

Intraplex® IP Link 100n

Single bidirectional stereo audio over IP STL codec





A member of the award-winning Intraplex® IP Link audio codec family, the IP Link 100n is a powerful 1 rack unit AoIP model, designed to provide state-of-the art capabilities for remote contribution, studio-to-transmitter, and studio-to-studio applications at an affordable price.

With a full-duplex AES3, Analog, AES192 input and output along with 3 GigE network ports, the IP Link 100n packs full-featured IP audio codec capabilities into one standard rack unit. 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 100n 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 with selectable AES3, Analog and AES192 input and output
- AoIP formats include Linear, Compressed, AES192, and Icecast
- Standard audio coding: Linear; Opus
- Optional audio coding: AAC-LC; AAC-HE; AAC-HEv2; AAC-ELD; AES192; MPEG2; MPEG3; Icecast; Shoutcast
- Protocol Encapsulation: RTP; Icecast (requires optional audio coding pack); SRT
- Three independent IP interfaces for redundant network operation
- Built-in silence detection
- Automatic backup to audio playout from USB drive
- Multicoding allows the input Line signal to be sent to multiple destinations with different encoding formats and protocols
- Prioritized stream sources at the decoder with automatic switch over and switch back between primary, secondary, and backup sources
- Programmable RTP-level Forward Error Correction (FEC) scheme
- 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 timealignment to audio
 - Alarm notification
- Additional options:
 - Digital FM-MPX format support with compatibility with IP Link MPXp. Full uncompressed MPX with RDS with bitrate of 1.64 mbps.
 - µMPX transport a full FM composite MPX signal, including pilot and RDS, with perfect peak control with bitrate of 320 kbit/s.
 Compatible with Intraplex SynchroCast.
 - 10-band high-resolution Audio Processing with Intelligent Loudness Control, Vocal Enhancement, Bass Enhancement and Stereo image stabilization.
 - Secure Reliable Transport (SRT) with 128/256-bit encryption and automatic packet re-transmission
 - Dynamic Stream Splicing for both RTP and SRT formats, providing "hitless" operation via diverse network paths or time diversity.
 - SynchroCast™ provides dynamically managed precision delay for Single Frequency Network (SFN) broadcasting and simulcasting

Product Details

The IP Link 100n 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 the IP Link MPXp codec for FM-MPX signal transport.

The IP Link 100n is designed to provide an unprecedented level of full-featured reliability in an affordable form factor.

At the streaming layer, the combination of SRT and Dynamic Stream Splicing (DSS) provides a set of networking tools for signal reliability even over challenging IP connections. The SRT transport protocol can simultaneously re-transmit lost packets in real-time while encrypting the full 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 Dynamic Stream Splicing (DSS) provides "hitless" protection against packet or link losses using diverse network paths for both SRT and RTP transport formats.

Product Details (continued)

With full-duplex capability, the codec enables simultaneous operation of multiple transmit streams and receive streams for reliability. Using Multicoding capability, the transmit streams can be sent to multiple destinations with different formats and encoding. For instance, feeding multiple transmitter sites with different network bandwidths or feeding an Icecast server simultaneously, while sending an RTP or SRT streams to remote studio or transmitter locations.

In addition to the various built-in "hitless" packet loss protection techniques (e.g. FEC, retransmission 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 100n 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
Front Display	Graphical front-panel user interface: 3.2 inch display; 256 x 64 pixel, white monochrome OLED; six-button keypad; VU meters
Audio Coding	■ Standard: Linear Uncompressed, Opus & AES67 output ■ Optional Package 1: MPEG2, MPEG3, AAC-LC, AAC-HE, AAC-HEv2, AAC-ELD, AES192 ■ Optional µMPX: MicroMPX Encoder & MicroMPX Decoder (sold separately). Transport a full FM composite MPX signal, including pilot and RDS, with perfect peak control with bitrate of 320 kbit/s. Compatible with Intraplex Synchrocast feature.
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 (requires optional audio coding algorithms)
SynchroCast	Optional: Audio delay programmable up to 2.5 seconds with 1 microsecond accuracy
Multicoding	Allows the input to be encoded and streamed out using multiple different algorithms simultaneously
Webcasting	Can receive and transmit Icecast streams (requires optional audio coding algorithms)
Backup	Configurable for automatic backup to secondary incoming audio streamPlayout 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	 XLR for analog L&R and digital AES/EBU inputs and outputs Ethernet: Three 10/100/1000 Base-T, RJ-45 RS-232 data: D-sub, 9 pin male Contact Closures: D-sub, 26-pin female USB: Type A DC Power: Two pin screw terminal AC Power: C14 power inlet Front Panel Ethernet: One 10/100/1000 Base-T, RJ-45 Front Panel Audio Headphone: One ¼" stereo headphone jack
GPS	 External GPS: 10 MHz and 1 PPS BNC connectors Optional: GPS receiver plug-in board kit with SMA connector for external GPS antenna (provided with kit)
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) signals
Sample Rate Conversion	Automatic sample rate conversion at input with a THD of 128 dB
Digital Gain	AES/EBU output has micro adjustable gain between +6 and -6 dB
Analog Audio	
Input Impedance	Balanced, greater than 10 k Ohms
Output Impedance	Balanced, less than 52 Ohms
Audio Frequency Response	■ 48 ksps: 10 Hz to 22 kHz ■ 44.1 ksps: 10 Hz to 20.5 kHz ■ 32 ksps: 10 Hz to 15 kHz

Total Distriction ITHO-Mol Least than 0.00% at 1 MHz. 1 dBPS input Dynamic Range Greater than 91 dB Sample Size 16 or 24 bit Microphone Opporation internal plugic in module supports up to two microphone level inputs from -26 to -50 dBu, user-settable in 1 dB steps. Module supports user selectable 48 MVC microphone power FM MPX using ASTSI2 (BBS92) Interoperation Interop	Audio Level	Full scale analog audio input/output: 9 to 24 dBu, user-settable in 1 dB steps	
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Sample Size	Interoperation		
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Remote Management # Web browser user interface HTTP/HTTPS with multiple levels of user accounts \$\frac{\text{SNMP} \text{with SNMP2C/SNMPv3}}{\text{SNMP2C/SNMPv3}} # Total of 8 streams with multiple IP destinations for the transmit streams # Stepury Static # Unicast, multiple interest with multiple IP destinations for the transmit streams # Stepury Static # Unicast, multiple interest with multiple IP destinations for the transmit streams # Source IP address and UDP port verification at the receiver for security # Audio plus meta-data format to support GPIO and RS-232 alignment # Source IP address and UDP port verification at the receiver for security # Audio plus meta-data format to support GPIO and RS-232 alignment # Redundancy # Automatic fallower mode between Primary, Secondary and Backup streams # Backup Audio Source # USB playist # Optional: Enables multiple identical audio streams to be sent across the IP network (or two separate IP paths, if available) and provides for hidess switching at the decoder # Optional: Enables multiple identical audio streams to be sent across the IP network (or two separate IP paths, if available) and provides for hidess witching at the decoder # Optional: Enables multiple identical audio streams to be sent across the IP network (or two separate IP paths, if available) and provides for hidess witching at the decoder # Programmable jitter buffer depth up to 512 packets. Static or automatic jitter buffer adjustment # Stream encryption supported in SRT (AS-128/256) # Stream encryption supported in SRT (AS-128/256) # Stream encryption supported in SRT (AS-128/256) # Time delay configured on per stream basis, used with redundant streams for burst packet loss protection # Diagnostics # Time delay configured on per stream basis, used with redundant streams for burst packet loss protection # Diagnostics # Time delay configured on per stream basis, used with redundant streams for burst packet loss protection # Diagnostics # Diagnostics # Diagnostics # Diagnostics #	Network Connections		
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Cooling Convection cooled Humidity 10% to 90% non-condensing Operating Temperature 32° to 122° F (0° to 50° C) Compliance	Power Supply	Main: AC 100-240 VAC, 50/60 Hz with type T2A 250VAC Input Fuse - Backup: Optional external AC to 12vdc or Internal -48VDC	
Humidity 10% to 90% non-condensing Operating Temperature 32° to 122° F (0° to 50° C) Compliance	Power Consumption	15 Watts, typical	
Operating Temperature 32° to 122° F (0° to 50° C) Compliance	Cooling	Convection cooled	
Compliance	Humidity	10% to 90% non-condensing	
Compliance	Operating Temperature	32° to 122° F (0° to 50° C)	
Regulatory Compliance CE, FCC Part 15 Class A, UL 60950, RoHS	Compliance		
	Regulatory Compliance	CE, FCC Part 15 Class A, UL 60950, RoHS	