



## NovelSat **NS1000** Satellite Modulator

### A New Standard for Satellite Broadcast

The innovative NovelSat NS1000 is a state-of-the-art modulator designed for high demand satellite transmission. The NS1000 is the only system with NovelSat NS4™ satellite transmission technology, delivering more than 40% higher spectral efficiency compared with DVB-S2.

The NovelSat NS4 system has several marked advantages that set it apart from the field:

**Lower Satellite Bandwidth:** Satellite bandwidth savings of up to 45% (over available DVB-S2 equipment in the market)

**Higher Data Rate:** Increases transmitted data rate by over 100% (compared with DVB-S2 equipment)

**Smaller Dish:** Achieves the same data rate using a smaller dish.

The NS1000 supports high data rates of up to 425Mbps using 80Msps, which enables transmission of one carrier over an entire 84MHz 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.



#### Key Features:

- NovelSat NS4 technology - More than 40% efficiency gain over DVB-S2
- DVB-S, DSNG, DVB-S2 and DVB-S2X standard compliant
- Data rates of up to 425Mbps
- TSolP support
- Dual-channel mode
- L-Band output mode 950MHz-2150MHz (Extended L-Band)
- 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
- CCM, VCM & ACM support
- CID (Carrier ID) compatible
- Non-Linear pre-distortion Technology (NLPD)

# NovelSat NS1000 Satellite Modulator – Specifications

## Output Interfaces

L-Band Output		IF-Band Output	
<b>Connector</b>	SMA (F) 50 ohm	<b>Connector</b>	BNC (F) 75 Ohm
<b>Frequency range</b>	950-2150MHz in 1Hz steps	<b>Frequency range</b>	70MHz±20MHz, 140MHz±40MHz in 1Hz steps
<b>Power level</b>	-30/0 dBm in 0.1dB steps	<b>Power level</b>	-30/0 dBm in 0.1dB steps
<b>Power accuracy/ temp. stability</b>	±0.5dB/±0.5dB	<b>Power accuracy/ temp. stability</b>	±0.5dB/±0.5dB
<b>Return loss</b>	>12 dB	<b>Return loss</b>	>20dB (50-90MHz)
<b>Spurious</b>	<-55dBc in band and out of band at max. power	<b>Spurious</b>	<-65dBc/4KHz @ -10dBm
<b>Phase noise</b>	@100Hz -70dBc, @1KHz -80dBc, @10KHz -85dBc, @100KHz -95dBc, @1MHz -100dBc	<b>Phase noise</b>	Meets IESS-308
Monitoring Output		10MHz Reference Clock I/O (Optional)	
<b>Connector</b>	SMA (F) 50 Ohm	<b>Connector</b>	BNC (F) 50 Ohm
<b>Frequency</b>	Identical to L-Band/IF-Band frequencies	<b>Ref. input power level</b>	-3dBm up to +7dBm
<b>Power level</b>	-40 dBm	<b>Ref. output power level</b>	+7dBm Typical
<b>Return loss</b>	> 7dB	<b>Waveform</b>	Sine wave

## Baseband

DVB-S/DSNG		DVB-S2/S2X		NovelSat NS3/NS4	
<b>Inner code</b>	Convolution	<b>Outer code</b>	BCH	<b>Outer code</b>	BCH
<b>QPSK</b>	1/2, 2/3, 3/4, 5/6, 7/8	<b>Inner code</b>	LDPC	<b>Inner code</b>	LDPC
<b>8PSK</b>	2/3, 5/6, 8/9	<b>Code rates and modulation:</b>		<b>Modulations</b>	QPSK, 8PSK, 16APSK, 32APSK, 64APSK
<b>16QAM</b>	3/4, 7/8	<b>QPSK</b>	1/4, 13/45*, 1/3, 2/5, 9/20*, 1/2, 11/20*, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10	<b>Frame length</b>	64800, 16200
<b>Outer Code</b>	Reed Solomon (204, 188, T=8)	<b>8PSK</b>	5/9(L)*, 26/45(L)*	<b>Baseband ROF</b>	"SRRC like" 2% (NovelSat NS4), 5%, 10%, 15%, 20%, 25%, 35%
<b>Interleaving</b>	(I=12)	<b>16APSK</b>	3/5, 23/36*, 2/3, 25/36*, 13/18*, 3/4, 5/6, 8/9, 9/10		
<b>Frame length</b>	204, 188	<b>32APSK</b>	26/45*, 3/5*, 28/45*, 23/36*, 2/3, 25/36*, 13/18*, 3/4, 7/9*, 4/5, 5/6, 7/9*, 8/9, 9/10, 1/2(L)*, 8/15(L)*, 5/9(L)*, 3/5(L)*, 2/3(L)*		
<b>Baseband ROF</b>	SRRC 25%, 35%	<b>64APSK</b>	32/45*, 11/15*, 3/4, 7/9*, 4/5, 5/6, 8/9, 9/10, 2/3(L)*		
		<b>Frame length</b>	64800, 16200		
		<b>Baseband ROF</b>	SRRC 20%, 25%, 35% (optional 5%, 10%, 15%)		

\*DVB-S2X only

## Input Interfaces

ASI Input		ASI Output (Loopback)	
<b>2 ASI interfaces that can function in parallel</b>		<b>Loopback on each ASI input</b>	
<b>Connector</b>	BNC female with 75 Ohm coax	<b>Connector</b>	BNC female with 75 Ohm coax
<b>Return loss (22-270 MHz)</b>	18-20 dB	<b>Power level</b>	800 mVpp ±10%
<b>Sensitivity</b>	230 mVpp		
<b>Max. input</b>	950 mVpp		
10 MHz Clock		10 MHz Clock – High Stability (Optional)	
<b>Stability</b>	±1.5 ppm over 0degC to 50degC	<b>Stability</b>	±10 ppb over 0degC to 70degC
<b>Aging</b>	±1.0 ppm/year	<b>Aging</b>	<± 0.5 ppb/day, <± 75 ppb/year

## Additional Information

Monitor and Control Interfaces		Optional Interfaces	Physical	Environmental	
<b>SW interfaces</b>	Command line interface Web based graphic user interface SNMP V3 Front panel	Dual Ethernet 10/100/1G	<b>Weight</b>	<b>Prime power</b>	100-240 VAC, 50-60Hz, 30 Watts Max.
<b>Serial RS232 interface</b>	Female 9-Pin D-Sub connector		<b>Size</b>	<b>Operating temp.</b>	0 to 50°C
<b>Ethernet 10/100</b>	BaseT interface to monitor and control the modulator			<b>Operating humidity</b>	Up to 85% Non-Condensing
<b>Alarm interface</b>	Female 9-Pin D-Sub connector			<b>Storage temp.</b>	-40°C to 70°C
				<b>Storage humidity</b>	Up to 95% Non-Condensing

\*Specifications are subject to change without prior notice.

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