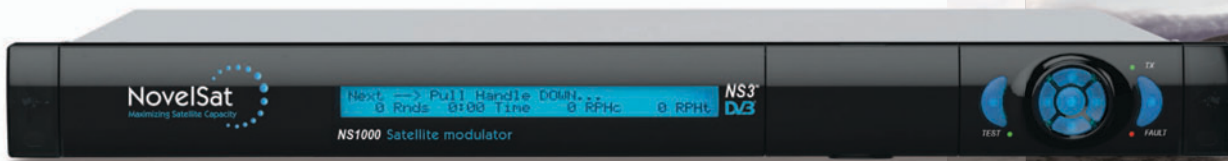## NS1000 Modulator

### 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.

## 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

| RELATED PRODUCTS | ADDITIONAL INFORMATION |
|---|---|
| NovelSat's Demodulator NS2000 | Web: www.novelsat.com <br> Email: sales@novelsat.com |

**NovelSat**
Maximizing Satellite Capacity

## ● 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<br>Web based graphic user interface<br>SNMP V3<br>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"<br>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 |