

# NovelSat

## NS3000 Professional High-Data Rate Satellite Modem



## Widest Support for Customer Needs

The NS3000 is a member of the NovelSat Professional Satellite Modem series along with the NS300X Professional Satellite Modem (up to 60Mbps). The NovelSat NS3000 satellite modem offers several hardware and software options to accommodate a wide range of customer needs. It supports point-to-point as well as point-to-multipoint links and incorporates the NovelSat high-efficiency NSPE™ encapsulation scheme.

### Best Performance

The NS3000 can dramatically improve performance by more than 40% over basic DVB-S2 mode using NovelSat NS4™ satellite transmission technology coupled with the capacity to transmit using a single carrier over a 84MHz channel. In addition, the NS3000 supports optional NovelSat DUET CeC (carrier-echo-cancellation) technology and a built-in receiver equalizer that further improves performance over saturated channels.

### Superior Scalability, Economics and Security

The NS3000 delivers 100Kbps to world record 850Mbps on a single modem while reducing dish and HPA sizes or required satellite bandwidth. The NS3000 offers a fully integrated IP solution incorporating routing capabilities, bandwidth management and an advanced QoS mechanism. Further utilization of allocated bandwidth can be accommodated using NovelSat optimized ACM mode. The NS3000 also offers powerful options including embedded TCP acceleration, compression and optimization, plus a Radio Frequency Interference (RFI) Mitigation software package.

The NS3000 comes with IF/extended L-Band input/output interfaces and can support BUC feeders and LNB, offering a compact and cost effective solution in a space-saving 1U

package. The NS3000 is also CID compatible.

NovelSat DUET CeC transmits the uplink and downlink carriers on the same frequency by canceling the transmitter signal echo to enable the remote transmission to be received. This also enhances transmission security by making any other modem perceive the mixed signal as noise.

### Key Features:

- NovelSat NS4 technology – up to 40% efficiency gain over DVB-S2
- Scalable from 100Kbps to 850Mbps (bidirectional 425Mbps) with built-in NovelSat DUET™ CeC™ (carrier-echo-cancellation)
- DVB-DSNG, DVB-S, DVB-S2 & DVB-S2X standard compliant
- Embedded TCP acceleration, compression & optimization
- Radio Frequency Interference (RFI) Mitigation software package
- 10-15dB stronger jamming immunity
- Up to 80Msymbols/sec
- Optimized ACM mode
- NovelSat DDC™ - Dynamic Distortion Compensator (non-linear processing mode for saturated signals)
- IP routing/switching/bridging capabilities
- Advanced QoS
- NSPE IP Encapsulation
- QPSK, 8PSK, 16APSK, 32APSK, 64APSK
- Extended L-Band 950MHz-2150MHz
- L-Band monitoring output
- Gigabit Ethernet, E1/T1, ASI interfaces
- OC-3/STM-1, OC-3 interface
- 24V/48V integrated BUC feeder
- Supports N+1 redundancy
- Carrier ID (CID) compatible
- TSolP Support



The NS3000 is the world's most scalable satellite modem, with bi-directional data rates from 100Kbps to 850Mbps. It also offers the most compelling ROI in the industry. The NS3000 incorporates state-of-the-

art NovelSat NS4 satellite transmission technology and interfaces directly with IP infrastructure via a Gigabit Ethernet and E1/T1-G.703 interfaces for cellular backhaul applications.

## NovelSat NS3000 Professional High-Data Rate Satellite Modem - Specifications

### Specifications

Parameter	DVB-S2/2X	NovelSat NS3/NS4	Features
QPSK	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	1/4, 1/3, 2/5, 13/30, 7/15, 1/2, 8/15, 17/30, 3/5, 19/30, 2/3, 32/45, 3/4, 4/5, 5/6, 8/9, 9/10	Maximum rate: bidirectional 850Mbps (2x425Mbps) Symbol rate: 0.1-80Mpsps DVB-S, DVB-S2, DVB-S/S2 with 5% ROF, DVB-S2X, DVB-DSNG & NovelSat NS3 compliant FEC: DVB-S: CC/RS, DVB-S2/NS3: LDPC/BCH NovelSat DUET™ CeC™ (Carrier-echo-Cancellation) technology / PtP & PtMP IP Enhancements: - Bridge mode (Layer 2)/ VLAN switching (Layer 2)/ Router mode (Layer 3) - IP Encapsulation (NSPE) - QoS (Quality of Service) - Embedded WAN Acceleration (TCP Acceleration, Compression & Optimization) ACM – Adaptive Coding & Modulation, Up to 1dB/Sec / PtMP configuration AUPC – Automatic Uplink Power Control DDC – Dynamic Distortion Compensator OTA – Over The Air: M&C, Software Upgrade TS over IP / Support for SMPTE 2022-1/2 standards DVB-Carrier ID (CID) compliant Clock Extension with E1 interface. Configuration Retention - Non-volatile memory; Returns upon power up Layer-2 bridge: Ethernet over satellite (compatible with IPv6/VLAN/MPLS) Layer-3 router function: IPv4 over satellite
8APSK	5/9(L)*, 26/45(L)*		
8PSK	3/5, 23/36*, 2/3, 25/36*, 13/18*, 3/4, 5/6, 8/9, 9/10	2/5, 13/30, 7/15, 1/2, 8/15, 17/30, 3/5, 19/30, 2/3, 32/45, 3/4, 4/5, 5/6, 8/9, 9/10	
16APSK	26/45*, 3/5*, 28/45*, 23/36*, 2/3, 25/36*, 13/18*, 3/4, 7/9*, 4/5, 5/6, 77/90*, 8/9, 9/10, 1/2(L)*, 8/15(L)*, 5/9(L)*, 3/5(L)*, 2/3(L)*	2/5, 13/30, 7/15, 1/2, 8/15, 17/30, 33/5, 19/30, 2/3, 32/45, 3/4, 4/5, 5/6, 8/9, 9/10	
32APSK	32/45*, 11/15*, 3/4, 7/9*, 4/5, 5/6, 8/9, 9/10, 2/3(L)*	2/5, 13/30, 7/15, 1/2, 8/15, 17/30, 3/5, 19/30, 2/3, 32/45, 3/4, 4/5, 5/6, 8/9, 9/10	
64APSK	11/15*, 7/9*, 4/5*, 5/6*, 32/45(L)*	19/30, 2/3, 32/45, 3/4, 4/5, 5/6, 8/9, 9/10	
Frame length	16200, 64800	16200, 64800	
ROF	SRRC 5%, 10%, 15%, 20%, 25%, 35%	SRRC 2% (NS4 only), 5%, 10%, 15%, 20%, 25%, 35%	

\*DVB-S2X only

### Modulator L band / IF band Ports

<b>Connector</b>	L band: SMA (F) 50 Ohm or N-type (F) 50 Ohm, 10MHz ref out, +24/+48V/120W (opt) IF band: BNC (F) 75Ohm
<b>Freq. range / Set resolution</b>	L band: 950-2150MHz / 10Hz step IF band: 50-180MHz / 10Hz step
<b>Power level / Set resolution</b>	-30 to 0dBm / 0.1dB
<b>Power accuracy</b>	±0.5dB @ 25degC
<b>Power stability</b>	±0.5dB @ 25degC for 24 hours ±0.5dB over temperature
<b>Monitor port Power</b>	-40dBm ±5dB
<b>Return loss</b>	>14dB (optional 18dB)
<b>Spurious / TX On/Off</b>	>55dBc/4KHz in band and out of band
<b>Phase noise</b>	@100Hz-70dBc, @1KHz-80dBc, @10KHz-85dBc, @100KHz-95dBc, @1MHz-100dBc, RMS < 0.5deg

### Demodulator RF Ports

<b>Connector</b>	L band: F-Type (F) 75 Ohm IF band: BNC (F) 75 Ohm
<b>Freq. range / Set resolution</b>	L band: 950-2150MHz / 10Hz steps IF band: 50-180MHz / 10Hz step
<b>Signal level</b>	-106+10log(F) (F in Mpsps) Max: -20dBm
<b>Composite power</b>	<-20 dBm
<b>Return loss</b>	L band: >12dB IF band: > 10dB
<b>Max. input level</b>	0dBm
<b>LNB control (L band): Voltage</b>	11.5-14V (Vert. Pol.), 16-19V (Horiz. Pol.)
<b>Band select</b>	22KHz ±4KHz, 10MHz refout
<b>Max. current</b>	350mA

### Additional Information

Interfaces	10MHz port	Physical & Environmental
<b>SW interfaces</b>	<b>10MHz Out: Stability</b> ± 1.0 ppm over 0°C to 50°C (standard) ±0.03ppm over 0°C to 50°C (option)	<b>Prime power</b> 100-240 VAC, 50-60Hz, -48VDC (Option)
<b>M&amp;C Interfaces</b>	<b>Aging</b> ± 1.0 ppm/year (standard) ± 0.075 ppm/year (option)	<b>Weight Size</b> 4Kg (8.8 lbs) 19" W x 18" D x 1.75" H 48.3 x 45.7 x 4.45 cm
<b>Data Interfaces</b>	<b>Power Connector</b> 5dBm ± 2dB BNC (F) 50 Ohm	<b>Operating temp. Storage temp.</b> 0 to 50°C -40°C to 70°C
	<b>10MHz In: Max power Connector</b> < 20dBm BNC (F) 50 Ohm	<b>Operating humidity Storage humidity</b> Up to 85% Non-Condensing Up to 95% Non-Condensing
		<b>Certifications</b> EMC: EN55022, EN55024, EN6100-3-2/3, FCC CFR 47-part 15 Safety: CB, TUV, CE, IEC 60950-1: 2005 (2nd Ed)+ Am 1:2009