Newtec

M6100
BROADCAST SATELLITE MODULATOR
(R2.9)

Description

The Newtec M6100 Broadcast Satellite Modulator is the new generation DVB compliant modulator specifically designed for broadcast direct-to-home, primary distribution to headends and contribution of television and radio content. This single Transport Stream modulator supports the updated DVB-S2 and DVB-S2X, next to the legacy DVB-S and DVB-DSNG standards, as well as Newtec S2 Extensions in order to achieve barrier-breaking efficiency. The M6100 can be used in conjunction with set-top boxes, professional IRDs or professional satellite demodulators such as the MDM6100.

Delivering the Highest Uptime for Vital Links

Uptime and reliability are essential in the design of the modulator, which plays a vital role in the satellite network. Input source redundancy on ASI or on the GbE ports supporting any IP network configuration and the shortest redundancy switch-over times of modulators, operating both in 1+1 and N+1 topologies, are setting the standard in our industry.

Advanced capabilities are built in, such as an MPEG Transport Stream analyser, support of SMPTE 2022 FEC at the GbE inputs (for distributed IP headends), and native support of Carrier ID, according to the new DVB standard, as well as in the transport stream NIT Table.

Special care was taken to cope with jittery transport stream over IP inputs. Two input ASI ports can be used as redundant interfaces while the two output ASI ports provide monitoring. The presence of ECM/EMM messages, essential to paid services in DTH constellations can be monitored and triggers your management system in case of interruptions.

Get the Best Performance and Lower Your Costs

The broadcast satellite modulator performs among the best, offering unmatched bandwidth efficiency optimization options, thereby lowering overall Total Cost of Ownership. The fully automated operation of Newtec´s field-proven Equalink® 3 pre-distortion technology with its seamless calibration is now available for any satellite transmission application providing up to 10% bandwidth gains for single carrier per transponder constellations.

Clean Channel Technology®, in combination with DVB-S2X or Newtec S2 Extensions, improves satellite efficiency by up to 15%, thereby enabling much smaller carrier spacing.

Maximum symbol rates up to 72 Mbaud and modulations up to 256APSK (DVB-S2X standard) combined with VCM (Variable Coding and Modulation) allow for maximum throughput of up to six transport streams in large contribution links. The powerful MPE encapsulator gives access to dual stream communication where live video is combined with file transfer, a service channel or video streaming.

Newtec's next generation broadcast satellite modulator is not just a modulator. It's a platform that takes a vital role in your networks, performs the best on the market and helps you evolve your business through ongoing market and technology innovations.

At the output of the broadcast satellite modulator, the signal is available in IF or extended L-band (950 MHz-2150 MHz), providing a compact and cost-effective solution. A built-in Ku-band or C-band upconverter is optional. A switchable 10 MHz reference signal and optional 24 Vdc or 48 Vdc for an outdoor BUC is multiplexed on the L-band interface.

The broadcast satellite modulator can be easily monitored and controlled via a comprehensive front panel menu and advanced web GUI, as well as via SNMP protocol. This enables easy integration into any industry-standard EMS/NMS system.

Evolve Towards Tomorrow's Technology

Built upon flexible and latest generation programmable technology, the M6100 Broadcast Satellite Modulator is a future-proof building block that lets any satellite network evolve to the next level of capabilities. A scalable, pay-as-you-grow, licensing and software upgrade mechanism facilitates the launch of new services, or last minute network design changes, without rebuilding the entire network infrastructure. Migration from ASI to GbE and IF to L-band or an upgrade to the new DVB-S2X standard or Newtec S2 Extensions is facilitated by simple in-field installation of license keys.

The brand new DVB-CID carrier identifier is already available as a software option on the M6100 and DSNG profiles, as defined by WBU-ISOG, can be easily selected. These profiles define the basic parameters for the most common use cases including the new DVB-S2X standard.

SPECIFICATIONS

Key Features

- Single Transport Stream modulator with optional MPE encapsulator
- Baud rate range: 50 kbaud – 72 Mbaud
- Data rates up to 216 Mbit/s
- IF (70/140) and L-Band (950-2150) high power outputs
- Optional integrated RF upconverter (Ku-band or C-band)
- Highest system reliability and service uptime through robust design and industry-leading redundancy solutions
    - Exceptional jitter recovery on TS over IP inputs with SMPTE 2022 FEC
    - Redundant optional ASI or GbE interfaces with support of redundant IP network configurations
    - Built-in TS Analyser with
      - TR101 290 priority 1 and 2 error monitoring
      - PID table with rate and PCR jitter measurements
      - Continuity Count error monitoring per PID
    - RFI reduction using optional DVB RF Carrier ID (DVB-CID) and NIT table CID (default)
    - Input rate recovery based upon PCR timestamps
    - Automatic TS rate adaptation
    - L-band monitoring output
    - Market-leading RF purity and performance
    - Programmable amplitude slope equalizer
    - PRBS generator for link performance tests
    - Output level adjust for cable loss compensation
    - Optional high stability internal clock reference
    - Optional dual AC power supply
- Low Total Cost of Ownership as a result of very high bandwidth efficiency technology options, and ease of monitoring and control
    - DVB-S2X, DVB-S2, DVB-DSNG and DVB-S compliant
    - Newtec S2 Extensions
    - QPSK, 8PSK, 16APSK, 32APSK, 64APSK, 128APSK and 256APSK
    - Clean Channel Technology provides up to 15% bandwidth efficiency gains on top of the DVB-S2 standard
    - Optional automated Equalink 3 predistortion provides up to 10% bandwidth gains, higher QoS and geographic coverage
    - Secure front panel, SNMP, HTTP and CLI interfaces
    - Selection of DSNG profiles acc. WBU-ISOG including the new DVB-S2X standard
    - Optional PID Activity Monitoring for ECM/EMM message interruption triggering external management system
- Optional built-in support for opportunistic data insertion up to 20 Mbps, interoperable with IRD's that support Multi Protocol Encapsulation (MPE)
- Supports SFN Networks using transparent TS pass-through
- Optional BISS content protection
- External reference input
- Optional 10 MHz reference output
- Easy integration with industry-leading management systems (EMS/NMS/OSS)
- Feature-based pricing and software upgrades
- Pay-as-you-grow flexible licensing scheme

Applications

- Broadcast Direct-to-Home (DTH)
- Broadcast primary distribution
- Broadcast contribution
- Upgrade of distribution networks towards Newtec S2 Extensions or DVB-S2X

Support Services for Your Professional Equipment

Care Pack Basic and Care Pack Enhanced are the Newtec service and support packages protecting your Newtec equipment over a three-year period.

Related Products

MDM6100	Broadcast Satellite Modem (works together with M6100 to perform Equalink 3)
FRC07x0	Frequency converters portfolio
USS0212	1+1 Modulator Redundancy Switch
USS0202	Universal Switching System

Related Bandwidth Efficiency Technologies

Clean Channel Technology
Fully Automated Equalink 3
Newtec S2 Extensions and DVB-S2X

Newtec

Data Interfaces

ASI INTERFACE (OPTIONAL)

Single stream mode

- 2 selectable ASI inputs on BNC (F) – 75 Ohm (coax)
- 2 x ASI output (loop through) on BNC (F) – 75 Ohm (coax)
- 188 or 204 byte mode
- Rate adapter
- MPTS or SPTS according to ISO/IEC 13818

ETH INTERFACE

- Auto switching 10/100/1000 Base-T Ethernet interface
- Transport stream over IP interface (UDP/RTP)
  - Forward Error Correction SMPTE 2022-1 and -2
  - 188 or 204 byte mode
  - Rate adapter
  - MPTS or SPTS according to ISO/IEC 13818
  - Single stream mode

Content Encryption and Protection

BISS ENCRYPTION

- Support for BISS-0, BISS-1 and BISS-E
- On one single TS (SPTS or MPTS)

IP Encapsulation

- MPE Encapsulation of IP frames in 1 transport stream
- Max 20 Mbit/s

Modulation

SUPPORTED MODULATION SCHEMES AND FEC

- DVB-S
  Outer/Inner FEC: Reed Solomon / Viterbi
  MODCODs
  QPSK: 1/2, 2/3, 3/4, 5/6, 7/8
- DVB-DSNG
  Outer/Inner FEC: Reed Solomon / Viterbi
  MODCODs
  8PSK: 2/3, 5/6
  16QAM: 3/4, 7/8
- DVB-S2 (acc. ETSI EN 302 307 v1.2.1)
  Outer/Inner FEC: BCH/LDPC
  52 MODCODs (short & normal frames)
  QPSK: from 1/4 to 9/10
  8PSK: from 3/5 to 9/10
  16APSK: from 2/3 to 9/10
  32APSK: from 3/4 to 9/10
- Newtec S2 Extensions
  Outer/Inner FEC: BCH/LDPC
  54 MODCODs
  QPSK: from 45/180 to 144/180
  8PSK: from 80/180 to 150/180
  16APSK: from 80/180 to 162/180
  32APSK: from 100/180 to 162/180
  64APSK: from 90/180 to 162/180
  29 Linear MODCODs
  8PSK-L: from 80/180 to 120/180
  16APSK-L: from 80/180 to 162/180
  64APSK-L: from 90/180 to 162/180
- DVB-S2X standard
  Outer/Inner FEC: BCH/LDPC
  53 MODCODs (normal frames)
  QPSK: from 1/4 to 9/10
  8PSK: from 3/5 to 9/10
  16APSK: from 26/45 to 9/10
  32APSK: from 32/45 to 9/10
  64APSK: from 11/15 to 5/6
  128APSK: 3/4; 7/9
  256APSK: 32/45; 3/4
  13 Linear MODCODs (normal frames)
  8APSK-L: 5/9; 26/45
  16APSK-L: from 1/2 to 2/3
  32APSK-L: 2/3
  64APSK-L: 32/45
  256APSK-L: 29/45 to 11/15
  41 MODCODs (short frames)
  QPSK: from 11/45 to 8/9
  8PSK: from 7/15 to 8/9
  16APSK: from 7/15 to 8/9
  32APSK: from 2/3 to 8/9
- Support of DVB-S2 VCM mode

BAUD RATE RANGE

- DVB-S2, DVB-S2X & Newtec S2 Extensions 50 kbaud - 72 Mbaud
- DVB-S 50 kbaud - 72 Mbaud

FRAME LENGTH

- DVB-S 188 bytes
- DVB-S2, DVB-S2X & Newtec S2 Extensions Short Frames 16200 bits
- DVB-S2, DVB-S2X & Newtec S2 Extensions Normal Frames 64800 bits

CLEAN CHANNEL TECHNOLOGY

- Roll-off : 5% -10% -15% -20% - 25% - 35%
- Optimum carrier spacing
- Advanced filter technology

EQUALINK 3

- Predistortion for all MODCODs

CARRIER INTERFERENCE REDUCTION

- DVB RF Carrier ID (DVB-CID)
  - Spread Spectrum Modulator (BPSK)
  - Supports User Data
  - Compliant to ETSI 103 129 v1.1.1 (2013-05)
- Carrier ID NIT Table

Modulation Interfaces

L-BAND (CONFIGURATION OPTION)

- Connector N(F), 50 Ohm (optional SMA adapter)
- Frequency 950 - 2150 MHz (10 Hz steps)
- Level -35/+7 dBm (+/- 2 dB)
- Return loss > 14 dB
- Switchable 10 MHz Reference
- Spurious performance
  Better than - 65 dBc /4 kHz @ +5 dBm output level and > 256 kbaud
  Non-signal related: < - 80 dBc @ +5 dBm output

IF-BAND (CONFIGURATION OPTION)

- Connector BNC (F) - 75 Ohm (intermateable with 50 Ohm)
- Frequency 50 - 180 MHz (10 Hz steps)
- Level -35/+10 dBm (± 2 dB)
- Return loss 50 Ohm : > 14 dB
  75 Ohm : > 20 dB
- Spurious performance
  Better than - 65 dBc/4 kHz @ +5 dBm output level and > 256 kbaud
  Non-signal related:< - 80 dBc @ +5 dBm output

L-BAND MONITORING

- Connector SMA (F), 50 Ohm
- Frequency Same as L-Band output frequency or 1050 MHz in case of IF output option only
- Level -45 dBm
- Return loss > 10 dB

RF BAND (OPTIONAL)

- Connector SMA (F), 50 Ohm
- Return loss > 15 dB
- Frequencies 5.85-7.05 GHz
  13.75-14.5 GHz
- Level -25/+7 dBm (+/- 3dB)

with secondary L-band input:

- Connector SMA (F), 50 Ohm
- Return loss >12dB
- Range -35/-3 dBm
- Maximum input power for no damage +13 dBm

with L-band output:

- Connector SMA (F), 50 Ohm
- Return loss >12 dB
- Level -35/-3 dBm (+/- 3dB)

10 MHZ REFERENCE INPUT

- Connector BNC (F), 50 Ohm
- Input level -3 dBm up to + 7 dBm
- Frequencies 1,2,5,10,20 MHz

10 MHZ REFERENCE OUTPUT (OPTIONAL)

- Connector BNC (F), 50 Ohm
- Output level +3 dBm (+/- 2 dB)

BUC POWER (OPTIONAL)

- Max. current: 3.8 A
- Voltage: 24 V,48 V (Software controlled)

Internal 10 MHz Reference Frequency

STANDARD STABILITY

- Stability: +/- 2000 ppb over 0 to 70°C
- Ageing: +/- 1000 ppb/year

VERY HIGH STABILITY (OPTIONAL)

- Stability: +/- 2 ppb over 0 to 65°C
- Ageing: +/- 500 ppb/10 year

Generic

MONITOR AND CONTROL INTERFACES

- Web server GUI (HTTP) via web browser
- M&C connectivity via separate Ethernet links
- Diagnostics report, alarm log (HTTP)
- SNMP v2c

ALARM INTERFACE

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

Physical

- Height 1RU, width: 19", depth 51 cm, 5.8 kg
- Power supply:
  90-130 & 180-260 Vac, 125 VA, 47-63 Hz
- Temperature:
  Operational: 0°C to +50°C / +32°F to +122°F
  Storage: -40° to +70°C / -40°F to +158°F
- Humidity: 5% to 85% non-condensing
- CE label and UL

Newtec M6100 Broadcast Satellite Modulator (R2.9)		Ordering n°
Configuration Options Category		**M6100**
		Select 1 option
Hardware Platform	Chassis Type 01 (Modulator)	CH-01
		Select 1 option
Operating Software	M6100/MDM6100 Software R2.9*	MS-29
		Select 1 option
Mains Power Supply Unit	PSU Single AC 110/240 V	PS-00
	PSU Dual Redundant AC 110/240 V**	PS-01
		Select 1 option
Video Package	Video TS, Carrier-ID(NIT), TS Analyser*	VP-01
		Select 1 option
Video Interface	GbE TSoIP, SMPTE-2022 FEC (req. VP-01)*	VI-01
	ASI (6 connectors) (req. VP-01)	AS-02
	GbE TSoIP + ASI(6) (req. VP-01)	VI-02
		Select 1 option
Modulator Output Interface	L-band with switchable 10 MHz output*	OU-00
	IF (50-180 MHz)*	OU-01
	IF+ L-band with switchable 10 MHz out*	OU-02
	L-band + 10 MHz output + 24/48 V BUC**	OU-05
	IF+L-band + 10 MHz output + 24/48 V BUC**	OU-06
	L + C band (5.85-7.05 GHz)	OU-11
	L + Ku band (13.75-14.50 GHz)	OU-13
		Select 1 option
Modulation Standard and Coding	DVB-S Q/8PSK*	SC-01
	DVB-S/S2 QPSK*	SC-02
	DVB-S/S2 Q/8PSK*	SC-03
	DVB-S/S2 Q/8PSK 16QAM 16APSK*	SC-04
	DVB-S/S2 Q/8PSK 16QAM 16/32APSK*	SC-05
	DVB-S/S2/Ext Q/8PSK*	SC-06
	DVB-S/S2/Ext Q/8PSK 16QAM 16APSK*	SC-07
	DVB-S/S2/Ext Q/8PSK 16QAM 16/32APSK*	SC-08
	DVB-S/S2/Ext Q/8PSK 16QAM 16/32/64APSK*	SC-09
	DVB-S/S2/Ext/S2X Q/8PSK*	SC-10
	DVB-S/S2/Ext/S2X Q/8PSK 16QAM 16APSK*	SC-11
	DVB-S/S2/Ext/S2X Q/8PSK 16QAM 16/32APSK*	SC-12
	DVB-S/S2/Ext/S2X Q/8PSK 16QAM 16-256APSK*	SC-13
		Select 1 option
Modulation Maximum Symbol Rates	Modulation Symbol Rate 5 Mbaud*	SR-05
	Modulation Symbol Rate 15 Mbaud*	SR-15
	Modulation Symbol Rate 36 Mbaud*	SR-36
	Modulation Symbol Rate 54 Mbaud*	SR-54
	Modulation Symbol Rate 72 Mbaud*	SR-72
		Select 1 option
Internal Reference Clock	Standard 10 MHz	IR-00
	Very High Stability 10 MHz	IR-02
Additional Options Category		
		Max. 1 option per category
Reference Clock Output	10 MHz Reference Output (BNC)	RO-01
		Max. 1 option per category
Modulator Output Connector	L-Band output N to SMA output adapter	OU-10
		Max. 1 option per category
Clean Channel Technology	Clean Channel Technology for 5 Mbaud*	CC-05
	Clean Channel Technology for 15 Mbaud*	CC-15
	Clean Channel Technology for 36 Mbaud*	CC-36
	Clean Channel Technology for 54 Mbaud*	CC-54
	Clean Channel Technology for 72 Mbaud*	CC-72
		Max. 1 option per category
Predistortion	Equalink 3*	AE-01
		Max. 1 option per category
DVB Carrier Identifier	DVB RF Carrier Identifier*	ID-01
		Max. 1 option per category
MPE Insertion	MPE Data insertion in TS (req. VP-01)*	VM-01
		Max. 1 option per category
Encryption	BISS (0-1-E) Single TS (Req. VP-01)*	CA-01
		Max. 1 option per category
Monitoring	PID Acitivity Monitoring*	PA-01
Services Category		
		Max. 1 option per category
Support	Care Pack 3 Basic	GA-08
	Care Pack 3 Enhanced	GA-09

(*) Selectable via license key
(**) Dual PSU option PS-01 cannot be combined with OU-05 nor OU-06
Contact your sales representative for details (sales@newtec.eu).

Europe	North America	South America	Asia-Pacific	China	MENA
Tel: +32 3 780 65 00	Tel: +1 203 323-0042	Tel: +55 11 2092 6220	Tel: +65 6777 22 08	Tel: +86 10-823 18 730	Tel: +971 4 390 18 78
Fax: +32 3 780 65 49	Fax: +1 203 323-8406	Fax: +55 11 2093 3756	Fax: +65 6777 08 87	Fax: +86 10-823 18 731	Fax: +971 4 368 67 68