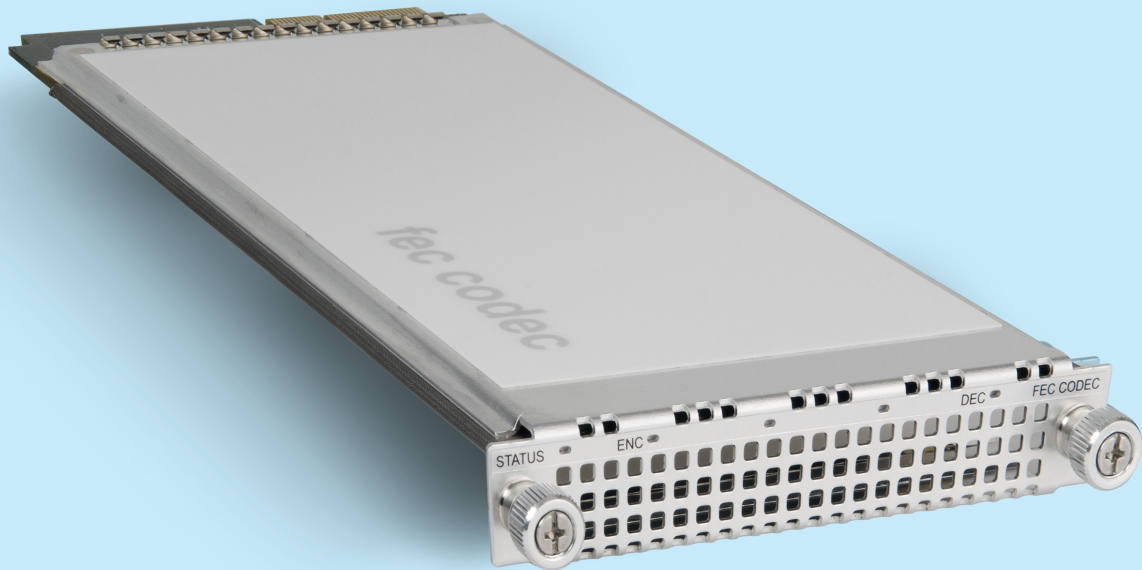IP Forward Error Correction for the Luminato platform

FEC codec module for the Luminato platform

The FEC codec module enables error protection and the correction of IP streams. The module is ideal when error-resistant, high-quality IP network streams are either received in the headend or delivered from the headend.

Versatile functionality

The Luminato FEC codec module provides an advanced error correction and protection platform for SPTS and MPTS IP streams. The FEC codec module makes it possible for a Cable TV operator to provide high-quality, error free services in an optimal and flexible way.

The Luminato FEC codec module supports both encoder and decoder functions in the same module with either mode. Versatile configuration options supported by numerous monitoring functions make it possible to select the most efficient method for minimizing the impact of errors in the IP network.

Effective flexibility

The Luminato FEC codec module is fully compatible with the high-per-formance Luminato chassis, where it can be fitted freely to any of the six module slots. In accordance with the Luminato system's architecture, the stream is processed on the FEC codec modules, which enables low-cost applications, even with a partially equipped chassis, while having the performance scalability of a fully equipped chassis.

Extreme error resistance

The Luminato ProMPEGFEC encoder and decoder support both 1D and 2D FEC patterns up to 120 streams. The FEC matrix size is fully configurable, enabling square and parallelogram rectangle shapes.

The FEC decoder is able to recover all recoverable packets, regardless of whether they are erroneous, lost, reordered or duplicated. Versatile monitoring functions that have been completed using statistics information enable a comprehensive view of the input streams; this can also be done for a longer period of time. One benefit of the Luminato FEC decoder is the network jitter monitoring feature, which can show the current and peak jitter of the received packets, thus helping to reveal possible network problems.

The FEC encoder provides error protection for the output IP streams. The adjustable configuration supported by the FEC overhead and decoding latency estimation enables the operator to select the most efficient mode that has been adapted for the network infrastructure.
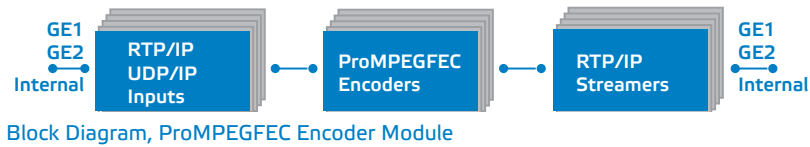
Block Diagram, ProMPEGFEC Encoder Module

Block Diagram, ProMPEGFEC Decoder Module

Features

- RTP/IP streaming with ProMPEG FEC CoP#3 encoding
- RTP/IP stream reception with ProMPEG FEC CoP#3 decoding
- Error correction based on ProMPEG FEC CoP#3
- Supports both 1D (column only) and 2D (column+row) FEC streams
- Wide supported matrix size range: L*D<=120
  - in 1D mode: L=1…20, D=4…20
  - in 2D mode: L=4…20, D=4…20
- Recursive packet recovery

- Stream monitoring with encoder:
  - Input packet format
  - Current bitrate
  - Calculated overhead
  - Calculated latency
  - FEC mode and matrix size

- Stream monitoring with decoder:
  - Input packet format
  - Current bitrate
  - FEC Mode and matrix size
  - Latency
  - Valid packets
  - Uncorrected packets
  - Duplicated packets
  - Reordered packets
  - Discontinuity detection
  - Incorrect sequence number detection
  - Network jitter monitoring

Technical specifications

Parameter	Specification	Note
ProMPEG Encoder IP inputs		
Frame formats	UDP/IP or RTP/IP	
IP input interfaces	GE1, GE2 or internal	
ProMPEG FEC Encoder Error Protection Coding		
Standards	ProMPEG CoP#3	
	SMPTE 2022-1-2007	
Matrix size, L	in 1D mode: 1…20	
	in 2D mode: 4…20	
Matrix size, D	4…20	
Matrix size, L*D	<=400	
ProMPEG FEC Encoder IP outputs		
Frame formats	RTP/IP	
ProMPEG FEC ports	RTP/IP port +4 for row	
	RTP/IP port +2 for column	
Max encoded output streams per module	120	
Max streaming capacity	500 Mb/s	
IP output interfaces	GE1, GE2 or internal	
ProMPEG Decoder IP inputs		
Frame formats	RTP/IP	
ProMPEG FEC ports	RTP/IP port +4 for row	
	RTP/IP port +2 for column	
IP input interfaces	GE1, GE2 or internal	

Parameter	Specification	Note
ProMPEG FEC Decoder Error Correction		
Standards	ProMPEG CoP#3	
	SMPTE 2022-1-2007	
Matrix size, L	in 1D mode: 1…20	
	in 2D mode: 4…20	
Matrix size, D	4…20	
Matrix size, L*D	<=120	
Max decoded inputs streams per module	120	
Max streaming capacity	1.0 Gb/s	
ProMPEG FEC Decoder IP outputs		
Frame formats	UDP/IP or RTP/IP	
IP output interfaces	GE1, GE2 or internal	
General		
Power consumption	6 W	
Supply voltages	24 V	
Connectors,	n/a	
Dimensions	20 x 109 x 253 mm (HxWxD) 1)	
Weight	0,3 kg	
Enclosure classification	IP21	
Operating temperature range	-10...+55 ºC	
Storage temperature range	-30...+70 ºC	
Specification is met	0…+45 ºC	

Notes
1) Dimensions excluding connectors and locking screws