

FEC Box IP IP™

Compact (4.5 Inches Square), Real Time, End to End Pro-MPEG FEC SMPTE 2022 Error Correcting Router for UDP Traffic. Corrects Bit Errors and Packet Loss which Impacts UDP (and RTP) Traffic on both LAN and WAN Communications. Commonly Used to Fix or Protect Against Frame Loss, Picture Artifacts, Audio Drop-Out and Other Video Decoding Errors Caused by Packet Loss. Unlike TCP-IP Retry Solutions, FEC Does Not Increase Jitter and Only Minimally Increases Latency. Generally Used in Pairs, but also Works with Other "2022 1-4" Compatible Devices. Adds FEC to Encoders or Decoders that Do Not Support It.



Features

- Alleviates corrupted bits and packet loss introduced on WiFi, satellite, microwave, cellular, Internet, and other networks prone to packet loss
- Compatible with SMPTE 2022 1-4 standards
- Inputs/Outputs: UDP/RTP IP streams
- Supports IP UDP unicast and multicast, in or out
- Supports all UDP traffic including HD and SD H.264/MPEG-4 AVC or MPEG-2 encoded streams
- 10/100 Ethernet ports – switched for flexible use
- Software updates can be performed via the Web GUI, or via the USB
- Will not alter the internal structure of the transport stream (PAT, PMT, etc.)
- Supports 50 rows and columns in transmit mode and 100 rows and columns in receive mode
- Tested for compatibility with other SMPTE-2022 FEC equipped devices
- Support for SMPTE-2022 5 and 6 coming soon

Applications

- Providing SMPTE 2022 based FEC compatibility to devices that don't support it
- Streaming Live IP camera views
- Video over IP
- Any application where UDP/RTP traffic is used and data loss is possible

Overview

Forward Error Correction (FEC) is a method for finding and correcting bit and low packet loss errors in data transmissions. Extra data, called multi row and multi column checksum packets, are transmitted in parallel to the outgoing video stream so that errors can be corrected at the receiving end. The original UDP stream is not modified in any way.

The FEC Box IP IP™ reduces corrupted bits and packet loss over a lossy network transport by mathematically reconstructing the missing data packets using the added FEC data.

The FEC Box IP IP is a very small, DC brick powered, computing device with two 10/100 Ethernet jacks. The purpose of the device is to ensure UDP traffic reaches the destination even when errors occur during transmission.

The FEC Box IP IP provides this functionality by intercepting the specified UDP stream and transparently adding (transmit) or applying (receive) the required 2022 data. The FEC data used in this process increases the transmission bandwidth. A typical application will increase bandwidth by 10%. The actual amount is programmable.

The FEC Box IP IP can be paired with a target device to apply FEC to the data provided by the source, or paired with a source to insert FEC data for consumption by a compatible target, or deployed as a set of devices with transmit and receive functions.



Computer Modules, Inc.

11409 West Bernardo Court

San Diego, CA 92127

Tel: 858-613-1818 Fax: 858-613-1815

www.dveo.com

FEC was developed to improve communications with long distance interplanetary probes by NASA and others.

The underlying principle of FEC is similar to "parity bits" added to data transmission in the days of IBM mainframes. As you recall, the parity bit magically corrected single bit errors in "words" of data.

IP networks are plagued primarily by packet loss and "bit errors" in the packets themselves. Ethernet protocols themselves look out for small bit errors in IP transmissions but cannot fix serious bit errors.

FEC works by adding defined redundant packets into rows and columns of transmitted data packets. Due to the underlying mathematics, by adding the extra packets it becomes possible to correct for a certain number of dropped packets and correct any corrupted packets as well.

The SMPTE 2022 Standards: 2022 1-6

SMPTE 2022-1: "Forward Error Correction for Real Time Video/Audio Transport over IP Networks"

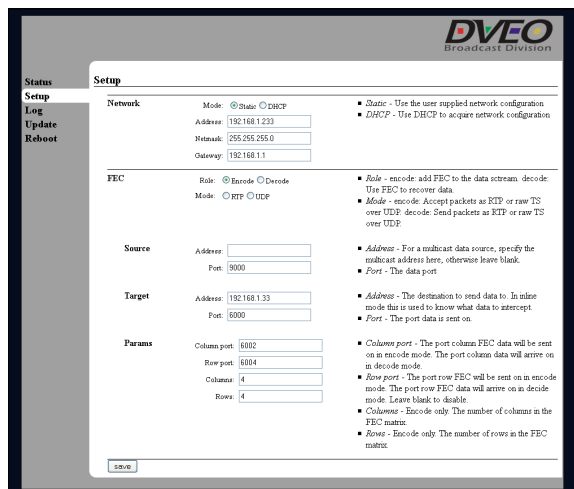
SMPTE 2022-2: "Unidirectional Transport of Constant Bit Rate MPEG-2 Transport Streams on IP Networks"

SMPTE 2022-3: "Unidirectional Transport of Variable Bit Rate MPEG-2 Transport Streams on IP Networks"

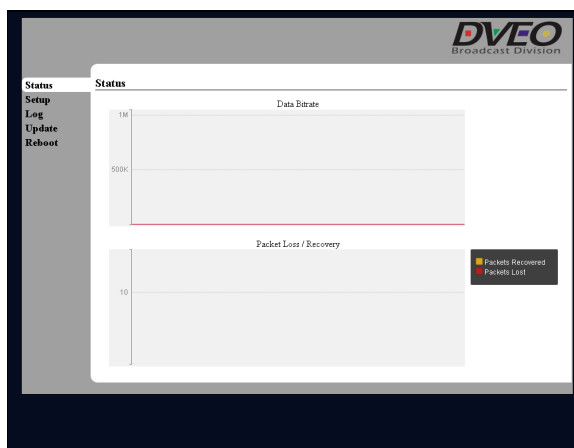
SMPTE 2022-4: "Unidirectional Transport of Non-Piecewise Constant Variable Bit Rate MPEG-2 Transport Streams on IP Networks"

SMPTE 2022-5: "Forward Error Correction for High Bit Rate Media Transport over IP Networks"

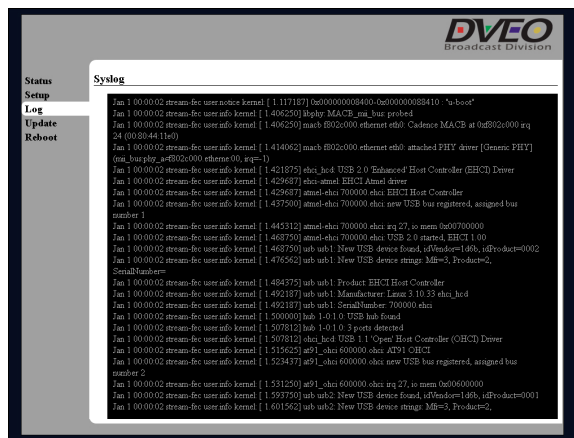
SMPTE 2022-6: "High Bit Rate Media Transport over IP Networks"



Setup



Status



Log



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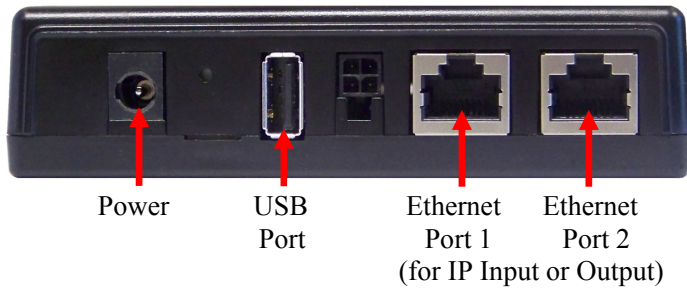
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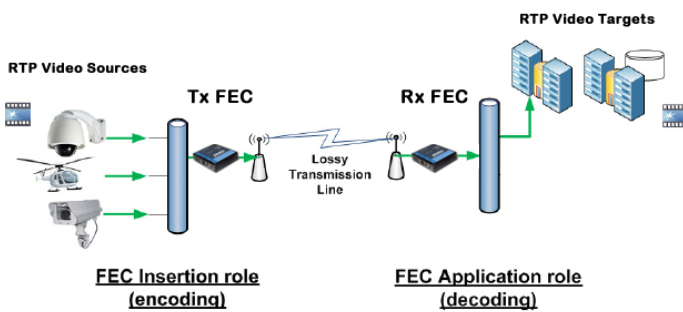
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Inputs/Outputs



Block Diagram



FEC Standard

This unit supports up to 50 rows and columns in transmit mode and up to 100 rows and columns in receive mode. The column value can be adjusted to compensate for burst loss. The row value can be adjusted to compensate for intermittent loss.

Ordering Information

FEC Box IP IP (Usually sold in pairs)

Specifications

IP Inputs/Outputs

| | |
|----------------------------|---------------------------------|
| IP Input/Output Protocols: | UDP, RTP – Unicast or Multicast |
| Connectors: | 10/100 Ethernet |
| Bit Rates: | .025 (25 kbps) to 20 mbps |

Administration

| | |
|---------------------------------------|-----------------------------------|
| General Access and Remote Management: | Web-based user interface |
| USB Command Stick | To update and/or configure device |

LEDs

| | |
|----------|--|
| General: | Power, Link/Act with transfer rate (RJ-45), Lock |
| Status: | <ul style="list-style-type: none"> • Status (booting, management mode, healthy) • Ethernet 1, 2 (Link/Activity) • USB (active, update in processed) • Network (targeted vs. inline mode) • Data (UDP data found to match configuration) |

Physical & Power

| | |
|------------------------|--|
| Dimensions: | 4.48 x 3.38 x 1.12 inches (114 x 86 x 28 mm) Compact shelf top form factor |
| Power Supply: | 100-240V, 50-60 Hz, 0.8A |
| Operating Temperature: | 0°C to 50°C |
| Storage Temperature: | -10°C to 70°C |
| Humidity: | 10 to 90% non-condensing |
| Weight: | 0.2 lbs (.1 kg) |
| Conformities: | FCC class A/CE class A |