Professional Satellite Modulator

SMD 989

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 Modulation ensures the SMD 989 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 989 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.

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 (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

KEY FEATURES

- Super-efficient S2X modulation schemes and roll off factors
- Broadcom TurboPSK modulation modes
- 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

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:	
910 Modulator Option:	4x BNC
912A Modulator Option:	2x BNC
Impedance:	75Ω
Packet format:	Auto detect 188/204 byte
TS Bitrate:	0.5 Mbps - 213 Mbps

IP

Ports:	
910 Modulator Option:	1x RJ45 GbE Port
912A Modulator Option:	2x RJ45 GbE ports
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* 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10* 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10* 32APSK: 3/4, 4/5, 5/6, 8/9, 9/10* *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)

DVB-S2X

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*, 11/45**, 4/15**, 14/45**, 7/15**, 8/15**, 32/45** 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10*, 23/36*, 25/36*, 13/18*, 7/15**, 8/15**, 26/45**, 32/45** 8PSK-L: 5/9*, 26/45* 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 26/45, 3/5, 9/10*, 28/45*, 23/36*, 25/36*, 13/18*, 7/9*, 77/90*, 7/15**, 8/15**, 32/45** 16APSK-L: 1/2*, 8/15*, 5/9*, 3/5*, 2/3* 32APSK: 3/4, 4/5, 5/6, 8/9, 32/45, 9/10*, 11/15*, 7/9*, 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 **2.05, 2.10, and 2.20 bits/symbol modes
Symbol rate range:	0.5 - 30 MSps
Roll-off Factor:	0.10, 0.15, 0.20, 0.25, 0.35

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 External
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

SPECIFICATIONS
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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:	
910 Modulator Option:	57-145 MHz (1 Hz steps)
912A Modulator Option:	50-180 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)
Level Accuracy:	+/- 2 dB
Connector:	75Ω BNC
Return Loss:	>20 dB
Monitoring Output (912A only):	-20 dBc (IF) / -50 dBmV at 1000 or 1100MHz (as labeled)
Spurious Signal Level:	-60 dBc @ -10 dBm (Typical) -50 dBc @ -10 dBm (Maximum)

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)