GATESAIR®

Intraplex® IP Link 100e
Audio over IP STL codec via plugin card
for Flexiva transmitters/exciters

Made in USA

A member of the award-winning Intraplex® IP Link codec family, the IP Link 100e is a powerful plugin module, designed to give Flexiva transmitters superior AoIP capability to link studio and transmitter locations at an affordable price.

The IP Link 100e fortifies the high-performance of Flexiva over-the-air transmission solutions with state-of-the-art Intraplex network reliability by providing full-duplex AoIP capability.

With a full-duplex AES3 input and output and 3 GigE network ports, your Flexiva transmitter or exciter has direct, manageable digital access to the studio signal. Interoperable with other IP Link codecs and Ascent, it is also compatible with industry-standard AoIP formats, including support of FM-MPX signal transport. With the support of payload privacy using built-in 128/256 key encryption via Secure Reliable Transport (SRT), the IP Link 100e is extremely secure and flexible. Stream splicing and automatic multi-source audio switching, including USB playlist as backup, further ensures reliability with constant and successful signal transport for your station.

Product Features

- Full-duplex, single stereo channel plug-in card for Flexiva transmitters and exciters
- AoIP formats include Linear, Compressed, AES67, and Icecast
- Standard: Linear, AAC-LC, and Opus audio coding
- Optional: AAC-HE, AAC-HEv2, AAC-ELD, MPEG2, and MPEG3 audio coding
- Digital FM-MPX format support with compatibility with IP Link MPXp
- Protocol Encapsulation: RTP, Icecast, SRT
- Three independent IP interfaces for redundant network operation
- Built-in silence sensor

- Automatic backup to audio playout from USB drive
- Multicoding for over-the-air confidence monitoring, allowing the content to be sent to multiple destinations with different encoding format, including Icecast
- Prioritized stream sources at the decoder with automatic switch over and switch back between primary, secondary, and backup sources
- Supports Secure Reliable Transport (SRT) with 128/256-bit encryption and automatic packet re-transmission
- Programmable RTP-level Forward Error Correction (FEC) scheme

- Optional Dynamic Stream Splicing that works with both RTP and SRP formats, providing "hitless" operation over diverse network paths
- Integrated with Intraplex LiveLook (network analytics and monitoring software)
- Support for IP multicast and multi-unicast
- Web browser user interface and SNMP network management
- Four multipurpose contact closure inputs and outputs provide:
  - Transport of logic signals with time-alignment to audio
  - Alarm notification

Product Details

The IP Link 100e is a full-duplex, single stereo-channel codec for simultaneous reception and transmission of AoIP streams. The codec is designed to be compatible with the IP Link codec family and Ascent, including IP Link MPXp codec for FM-MPX signal transport.

The IP Link 100e is designed to provide unprecedented level of reliability from ground up.

At the streaming layer, the combination of SRT and Dynamic Stream Splicing (DSS) provides a set of networking tools for reliability of signal even over challenging IP connections. The SRT transport protocol provides both real-time packet re-transmission of lost packets and encryption of payload. When using the traditional RTP transport format, the packet loss protection is provided using Forward Error Correction (FEC) and time diversity of packets. The optional DSS, provides "hitless" protection against packet or link losses using diverse network paths for both SRT and RTP transport formats.

With full-duplex capability, the codec also enables off-air or local audio to be sent from the transmitter site back to the Studio or to the Cloud. The transmit streams can be sent to multiple destination with different formats and encoding using the Multicoding capability. For example, one stream can be sent back to the Studio side codec, and another stream can be sent to the Cloud using Icecast for recording.

In addition to the various built-in "hitless" packet loss protection techniques (e.g. FEC, re-transmission and DSS), the decoder also provides for three prioritized sources for switching. The source switching protects against failure of either an encoder or the main network connection. The codec lets the user define Primary, Secondary and Backup sources of streams or local USB audio.

An example configuration:

- Primary source stream: DSS protected from the studio encoder
- Secondary source: an Icecast stream
- Backup source: a local USB file

The switching between these sources can be configured to be fully automatic or user initiated.

For control and status, the IP Link 100e provides an intuitive web interface and comprehensive SNMP interface.

Specifications
Specifications and designs are subject to change without notice

Overview	
Channels	One full-duplex stereo (or two mono) program audio channel or one MPX channel, encode and decode
Audio Coding	■ Standard: Linear, AAC-LC, Opus, AES67 ■ Optional: MPEG2, MPEG3, AAC-HE, AAC-HEv2, AAC-ELD
FM MPX via AES192 (BB192)	Support for transport of FM MPX via AES192 (BB192) composite signal. Sampling rates and sample size compatible with IP Link MPXp.
Streaming Format	RTP (EBU N/ACIP Tech 3326), SRT, Icecast
Multicoding	Allows the input to be encoded and streamed out using multiple different algorithms simultaneously
Webcasting	Can receive and transmit Icecast streams
Backup	■ Configurable for automatic backup to secondary incoming audio stream ■ Playout of audio from USB drive
Aux Data Channel	RS-232 data transport programmable to 2400, 4800 & 9600, and 19200 bps with time-alignment to audio streaming
Contact Closures	■ Four input and four output opto-isolated contact closures, with time-alignment to audio streaming ■ Contact inputs can transport state to peer within the stream packet ■ Contact outputs can receive state from peer or be linked to system alarms
Connectors	■ Ethernet: Three 10/100/1000 Base-T, RJ-45 connector ■ AES/EBU: One input and one output, RJ-45 connector with StudioHub compatibility ■ RS-232: One full-duplex port, RJ-45 connector ■ Contact Closures: RJ-45 connector ■ USB: One type A connector
Digital Audio	
Accepted Audio Sampling Rates	Accepts AES/EBU sample rates between 32 and 192 ksps to support both discreet (L&R) audio and AES192 (BB192). Decoded audio simultaneously available internally to the exciter and on the external AES3 output.
Sample Rate Conversion	Automatic sample rate conversion at input with a THD of 120 dB
Digital Gain	AES/EBU output has micro adjustable gain between +6 and -6 dB
FM MPX via AES192 (BB192)	
Interoperation	Interoperation with Intraplex IP Link MPXp
Sample Rate	132, 162, or 192 ksps
Sample Size	12, 14, 16, 20, or 24 bit

Ethernet	
Ethernet Data Rate	10/100/1000 Base-T full duplex, auto-negotiation
Network Connections	■ Two WAN ports plus management port ■ Three network ports all available for both streaming and management
Network Protocols	IPV4, TCP, SRT, UDP, RTP, HTTP, NTP, DNS, DHCP, SNMP, ARP, ICMP, Ultravox (v1, v2) for Icecast
Remote Management	■ Web browser user interface HTTP/HTTPS with multiple levels of user accounts ■ SNMP with SNMPv2C/SNMPv3
Streaming	
RTP / SRT Streams	■ Total of 8 streams with multiple IP destinations for the transmit streams ■ Setup: Static ■ Unicast, multi-unicast, multicast (RTP only) ■ Standard RFC payload formats, auto configuration ■ Source IP address and UDP port verification at the receiver for security ■ Audio plus meta-data format to support GPIO and RS-232 alignment
TCP Streams	Multiple Icecast streams not exceeding the total count of 8
Redundancy	Automatic failover mode between Primary, Secondary and Backup streams
Backup Audio Source	USB playlist
Dynamic Stream Splicing	Optional: Enables multiple identical audio streams to be sent across the IP network (or two separate IP paths, if available) and provides for hitless switching at the decoder
Jitter Buffer	Programmable jitter buffer depth up to 512 packets. Static or automatic jitter buffer adjustment
Reliability	Secure Reliable Transport SRT (automatic retransmission of lost packets), FEC, Time-diversity
Security	■ Stream encryption supported in SRT (AES-128/256) ■ Access control with user settable firewall configuration per network interface
Time Diversity	Time delay configured on per stream basis, used with redundant streams for burst packet loss protection
Diagnostics	
Test Tone Generator	1 kHz test tone at -12 dBFS
Loopbacks	Input to output channel equipment loopback while simultaneously sending
Network Performance Statistics Tracked	■ Per stream and group statistics for packets received, packet lost, packets recovered by FEC and packets sent ■ Send and receive stream bandwidth
Network Tools	■ Ping
Alarms	
Alarm Reporting	■ Major/minor alarms, normally open relay contacts, SNMP traps ■ Maintains internal and syslog messages alarm log
Loss-of-Audio Alarm	Built-in silence detection with ability to provide alarm and perform switch over of stream on loss of audio
Mechanical and Environmental	
Dimensions (H X W X D)	1 x 6.5 x 5 in (2.54 x 16.51 x 12.7 cm)
Power Consumption	10 Watts, typical
Humidity	10% to 90% non-condensing
Operating Temperature	32º to 122º F (0º to 50º C)
Compliance	
Regulatory Compliance	CE, FCC Part 15 Class A, IEC 60950, RoHS