NovelSat
Making Space in Space

PCIe Cards
for OEM Broadcast Applications

NovelSat NS20C Satellite Demodulator Card

NovelSat NS10C Satellite Modulator Card

The NS10C/NS20C are versatile PCie OEM broadcast modulator and demodulator cards that support all satellite transmission standards, including DVB-S/S2/S2X and NovelSat NS4, as well as the NovelSat DRM (Digital Rights Management) license. This makes them capable of meeting the demands of any broadcast application.

The NS10C and NS20C PCIe OEM cards are designed for easy integration into any PC-based satellite broadcast platform for Cable, DTH and OTT live delivery of SD, HD and Ultra HD content. They are ideal for both terrestrial and space-side OEM satellite broadcast applications including mobile flyaways, expandable all-in-one transmission ground solutions and even satellite.

Reduce space demands and setup and service time with SNGs and flyaways. Easily build all-in-one distribution solutions by integrating a modulator into an encoder, convert a decoder into an IRD by adding a demodulator, enhance transcoders, multiplexers, statmuxes, packagers and origin servers.

NovelSat NS4 provides marked advantages that set it apart from the field:

Lower Satellite Bandwidth: Satellite bandwidth savings of up to 45% compared with DVB-S2 and 32% vs. DVB-S2X.

Variety of Roll-Off Usage: From 35% down to 2% ROF (offered in NS4 waveform).

Higher Data Rate & Smaller Dish: Same data rate using a smaller dish. The NS10C/NS20C support high data rates of up to 425Mbps using 80Msps, enabling transmission of a single carrier over an entire 84MHz transponder.

The NS20C has groundbreaking signal processing methods such as an adaptive equalizer and error correction techniques that enable the receiver to be more resilient to impairments.

Key Features:

- DVB-S2X, DVB-S/S2, DVB-DSNG, DVB-CID standard compliant
- NovelSat NS3/NS4 waveforms
- Supported Modulations: QPSK, 8PSK, 16APSK, 32APSK, 64APSK, 128APSK & 256APSK
- NovelSat Dynamic Distortion Compensator – Highly effective in non-linear channels
- Support for IF output Mode 50MHz-180MHz
- Support for Extended L-Band 950MHz-2150MHz
- Adaptive Code Modulation (ACM)
- 10Mhz Reference Clock In/Out

Applications:

- DSNG/Flyaways
- Broadcast Contribution
- Broadcast Distribution
- Support for NovelSat DRM (Data Rights Management)

NovelSat PCIe OEM Modulator/Demodulator Cards - Specifications

Baseband

DVB-S/DSNG

Inner code	Convolution
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 (204, 188, T=8)
Interleaving	(I=12)
Frame length	204, 188
Baseband ROF	SRRC 25%, 35%

DVB-S2/S2X

Outer code	BCH
Inner code	LDPC
Code rates and modulation:	
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
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
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)*
32APSK	32/45*, 11/15*, 3/4, 7/9*, 4/5, 5/6, 8/9, 9/10, 25/36(L)* 11/15*, 7/9*, 4/5*, 5/6*, 32/45(L)*
64APSK	3/4*, 7/9*
128APSK**	32/45*, 3/4*, 29/45(L)*, 2/3(L)*, 31/45(L)*, 11/15(L)*
256APSK**	64800, 16200
	SRRC 2%, 5%, 10%, 15%, 20%, 25%, 35%
Frame length	*DVB-S2X only
Baseband ROF	**NS10C only

NovelSat NS3/NS4

Outer code	BCH
Inner code	LDPC
QPSK	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
8PSK	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	2/5, 13/30, 7/15, 8/15, 17/30, 19/30, 2/3, 32/45, 3/4, 4/5, 5/6, 8/9, 9/10
32APSK	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	19/30, 2/3, 32/45, 3/4, 4/5, 5/6, 8/9, 9/10
Frame length	64800, 16200
Baseband ROF	"SRRC like" 2% (NovelSat NS4), 5%, 10%, 15%, 20%, 25%, 35%

NS10C Modulator Interfaces

L-Band Output

Connector	SMA (F) 50 ohm
Frequency range	950-2150MHz in 10Hz steps (on/off 10MHz out combined on port)
Power level	-35 to +5 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	50MHz to 180MHz in 10Hz steps
Power level	-35 to +5 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	Meets IESS-308

Monitoring Output

Connector	SMA (F) 50 Ohm
Frequency	Identical to L-Band/IF-Band frequencies
Power level	-30 dBm to -45 dBm
Return loss	> 7dB

10MHz Reference Clock Output (Optional)

Ref. output power level	+2 to +8 dBm Typical
Waveform	Sine wave
Initial frequency accuracy	+/-1.5ppm
Stability over temp.	+/-1ppm
10 year aging	+/-5ppm

NS20C Demodulator Interfaces (4x L Band -or- 4x IF Band)

L-Band

Connector	F Type (F) 50 Ohm (Optional SMA (F) 50 Ohm
Frequency range	950-2150MHz in 20KHz steps (on/off 10MHz out combined on port)
Input power level	-105/+10Log(F) F in Msps, -20dBm max
Max input composite power	<-20dBm
Max input power (no damage)	0dBm
Return loss	>10 dB

IF-Band

Connector	BNC (F) 75 Ohm
Frequency range	50MHz to 180MHz in 20KHz steps (on/off out combined on port)
Input Power level	-105/+10Log(F) F in Msps, -20dBm max
Max input composite power	<-20dBm
Max input power (no damage)	0dBm
Return loss	>10 dB

DISEqC

Voltage	11.5-14 V (Vert. Pol.), 16-19V (Horiz. Pol.)
Band select	22KHz ±4KHz
Max. current	350mA

10MHz Reference Clock Output (Optional)

Ref. output power level	+2 to +8dBm
Waveform	Sine wave
Initial frequency accuracy	+/-1.5ppm
Stability over temp.	+/-1ppm
10 year aging	+/-5ppm

Additional Information

Monitor and Control Interfaces

SW interfaces	Web based graphic user interface SNMP V3

PC Interface

PCI Express V2.1 x1 lanes

Physical

Size	4.3" x 6.6" 110mm x 167mm

Environmental

Power	25 Watts Max. (excl 16W max for DISEqC)
Operating temp.	0 to 50°C
Storage temp.	-40°C to 70°C
Operating humidity	Up to 85% Non-Condensing
Storage humidity	Up to 95% Non-Condensing

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Related products: NovelSat NS1000 Satellite Modulator, NovelSat NS2000 Satellite Demodulator

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