



The class leading SM5600 is a flexible and compact satellite modulator intended for DVB-S and DVB-DSNG applications.



## Business Benefits

The SM5600 is a highly flexible unit giving the user a feature rich solution for digital satellite modulation.

- DVB-S and DVB-DSNG modulation modes
  - All modulation modes available in a compact 1RU design
- Variable symbol rate from 0.2 to 66 Msymbols/s
  - Suitable for all applications from low data rate DSNG to high data rate IP backbone
- IF and L-band output frequency options
  - L-band output reduces the cost and space of extra up-converters
- Full set of control methods
  - RS232 and RS485 remote control
  - Ethernet remote control
  - Easy to use front panel control

## Application

### A Flexible Solution for the Transmission of Digital Satellite Television

The SM5600 is well suited for all types of MPEG data modulation from Direct to Home, Contribution and Distribution, and DSNG. The SM5600 has a reputation for its quality and high level of integration in a compact 1RU chassis, rich in features allowing ease of use and controllability making it suitable for installations small and large, fixed or mobile.

## Base units

### SM5600 Satellite Modulator

#### (M2/SM5600/BAS + M2/SM5600/TS-INPUT + M2/SM5600/IF-OUTPUT)

- Operation to ETSI standard EN 300 421 (DVB-S: BPSK and QPSK)
- Variable symbol rate operation: 1 to 48Msymbols/s
- User selectable spectrum roll-off factor: 0.2, 0.25, 0.3, 0.35
- IF Output: 50 – 180MHz, tunable in 1kHz steps with low spurious output levels
- 2x ASI inputs and 1x SPI input
- Easy software upgrades for extra features

## Options

### L-Band Output Option (M2/SM5600/LBAND-OUT)

- Transmission quality L-band output: 950 – 1750MHz, tunable in 1kHz steps
- L-band card provides switchable DC power and 10MHz frequency reference for external up-converter
- L-band monitor and Communications channel L-band input and combiner

### DVB-DSNG Higher Order Modulation Option (M2/SM5600/16QAM)

- 16QAM and 8PSK option to EN 301 210 standard in addition to BPSK and QPSK

### High Symbol Rate Option

#### (SM5600/IF-OUT/HS or SM5600/LBAND-OUT/HS)

- Extended symbol rate range of 0.2 to 66Msymbols/s

### PREKOR Option (M2/SM5600/DPC-OPT)

- Dramatically improves the link budget for 8PSK and 16QAM, single carrier per transponder transmissions.



Sample configuration:



<b>INPUTS</b>	<p><b>Transport Stream Inputs</b></p> <p>2 x DVB ASI Rear panel connector: BNC (F)</p> <p>Copper 75 Ohms</p> <p>1 x DVB SPI Rear panel connector: 25-way D-type (F)</p>	<b>FEATURES</b>	<p>Single Conditioning: EN 300 421 (DVB-S) and EN301 210 (DVB-DSNG)</p> <p>Modulation: BPSK, QPSK, 8PSK (option) and 16QAM (option)</p> <p>Symbol Rate: 1 to 48 Msymbol/s 0.2 to 66Msymbol/s – High symbol rate option variable in 1 symbol/s increments</p> <p>Input Bit-Rate <math>R_{U188}</math>: 154 Mbit/s maximum 212 Mbit/s Maximum – High symbol rate option</p> <p>Spectrum Roll-off Factor <math>\alpha</math>: 0.2, 0.25, 0.3, 0.35 user selectable</p>
<b>FEATURES</b>	<p><b>IF Output Option</b></p> <p><b>Main IF Output:</b></p> <p>IF Frequency: 50 – 180 MHz (tuneable)</p> <p>IF Frequency Step Size: 1 kHz</p> <p>IF Frequency Error: <math>\pm 1</math> kHz maximum</p> <p>Output Power: -20 to +5 dBm (0.1 dB steps)</p> <p>Impedance: 75 Ohms</p> <p>Connector: BNC (F)</p> <p>Spurious Outputs: &lt; -60 dBc/4 kHz over 0-500 MHz (modulated carrier) &lt; -55 dBc/4 kHz over 0-500 MHz (unmodulated carrier)</p> <p>Phase Noise: &gt; 6 dB below IESS-308 limits</p> <p><b>IF Monitor Output:</b></p> <p>Output Power: -20 dB nominal relative to Main IF Output power</p> <p>Impedance: 75 Ohms</p> <p>Connector: BNC (F)</p> <p><b>L-Band Output Option</b></p> <p><b>Main L-band output:</b></p> <p>Frequency Range: 950 – 1750 MHz</p> <p>Frequency Step Size: 1 kHz</p> <p>Frequency Error: <math>\pm 1</math> kHz</p> <p>Output Power: -20 to +5 dBm (0.1 dB steps)</p> <p>Impedance: 50 Ohms</p> <p>Connector: SMA (F)</p> <p>Spurious Outputs: &lt; -60 dBc/4 kHz over 500-2500 MHz, (modulated carrier) &lt; -55 dBc over 500-2500 MHz, (unmodulated carrier)</p> <p>Phase Noise: &gt; 6 dB below IESS-308 limits</p> <p><b>L-band monitor output</b></p> <p>Output Power: -30 dB nominal relative to Main L-band output</p> <p>Impedance: 75 Ohms</p> <p>Connector: F-type female</p> <p><b>DC Power Output:</b></p> <p>Voltage: 24 V switchable on/off</p> <p>Current: 500 mA maximum, short circuit protected</p> <p><b>10 MHz Reference Output:</b></p> <p>Output Power: 0 dBm <math>\pm 3</math> dB sine wave into 50 Ohm load, switchable on/off</p> <p>Frequency Stability: <math>\pm 5.5</math> Hz over 10 years</p> <p><b>Carrier Combining Input:</b></p> <p>Carrier Combining Path Gain: 0 dB <math>\pm 2</math> dB</p> <p>Input Power: <math>\leq +6</math> dB relative to main output, subject to a maximum of +5 dBm</p> <p>Intermodulation Products: &lt; 60 dBc/4 kHz</p> <p>Input Impedance: 50 Ohms</p> <p>Connector: SMA (F)</p>	<b>CONTROL</b>	<p><b>Front Panel:</b> 2 line x 40 character LCD display</p> <p><b>Navigation:</b> 4 cursor keys 2 function keys</p> <p><b>RS-232 / 485:</b> Via RS-232/485 control port using VT100 emulator or PC control software</p> <p><b>Connector:</b> 9-way D-type (M)</p> <p><b>Ethernet:</b> Dual-redundant 10BaseT Ethernet Telnet/FTP</p> <p><b>Connectors:</b> 2 x RJ45</p> <p><b>Aux Control:</b> IF output ON/OFF control by external electrical input</p> <p><b>Connector:</b> 9-way D-type (M)</p> <p><b>Reset/Status Port:</b> Relay contacts for signaling equipment and input signal failure</p> <p><b>Connector:</b> 9-way D-type (F)</p>
		<b>PHYSICAL AND POWER</b>	<p>1RU, 19" rack mounting</p> <p>Mass approx 8 kg</p> <p>Supply voltage: 100-120 Vac and 220-240 Vac, auto-ranging</p> <p>Power consumption approx 60W (dependent upon options fitted)</p>
		<b>ENVIRONMENTAL CONDITION</b>	<p><b>Temperature Range:</b> 0 °C to +50 °C operational -20 °C to +70 °C storage</p> <p><b>Relative Humidity:</b> 0% - 90% (non-condensing)</p>
		<b>COMPLIANCE</b>	<p>CE marked in accordance with EEC low voltage and EMC directives. Standards applied: EN55022, EN55024, EN61000-3-2, EN61000-3-3 for EMC and EN60950 for Safety, as a minimum where applicable. Also meets other relevant requirements and national standards derived from international requirements on which the above European Standards are based and FCC Pt 15B. Designed to meet UL 1950.</p>

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