



The SmartStream Encryptor Modulator (SEM), Motorola's family of encryptor/modulator/upconverter products, provides cable operators with a cost- and space-efficient means to perform encryption, modulation, and upconversion functions within the digital headend. Providing up to 16 multiplexes of processing functionality (up to 12 QAM outputs) in a single-RU package, the SEM V12 significantly lowers the barrier to entry in an on-demand environment. With high-speed interfaces to servers and content aggregation systems, the SEM V12 performs multiplex creation, encryption, 64/256 QAM modulation, and upconversion across the full HFC band. The SEM V12 gives system operators the necessary tools to launch narrowcast services as the HFC infrastructure evolves to allow subscribers to watch what they want, when they want.

The SEM is ideal for secure session-based VOD applications, 256 QAM upgrades, digital headend deployments, on-demand applications, switched digital video, encryption, and modulation/upconversion.

HIGHLIGHTS

DigiCipher® II/MediaCipher encryption of up to 192 services

Multiplex Creation

- Generates 16 output streams from up to 384 input streams
- PID filtering/re-mapping

Modulation

- 64/256 QAM modulation for 12 QAM transport streams
- Support for ITU J.83 Annex A (DVB), Annex B (SCTE), and Annex C (Japan)

RF/Upconversion

- 6 RF ports (2 QAM channels per port)
- 91 to 861 MHz RF output

GigaBit Ethernet

- 2 physical ports (SFP slots)
- Support for electrical and optical SFPs

Cost- and space-efficient encryption, modulation, and upconversion in a digital cable headend

SPECIFICATIONS

Dimensions	1 RU
INPUTS/OUTPUTS	
General	Receives up to 384 input transport streams Outputs up to 16 transport streams (MPTS) (up to 12 QAM outputs) 900 Mbps aggregate input/output
GigaBit Ethernet	2 physical ports Optical support (850, 1310, and 1550 nm pluggable modules) Loop-through-capable Electrical support (1000Base-T pluggable modules)
RF Outputs	
QAM Frequency Range	91 to 861 MHz
Carrier Frequency Step Size	1 kHz
Channel Spacing	6 to 8 MHz
Symbol Rate	
DCII 64 QAM	5.056942 Msym/sec
DCII 256 QAM	5.360537 Msym/sec
DVB	0.8 to 7.0 Msym/sec
QAM Carriers Per Output	6 outputs (2x6; each RF output contains 2 adjacent QAM channels)
Output Level Adjustment Range	45 to 58 dBmV dual QAM channels; 45 to 61 dBmV single QAM channels
PERFORMANCE	
Output Level Step Size	0.5 dB
Output Impedance	75 Ω
Output Return Loss	>14 dB
QAM Constellations	QAM-64 or QAM-256
QAM FEC Encoding Modes	ITU-T J.83 Annex A, B, or C
MER Equalized	> 41 dB
Phase Noise at 10 kHz (SSB)	< -96 dBc/Hz
DSB Phase Noise Integrated	
1 to 10 kHz	< -35 dBc
10 to 50 kHz	< -54 dBc
50 to 3 MHz	< -56 dBc
ELECTRICAL	
Input Voltage	100 to 240 VAC (50 to 60 Hz); 40 to 60 VDC (7 A)
VA Frequency	3.2 to 1.3 A, 120 V
Consumption	280 W (maximum)
OPERATING ENVIRONMENT	
Ambient Temperature	0 °C to 40 °C
Ambient Humidity	0 % to 90%
Storage Temperature	-40 °C to 70 °C
Cooling	5 fans

Specifications are subject to change without notice.



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