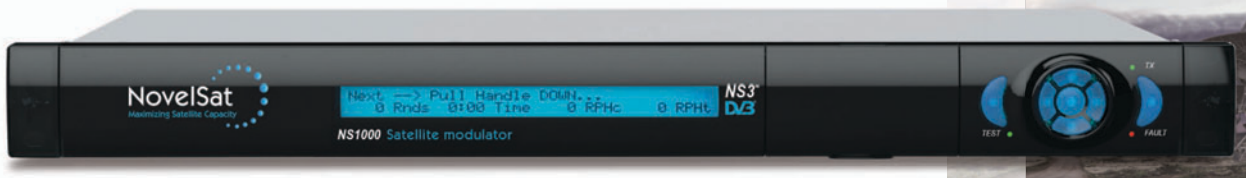
NovelSat

Maximizing Satellite Capacity

NS1000 Modulator

A New Standard for Broadcast Satellites.

NovelSat's innovative NS1000 is a state-of-the-art modulator designed for high demand satellite transmission. NS1000 is the only system in the market that has NS3™ enhancement, delivering significantly higher spectral efficiency compared to DVB-S2.



The NS3™ system has several marked advantages that set it apart from the competition:

- **Lower Satellite Bandwidth:** Savings of 20% to 78% satellite bandwidth (over available DVB-S2 equipment in the market)
- **Higher Data Rate:** Increases transmitted data rate by over 100% (over available DVB-S2 equipment in the market)
- **Smaller Dish:** Reduction of dish size. Achieves the same data rate using a smaller dish

The NS1000 supports high data rates of up to 365Mbps using 70Msps, which enables transmission of one carrier over a 72MHz transponder.

The NS1000 dual-channel option enables any two inputs to be combined simultaneously over one carrier, each with a different modulation scheme using Variable Coding Modulation (VCM), one for each channel. This enables transmission quality that is dependent upon the interface content and the different receivers' locations.

Dual-channel operation also enables the combination of Ethernet streaming and the ASI interface, easing migration to IP streaming while controlling the QoS of each stream.

NS3™ achieves a remarkable data rate improvement of over 36% compared to DVB-S2, when working at high SNR links.

RELATED PRODUCTS	ADDITIONAL INFORMATION
NovelSat's Demodulator NS2000	Web: www.novelsat.com Email: sales@novelsat.com

Key Features:

- Compatible with the innovative NS3™ protocol
- DVB-S, DSNG, DVB-S2 (EN300-421, EN301-210, EN302-307) compliant
- Data rates of up to 365Mbps
- Powerful pre-distortion algorithm for saturated channels
- Dual-channel mode
- L-Band output mode 950MHz-1750MHz (optional extended L-Band 950MHz-2150MHz)
- IF output mode 50MHz-180MHz (either L-Band or IF)
- Monitor output port
- 10MHz reference (In/Out)
- Dual ASI input interface
- Dual Ethernet 1Gb input interface
- ACM support

NovelSat: 25 Tanglewood Rd. Newton, MA 02459

NS1000 Modulator – SPECIFICATIONS

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Output Interfaces

L-Band Output

Connector	SMA (F) 50 ohm
Frequency range	950-1750MHz (optional up to 2150MHz) in 1Hz steps
Power level	-30/0 dBm in 0.1dB steps
Power accuracy/ temp. stability	±0.5dB/±0.5dB
Return loss	>12 dB
Spurious	-55dBc in band and out of band at max. power
Phase noise	@100Hz -70dBc, @1KHz -80dBc, @10KHz -85dBc, @100KHz -95dBc, @1MHz -100dBc

IF-Band Output

Connector	BNC (F) 75 Ohm
Frequency range	70MHz±20MHz, 140MHz±40MHz in 1Hz steps
Power level	-30/0 dBm in 0.1dB steps
Power accuracy/ temp. stability	±0.5dB/±0.5dB
Return loss	>12 dB
Spurious	-55dBc in band and out of band at max. power

Monitoring Output

Connector	SMA (F) 50 Ohm
Frequency	Identical to L-Band/IF-Band output frequencies
Power level	-40 dBm
Return loss	> 7dB

10MHz Reference Clock I/O (Optional)

Connector	BNC (F) 50 Ohm
Ref. input power level	-3dBm up to +7dBm
Ref. output power level	+7dBm Typical
Waveform	Sine wave

Baseband

DVB-S/DSNG

Inner code	BCH
QPSK	1/2, 2/3, 3/4, 5/6, 7/8
8PSK	2/3, 5/6, 8/9
16QAM	3/4, 7/8
Outer Code	Reed Solomon (203, 188, T=8)
Interleaving	(I=12)
Scrambling	
Frame length	204, 188

DVB-S2

Inner code	BCH
Outer code	LDPC
Code rates and modulation:	
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
Frame length	64800, 16200
Baseband ROF	SRRC 20%, 25%, 35%

NS3™

Inner code	BCH
Outer code	LDPC
Modulations	QPSK, 8PSK, 16APSK, 32APSK, 64APSK
Frame length	64800, 16200
Baseband ROF	"SRRC like" 5%, 10%, 15%, 20%, 25%, 35%

Input Interfaces

ASI Input

2 ASI interfaces that can function in parallel	
Connector	BNC female with 75 Ohm coax
Return loss (22-270 MHz)	18-20 dB
Sensitivity	230 mVpp
Max. input	950 mVpp

ASI Output (Loopback)

Loopback on each ASI input	
Connector	BNC female with 75 Ohm coax
Power level	800 mVpp ±10%

10 MHz Clock

Stability	±1.5 ppm over 0degC to 50degC
Aging	±1.0 ppm/year

10 MHz Clock – High Stability (Optional)

Stability	±10 ppb over 0degC to 70degC
Aging	<± 0.5 ppb/day, <± 75 ppb/year

Additional Information

Monitor and Control Interfaces

SW interfaces	Command line interface Web based graphic user interface SNMP V3 Front panel
Serial RS232/RS485 interface	Female 9-Pin D-Sub connector
Ethernet 10/100	BaseT interface to monitor and control the modulator
Alarm interface	Female 9-Pin D-Sub connector

Optional Interfaces

Dual Ethernet 10/100/1G

Physical

Weight	3.5 Kg (7.7 pounds)
Size	19"W x 18"D x 1.75" 48.3 x 45.7 x 4.45 cm

Environmental

Prime power	100-240 VAC, 50-60Hz, 30 Watts Max.
Operating temp.	0 to 50°C
Operating humidity	Up to 85% Non-Condensing
Storage temp.	-40°C to 70°C
Storage humidity	Up to 95% Non-Condensing

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