Pros & Cons of Electronic Marshalling for a Safety System

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Electronic Marshalling represents a new technology for connecting hard wired inputs and outputs to a control system. A conventional system requires wiring field inputs and output to a local junction box, then using a ‘home run’ cable to bring the signals from the local junction box to a marshalling panel in a control building, and then using unscrambling wiring to route the signals to respective termination assemblies. The termination assemblies are connected via prefabricated cables to input/output modules in a system chassis. The input/output modules in a chassis are connected via a chassis backplane to controller modules. Each I/O point can require a total of 13 individual connections from the field device to the termination panel. Wiring reports have to be created for the local instrument, for the local junction box and for the marshalling panel. A loop diagram is required for maintenance purposes to provide a picture of the entire route of wiring the field instrument.

Electronic Marshalling allows for the field device to be connected to a local electronic field junction box. The local electronic field junction box then uses two fiber optic cables to communicate with a processor in a local equipment room. This means two wiring connections instead of thirteen, and the potential to replace three wiring reports with one. This also means the potential to eliminate the need for a ‘loop’ drawing.

There are specific and obvious advantages to using electronic marshalling in a safety system, but are there specific disadvantages? This would include the risk incurred in moving from a system that brings specific field inputs to the safety system processor, and instead multiplexes a number of inputs/outputs in a set of fiber optic strands. Electronic marshalling also depends on redundant power being supplied from a local equipment room. The loss of power from the redundant source would mean that a whole junction box worth of safety system inputs/outputs would be lost.

This paper will review the advantages and potential disadvantages to the use of electronic marshalling in safety system applications.