Description

The EL170 is a state-of-the-art satellite modulator designed for IP applications over satellite in full compliance with the DVB standards. As a real IP product, this modulator performs IP processing functions such as packet filtering, routing and encapsulation. Depending on the applications and the activated features, the EL170 can be used in conjunction with consumer satellite IP receiving devices, professional IP receivers such as the EL940, or professional satellite IP demodulators such as the EL970.

The EL170 offers a dual auto-switching Gigabit Ethernet interface and integrates seamlessly with terrestrial IP networks and equipment. The incoming IP packets can be filtered using e.g. VLAN or MAC addresses, transmitted transparently (data piping mode) or routed to several receiving points and destination addresses. Several routing and addressing mechanisms can be used and even combined:

- Routing to the MAC address of the IP receivers, using Multi-Protocol (MPE) or Ultra Light (ULE) encapsulation, or with the more efficient Extended Performance (XPE) or Generic Stream (GSE) Encapsulation.
- Addressing using several PIDs (MPE or ULE only)
- Addressing using several stream identifiers (with the DVB-S2 Multistream mode)

At the output of the modulator, the signal is available on an L-band interface. Extended L-band, IF-band as well as BUC power supply and reference frequency are available as configuration options, providing a compact and cost effective solution.

For maximum bandwidth efficiency, the EL170 can also be used in Adaptive Coding and Modulation (ACM) mode, modifying the modulation parameters dynamically in function of the link conditions. The optional Base-Band Frame input option allows the EL170 to work with the external EL860 Bandwidth Manager. The modulator incorporates the renowned FlexACM™ technology which fully optimizes the satellite link at optimal availability.

When activated, the unique linear and non-linear predistortion option Equalink™ provides an additional link margin improvement of up to 2dB, truly unleashing the full efficiency of higher modulation schemes such as 16 and 32 APSK.

Combining new innovative features and advanced data encapsulations protocols with DVB-S2 technology, the EL170 ensures the highest bandwidth efficiency available on the market.

Clean Channel Technology™ is available on the EL170 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
- L-band monitoring output

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

Applications

- IP trunking and backbone
- Corporate networks
- Primary distribution of IPTV
- IP Backhauling
- Government and Defence networks

Related products

EL178 High speed IP satellite modulator
EL470 IP satellite modem
EL478 High speed IP satellite modem
EL940 IP satellite receiver
EL970 IP satellite demodulator
EL978 High speed IP satellite demodulator
EL501 Elevation IP Hub
EL860: Bandwidth Manager
AZ7x0 Frequency converters
AZ200/AZ202 Universal Switching System
AZ210 1+1 Modulator Redundancy Switch

Related Documents

White paper Equalink™
White paper optimization of satellite capacity
Care Pack Brochure
Reference cases

www.newtec.eu
Specifications – EL170 (R9)

Input 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
- Generic Stream Encapsulation (GSE)
- Filtering and routing capabilities:
  - Up to 32 VLAN filters
  - Up to 255 IP routes/air-MAC addresses
  - Up to 255 PIDs
  - Up to 16 DVB-S2 Streams
- Proxy ARP support
- Base Band Frame input (optional)
- AES 64 bit encryption

Modulation
Supported modulation schemes and FEC
- DVB-S/DSNG: Reed Solomon /Viterbi
- DVB-S2: 3/4, 4/5, 5/6, 8/9, 9/10
- 16QAM:
  - 3/4, 7/8
- 8PSK:
  - 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
- 16APSK:
  - 3/4, 4/5, 5/6, 9/10
- VCM support (optional)
- Embedded point-to-point FlexACM controller (optional)

Baud rate range
- DVB-S2
  - QPSK/8PSK: 0.05 – 45 Mbaud
  - 16APSK/32APSK: 0.05 – 33 Mbaud
  - (for higher baud rates see EL179)
- DVB-S/DSNG
  - QPSK/8PSK/16QAM: 0.05-45 Mbaud

Frame length
- DVB-S/DSNG: 188 bytes
- DVB-S2 Short Frames: 16200 bits
- DVB-S2 Normal Frames: 64800 bits

Roll-off factor
- 20 % – 25 % – 35 %

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

Output interfaces
L-band output (default):
- Connector: SMA (F), 50 ohms
- Return loss: > 14 dB
- Level: < -35 dBm (+/- 2dB)
- Frequency: 950 - 1750 MHz (50 Hz steps)
- Spurious: better than -65 dBc/4 kHz @ +5 dBm level and > 256 kbaud

Extended L-band output (optional):
- Connector: SMA (F), 50 ohms
- Return loss: > 14 dB
- Level: < -35 dBm (+/- 2dB)
- Frequency: 950 - 2150 MHz (50 Hz steps)
- Spurious: better than -65 dBc/4 kHz @ +5 dBm level and > 256 kbaud

IF-band (optional):
- Connector: BNC (F) – 75 ohms (intermateable with 50 ohms)
- Return loss: 50 ohms; > 14 dB
- Level: > 20 dB
- Frequency: 50 - 180 MHz (50 Hz steps)
- Spurious: better than -65 dBc/4 kHz @ -10 dBm level and > 256 kbaud

L-band+IF (optional):
- L-band: -30/-0 dBm (+/- 3dB) output level
- IF: fixed 70 or 140 MHz frequency
- Output: -34/-1 dBm (+/- 3 dB) output level

L-band monitoring output (default):
- Connector: SMA (F), 50 ohms
- Return loss: > 7 dB
- Level: < -45 dBm
- Frequency: default: identical to L-band output. with options AA-02 / AA-06: 1080 MHz
- Spurious: better than -65 dBc/4 kHz @ -10 dBm level and > 256 kbaud

BUC power and reference frequency (optional):
- max. current: 3 A
- voltage: 24V, 48V
- frequency: 10 MHz
- stability: ±5x10^-8 over 0°C to 65°C
With this option installed, the L-band output connectors become N(F), 50 ohms

10 MHz reference input / output (optional):
- Connector: BNC (F) – 50 ohms
- Input level: -3dbm up to 7dBm
- Output level: 7dBm

Internal Reference frequency
High Stability (optional)
- Stability: ±5x10^-10 over 0°C to 70°C
- Ageing: ±15 ppb/day; ≤ 300 ppb/year

Very High Stability (optional)
- Stability: ±2x10^-10 over 0°C to 65°C
- Ageing: ±0.5 ppb/day; ≤ 500 ppb/10 year

Generic
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

Ordering information
EL170 IPE SATELLITE MODULATOR

Configuration options
- L-band (950-1750 MHz)

Output interface
- Default
- IF (50-180 MHz)
- L-band + 10MHz for BUC
- L-band + 10MHz + 24Vdc for BUC
- Extended L-band (950 - 2150 MHz)
- IF + L-band

Modulation & Band rate
- QPSK-8PSK 5Mbaud
- QPSK-8PSK 3Mbaud *
- QPSK-8PSK 4Mbaud *
- QPSK-8PSK 5Mbaud *
- QPSK-8PSK 3Mbaud *
- QPSK-8PSK 4Mbaud *
- QPSK-8PSK 5Mbaud *
- QPSK-8PSK 3Mbaud *
- QPSK-8PSK 4Mbaud *
- QPSK-8PSK 5Mbaud *
- QPSK-8PSK 16APSK 3Mbaud *
- QPSK-8PSK 16APSK 3Mbaud *
- QPSK-8PSK 16APSK 3Mbaud *
- QPSK-8PSK 16APSK 3Mbaud *
- QPSK-8PSK 16APSK 3Mbaud *
- All Modocis, BInput (for use with EL860*)

Additional options
- 10MHz reference
  - In/Out
  - GR-01
  - Very high stability: 1ppm
  - GR-02
  - Encryption
    - AES 64 bit encryption
    - AG-01
  - Clean Channel Technology™
    - Cleaning Channel Technology for 45 Mbaud*
    - AI-01
    - Cleaning Channel Technology for 33 Mbaud*
    - AI-03
    - Cleaning Channel Technology for 25 Mbaud*
    - AI-04
  - Predistortion
    - Equalink *
    - AC-01
  - VCM/ACM
    - VCM *
    - AN-01

Services
- Assistance
  - Care Pack Basic
  - GA-06
  - Care Pack Extended
  - GA-07

Ordering information
- EL170
- DVB-S2/IP DVB-S2 IP modulator with GSE interface, data piping, MPK, ULE, GSE and XPE encapsulator, CCM, Multistream, SNMP

Specifications - EL170 (R9)

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