

M6100 Modulator



Broadcast Satellite Modulator

The M6100 Broadcast Satellite Modulator is the latest generation satellite modulator – built from the ground up for contribution, distribution and direct-to-home applications.

The M6100 Broadcast Satellite Modulator is the new generation DVB-S2, DVB-DSNG and DVB-S modulator specifically designed for broadcast direct-to-home, primary distribution and contribution applications. The modulator supports the new DVB-S2X transmission standard to achieve barrier-breaking efficiency.

Product Overview

Ready for the Future

Built upon flexible and latest generation programmable technology, the M6100 Broadcast Satellite Modulator is a future-proof unit that lets any satellite network evolve to the next level of capabilities. The M6100 fully supports DVB-S2X transmission enabling broadcasters and operators to optimize their satellite links for highest bit rate capacity and best bandwidth utilization.

Carrier ID – A benefit for all

The M6100 Broadcast Satellite Modulator includes the latest Carrier ID technology – enabling operators to manage satellite transmissions effectively and easily identify any transmissions that accidentally get up-linked on the incorrect frequency.

Ultimate Link Efficiency

The M6100 Broadcast Satellite Modulator allows use of tighter rolloffs, including 5%, to enable use of higher symbol rates over the satellite transponder. This more efficient use of available bandwidth allows a significant increase in bit rate throughput for the satellite link.

All Interfaces Solution

The M6100 Broadcast Satellite Modulator is fully equipped with all necessary input and output interfaces offering both ASI and IP transport stream input capabilities as well as IF and L-band output interfaces. In conjunction with full remote control capability the M6100 can seamlessly integrate into any network and infrastructure.

Degradation Free Satellite Link

The M6100 Broadcast Satellite Modulator offers Equalink® technology to pre-correct for distortions introduced within the satellite thus ensuring near-perfect down-link quality. Equalink® enhances the link margin allowing increased bit rate throughput over the satellite channel - providing up to 10% bandwidth gains for single carrier per transponder constellations.

Why MediaKind

By combining ultimate quality video compression platforms with ultimate efficiency satellite modulation technology, MediaKind is able to provide world-beating, fully integrated, end-to-end solutions for contribution and distribution applications

BASE UNIT FEATURES

M6100 – IF output, Single PSU Satellite Modulator Chassis (M6100/BAS/IF/1AC)

Base Chassis Functionality Includes:

- IF frequency range output
- Single AC power supply
- DVB RF Carrier ID and CID in the NIT
- Up to 36MSyms operation
- 5% to 35% rolloff
- IP or ASI Transport stream inputs
- Capable of DVB-S, DVB-S2, DVB-S2X and higher symbol rates
- Transport Stream Analyzer with PCR jitter measurement
- IP based SNMP and Web browser remote control
- Integration with nCompass Control

M6100 – L-Band output, Single PSU Satellite Modulator Chassis (M6100/BAS/L/1AC)

- L-band frequency range output

M6100 – IF and L-Band output, Single PSU Satellite Modulator Chassis (M6100/BAS/IF/L/1AC)

- IF and L-band frequency range output

M6100 – IF output, Dual PSU Satellite Modulator Chassis (M6100/BAS/IF/2AC)

- Dual AC power supply variant

M6100 – L-Band output, Dual PSU Satellite Modulator Chassis (M6100/BAS/L/2AC)

- Dual AC power supply variant

M6100 – IF and L-Band output, Dual PSU Satellite Modulator Chassis (M6100/BAS/IF/L/2AC)

- Dual AC power supply variant

M6100 Options

Transport Stream Input Options

The M6100 satellite modulator allows operators to equip their unit with the most suitable transport stream input interfaces.

IP Transport Stream Input option (M6100/SWO/IP/IN)

- Dual GigE IP transport stream input
- SMPTE 2022 ProMPEG FEC

ASI Transport Stream Input option (M6100/HWO/ASI/IN)

- Dual ASI transport stream input
- Dual ASI transport stream loop-through output

IP and ASI Transport Stream Input option (M6100/HWO/ASI/IN/IP)

- Dual GigE IP transport stream input
- SMPTE 2022 ProMPEG FEC
- Dual ASI transport stream input
- Dual ASI transport stream loop-through output

Symbol Rate Capability Options

The M6100 Satellite Modulator is equipped for 36MSyms operation but can be further enhanced for wider transponders.

Up to 72MSyms Capability (M6100/SWO/SYM/72)

- Enables symbol rates up to 72Msyms

Modulation Standard and Coding Options

M6100 Satellite Modulator is capable of all modulation schemes from the simplest DVB-S QPSK through to the new, high efficiency DVB-S2X standard. M6100 modulation capability can be entitled through software options.

DVB-S (M6100/SWO/S)

- Enables DVB-S QPSK and DVB-DSNG 8PSK Capability

DVB-S and DVB-S2 QPSK (M6100/SWO/S2/Q)

- Enables DVB-S QPSK capability
- Enables DVB-S2 QPSK capability

DVB-S/DVB-DSNG QPSK/8PSK and DVB-S2 QPSK/8PSK (M6100/SWO/S2/8)

- Enables DVB-S QPSK, DVB-DSNG 8PSK capability
- Enables DVB-S2 QPSK and 8PSK capability

DVB-S/DVB-DSNG QPSK/8PSK/16QAM and DVB-S2 QPSK/8PSK/16APSK (M6100/SWO/S2/16)

- Enables DVB-S QPSK, DVB-DSNG 8PSK and 16QAM capability
- Enables DVB-S2 QPSK, 8PSK and 16APSK capability

DVB-S/DVB-DSNG QPSK/8PSK/16QAM and DVB-S2 QPSK/8PSK/16/32APSK (M6100/SWO/S2/32)

- Enables DVB-S QPSK, DVB-DSNG 8PSK and 16QAM capability
- Enables DVB-S2 QPSK, 8PSK, 16APSK and 32APSK capability

DVB-S/DVB-DSNG, DVB-S2, DVB-S2X QPSK/8PSK (M6100/SWO/S2X/Q/8)

- Enables DVB-S QPSK, DVB-DSNG 8PSK capability
- Enables DVB-S2 QPSK, 8PSK
- Enables DVB-S2X QPSK, 8PSK

DVB-S/DVB-DSNG, DVB-S2, DVB-S2X QPSK/8PSK/16APSK (M6100/SWO/S2X/16)

- Enables DVB-S QPSK, DVB-DSNG 8PSK and 16QAM capability
- Enables DVB-S2 QPSK, 8PSK, 16APSK
- Enables DVB-S2X QPSK, 8PSK, 16APSK

DVB-S/DVB-DSNG, DVB-S2, DVB-S2X QPSK/8PSK/16/32APSK (M6100/SWO/S2X/32)

- Enables DVB-S QPSK, DVB-DSNG 8PSK and 16QAM capability
- Enables DVB-S2 QPSK, 8PSK, 16APSK, 32APSK
- Enables DVB-S2X QPSK, 8PSK, 16APSK, 32APSK

DVB-S/DVB-DSNG, DVB-S2, DVB-S2X QPSK/8PSK/16/32/64APSK (M6100/SWO/S2X/64)

- Enables DVB-S QPSK, DVB-DSNG 8PSK and 16QAM capability
- Enables DVB-S2 QPSK, 8PSK, 16APSK, 32APSK
- Enables DVB-S2X QPSK, 8PSK, 16APSK, 32APSK, 64APSK

Pre-Distortion

M6100 Satellite modulator offers the ability to further enhance the performance of the satellite link through pre-distortion of satellite link to account for non-linearities present in single carrier per transponder applications.

Automated Equalink® Pre-Distortion (M6100/SWO/EQ)

- Enables Equalink® pre-distortion

Reference Clock Frequency Options

The M6100 is equipped with a high accuracy 10MHz internal reference clock to ensure accurate modulation and frequency synthesis. If required the M6100 can also be used to provide the 10MHz reference externally to drive other equipment that forms part of the overall system.

10MHz reference clock Output (M6100/HWO/10MHZ/OUT)

- 10MHz reference frequency output on BNC connector

Additional Options

M6100 Satellite modulator provides additional capability to further enhance system operations and deliver additional value to transmissions.

MPE Data Insertion (M6100/SWO/MPE)

- Enables MPE Data insertion
- Requires IP Input option

BISS Encryption (M6100/SWO/BISS)

- Enables BISS mode 1 and E encryption for a single transport stream

N type to SMA adapter (M6100/HWO/N/SMA)

- N type to SMA adapter
- For use in conjunction with L-band output units



Sample configuration with: ASI Input card installed

Specifications

Data Interfaces

ASI Interface 2x DVB ASI Input	Connector: 2x BNC (F), 75 Ohm
2x DVB ASI Loop-through Output	Connector: 2x BNC (F), 75 Ohm
Transport Stream Data Specification	Packet size: 188-byte, 204-byte Input data rate adaptation mode MPTS or SPTS input
IP TS Interface 2x Ethernet Input	Connector: RJ45 Electrical Ethernet (autosensing 10/100/1000BaseT) Supported protocols: UDP, RTP
Transport Stream Data Specification	Packet size: 188-byte (IP/ASI), 204-byte (ASI) Input data rate adaptation mode MPTS or SPTS input FEC: SMPTE 2022 -1 and 2
IP Encapsulation	MPE based IP data encapsulation Max. data rate: 20 Mbps Requires IP TS interface option for IP data

Modulation

DVB-S	Signal conditioning: EN 300 421 (DVB-S) Modulation: QPSK FEC: 1/2, 2/3, 3/4, 5/6, 7/8
DVB-DSNG	Signal conditioning: EN 301 210 (DVB-DSNG) Modulation: 8PSK, 16QAM FEC 8PSK: 2/3, 5/6, 8/9 FEC 16QAM: 3/4, 7/8
DVB-S2	Signal conditioning: EN 302 307 Part 1 (DVB-S2) Modulation: QPSK, 8PSK, 16APSK, 32APSK FEC QPSK: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 FEC 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 FEC 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 FEC 32APSK: 3/4, 4/5, 5/6, 8/9, 9/10

DVB-S2X	<p>Signal conditioning: EN 302 307 Part 2 (DVB-S2X) Modulation: QPSK, 8PSK, 16APSK, 32APSK, 64APSK Normal Frames: FEC QPSK: 1/4 to 9/10 FEC 8PSK: 3/5 to 9/10 FEC 16APSK: 26/45 to 9/10 FEC 32APSK: 32/45 to 9/10 FEC 64APSK: 11/15 to 5/6 FEC 8PSK-L 5/9 and 26/45 FEC 16APSK-L 1/2 to 2/3 FEC 32APSK-L 2/3 FEC 64APSK-L 32/45 Short Frames: FEC QPSK: 11/45 to 8/9 FEC 8PSK: 7/15 to 8/9 FEC 16APSK: 7/15 to 8/9 FEC 32APSK: 2/3 to 8/9</p>
Symbol Rate	<p>DVB-S: 0.05 to 72 MSyms DVB-S2/S2X: 0.05 to 72MSyms</p>
Frame Length	<p>DVB-S: 188 bytes DVB-S2/S2X: 16200 bits (short frames), 64800 bits (normal frames)</p>
Roll-off	<p>Roll-off: 5%, 10%, 15%, 20%, 25%, 35%</p>
Carrier ID	<p>Carrier ID via NIT table DVB RF Carrier ID (DVB-CID, ETSI 103 129)</p>

Outputs

Main IF Output	<p>Connector: BNC (F), 75 Ohm IF frequency: 50 to 180 MHz IF frequency step size: 10 Hz Output power level: -35 to +10 dBm (± 2 dB) Return loss: >14dB into 50 Ohms, >20dB into 75 ohms Spurious performance: Better than -65 dBc/4kHz @ +5 dBm output level and >0.256 MSyms Non signal related:<-80 dBc @ +5 dBm output</p>
Main L-band Output	<p>Connector: N (F), 50 Ohm L-band frequency: 950 to 2150 MHz L-band frequency step size: 10 Hz Output power level: -35 to +7 dBm (± 2 dB) Return loss: >14 dB Spurious performance: Better than -65 dBc/4kHz @ +5 dBm output level and >0.256 MSyms Non signal related:<-80 dBc @ +5 dBm output</p>

L-band Monitoring Output	Connector: SMA (F), 50 Ohm L-band frequency: follows main L-band output, 1050 MHz when used with IF output only Output power level: -45 dBm Return loss: >10 dB
10 MHz Reference Input	10 MHz Reference Input Connector: BNC (F), 50 Ohms Input level: -3 dBm to +7 dBm Frequency: 1, 2, 5, 10, 20 Mhz
10MHz Reference Clock Output	Connector: N (F), 50 Ohm Output level: +3dBm (± 2 dB) Stability: Standard stability option Stability: ± 2000 ppb over 0 to 70°C Ageing: ± 1000 ppb/year

Management

Management	2x Electrical Ethernet (10/100/1000BaseT) User management via web browser Front panel keypad and LCD SNMP v2c Support for nCompass
-------------------	--

Alarms

Alarms	Connector: 9-pin D-sub (F) Electrical dual contact closure alarm contacts Logical interface and general device alarm
---------------	--

Physical and Power

Dimensions (W x D x H)	442.5 x 510 x 44mm (17.5" x 20.1" x 1.75" approx.)
Input Voltage	90 to 130 Vac, 180 to 260 Vac 47 to 63 Hz
Power Consumption	105 W
Cooling	Integrated fan

Environmental Conditions

Operating Temperature	0°C to +50°C (32°F to 122°F)
Storage Temperature	-40°C to +70°C (-40°F to 158°F)
Relative Humidity	5% to 85% (non-condensing)

Compliance

Compliance	CE marked in accordance with in accordance with EU R&TTE Directive (EU Directive 1999/5/EC Radio and Telecommunication Terminal Equipment Directive Essential Requirements 3.1(a), 3.1 (b), 3.2.)
EMC Compliance	EN55022, EN61000-3-2, EN61000-3-3, EN55024, CISPR22, FCC CFR47 Part 15B Class A
Safety Compliance	EN60950-1, IEC60950-1, UL60950-1