual power supply

# SmartGate: IP/Ethernet Satellite Gateway



## Specifications<sup>1</sup>

### Standards

- o DVB-S2: EN 302 307 part I
- o DVB-S2X: EN 302 307 part II
- o Carrier ID: ETSI 103 129
- o MPEG-TS: ISO/IEC 13818-1
- o MPEG-TS PSI Tables: EN 300 468
- o DVB Multi Protocol Encapsulation: ETSI EN 301 192
- o DVB MPEG-TS over ASI: EN50083-9, ETSI TR 101 891
- o DVB MPEG-TS over IP: ETSI TR 102 034 (SMPTE-2022)
- o VRRP: IETF RFC 5798
- o VLAN: IEEE 802.1q & IEEE 802.1ad

### Inputs

- o IP Datagrams over Ethernet:
  - 2 x 1GigE & 2 x 10GigE (electrical or optical)
  - Useful Ethernet data rate up to 200Mbit/s
  - Up to 1000 independent components (PID)
  - L2 or L3 Multiprotocol encapsulation (DSM-CC)
  - Standard & QinQ VLAN support
  - MAC mapping
  - Section packing
  - Traffic Management (shaping, policing, priority)
- o MPEG-TS (188/204 bytes) over ASI (x8) - BNC connectors, 75 Ω
- o MPEG-TS (RTP/UDP) over IP - 1 RJ45 1GigE

### Clock & Synchronization

- o Internal 10 MHz Reference Frequency:
  - High stability: +/- 5 ppb over 0 to 70° C
  - Ageing: +/- 0.05 ppb/day - +/- 7.5 ppb/year
- o External 10 MHz input for RF synchronization

### Modulation

- o Symbol rate: 0.05 to 72 Mbaud (1 Baud steps)
- o Standard roll-off and custom roll-off from 5 to 35 % (1% steps)
- o DVB-S2 & DVB-S2X:
  - Outer encoding: BCH
  - Inner encoding: LDPC (all code rates of the standards)
  - Constellations: QPSK, 8PSK, 16APSK, 32APSK, 64APSK, 128APSK, 256APSK
  - PL Scrambling codes
  - Operating modes: CCM, VCM & ACM
  - Frame length: Short & Normal frames
  - Pilots insertion

### RF Outputs

- o Bandwidth up to 72 MHz
- o L-Band: 950 MHz to 2150 MHz, step 1 Hz N 50 Ω / +0dBm / -35dBm, step 0.1 dB
- o SNR > 40 dB @ 0 dBm -16 APSK - 72 Mbaud
- o Shoulders rejection < -50dB @ 0dBm & f/fN=1.5 for roll-off 20%
- o Spurious:
  - < -65 dBc/4KHz @ 0 dBm for 950 to 2150 MHz range
  - -60 dBc outside the useful band
- o Phase noise:
  - @10Hz < -80 dBc/Hz
  - @100Hz < -90 dBc/Hz
  - @1KHz < -100 dBc/Hz
  - @10KHz < -105 dBc/Hz
  - @100KHz < -110 dBc/Hz
  - @1MHz < -130 dBc/Hz

### Enhanced Satellite Precorrection (E.S.P)

- o Static Non-Linear precorrection
- o Static Linear precorrection

### Control & Monitoring

- o RS232 control port with SCPI protocol
- o 2 dedicated Ethernet ports for
  - SNMP (V2C) over Ethernet
  - HTTP over Ethernet (Embedded web client)
- o Front panel keyboard & display

### Redundancy

- o 1+1 redundancy Ethernet ports (x2) for Control
- o VRRP management for the 4 Data Ethernet ports
- o 1+1 redundancy RF signal with Alarm relays:
  - connector 9-pin sub-D (F)
  - Dry contact management

### Physical

- o Dual Redundant AC Power supply: 90 to 240 VAC - 50 Hz
- o Mountable 1RU rack, Dimensions: 483 x 376.5 x 43.8 mm
- o Weight: 8 kg
- o Temperature Range: 0° C to 50° C

## Ordering Information

### Default hardware configuration

XSSR-SGT0-3000	SmartGate: IP S2/S2X Satellite Gateway - MPE/100 PID, QPSK/8PSK, L Band/15 Mbaud
----------------	--

### Software options

XSSO-SGT0-16AM	16APSK constellations
XSSO-SGT0-32AM	16/32APSK constellations
XSSO-SGT0-64AM	16/32/64APSK constellations
XSSO-SGT0-128AM	16/32/64/128APSK constellations
XSSO-SGT0-256AM	16/32/64/128/256APSK constellations
XSSO-SGT0-36MB	Symbol Rate < 36 Mbauds
XSSO-SGT0-72MB	Symbol Rate < 72 Mbauds
XSSO-SGT0-ESPO	Enhanced Satellite Precorrection - Linear & Non-linear

<sup>1</sup>Specifications are not contractual and are subject to revision without notice.