

# NovelSat Satellite Data Networks

## Scalable Remote Data Links Solutions



# Cost-effective Data Satellite Solutions for Data Communications

Satellite service providers, teleports and satellite operators enable Internet, cellular and data network connectivity for remote locations. Their constant challenge is to keep pace with the explosive demand for data while controlling operational expenses. The key is to implement a scalable and efficient satellite transmission solution that can easily adapt to the growing demand for data/users while limiting resources, equipment and operating expenses.

NovelSat Remote Data Links solutions for Point-to-Point and Point-to-Multipoint satellite networks deliver the most efficient, flexible and cost saving operation. These solutions are the perfect match for the specific challenges of data transmission in IP Trunking, Cellular Backhaul, Oil & Gas, Military, Maritime, Homeland Security, Disaster Recovery and more.

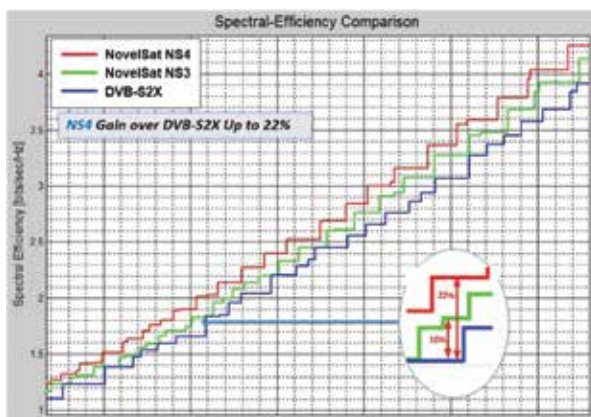
## NovelSat Data Connectivity and the Cellular Backhaul Value Proposition

In order to meet these unique demands, NovelSat offers both a rich set of software features and hardware components suited for any satellite data connectivity application.

### Enhanced Software-based Feature Set

- **NovelSat NS4™ Satellite Waveform**

The latest, most advanced satellite waveform from NovelSat enables up to 45% higher spectral efficiency compared with DVB-S2.



- **Wireless Link optimization package**

- TCP acceleration solution
- IP header and payload compression
- Byte caching for dramatic data reduction on multi-pass traffic
- Web object caching to improve Web surfing performance
- Advanced cellular compression (ACC)

- **IP Processing Enhancements**

- VLAN switching (L2)/ Router mode (L3)
- IP Transparent Bridging

- **NSPE™ IP Encapsulation**

Unsurpassed encapsulation scheme compared with any other market standard: provides negative overhead (up to 25% compression ratio)

- **Advanced QoS (Quality of Service)**

Architecture based on two-level hierarchical queues, bandwidth allocation for each remote and 8 priority queues per remote.

- **NovelSat DUET™ CeC™ (Carrier Echo Cancellation)**

Transmitting both forward and return signals over the same frequency results in up to 50% in bandwidth saving.

- **Advanced ACM, AUPC**

An optimal selection of MODCODs per remote. For links with fast fading changes, such as Ka band, NovelSat Fast ACM reacts to 1dB/sec changes in link conditions.

- **NovelSat NovelNet NMS (Network Management System)**

A scalable platform that can be used to dynamically provision, manage and maintain services in satellite and mixed satellite-terrestrial communication networks.

- Management & Control
- Dynamic Bandwidth Allocation



## Enhanced Hardware Components

- NovelSat Satellite Modem Series (NS3000, NS300X)



- Embedded TCP acceleration and optimization
  - Fills link capacity and compensates for satellite delay
  - Enables modem traffic to exceed link capacity
  - Header and payload compression, byte caching, Web object caching
  - Advanced Cellular Compression (ACC) for 2.5G, 3G and 4G backhaul

- Redundancy Switch Series (1+1, N+1)  
The NovelSat NSR9100 and NSR9800 provide hot standby for modulators, demodulators and modems while protecting up to 8 units.



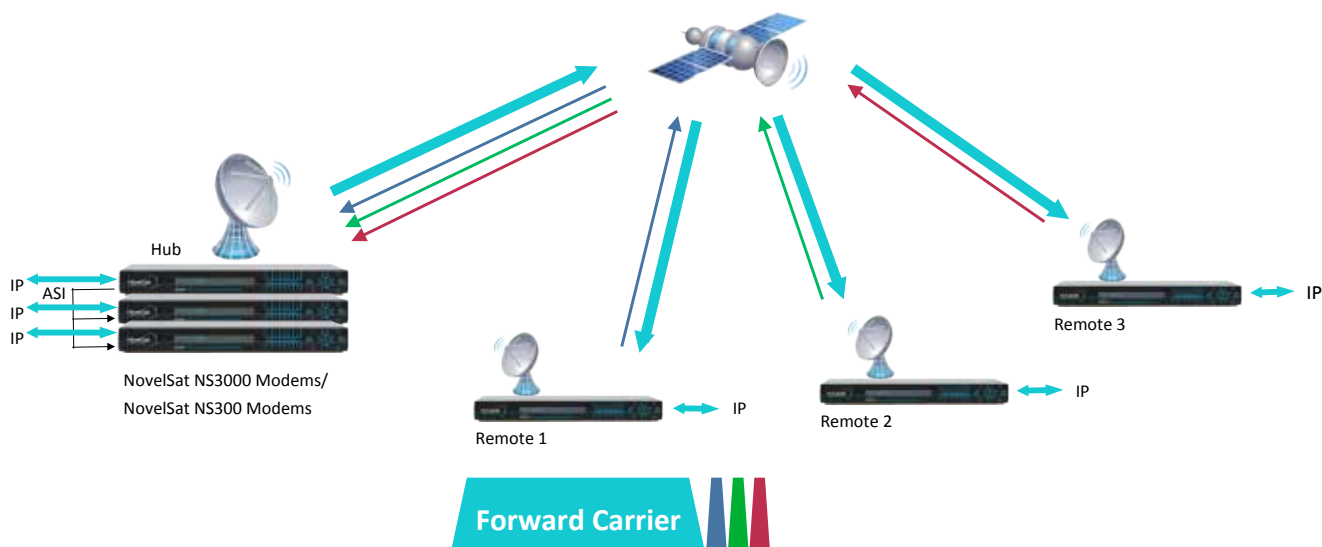
## Point-To-Multipoint Network Structure Value Proposition

NovelSat point-to-multipoint architecture can support up to 128 remotes. Each P2MP architecture configuration offers a unique set of advantages for different cases.

### Case A: SCPC P2MP Architecture – Spectral Efficiency

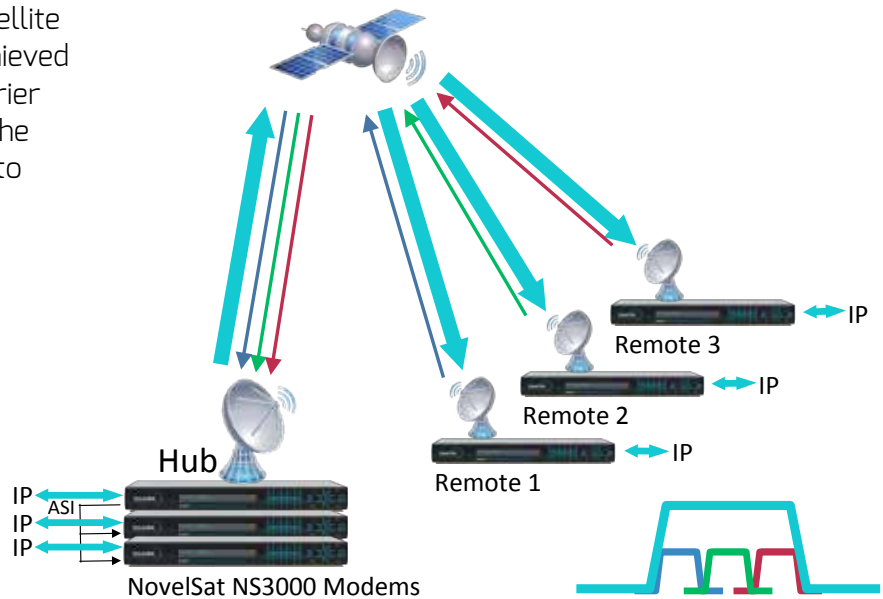
In a typical P2MP architecture, the NovelSat NS4 waveform provides the world's most spectrum-efficient satellite transmission. In such a case, the Forward carrier is in NovelSat NS4 mode, delivering up to 45% more capacity compared with DVB-S2.

In this configuration, each of the return channels can transmit back to the Hub in NovelSat NS4 mode, requiring the same number of modems as in the remote sites.



## Case B: NovelSat DUET CeC in P2MP Architecture - Satellite Bandwidth Savings

In some cases, significant satellite bandwidth savings can be achieved with NovelSat DUET CeC (Carrier Echo Cancellation), enabling the Forward and Return carriers to share the same bandwidth.

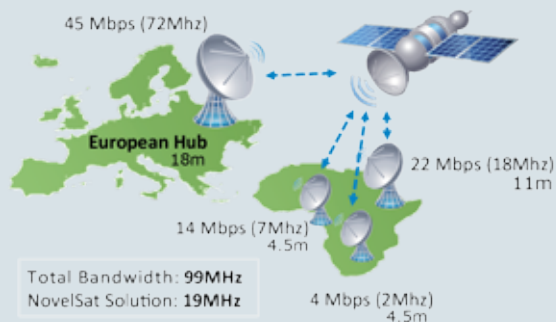


## Reference Cases

### Success Story: Satellite IP Trunking

A point-to-multipoint IP trunking network between a European hub and several terminals in Africa.

Bandwidth usage reduced from **97MHz** to **19MHz**.



### Success Story: Cellular Backhaul

With NovelSat NS3 and NovelSat DUET CeC technologies, NovelSat **tripled** bandwidth efficiency.

The number of transponders was **reduced from 10 to 4**.



### Related products:

NS3000 Professional High-Data Rate Satellite Modem (up to 850Mbps)  
NS300X IP Satellite Modem (up to 30Mbps)  
NSR9100/NSR9800 N+1 Redundancy Switches.

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