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Alternative IP Data Channels - not to be underestimated!

Some often glossed-over and perhaps less glamorous features of modern IP video surveillance systems are the non-media data channels supported to a greater or lesser extent by almost all IP media devices. Generic serial data, PTZ protocols, alarm inputs and relay outputs all have a lot more to offer the IP security world than we might first suppose.

Now that the video and audio elements of IP-based security have become mainstream, it is probably a good time to revisit the powerful functionality and flexibility provided by these sometimes neglected elements. Projects these days can be won or lost on the details, so making full use of the feature sets available is becoming more and more important.

If IP video surveillance systems are to fully integrate with the likes of access control and building management, security alarms, then there needs to be a way for the disjointed components to interoperate. Until these technologies fully embrace IP as their de-facto standard, IP media devices can be an excellent way to bridge the integration gap and provide a cost-effective migration path.

The abundance of peripheral devices based on the RS232 / 422 / 485 serial data protocols means that the majority of IP media manufacturers provide good support for these interfaces. Contact closure and relay outputs, often collectively known as Binary I/O, are also simple but effective technologies which have found their way into most IP media hardware providing a very generic control and feedback mechanism.

While the amount of data transmitted by these channels is normally very small compared to any associated media data, the priority needs to be higher to ensure that control and event data can be sent or received and acted on in a timely manner.

For binary I/O channels, most devices provide reliable IP communication between the client application or client device and the server device and there is generally opto-isolation and electrical protection to cover most of the issues inherent in this technology.

When it comes to serial communications, the majority of manufacturers will support RS232, RS422 and RS485 at an electrical level, however look out for the additional multi-drop features of RS485 - which are often neglected - should you be required to control more than one device over the two wire RS485 interfaces.

The transparent operation of serial communication varies depending on the protocol you are planning to use over the IP data link; this is mostly down to the latency introduced by the IP network and sometimes due to buffering within the devices. Protocols requiring a fast turnaround (e.g. sub 100ms) may have a hard time operating over such a link. Fortunately dome and PTZ control manufacturers have become smart to these issues and have steadily removed the need for these super-fast responses.

For PTZ control this introduced latency can have a different, more obvious and detrimental effect on the system. Combined with the latency introduced by encoding the video there can sometimes be over 2 seconds' delay between actions on a PTZ keyboard and the associated change on the video display. This may have the effect of causing the operator to over-shoot the target when manoeuvring a camera.

To counteract this, a number of IP media manufacturers provide low latency options for the video encoding parameters such as Telindus who can reduce their MPEG2 stream latency to below an exceptional 150ms providing high quality MPEG2 with a very responsive PTZ control. In addition, manufacturers such as Bosch have implemented many of the popular PTZ protocols within the device itself; their VIP-X series supports no less than 15 different devices including the very popular Pelco-P protocol. This approach enables the use of simple one-way commands such as "Pan Left" or "Zoom in", letting the device handle the actual communications with the PTZ unit and therefore minimising the overall latency. This also has the advantage of allowing PTZ control through a web interface.

As peripheral devices and peer systems adopt IP-based interfacing many of the issues will disappear but until then these are just some of the problems Codestuff's custom development team and the Codestuff Networked Media Software Development Kits are helping to solve.

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