

EL970

IP Satellite Demodulator Elevation Product Family

ELEVATION

Description

The EL970 is a state-of-the-art satellite demodulator designed for IP applications over satellite in full compliance with the DVB-S and DVB-S2 standards. The EL970 connects directly to terrestrial IP network infrastructures via a dual auto-switching Gigabit Ethernet interface. The receiver demodulates, restores and filters the data received from the satellite at rates of up to 133 Mbit/s.

The EL970 comes with several hardware and software options and can be used in Point-to-Point links as well as in Point-to-Multi Point networks. It is compatible with a wide range of encapsulation protocols: data piping, MPE, ULE, GSE (Generic Stream Encapsulation) and Newtec's XPE (Extended Performance Encapsulation). The EL970 is capable of receiving DVB-S2 Multistream and VCM streams, and is able to demodulate higher modulation schemes such as 16APSK and 32 APSK.

For maximum bandwidth efficiency, the optional FlexACM® client allows the EL970 to provide feedback on the link condition to an FlexACM controller located at the uplink site, so that the modulation parameters can be adapted automatically and dynamically.

The EL970 has a dual L-band input. The active input is selected by the user and can provide DC power and frequency band selection signals compatible with most professional and commercial LNBs. Optionally, one L-band input can be replaced by an IF input.

The integrated Noise & Distortion Estimator tool provides an accurate reading of the satellite link margin even in presence of non-linear distortion and allows the user to find the optimum input back-off setting very easily for 16APSK or 32APSK operation, whether or not non-linear predistortion is applied.

Combining new innovative features and advanced data encapsulations protocols with DVB-S2 technology, the EL970 ensures the highest bandwidth efficiency available on the market.

To protect the satellite transmission, the AES encryption option can be activated. AES allows to scramble the content of DVB-S2 streams with a high security level. The AES technology ensures the continuity of service without transmission outages or data losses when encryption keys are changed.

Clean Channel Technology™ is available on the EL970 IP modulator as an option. Clean Channel Technology™ further improves satellite efficiency by up to 15% compared to the current DVB-S2 standard. Newtec's customers will be able to immediately benefit from Clean Channel Technology, as it is available as a software field upgrade for existing Newtec equipment.

Key features

- DVB-S2 and DVB-DSNG/S compliant
- QPSK, 8PSK, 16APSK and 32APSK
- XPE, GSE, ULE, MPE, data piping encapsulation
- Data rates up to 133 Mbit/s
- Adaptive equaliser
- Multistream and VCM support
- Noise & Distortion Estimator (NoDE) tool
- Optional FlexACM client (FlexACM®)
- Optional 10 MHz reference input/output
- Optional AES decryption

- Optional Clean Channel Technology™ inside
- Optional Intelligence & National Security Filter Features

Main advantages

- Lower operational costs thanks to highest bandwidth efficiency and lowest IP encapsulation overhead
- Integrated hardware and software offering for end-to-end solution
- Easy integration with terrestrial IP networks and routers
- High versatility and flexibility
- Secure and encrypted satellite transmissions
- Fit for operations over Inclined Orbit Satellites

Applications

- Corporate networks
- IP trunking
- IP Backhauling
- Government networks
- Intelligence and National Security

Related products

EL170 IP satellite modulator
EL178 High speed IP satellite modulator
EL470 IP satellite modem
EL478 High speed IP satellite modem
EL940 IP satellite receiver
EL978 High speed IP satellite demodulator

EL8xx Protocol Enhancement Proxy appliances
EL860 Shaper and Bandwidth Manager
EL501 Elevation IP Hub

AZ7x0 Frequency converters
AZ290 1+1 Demodulator Redundancy Switch
AZ2xx Universal Switching System

Related Documents

White paper optimization of satellite capacity
Care Pack Brochure
Reference cases
Application notes



SHAPING THE FUTURE OF SATELLITE COMMUNICATIONS

www.newtec.eu

Rev. 8/03.2012

Specifications – EL970^(R9)



Input interface

Dual L-band input (default)

- Connector 2 x F-type (F), 75 ohms
- Return loss > 7 dB
- Level -65/-25dBm
- Frequency 950 - 2150 MHz
- Adjacent signal < (Co+7) dBm/Hz where Co = signal level density

IF-band input (optional, replaces one L-band input)

- Connector BNC (F) - 75 ohms
- Return loss > 15 dB
- Level -55 to -15 dBm
- Frequency 50 - 180 MHz
- Adjacent signal < (Co+7) dBm/Hz where Co = signal level density

LNB power and control (optional)

- max. current 350 mA (on selected IFL input)
- voltage 11,5 - 14 V (Vertical polarization) 16 - 19 V (Horizontal polarization) & additional 22 kHz +/- 4KHz (band selection according to universal LNB for Astra satellites & DiSEqC command transmission)
- 10 MHz reference

Demodulation

Supported modulation schemes and FEC

- DVB-S/DSNG: Outer/Inner FEC: Reed Solomon /Viterbi MODCODs: QPSK: 1/2, 2/3, 3/4, 5/6, 7/8 8PSK: 2/3, 5/6, 8/9 16QAM: 3/4, 7/8
- DVB-S2: Outer/Inner FEC: BCH/ LDPC MODCODs: 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
- CCM + VCM support
- ACM client (optional)

Baud rate range

- DVB-S2
 - QPSK/8PSK 0,256 – 45 Mbaud
 - 16APSK 0,256 – 33 Mbaud
 - 32APSK 1 - 33 Mbaud
- DVB-S/DSNG
 - QPSK/8PSK/16QAM 1-45 Mbaud

Frame length

- DVB-S/DSNG 188 bytes
- DVB-S2 Short Frames 16 200 bit
- DVB-S2 Normal Frames 64 800 bit

Roll-off factor

- 20% - 25% - 35%

Clean Channel Technology™

- Roll-Off: 5%-10%-15%-20%-25%-35%
- Optimum carrier spacing
- Advanced filter technology

DVB-S2 performances at PER 1E-5

Config	Short Frames		Normal Frames	
	< 15 Mbaud Es/No	< 45 Mbaud Es/No	< 15 Mbaud Es/No	< 45 Mbaud Es/No
QPSK-1/3	-0,6	-0,7	-	-
QPSK-2/5	0,4	0,2	-	-
QPSK-1/2	3,1	1,4	-	-
QPSK-3/5	3,1	2,8	-	-
QPSK-2/3	3,8	3,6	-	-
QPSK-3/4	4,5	4,3	-	-
QPSK-4/5	5,1	5,1	-	-
QPSK-5/6	5,8	5,5	-	-
QPSK-8/9	6,7	6,6	-	-
QPSK-9/10	-	6,7	-	-
8PSK-3/5	6,5	6,3	-	-
8PSK-2/3	7,4	7,1	-	-
8PSK-3/4	8,6	8,4	-	-
8PSK-5/6	10,2	9,7	-	-
8PSK-8/9	11,4	11,1	-	-
8PSK-9/10	-	11,3	-	-
16APSK-2/3	9,9	9,6	-	-
16APSK-3/4	10,9	10,5	-	-
16APSK-4/5	11,6	11,5	-	-
16APSK-5/6	12,4	12,1	-	-
16APSK-8/9	13,6	13,3	-	-
16APSK-9/10	-	13,6	-	-
32APSK-3/4	-	13,6	-	-
32APSK-4/5	-	14,5	-	-
32APSK-5/6	-	14,9	-	-
32APSK-8/9	-	16,1	-	-
32APSK-9/10	-	16,5	-	-

DVB DSNG/S performances at BER 1E-7 after RS

Config	< 20 Mbaud		> 20 Mbaud	
	Eb/No	Eb/No	Eb/No	Eb/No
QPSK-1/2	3,9	3,9	-	-
QPSK-2/3	4,4	4,5	-	-
QPSK-3/4	4,9	5,1	-	-
QPSK-5/6	5,4	5,8	-	-
QPSK-7/8	5,8	6,4	-	-
8PSK-2/3	6,3	6,5	-	-
8PSK-5/6	8,3	8,8	-	-
8PSK-8/9	8,8	9,8	-	-
16QAM-3/4	8,4	8,6	-	-
16QAM-7/8	10,1	11,1	-	-

Output interface

- Auto switching 10/100/1000 Base-T Ethernet interface
- Maximum rate: 133 Mbit/s or 67,000 packets per second
- Layer 2 bridge mode: Ethernet frames over satellite
- Layer 3 bridge or router mode: IP packets over satellite
- Supported encapsulation modes:
 - Data piping:
 - Ultra Lightweight Encapsulation (ULE)
 - Multi Protocol Encapsulation (MPE):
 - Extended Performance Encapsulation (XPE), Newtec's highly efficient encapsulation protocol for the encapsulation of Ethernet/IP frames in DVB-S2 Base-Band frames (optional)
 - Generic Stream Encapsulation (GSE)
- Data filtering:
 - up to 32 streams in DVB-S2 Multi-stream
 - up to 256 configurable PID filters
 - one air MAC address filter per PID or stream
- AES 64 bit decryption

Internal Reference frequency

High Stability (optional)

- Stability $\pm 5 \times 10^{-8}$ over 0°C to 70°C
- Ageing: ± 15 ppb/day ± 300 ppb/year

Very High Stability (optional)

- Stability $\pm 2 \times 10^{-9}$ over 0°C to 65°C
- Ageing: $\pm 0,5$ ppb/day ± 500 ppb/10 year

Generic

10 MHz reference input / output (optional)

- Connector BNC (F) – 50 ohms
- Input level -3dbm up to 7dbm
- Output level +7dbm

LNB reference frequency output (optional, only available with L-band)

- Frequency 10 MHz
- stability +/- 5x10-8 over 0°C to 65°C
- warm up time 5 min (+/-100ppb)
- ageing +/- 15 ppb/day +/- 300 ppb/year

Monitor and control interfaces

- Web based GUI
- Diagnostics report, alarm log
- RMCP over TCP/IP/UDP and RS232/RS485
- SNMP v2c

Alarm interface

- Electrical dual contact closure alarm contacts
- Connector 9-pin sub-D (F)
- Logical interface and general device alarm

Physical

- 1RU, width: 19", depth 51 cm, 6 kg
- Power supply: 90-130 & 180-260 Vac, 105 VA, 47-63 Hz
- Temperature
 - Operational: 0°C to 40°C
 - Storage: -40 to +70°C
- Humidity: 5% to 85% non-condensing
- CE label

Ordering information

EL970 IP SATELLITE DEMODULATOR		Order n°
Default Configuration		
DVB-S/DVB-DSNG-DVB-S2 IP demodulator with GbE interface, data piping, MPE, GSE, XPE and ULE decapsulator, Multistream, VCM, SNMP Input interface: L-band (950 - 2150 MHz) Modulation & Baud rate demodulator: QPSK-8PSK 5Mbaud		EL970
Configuration options		
Category	Max. 1 option per category	
Input Interface	L-band	Default
	L-band + 10MHz	AJ-02
	IF+ L-band	AJ-03
	IF + L-band + 10MHz	AJ-04
Modulation & Baud rate	QPSK-8PSK 5Mbaud	Default
	QPSK-8PSK 33Mbaud	AL-07
	QPSK-8PSK 45Mbaud *	AL-08
	QPSK- 8PSK-16APSK 5Mbaud *	AL-09
	QPSK- 8PSK-16APSK 33Mbaud *	AL-11
	Q/8PSK 16APSK -32APSK 5Mbaud *	AL-13
Q/8PSK 16APSK -32APSK 33Mbaud *	AL-15	
Additional options		
Category	Max. 1 option per category	
10MHz reference In/Out	High Stability : 1ppm	GR-01
	Very High Stability : 0,01 ppm	GR-02
Decryption	AES 64 bit decryption	AA-01
ACM	FlexACM client *	AR-04
Services		
Category		
Assistance	Care Pack Basic	GA-06
	Care Pack Extended	GA-07

(*) upgradeable via license key

Other configurations and options are available on request, such as Base-Band frame output. Contact your sales representative for details (sales@newtec.eu).

Europe

Tel: +32 3 780 65 00
Fax: +32 3 780 65 49

North-America

Tel: +1 203 323-0042
Fax: +1 203 323-8406

South-America

Tel: +55 11 2092 6220
Fax: +55 11 2093 3756

Asia-Pacific

Tel: +65 6777 22 08
Fax: +65 6777 08 87

China

Tel: +86 10-823 18 730
Fax: +86 10-823 18 731

MENA

Tel: +971 4 390 18 78
Fax: +971 4 368 67 68