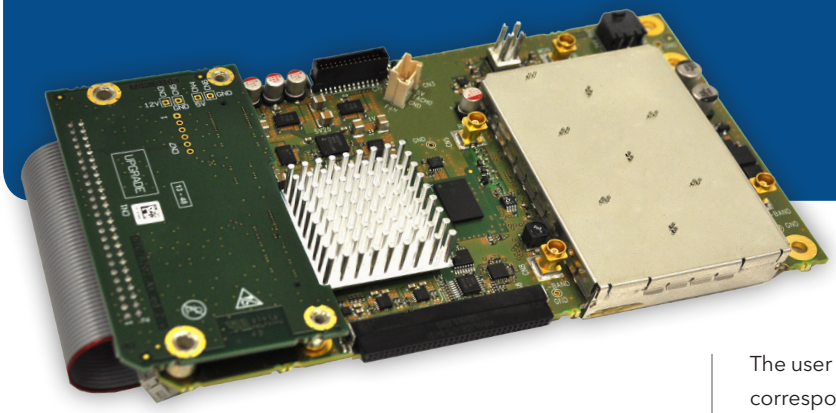
Newtec

OM6000
OEM SATELLITE MODULATOR BOARD
(R1.1)



Description

Being fully compliant with the new S2 Extensions standard for Digital Video Broadcasting over Satellite (DVB-S2X), the Newtec satellite modulator board OM6000 offers the following advantages:

- Backward compatible to the former NTC/7029, NTC/7039 and NTC/7139 OEM modulator boards in form-fit-function.
- IF or L-band output selectable by software command.
- Newtec Clean Channel Technology® compliant.
- Support for all Newtec S2 Extensions modulation schemes and DVB-S, DVB-DSBNG and DVB-S2 standards.
- Addition of a simple ASI interface.
- RF Carrier ID compliant (fully managed by the OM6000).

This product provides the OEM integrator a smooth upgrade path starting as a drop-in replacement for current functionality (Form Fit Function backward compatible with NTC/7029, NTC/7039 and NTC/7139) and moving towards Newtec state of the art technology features. A new logical JSON-RPC based management interface is introduced, replacing the legacy RMCP protocol. This interface can be accessed through a couple of physical interfaces: serial as used for RMCP or serial and Ethernet as used for JSON-RPC, depending on the interposer board.

The board has been designed for both DVB contribution and distribution. It handles baud rates from 0.05 up to 72 MBaud applicable to all modulation schemes compliant to DVB-S2X (acc. DVB document A83-2, excluding VL-SNR), the EN 302307 DVB-S2, EN 301210 DVB-DSNG and EN 300421 DVB-S Standards and Newtec's S2 Extensions.

Both the high data rate (72 MBaud) and the choice of modulation standards and modulation schemes allow it to work in full compliance with the most recent commercially available IRD's and demodulators.

The user can upgrade different rate capabilities after ordering the corresponding license file.

The integrated DVB modulator provides a comprehensive range of monitoring and control functions. It has a built-in PRBS pattern generator. When used with Newtec demodulators, this feature enables link testing without additional test equipment.

The R1.1 release has a dedicated interposer board for backward compatibility. Its 50-pin connector guarantees backward compatibility with previous generations of boards but excludes the use of the ASI and Ethernet interfaces. The flat cable is attached to the interface board and has a female 50-pin header. The RMCP protocol supports monitoring & control as well as license upgrades. The JSON-RPC protocol is needed for firmware upgrades.

Key Features

- Supports Newtec S2 Extensions and ModCods up to 64APSK and the new DVB-S2X standard
- Baud-Rate range: 0.05 – 72 MBaud
- Frequency ranges: 950-2150 MHz (extended L-band) and 50-90 and 100-180 MHz (IF-band), selectable by a software command – see options list
- Best in class spectral purity
- RF Carrier ID (DVB-CID) – see options list
- Legacy RMCP interface for backward compatibility or JSON-RPC alike management interface
- On-board reference

Applications

- For use in MPEG encoders with integrated modulators
- Up to 72 MBaud data rate transmission for satellite services such as broadcast, distribution or contribution (including Digital Satellite News Gathering) of Digital TV (UHDTV/HDTV/SDTV) signals

SPECIFICATIONS

OM6000
OEM SATELLITE MODULATOR BOARD (R1.1)

Data Summary

TRAFFIC INTERFACES
- 188-byte Transport Streams
  Clock offset < 30 ppm
- Baseband Synchronous Parallel (DVB-SPI) Interface:
  - Signals: IFCLK, IFDATA[7:0], IFCE, IFSYNC
  - Connector: IDC HE-10, 50-pin female (interposer board dependent)
- Interface rate: 50 kbps – 216 Mbps (FEC and interface dependent)
- ASI input (if supported on interposer board)

L-BAND OUTPUT
- Level -35/+5 dBm (+/- 2dB) in 0.1 dB steps
- Frequency 950 - 2150 MHz in steps of 10 Hz
- Connector MCX(F) - 50 Ohm
- Return loss > 15 dB
- Stability +/-0.2 dB/10°C
- 1-dB compression point @ output: >+20 dBm
- Switchable 10 MHz reference output: +3 dBm (+/- 3dB) mute <-100 dBm
- Spurious performance: Signal related: better than - 70 dBc/4kHz over -35/ +5 dBm output range and >50 kBaud Non-signal related: < - 80 dBc @ +5 dBm output
- Mute <-100 dBm
- DC switchable up to 600 mA/24 V with 1.5A current limiting Requires DC voltage input on 2-pin input connector

IF OUTPUT
- Level -35/+5 dBm (+/- 2dB) in 0.1 dB steps
- Frequency 50 – 90 and 100 – 180 MHz in steps of 10 Hz
- Connector MCX(F) - 50 Ohm
- Return loss > 16 dB @ 75 Ohm > 20 dB @ 50 Ohm
- Stability +/-0.2 dB/10°C
  1-dB compression point @ output: >+20 dBm
  Spurious performance:
  Signal related: better than - 65 dBc/4kHz @ +5 dBm output level and > 50 kBaud
  Non-signal related: < - 80 dBc @ +5 dBm output
- Mute <-100 dBm

L-BAND MONITORING OUTPUT
- Level - 45 dBm (+/- 5 dB)
- Frequency transmit frequency (L-band output selected) or 1050 MHz (IF output selected)
- Connector MCX (F) - 50 Ohm
- Return loss (50 Ohm) >14 dB

EXTERNAL REFERENCE INPUT
- Level -3 to +7 dBm
- Frequency 1,2, 5 & 10 MHz
- Connector MCX (F) - 50 Ohm

DC VOLTAGE INPUT FOR DC ON L-BAND OUTPUT
- Voltage up to 24 V
- Current up to 600 mA
- Connector 2-pin (MOLEX 43650-201 Micro-Fit)

INTERNAL 10 MHZ REFERENCE (VCTCXO)
- STABILITY :
  ± 1.0ppm at 25°C ± 2°C
  ± 2ppm -30 to 75°C
  ± 1ppm over the first year
  ± 3ppm over ten years

- PHASE NOISE :
  10 Hz < -100 dBc/Hz
  100 Hz < -125 dBc/Hz
  1 kHz < -140 dBc/Hz
  10 kHz < -149 dBc/Hz
  100 kHz < -153 dBc/Hz

PHASE NOISE (L-BAND AND IF OUTPUT)
10 Hz < -70 dBc/Hz
100 Hz < -80 dBc/Hz
1 kHz < -90 dBc/Hz
10 kHz < -95 dBc/Hz
100 kHz < -105 dBc/Hz
1 MHz < -130 dBc/Hz

BAUD RATE (L-BAND AND IF OUTPUT)
- 0.05 – 72 MBaud

DVB-S COMPLIANT (EN 300421)
Outer/Inner FEC: Reed Solomon / Viterbi
MODCODs
QPSK: 1/2, 2/3, 3/4, 5/6, 7/8

DVB-DSNG COMPLIANT (EN 301210)
Outer/Inner FEC: Reed Solomon / Viterbi
MODCODs
8PSK: 2/3, 5/6, 8/9
16QAM: 3/4, 7/8

DVB-S2 COMPLIANT (EN 302307)
Outer/Inner FEC: BCH/ LDPC
MODCODs
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
- Single Transport Stream/data Input interface
- BaseBand Shaping (roll-off 0.2, 0.25, 0.35)

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 COMPLIANT (DVB A83-2)
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

- BaseBand Shaping (roll-off 0.05, 0.10, 0.15)

Not in scope: the VL-SNR Header MODCODs
Also excluded are: Super-frame, Extended PL HEADER for wide-band mode and Channel bonding acc. table 1 of DVB Document A83-2

CLEAN CHANNEL TECHNOLOGY
- Roll-off factors: 5%, 10%, 15%, 20%, 25%, 35% for all modulations

INPUT VOLTAGE REQUIREMENTS
- 5 V/1.5 A and 12 V/0.6 A
- Power dissipation : <15 W

MECHANICAL
- Single PCB, 170x89 mm including interface board with cable

INTERPOSER BOARD
- R1.1 release: the interposer board has a 50-pin connector which is used for the power supply, the data as well as the serial interfaces. No ASI nor Ethernet interface

TEMPERATURE
- Operational: 0°C to 60°C @ airflow 1.5 m/s (17CFM)
- Storage: -40°C to +70°C

MONITORING AND CONTROL INTERFACES
- Serial: Async serial TTL link, even parity, 1 start bit, 1 stop bit, Baudrate 115.2 kBaud, RMCP v2 protocol / JSON-RPC protocol
- Ethernet (if available on the interposer board) for JSON/RPC protocol

CONTROL
- Physical layer pilot insertion
- FEC frame type (normal or short)
- Physical layer scrambler signature
- Test generator
- Interface bitrate and symbol rate
- Modulation standard
- FEC rate and modulation
- Spectrum inversion
- Output frequency and level
- Transmit ON/OFF

MONITORING
- Occupied bandwidth
- Output level
- Clock offset
- Transmit status
- Device temperature

ALARM
A full set of alarm monitoring, among others:
- General device
- PLL lock
- Input signal
- Synthesizer
- Etc.

Versions and Options

Newtec OM6000 OEM Satellite Modulator Board		Ordering n°
Configuration Options Category		**OM6000**
		Select 1 option
Operating Software	OEM6000 Software R1.1*	MS-11
		Select 1 option
Hardware	OEM6000 Hardware R1	HW-10
		Select 1 option
Video Package	Video TS	VP-01
		Select 1 option
Modulator Output Interface	L-band with switchable 10MHz output*	OU-00
	IF (50-180 MHz)*	OU-01
	IF+ L-band with switchable 10 MHz out*	OU-02
		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/S2X/Ext Q/8PSK*	SC-10
	DVB-S/S2/S2X/Ext Q/8PSK 16QAM 16APSK*	SC-11
	DVB-S/S2/S2X/Ext Q/8PSK 16QAM 16/32APSK*	SC-12
	DVB-S/S2/S2X/Ext Q/8PSK 16QAM 16/32/256APSK*	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 36MBaud*	SR-36
	Modulation Symbol Rate 54 MBaud*	SR-54
	Modulation Symbol Rate 72 MBaud*	SR-72
Additional Options Category		
		Max. 1 option per category
DVB Carrier Identifier	DVB RF carrier identifier*	ID-01
		Max. 1 option per category
Modulation Maximum Symbol Rates	Clean Channel Technology 5 MBaud*	CC-05
	Clean Channel Technology 15 MBaud*	CC-15
	Clean Channel Technology 36 MBaud*	CC-36
	Clean Channel Technology 54 MBaud*	CC-54
	Clean Channel Technology 72 MBaud*	CC-72

(*) Selectable via license key

Newtec

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