White Paper
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Avoid Costly Change Orders Related to Field Wiring

Smart Junction Boxes Help Accommodate

EMERSON

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Smart Junction Boxes alone can save $14.5M on E&I Engineering, Installation, I/O Equipment (based on 18,000 point installation).

"Emerson's DeltaV Electronic Marshalling allows users to add or change I/O types whenever project design changes are made, and they can do it no matter where the I/O is located. Even more important than reducing projects costs is the reduced time to startup achieved by this kind of an approach."

Engineering Time and Materials Costs Fall by Accommodating I/O Design Changes with Smart Junction Boxes

Long field wires that run from the field to the control room lead to expenses related directly to physical wires, cable trays, and conduit. Increased also are related expenses such as engineering and set-up labor costs. Then, of course, those wires and connections all must be functionally tested, and after that, any late changes to the system design can lead to costly change orders. You don't need to experience these increased costs and headaches. There is a way now to avoid some common challenges you face today when figuring out how to wire and set up I/O for your automation project:

Late I/O changes — Traditionally, I/O wiring is one of the last system project tasks to be completed because the I/O must be known before the I/O SJB design and the control configuration can be started. Once I/O wiring is complete, inevitable design modifications bring labor-intensive changes and costs. Ultimately, the automation system ends up on the critical path, bringing risk to the schedule and incurring costs due to late changes.

Extensive wiring costs — Regardless of design changes, today's wiring methods are expensive. Even in a project with ten thousand wire strands running from the field to the control room, the costs come mostly from labor and cable trays. All those wires must be accurately sorted so they connect the system to the proper field devices.

Substantial engineering and construction expenses — In planning for wiring, projects must consider if they have space in the control room to gather the wires, or if they must create Remote Instrument Enclosures (RIEs). The engineering, materials, labor, and maintenance costs of RIE can be very high.

A More Certain Project Delivered to You in a Box

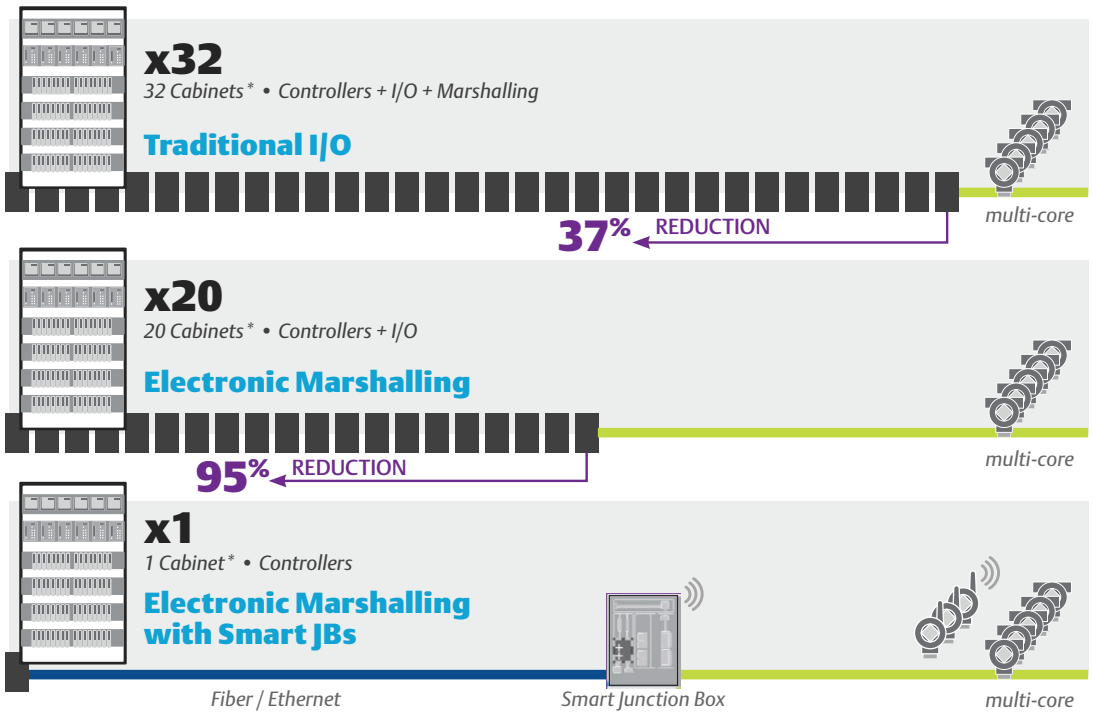
Emerson's Smart Junction Boxes provide an off-the-shelf solution for faster project execution and reduced installation costs. Bring a positive step change to your field enclosures by reducing system footprint, eliminating I/O home run cables, and significantly reducing SJB design engineering with Smart Junction Boxes and Electronic Marshalling technology.

Accommodate and embrace late changes

Smart Junction Boxes add flexibility to your project because you can start installing I/O much earlier in the project with only a rough estimate of I/O count and design. You can pre-order junction boxes and begin designing without knowing the final details of implementation and I/O distribution. In addition, the need for custom design is eliminated by using Electronic Marshalling with CHARacterization Modules (CHARMs) technology. If a late change in I/O is required, you can easily adjust the field signal type through minimal re-engineering and no rewiring.

Cut wiring costs

Eliminate long, expensive multi-core cable runs from field devices to your DeltaV distributed control system (DCS and Safety Instrumented Systems (SIS) SJB in the control room. Instead, use short runs of multi-core cables to connect devices directly to a local Smart Junction Box in the field; connect a less-expensive single fiber or Ethernet cable from the box to the control room (figure 1). Savings are magnified when facilities follow the recommended best practice to use wireless devices for 20% of the project points.



Smart Junction boxes can eliminate $14M of wiring costs and an additional 95% control room space.

*based on 18,000 point installation

Although the project saves money in home-run multi-core cables, savings in wiring costs extend beyond the wires themselves to include engineering time, cable trays, conduits, and all the labor to lay the wire and connect each device. In addition, the redundant Fiber Optic Ethernet connection running from the field to the DeltaV system can simplify migration and modernization projects.

Eliminate or reduce engineering and construction expenses

Emerson Smart Junction Boxes meet specific requirements related to outdoor installation in the field, including environmental protection, heat dissipation, power and grounding requirements, and installation in hazardous areas. Because Smart Junction Boxes are installed directly in the field, they can greatly reduce the equipment room footprint between 90% and 95% by replacing traditional marshalling cabinets with field mounted I/O, and eliminating the cost of a Remote Instrumented Enclosure. The junction boxes are pre-engineered, factory tested, and the wiring design is complete at the terminal block, eliminating a significant portion of upfront engineering.

In addition, the CHARM I/O card (CIOC) and CHARMs Smart Logic Solver (CSLS) within the Smart Junction Box communicates directly to the DeltaV DCS and DeltaV SIS and automatically connects the I/O to the software configuration. Taking only a few minutes per field device, this reduces commissioning hours by as much as 80%.

Contact Emerson to Avoid Overspending on Projects

Emerson Smart Junction Boxes provide fully functional enclosures in a standard, cost-effective way. Work-hours for cabinet design and engineering are eliminated — saving money on the overall project as well as reducing risk that the process automation system might delay the project schedule. Ask Emerson for more certain project success.

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