EL978
High Speed IP Satellite Demodulator
Elevation Product Family

ELEVATION

Description

The EL978 is a state-of-the-art satellite demodulator optimized for the reception of high speed IP applications over satellite in full compliance with the DVB-S2 standard. In order to achieve speeds up to 160 Mbit/s, only the fastest and most bandwidth-efficient encapsulation and modulation parameters are supported.

The EL978 can be used in high speed Point-to-Point backbone links or in star IP trunking configurations, in conjunction with the high speed satellite IP modulator EL178 at the uplink side.

The EL978 offers an auto-switching Gigabit Ethernet interface and integrates seamlessly with terrestrial IP networks and equipment. The data received from the satellite must be encapsulated with Newtec's XPE (Extended Performance Encapsulation) protocol, a highly efficient system to transmit IP data in DVB-S2.

For maximum bandwidth efficiency, the optional FlexACM client allows the EL978 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 EL978 supports the DVB-S2 Multistream mode, allowing the IP traffic to be divided in several streams, each stream being transmitted with its own identifier. When the Variable Coding and Modulation (VCM) mode is activated, each stream can be transmitted with its own set of modulation parameters, further optimizing the transmission efficiency when different streams are intended to different types of receiving sites.

The EL978 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.

Key features

- DVB-S2 compliant
- QPSK, 8PSK, 16APSK and 32APSK
- Data rates up to 160 Mbit/s
- XPE encapsulation
- Multistream and VCM support
- Adaptive equaliser
- Optional ACM client (FlexACM)
- Noise & Distortion Estimator (NoDE) tool
- Optional 10 MHz reference input/output

Main advantages

- Enables high speed IP links over satellite
- Lower operational costs thanks to highest bandwidth efficiency
- Easy integration with terrestrial IP networks and routers
- High versatility and flexibility

Applications

- Backbone / Leased line in the sky
- IP trunking for ISP's
- Backhauling for WiMax

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
EL970 IP satellite demodulator

EL8xx Protocol Enhancement Proxy appliances
EL860 ACM Controller, Shaper and Encapsulator (CSE)

AZ7x0 Frequency converters
AZ290 1+1 Demodulator Redundancy Switch
AZ200 Universal Switching System

Related Documents

White paper optimization of satellite capacity
Care Pack Brochure
Reference cases

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Specifications – EL978(R7)

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

- 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-S2:
  Outer/Inner FEC: BCH/ LDPC
  MODCODS:
  QPSK: 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 and Multistream support
- FlexACM client (optional)

Baud rate range

- QPSK/8PSK/16APSK: 0,256 – 45 Mbaud
- 32 APSK: 1 - 33 Mbaud

Frame length

- DVB-S2 Normal Frames: 64 800 bit

Roll-off factor

- 20 % - 25 % - 35 %

DVB-S2 Performances at PER 1E-5

	Normal Frames
	< 45 Mbaud
Config	Es/No
QPSK- 1/2	1.4
QPSK- 3/5	2.8
QPSK- 2/3	3.6
QPSK- 3/4	4.3
QPSK- 4/5	5.1
QPSK- 5/6	5.5
QPSK- 8/9	6.6
QPSK- 9/10	6.7
8PSK- 3/5	6.3
8PSK- 2/3	7.1
8PSK- 3/4	8.4
8PSK- 5/6	9.7
8PSK- 8/9	11.1
8PSK- 9/10	11.3

	Normal Frames
	< 45 Mbaud
Config	Es/No
16APSK- 2/3	9.6
16APSK- 3/4	10.5
16APSK- 4/5	11.5
16APSK- 5/6	12.1
16APSK- 8/9	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

Output interface

- Auto switching 10/100/1000 Base-T Ethernet interface
- Maximum rate: 160 Mbit/s or 78,000 packets per second
- Layer 2 bridge mode: Ethernet frames over satellite
- Layer 3 bridge or router mode: IP packets over satellite
- Encapsulation: Extended Performance Encapsulation (XPE) -Newtec's highly efficient encapsulation protocol for the encapsulation of Ethernet/IP frames in DVB-S2 base band frames
- Data filtering:
  - up to 32 streams in DVB-S2 Multi-stream
  - one air MAC address filter per stream

Internal Reference frequency

High Stability (optional)

Stability ±5x10^{-8} over 0°C to 70°C
Ageing: ± 15 ppb/day
± 300 ppb/year

Very High Stability (optional)

Stability ±2x10^{-9} over 0°C to 65°C
Ageing: ± 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

EL978 HIGH SPEED IP SATELLITE DEMODULATOR		Order n°
Default Configuration		
DVB-S2 IP demodulator with GbE interface, QPSK, 8PSK, 16APSK 45Mbaud, 32APSK 33 Mbaud, XPE Multistream decapsulator, VCM, SNMP Input interface: L-band (950 - 2150 MHz)		EL978
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
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
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).