**EL970**

**IP Satellite Demodulator**

**Elevation Product Family**

**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-D5NG/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

**Main advantages**

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

- 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

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**Newtec**

**ELEVATION**

**SHAPING THE FUTURE OF SATELLITE COMMUNICATIONS**

www.newtec.eu

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Input interface

Dual L-band input (default)
- Connector 2 x F-type (F), 75 ohms
- Return loss > 7 dB
- Level -65 to -25 dBm
- Frequency 950 to 1510 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 to 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 to 14 V (Vertical polarization) 16 to 19 V (Horizontal polarization) & additional 22 kHz +/- 4 kHz (band selection according to universal LNB for Astra satellites & DiSEqC command transmission)

Demodulation

Supported modulation schemes and FEC
- DVB-S/DVB-DSNG
  - Outer/Inner FEC: Reed Solomon / Viterbi MOCODCs:
    - QPSK: 1/2, 2/3, 3/4, 5/6, 7/8
    - 8PSK: 2/3, 3/4, 5/6, 7/8
    - 16QAM: 3/4, 5/6

- DVB-S2:
  - Outer/Inner FEC: BCh / LDPC MOCODCs:
    - QPSK: 1/4, 1/3, 2/3, 1/2, 3/4, 2/5, 3/5, 4/5, 5/6, 6/7, 8/9, 9/10
    - 8PSK: 3/4, 5/6, 7/8, 9/10
    - 16APSK: 3/4, 5/6, 7/8, 9/10

- Baud rate
  - 32APSK:
    - 16APSK:
      - 32APSK:
        - QPSK:
          - 16APSK:
            - 8PSK:
              - 16QAM:

- Frame length
  - DVB-S/DVB-DSNG
    - 188 bytes
  - DVB-S2 Short Frames
    - 16200 bit
  - DVB-S2 Normal Frames
    - 64800 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 performance at PER 1E-5

<table>
<thead>
<tr>
<th>Modulation</th>
<th>Eb/No</th>
<th>L</th>
<th>K</th>
<th>Agram</th>
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<tbody>
<tr>
<td>QPSK-1/2</td>
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<td>7</td>
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<td>QPSK-5/6</td>
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<tr>
<td>QPSK-7/8</td>
<td>24 dB</td>
<td>7</td>
<td>1</td>
<td>0.01</td>
</tr>
<tr>
<td>QPSK-9/10</td>
<td>26 dB</td>
<td>7</td>
<td>1</td>
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<tbody>
<tr>
<td>8PSK-1/2</td>
<td>15 dB</td>
<td>7</td>
<td>1</td>
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<td>0.01</td>
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LNB reference frequency output (optional, only available with L-band)
- Frequency 10 MHz
- Stability +/- 5 x 10^-8 over 0°C to 65°C
- Warm up time 5 min (+/- 100 ppb)
- Ageing +/- 15 ppb/day
- +/- 300 ppb/year

Monitor and control interfaces
- Web based GUI
- Diagnostics report, alarm log
- RMCP over TCP/IP and UDP and RS232/RS485
- SNMP v2

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

Default Configuration
- DVB-S/DVB-DSNG/DVB-S2 IP demodulator with XPE interface, data piping, MPE, GSE, XPE and ULE encapsulation, Multistream, VCM, SNMP
- Input interface: L-band (950 - 2150 MHz)
- Modulation & Baud rate demodulator: QPSK-8PSK 5 Mbaud

Configuration options

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<tr>
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<tbody>
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<td>Input Interface</td>
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<td>L-band</td>
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<tr>
<td>IF + L-band + 10 MHz</td>
<td>A2-03</td>
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<tr>
<td>QPSK-8PSK 5 Mbaud</td>
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<td>QPSK-8PSK 33 Mbaud</td>
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<td>QPSK-8PSK 64QAM</td>
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<tr>
<td>QPSK-8PSK 16APSK 5 Mbaud</td>
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<td>QPSK-8PSK 16APSK 33 Mbaud</td>
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<td>QPSK-8PSK 16APSK 64QAM</td>
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Modulation & Baud rate

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Additional options

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<th>Category</th>
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<tbody>
<tr>
<td>10 MHz reference In/Out</td>
<td>High Stability: 1 ppm</td>
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<td>Very High Stability: 0.1 ppm</td>
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<td>Decryption AES 64 bit encryption</td>
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<tr>
<td>ACM Fx ACM client</td>
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Services

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<tbody>
<tr>
<td>Assistance</td>
<td>Care Pack Basic</td>
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<tr>
<td></td>
<td>Care Pack Extended</td>
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(*) Upgradable 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).