Ovation™ Safety Instrumented System (SIS) with Electronic Marshalling

Features

- Uniquely scalable modular architecture, based on the CHARMs smart logic solver (CSLS)
- Uses the power of predictive intelligence to increase availability of the entire safety instrumented function
- Integrated into but architecturally distinct from the control system
- Scales to fit any size application
- SIL 3-rated
- Online addition of CHARMs smart logic solver

Overview

Ovation™ SIS with electronic marshalling has a uniquely scalable modular architecture that is based on the characterization modules (CHARMs) smart logic solver (SLS), (occluded as CSLS), and the unprecedented tractability and ease of use of the Emerson Electronic Marshalling solution.

Benefits

Optimized Process Reliability

The majority of failures in SIS applications occur in field instruments and final elements. However, Ovation SIS communicates with intelligent field devices using the HART protocol to diagnose faults before they cause spurious trips. This approach increases process availability and reduces lifecycle costs.

I/O Anywhere It’s Needed

The Ovation SIS CSLS provides an unprecedented flexibility in safety system I/O topology. Safety related I/O can be added anywhere by using standard Ethernet infrastructure hardware. From a local I/O cabinet to remote enclosures miles away, simply install the CSLS and connect it to the Local Safety Network (LSN). Each CSLS can read the input signals from any other CSLS on the same LSN every 50 milliseconds, the same as inputs wired directly to its own LS CHARM system.
Reduces Installed Cost of System

Ovation SIS electronic marshalling helps reduce overall system costs by eliminating internal cabinet cross wiring, reducing the overall footprint, simplifying safety instrumented functions (SIFs), design and reducing factory acceptance test (FAT) activities. Electronic marshalling provides separation between instrumentation and electrical (I&E) hardware installation schedules and SIF development. Wiring can begin earlier knowing any late changes are completed without lifting a wire. The ability to read any input on the LSN provides more efficient cabinet designs and accommodates late scope changes to add I/O anywhere. Adding additional SIF capacity does not require re-wiring I/O; instead, simply read the I/O signals from the proper CSLS.

Fully Redundant Communications

The CSLS architecture is fully redundant, starting with the two logic solvers on a carrier. The carrier has redundant safety network ports (SNPs) for communication with primary and secondary LSN connections. There are two 24 VDC input power connections. The carrier connects to CHARM base plates, providing redundant power and communication busses to the LS CHARMs. The option is also available to use redundant output LS CHARM terminal blocks with or without internal 1 A relays for both de-energize-to-actuate (DTA) and energize-to-actuate (ETA) services because everything is redundant down to the individual channel.

Plug and Play I/O

The Ovation SIS CSLS has been designed for ease of use, both in physical installation and its software tools. Components snap together with secure DIN-rail latches and interlocking carrier connectors. A series of 96 I/O channels can be attached to a DIN rail in a matter of minutes. Insert the LS CHARMs and create the I/O definition in your Ovation SIS configuration database. LS CHARMs use a self-keying system to automatically set a channel for a specific LS CHARM type. Users cannot mistakenly insert a LS CHARM into the wrong terminal block. Field power is provided through a redundant 24 VDC bus to each LS CHARM, with up to 100 mA per LS CHARM. Higher current Discrete Input Channels can be powered through integrated power injection bus local to each CHARM base plate. LS Discrete Output terminal blocks with integrated relays are also available for up to 1 A continuous load.

Flexibility to Meet Project Needs

Ovation SIS system scales to provide the safety coverage needed for SIL 1, 2 and 3 safety functions. Each CSLS provides I/O processing, SIL 3-capable logic solving and diagnostics. This means that processing power is added as the system expands and no additional processors will ever be required. Scan rate and memory usage are constant and independent of system size. Modularity also provides isolation of SIFs. This isolation eliminates single points of failure for improved reliable availability and safety integrity.

LS CHARM Types

A variety of analog and discrete LS CHARMs are available to meet specific requirements. The following LS CHARMs are available starting with Ovation 3.5.2:

- LS AI 4-20 mA HART
- LS RTD
- LS Thermocouple/mV
- LS AI 0-10 VDC Isolated
- LS DI NAMUR
- LS DI 24 VDC Low-side sense (dry contact)
- LS DI 24 VDC Isolated
- LS 24 VDC Power
- LS DO 24 VDC DTA
- LS DO 24 VDC ETA
- LS DVC HART DTA
- LS DO 24 VDC Redundant DTA
- LS DO 24 VDC Redundant ETA
- LS DVC HART Redundant DTA
- LS DI 120 VAC Isolated
- LS DI 230 VAC Isolated
## Ovation SIS CSLS Capacities

<table>
<thead>
<tr>
<th>Item</th>
<th>Limit</th>
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<tbody>
<tr>
<td>Maximum number of CSLSs on a single controller</td>
<td>16</td>
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<tr>
<td>Maximum number of secure parameters per CSLS</td>
<td>96</td>
</tr>
<tr>
<td>Maximum number of CSLS I/O channels on a single controller: 96 CHARMs I/O channels × 16 CSLS</td>
<td>1,536</td>
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<tr>
<td>Maximum number of CSLSs in a single Ovation SIS system: 10 controllers × 16 CSLS per controller</td>
<td>160</td>
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## Hardware Specifications

### Common Environmental Specifications (all components)

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<table>
<thead>
<tr>
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<tr>
<td><strong>Operating Temperature</strong></td>
<td>-40 to 70°C (-40 to 158°F)</td>
</tr>
<tr>
<td><strong>Storage Temperature</strong></td>
<td>-40 to 85°C (-40 to 185°F)</td>
</tr>
<tr>
<td><strong>Relative Humidity</strong></td>
<td>5 to 95%, non-condensing</td>
</tr>
<tr>
<td><strong>Protection Rating</strong></td>
<td>IP 20, NEMA 12</td>
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<tr>
<td><strong>Airborne Contaminants</strong></td>
<td>ISA-S71.04-1985 Airborne Contaminants Class G3 - Conformal coating</td>
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<tr>
<td><strong>Shock</strong></td>
<td>10 g ½-sine wave for 11 milliseconds</td>
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<tr>
<td><strong>Vibration</strong></td>
<td>1 mm peak-to-peak from 2 to 13.2 Hz; 0.7G from 13.2 to 150 Hz</td>
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