The SENCORE SMD 989 professional satellite modulator is ideal for MPEG Transport Stream transmission using DVB-S/S2/S2X or Broadcom TurboPSK modulation. Leveraging the latest modulation technology, the SMD provides high-value solution with unmatched signal quality.

Support for DVB-S2X and Multistream with Variable Coding and Modulation (VCM) ensures the SMD will be ready for the future of S2 modulation. Integrated processing features such as TR 101 290 error checking and BISS scrambling make the SMD an ideal solution for video delivery.

The optional, built-in L-Band upconverter enables the SMD 989 to provide an IF or L-band output. This eliminates the need for multiple pieces of equipment and provides a compact solution for facilities housing multiple modulators or for insertion into L-band inter-facility links.

The chassis has two bays allowing for a variety of configurations, including two independent modulators for density, redundant power supplies for reliability, or DC BUC power for truck installs.

### KEY FEATURES
- Super-efficient S2X modulation schemes and roll off factors
- Broadcom TurboPSK modulation modes
- Ability to modulate 1 to 6 multistream transport streams on a single carrier (single-box multistream solution)
- L-band and IF outputs
- Optional diplexed 10MHz and DC power on L-band
- Front panel and web GUI for easy configuration
- ASI and IP inputs
- Available with dual, redundant power supply

### APPLICATIONS
- **News Gathering**
  - Quick to boot, easy-to-use, robust platform
  - Support for stored presets
  - Carrier ID (DVB-CID) standard
  - Built-in BISS scrambling
  - Support for all advanced modulation features (multistream, VCM, 16APSK/32APSK/64APSK)

- **Uplink Facility Deployment**
  - State-of-the-art S2 and S2X modulation technology
  - TR 101 290 failover for redundant encoder support
  - Available dual power supply option for high reliability
  - High modulation efficiency with 8/16/32/64APSK modes
  - Full control and monitoring via SNMP

- **Advanced Modulation/Retransmission Use Cases**
  - Support for up to six streams of multistream transmission
  - VCM mode for variable-level protection
  - Higher-order modulation for high-throughput signals
## SPECIFICATIONS
Professional Satellite Modulator SMD 989

### INPUTS

#### SWITCHING
Automatic failover and failback between any two inputs
Triggered on: TS Sync Loss (Standard)
TR 101 290 P1 Errors (with License)

#### ASI
**Connector:** 2x BNC
**Impedance:** 75Ω
**Packet format:** Auto detect 188/204 byte
**TS Bitrate:** 0.5 Mbps - 213 Mbps

#### IP
**Ports:**
- 2x RJ45 GbE port
**Connector Type:** RJ45 10/100/1000 - Auto Negotiating
**Input Format:** UDP or RTP
**FEC Support:** SMPTE 2022/COP3
**IP Encapsulation:** 1 to 7 TS packets per IP packet
**Addressing:** Unicast and Multicast
**IGMP Compatibility:** Version 1, 2, and 3
**Per TS Bitrate:** 0.5 Mbps - 213 Mbps

### MODULATION

#### DVB-CID
**Modulation Format:** ETSI TS 103 129

#### DVB-S/DSNG
**Modulation Format & FEC rate:**
- QPSK: 1/2, 2/3, 3/4, 5/6, 7/8
- 8PSK: 2/3, 5/6, 8/9
- 16QAM: 3/4, 7/8
**Symbol rate range:** 0.5 - 45 MSpS
**Roll-off Factor:** 0.20, 0.25, 0.35
**Spectral Inversion:** On / Off

#### DVB-S2
**Modulation Format & FEC rate:**
- QPSK: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10*
- 13/45*, 9/20*, 11/20*,
- 8PSK-L: 5/9*, 26/45*
- 16APSK-L: 1/2*, 8/15*, 5/9*, 3/5*, 2/3*
- 32APSK-L: 2/3*
- 64APSK: 11/15*, 7/9*, 4/5*, 5/6*
- 64APSK-L: 32/45*  
**Normal FECFRAME only**
**Short FECFRAME only**
**Symbol rate range:** 0.5 - 45 MSpS
**Roll-off Factor:** 0.05, 0.10, 0.15, 0.20, 0.25, 0.35
**Spectral Inversion:** On / Off
**FEC Frames:** Normal (64,800) / Short (16,200)

#### TURBOPSK
**Modulation Format & FEC rate:**
- Turbo QPSK: 1/2, 2/3, 3/4, 5/6, 7/8
- Turbo 8PSK: 2/3, 3/4**, 5/6, 8/9
- Turbo 16QAM: 3/4
**Symbol rate range:** 0.5 - 30 MSpS
**Roll-off Factor:** 0.10, 0.15, 0.20, 0.25, 0.35
**Spectral Inversion:** On / Off

### REFERENCE

**External Reference Input:** 10 Mhz/50Ω BNC
**Reference Input Level:** -3dBm to 7dBm
**Internal Reference:** Ovenized 10MHz Oscillator
**Reference Output Source:** Internal or Reconditioned
**Reference Output Level:** +5dBm
**Reference Output Return Loss:** >25 dB

### PROCESSING

#### TS ANALYSIS
**Analysis Engines:** 2x (Primary and Backup Inputs)
**Error Checking:** Full TR 101 290 P1 Analysis with User-Settable Thresholds
BISS SCRAMBLING
Supported Modes: BISS 1 or BISS E with Injected ID
Scrambling Capability: Single Key, Single TS Scrambling
Supported Bitrates: 0.5 - 145 Mbps

OUTPUTS
IF OUTPUT MODULE
Frequency: 60-180 MHz (5 MHz steps)
Level:
- 910 Modulator Option: -30 dBm to -5 dBm (1 dB steps)
- 912A Modulator Option: -20 dBm to +5 dBm (1 dB steps)
Connector: 75Ω BNC
Return Loss: >20 dB
Monitoring Output: -20 dBc (IF) / -50 dBmV (1100MHz)
Spurious Signal Level (typical): -60dBc @ -10dBm

L-BAND UPCONVERTER OUTPUT
Frequency: 950-2150 MHz (1 KHz steps)
Level: -30 dBm to 5 dBm (0.1 dB steps)
Connector: 50Ω SMA
Return Loss: >15 dB
Monitoring Output: -20 dBc @ main L-band frequency
Spurious Signal Level: -60 dBc @ -10dBm

DIPLEXED L-BAND OUTPUT
Connector: 50Ω SMA
Reference on L-Band: 10 MHz
Reference Source: Internal or external (auto detect)
Reference Level: +5 dBm
DC Power on L-Band: 24VDC @ 3.1A (optional)
48VDC @ 1.6A (optional)
DC Power Source: Integrated or external supply
DC Power Control: On/Off switching (internal supply)

MANAGEMENT
Connector: RJ-45 10/100 - Auto Negotiating
Protocols: HTTP and SNMP
User Interfaces: Full control via web GUI
Full control via front panel
Automation Interfaces: Full status and control via SNMP
Configurable SNMP traps
Web services access to main GUI
Contact Closure Alarms: 2 form C relays (9 pin D-sub)

DIMENSIONS/POWER
Height: 1RU, 1.75" (5cm)
Width: 17.4" (44.2 cm)
Depth: 23" (58 cm)
Power: 100-240 AC 50/60 Hz @ 3 Amps
-48 VDC available
Supply Type: Integrated supply (standard)
Dual, hot-swappable, redundant load sharing supplies (optional)

ENVIRONMENTAL CONDITIONS
Operating Temp: 0° to 45°C
Storage Temp: -40°C to 65°C
Relative Operating Humidity: <95% (non-condensing)