

# NovelSat NS300X IP Satellite Modem

NovelSat  
Making Space in Space



## Optimal Low-Data Rate IP Communication

For IP data transmission applications requiring satellite data rates below 30Mbps, the NovelSat NS300X IP Satellite Modem is the optimal solution. Designed for cost-effective low-data rate applications including cellular backhaul, IP trunking and other data services, the NS300X can simultaneously send and receive a total of 60Mbps per modem. Now, even at low data rates, satellite users can benefit from both cost effective prices as well as the high-performance experience of advanced NovelSat technology.

The NS300X is a member of the NovelSat Professional Satellite Modem series along with the NS3000 Professional High-Data Rate Satellite Modem (up to 850Mbps). Like the NS3000, DVB-S2 is the basic satellite transmission standard in the NS300X modem. The NS300X and all NovelSat equipment also support DVB-S, DVB-S2 with 5% Roll-off Factor (ROF), DVB-S2X and NovelSat NS4.

### Cost-Effective for Low Data Rates

The NS300X modem includes built-in IP processing features to make data transmission more efficient and cost-effective. The NovelSat NS300X supports point-to-point and point-to-multipoint links and incorporates the NovelSat advanced high-efficiency NSPE2™ encapsulation scheme. The NS300X integrated IP processing unit supports a wide range of features such as advanced QoS, transparent bridging (Layer 2), VLAN switching (Layer 2), routing mode (Layer 3) and TCP header and payload acceleration.

Equipped for data transmission, the NS300X comes with up to 4 E1/T1 interfaces for cellular backhaul and Gigabit 1000Base-T. It also has built-in hardware support for LDPC advanced FEC, NovelSat NS4 waveform and NovelSat DUET CeC (carrier-echo-cancellation).

### Scalable Performance

The NS300X platform offers a wide range of performance boosting options that include DVB-S2 with 5% ROF, NovelSat NS4 waveform and NovelSat DUET CeC (carrier-echo-cancellation). Additional features include ACM/VCM, AUPC (Automatic Uplink Power Control), Carrier ID (CID) compliance and DDC (Dynamic

Distortion Compensation) for mitigating transponder saturation interference.

When you upgrade to NovelSat NS4 transmission technology, the NS300X boosts spectral efficiency by up to 45% compared with DVB-S2 equipment. NovelSat NS4 also adds superior resilience to jamming, adjacent satellite interference, phase noise and weather fluctuations. For additional savings in operational costs, add optional NovelSat DUET CeC to deliver the same traffic using half the bandwidth.

These and other unique technologies give the low-cost, high-performance NovelSat NS300X IP Satellite Modem the highest performance and most compelling ROI for businesses with low-data rate satellite IP transmission needs.

### Key Features:

- Scalable from 100Kbps to 60Mbps (30Mbps x2)
- DVB-DSNG, DVB-S, DVB-S2 & DVB-S2X standard compliant
- Symbol rate 0.1-36Msp/s
- NovelSat NS4™ technology
- Modulation: BPSK, QPSK, 8APSK, 16APSK, 32APSK, 64APSK
- LDPC (Low Density Power Check)
- Roll-off Filter: 5%, 10%, 15%, 20%, 25%, 35% with DVB-S, DVB-S2 and NovelSat NS4
- NovelSat DUET™ CeC™ (carrier-echo-cancellation) technology – lowest implementation loss in the market
- Dual Band Support (IF-Band 50-180MHz & Extended L-Band 950-2150MHz)
- 10-15dB stronger jamming immunity
- Dynamic Distortion Compensation (DDC)
- Optimized ACM mode
- AUPC (Automatic Uplink Power Control)
- IP Processing Enhancements
  - VLAN switching (Layer 2)/ Router mode (Layer 3)
  - NSPE™ IP Encapsulation
  - Advanced QoS (Quality of Service)



- IP Transparent Bridging
- Jumbo frame support
- Header Compression
- Internal WAN Acceleration (TCP Payload Acceleration)
- Gigabit Ethernet (GbE), Up to 4 E1/T1 Interfaces,
- SFP-(Additional GbE/Optical Interface)
- Dual Channel Mode (2 IP channels in a single carrier)
- 24V/48V integrated BUC feeder
- Supports N+1 redundancy
- Secured transmission
- Technology Agnostic Network Management System
- Over-the-Air (OTA): Management & Control and Software upgrades
- Compatible with all NovelSat satellite equipment (Modulators, demodulators, modems)

## NovelSat NS300X IP 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 60Mbps (2x30 Mbps) Symbol rate: 0.1-36Mpsps DVB-S, DVB-S2, DVB-S2 with 5% ROF, DVB-S2X, DVB-DSNG & NovelSat NS4 compliant 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, Payload Acceleration) ACM – Adaptive Coding & Modulation, Up to 1dB/Sec / PtMP configuration AUPC – Automatic Uplink Power Control OTA – Over The Air: M&C, Software Upgrade Data interfaces: GbE (1000Base-T), 4 E1/T1, SFP Carrier ID (CID) compliant
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 Like" 5%, 10%, 15%, 20%, 25%, 35%	

\*DVB-S2X only

### Modulator RF Ports

L-Band	
<b>Connector</b>	SMA (F) 50 Ohm or N-type (F) 50 Ohm +24/+48V/120W (opt)
<b>Freq. range</b>	950-2150MHz in 10Hz steps
<b>Power level</b>	-30 to 0dBm
<b>Power setting resolution</b>	0.1dB
<b>Power accuracy / temp. stability</b>	±0.5dB/±0.5dB
<b>Return loss</b>	>12dB
<b>Spurious</b>	-55dBc in band and out of band at max power
<b>Phase noise</b>	@100kHz-70dBc, @1kHz-80dBc, @10kHz-85dBc @100kHz-95dBc, @1MHz-100dBc

### Demodulator RF Ports

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

IF-Band	
<b>Connector</b>	BNC (F) 75 Ohm
<b>Freq. range</b>	50MHz – 180MHz in 10Hz steps
<b>Power level</b>	-30 to 0dBm
<b>Power setting resolution</b>	0.1dB
<b>Power accuracy / temp. stability</b>	±0.5dB/±0.5dB
<b>Return loss</b>	>12dB
<b>Spurious</b>	-55dBc in band and out of band at max power

IF-Band	
<b>Connector</b>	BNC (F) 75 Ohm
<b>Frequency range</b>	50MHz – 180MHz in 10Hz steps
<b>Signal level</b>	-106+10log(F) (F in MSPS) Max: -20dBm
<b>Composite power</b>	<-20 dBm
<b>Return loss</b>	>10dB
<b>Max. input level</b>	0dBm
<b>LNB power control:</b>	
<b>Voltage</b>	11.5-14V (Vert. Pol.), 16-19V (Horiz. Pol.)
<b>Band select</b>	22KHz ±4KHz
<b>Max. current</b>	350mA

### Additional Information

Monitor and Control Interfaces		Physical	Environmental
<b>SW interfaces</b>	Command line interface Web based graphic user interface SNMP V3	<b>Weight</b> 4Kg (8.8 lbs) <b>Size</b> 19" W x 18" D x 1.75" H 48.3 x 45.7 x 4.45 cm	<b>Prime power</b> 100-240 VAC, 50-60Hz, -48VDC (Option)
<b>M&amp;C Interfaces</b>	Front panel Serial RS232 GbE 10/100	<b>10MHz Clock Stability</b> ± 1.0 ppm over 0°C to 50°C (standard) ±0.03ppm over 0°C to 50°C (option)	<b>Operating temp.</b> 0 to 50°C <b>Storage temp.</b> -40°C to 70°C
<b>Data Interfaces</b>	GigaBit 10/100/1000Base-T Up to 4 x E1/T1 Interfaces SFP-(additional GbE/Optical Interface)	<b>Aging</b> ± 1.0 ppm/year (standard) ± 0.075 ppm/year (option)	<b>Operating humidity</b> Up to 85% Non-Condensing <b>Storage humidity</b> Up to 95% Non-Condensing