

IVC-32 and E-Fib Trunk comparison

	IVC-32 HX	E-FIB
Medium	IP (LAN. WAN. internet)	Dark Fiber
Connectivity	IP (IVC-32 and Matrix Frame LAN)	Single mode Fiber : Up to 20KM (10KM by stock, 20KM by upgrade) or Multi mode Fiber: Around 200m to 300m with 850nm cable With Matrix Frame LAN
Network Bandwidth required for Trunk	Full Duplex to/from IVC-32-HX LAN: 240kbps; WAN: 180*kbps; Intrenet 280kbps**	(Only Matrix Frame LAN)
End to end delay = audio + control data setup (Key press to hearing audio)	80 – 100ms	80 – 100ms
Group delay = just audio delay in the system (Key is PRESSED and you just tap the mic)	LAN : Approx 63.5ms; WAN: Approx 93.5ms; Internet: Approx 133.5ms (including V-series panel to panel @ 13.5ms)	< 4ms
Redundancy support	With secondary IVC-32 HX card	Redundancy Fiber Ring within same E-Fib card.
Audio Quality	Audio bandwidth is 7Khz using G722 codec	Provides full audio bandwidth

* AES128bit encryption is used if the IP trunk is set to WAN mode

** Note: Silence suppression is enabled and Forward Error Correction module is ON both ways. The FEC module increases bandwidth but will support ~5% packet loss without affecting audio and keep acceptable audio up to ~10% loss.

Frequently Asked Questions.

Regarding IVC-32 IP Intelligent linking and tie lines:

Q1 Can I use IP trunking in an Eclipse 5.2.4 system with IVC-32 cards?

A1 Native IVC-32-HX IP trunking has been developed for our Eclipse HX platform only. In many cases, Eclipse system customers can upgrade their systems to Eclipse HX.

Q2 Are IP based Audio tie lines and intelligent trunk lines Secure?

A2 Normally IVC-32-HX audio is encoded in G.722 which cannot be inadvertently decoded and “snooped” on. In Internet mode the system uses full 128-bit audio encryption to prevent calls from being overheard.

Q3 What Audio latency can I expect from IP trunk lines and IP tie lines?

A3 End to end audio latency, measured from analog audio in to audio out via two IP connected matrixes is about 40ms at a minimum. Two factors can contribute to cause higher latency; underlying **Network latency** and **Network mode**.

Network latency is a function of the infrastructure in place between the two endpoints, for modern wired LANs this is negligible, for international internet connections it can run to 100's of milliseconds.

Network Mode is user selectable per channel, LAN mode can be used on good quality network connections to keep latency to the minimum.

Q4 Can a single IVC-32 support V-series panel, Concert Clients, IP trunk lines and IP Tie lines?

A4 Yes, each of the cards 32 channels is independently configurable.

Q5 OK, but could a single IVC-32-HX card support, say, for example:-

- 5x Remote V-series panels
- 5x Concert Clients
- 5x Tie lines to a Remote Eclipse Matrix in an OB Truck1
- 5x Tie lines to a Remote Eclipse Matrix in an OB Truck2
- 5x Intelligent Trunk lines to a third Matrix at an affiliate site.

A5 Yes a single IVC-32-HX will support all these connections and still have 7 free unused channels.

Q6 Doesn't supporting so many interfaces on one card make it a point of vulnerability or failure.

A6 Not necessarily, a second IVC-32-HX could be installed in the matrix to provide auto changeover in case of card failure or local switch failure.

Q7 OK, but wouldn't it take a long time for the system to re-establish all those connections.

A7 Yes, in the unlikely event of a failure it could take between 30 seconds and 1 minute for the redundant card to automatically recover the connections.

Q8 Is an external computer needed to manage tie lines and intelligent lines between systems?

A8 No, once configured the Eclipse HX matrix frames dynamically manage their interconnecting trunk lines. This simplifies the design and removes the management computer(s) as a single point of failure.

Q9 Does the system support static IP addresses and NAT to address remote matrix frames?

A9 Yes, a just single TCP/IP port needs to be opened for Internet access for system.

Q10 Can IP trunking be used as a backup for other types of matrix connection?

A10 Yes, IP trunks can be used to automatically backup any of the systems other supported intelligent trunking media.

Q11 What network bandwidth is required by an IVC-32-HX card?

A11 The IVC-32-HX implements the G.722 wideband audio codec. This single codec offers the best tradeoff between audio quality and network bandwidth for our markets.

The Network bandwidth requirements are proportional to the number of active channels and the connection type set on each channel.

	LAN (kbps)	WAN (kbps)	Internet (kbps)
Half Duplex from IVC-32-HX	120	90	140
Half Duplex to IVC-32-HX	120	90	140**
	240	180	280

You can use the following table to estimate the bandwidth requirements for audio data when using IP Panels or IP trunking. Note, the total network utilization should never exceed 20% of its nominal capacity.