Network Planning Guide

Network Capacity

The IP networking requirements are directly related to the number of V series IP Panels that are connected over the network and the connection type set on each panel.

Also note that the IP network has to carry other traffic, such as communication between the Concert server and PC concert clients.

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

Bandwidth requirements for audio data when using IP Panels

	LAN (kbps)	WAN (kbps)	Internet (kbps)
Half Duplex from IVC32 to panel	120	90	140
Half Duplex from Panel to IVC32	120	90	140**
Max jitter buffer (ms)	80	120	200

** Note: Silence suppression is enabled from Panel to Matrix, 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.

Network Architecture

Ethernet Hubs must not be used to connect IP Panels to the Matrix across a LAN or WAN. This creates a bottleneck and introduces jitter causing random noise on the audio. Ethernet Switches must be used instead.

The use of routers and firewalls is supported. If a NAT device or Firewall is used then an externally visible address for each IVC-32 card must be configured if the card is to communicate with panels beyond the NAT or firewall. This must be entered in the card configuration dialog of ECS.

Address Requirements

Static IP Addresses must be assigned, 1 per card, to each IVC-32 and to the configuration card in each matrix frame.

Panels may use static or DHCP assigned addresses. This is controlled by settings on the panels themselves.

TCP / UDP Ports

The port for audio transmission is UDP/6001 on each IVC32 (not required on the CPU card). The UDP ports settings are not configurable. Communication flow is established from panels to matrix to ease firewall traversal or operate behind NAT. All panels use UDP/6001 as source port which could be useful if outbound firewall rules exist on the network.

The default port for panels to log-in and establish connections with Eclipse is TCP/6001. TCP source port numbers can be reconfigured on the CPU and IVC32 if necessary. It is recommended that all cards use the same port number. The panel can either contact the CPU card at TCP/6001, or the IVC32 directly at the same port, so your network must provide access to the CPU TCP/6001, and each of the IVC32 TCP/6001. Automatic panel discovery broadcast messages are sent from the CPU card at TCP/6001.

If a source port is modified on the IVC32 or the CPU card, or if the Eclipse frame is behind NAT with port forwarding, and the panels are manually configured, ensure that the login port and IP address

configured on the panels is matching. These values are automatically assigned to panels if they are configured via the panel discovery and drag drop method.

The Matrix also requires ports 512 and 1300 to be opened. These are used for internal (non IP Panel) communication.

Broadcast Messages

Panel discovery is performed using broadcast messages from the CPU Card. Panels that are on the WAN or Internet will not receive these messages and so must be manually configured to log in with the (external) IP Address of the required IVC-32 card.

All other messages are unicast.

Other information

SNMP is not implemented

Transmissions are encrypted only in WAN and Internet mode.

TLS/SSL is not used.

Quality of Service

IP headers set to 01011000 , which means Precedence: Critical, Type of Service: Minimum Delay.