

# DeltaV SIS™ with Electronic Marshalling for Migrations

- I/O anywhere you need it
- Flexibility to meet project needs
- Replaces legacy Safety System I/O in place
- Optimized process reliability
- Simplified safety lifecycle management
- Field-mounted capable hardware



*DeltaV Safety Instrumented System (SIS) CHARMs Smart Logic Solver (CSLS) mounted on a Migration Panel.*



*DeltaV SIS Baseplate Migration Panel.*

## Introduction

The DeltaV SIS process safety system has a uniquely scalable modular architecture that is based on the CHARMs Smart Logic Solver and the unprecedented flexibility and ease of use of the Emerson Electronic Marshalling solution. Each CSLS provides I/O processing, SIL 3-capable logic solving, and diagnostics in a single logic solver. The CSLS supports up to 96 individually configurable channels, allowing flexibility for implementing safety instrumented functions and is designed specifically for multi-core home run cables or field junction box installation. All communications are completely redundant from the channel (LS CHARM) to the CSLS. Integrated HART® I/O brings field diagnostics into the CSLS.

## Benefits

**I/O anywhere you need it.** The DeltaV SIS CSLS provides an unprecedented flexibility in safety system I/O topology. Using standard Ethernet infrastructure hardware you can add safety related I/O anywhere you need it. 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 ms, the same as the inputs wired directly to its own LS CHARM system.

**Flexibility to meet Project needs.** Whether you have an isolated wellhead or a large emergency shutdown (ESD) application, the DeltaV SIS system scales to provide you with the safety coverage you need for your 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 safety instrumented functions (SIF). This isolation eliminates single points of failure for improved availability and safety integrity.

The DeltaV SIS system looks for new hardware every scan, so equipment can be added to a running system in real time. Online addition of new logic solvers will not interrupt your process.

**Replaces Legacy Safety System I/O in place.** DeltaV SIS with Electronic Marshalling goes where no one else's I/O can. Install the LS CHARMS migration panel above, below, or even in front of your legacy termination panel and move your wires inches to complete your migration to DeltaV SIS. Since the LS CHARMS migration panel is a standard LS CHARMS baseplate, it talks to the CSLS the same as the standard vertical installation through the cable interface. This allows you to mount the migration panel in the best location to facilitate a clean system cutover and not how to "stretch" your I/O cables to a new termination. As an added bonus, install LS CHARMS vertical if your wiring allows for it in certain areas. Now you can mount your I/O in any orientation as best fits your current migration layout and needs.

**Optimized process reliability.** Emerson has extended the benefits of the PlantWeb® architecture to SIS, with DeltaV SIS being a key component of the Smart SIS solution. Research shows that over 90% of all faults in SIS applications occur in field instruments and final elements. The DeltaV SIS process safety system has the world's first Smart Logic Solver using LS CHARMS. It 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.

**Simplified safety lifecycle management.** The DeltaV SIS CSLS's are SIL 3-rated for both simplex and redundant architectures. Redundant pairs of CSLSs can be installed for increased process availability of your SIFs.

**Field-mounted capable hardware.** All components of the CSLS are rated for installation in Class 1/Div 2 or Zone 2 hazardous locations. The extended operating temperature ranges and G3 environment rating allows them to be installed in field-mounted junction boxes. This further reduces the footprint required in central equipment rooms, as well as reduces the overall wiring infrastructure of traditional multi-core instrumentation cable.



LS CHARM and Terminal Block.

## Product Description

### DeltaV SIS with Electronic Marshalling for Migrations hardware includes:

- CSLS Carrier (DIN-rail mounted and supports redundant pair of CSLS and Power Modules)
- CSLS (provides redundant safety logic processing and communication up to 96 LS-CHARMs)
- CHARM Baseplate (DIN-rail mounted with interleaving power and bus connectors. Supports 12 CHARMs and their terminal blocks, as well as connection for injected field power)
- LS CHARM Terminal Block (removable terminal block providing terminal connections to field wiring and physical latch for LS CHARM)
- LS CHARMs (Logic Solver Characterization Module for each field signal. Provides basic analog to digital conversion and signal isolation to the redundant communication bus)
- Cable Extenders that provide flexibility in carrier mounting
- Baseplate terminators (provides bus terminations for redundant I/O bus)
- 19" CSLS Migration Panels (provides DIN-rail mounting for two migration CSLS's or one SZ Controller and one migration CSLSs or two baseplates and cable extenders for installation into your standard 19" legacy cabinets.)



*CSLS Migration Panel.*

The SZ and CSLS carrier are supposed to be mounted on a vertical DIN-rail and can communicate with up to eight CHARM Baseplates mounted vertically or on migration panels and connected to each other through extender cables. The bus terminators are attached to the last baseplate.



*DeltaV SIS Baseplate Migration Panel.*

Each DeltaV SIS Migration Baseplate Assembly is ordered pre-loaded with 24 terminal blocks that are ready to receive field wires from 2-, 3-, and 4-wire devices. Electronic Marshalling eliminates the need to scramble the field wiring or to partition the I/O in order to match signals to channel types of specific cards. Simply connect field signals in an orderly fashion as desired. Insert the appropriate LS CHARM into each terminal block to complete the field circuit.

For each Migration CSLS installation you will need to determine the quantity and connector cable length as well as the appropriate quantity of top and/or bottom baseplate terminators.

The Migration CSLS assembly has a height of 7 EIA units (12.22 inches) and is designed to be mounted at the top of the migration cabinet and connected to the DeltaV SIS base plate assemblies through the cables and cable extenders. It should be noted that the SZ or CSLS can be mounted on vertical DIN-rail anywhere in the cabinet (front, back, side, top, middle, bottom...) and connected to the DeltaV SIS baseplate assembly the same way. NOTE: the SZ or CSLS cannot be mounted on a horizontal DIN-rail.

The DeltaV SIS Migration CHARM baseplate assembly has a height of 3 EIA units (5.25 inches), which allows for each installation to determine the mounting location within each cabinet. The user can decide to reuse existing wire way / cable tray, mount each assembly adjacent to each other, or mount with spacing between each assembly. LS CHARMs allow for installation flexibility by allowing each assembly to be mounted as needed to achieve the best result for each customer specific termination installation.

Each LS CHARM acts as circuit protection device and field wiring disconnects. Signals are current limited or fused to protect against wiring faults to ground. Each LS CHARM provides surge protection to meet industry standards in the area of EMC, and is designed to fail during overvoltage conditions due to incorrect field wiring. Signal faults are isolated to the single LS CHARM.

LS CHARMs can be partially ejected to a locked position that disconnects the field wiring from the system to perform field maintenance actions or to remove power to a field device. Activating the LS CHARM latch ejects the LS CHARM to the detent position. Closing the latch locks the LS CHARM in place and isolates the field wiring for field work.

A pair of CSLs installs on the carrier and communicates over a redundant Ethernet safety network with up to 15 other CSLs' and 1 SZ controller, allowing great flexibility and ease of system expansion. Safety Network Ports are available for copper only.

*Only DeltaV SIS Smart Switches* are supported on the Local Safety Network.

### LS CHARM Types

All LS CHARM types function on the migration panel. See **PDS DeltaV SIS with Electronic Marshalling** and **PDS DeltaV SIS with IS Electronic Marshalling** for a complete listing of LS CHARMs and LS IS CHARMs.

### I/O Terminal Block Options

All IS and non IS I/O Terminal Block types function on the migration panel by choosing the right baseplate assembly.

### LS CHARM Keying Posts

Keying Posts function the same.

### SZ or CSLS Hardware

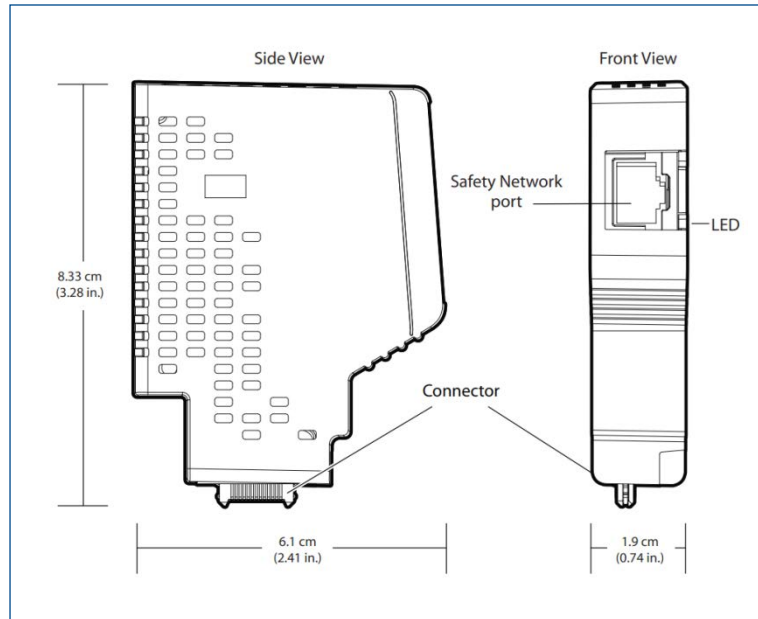
See PDS DeltaV SIS with Electronic Marshalling and PDS DeltaV SIS with IS Electronic Marshalling for a complete description of DeltaV SIS Hardware.

### SZ or CSLS Carrier

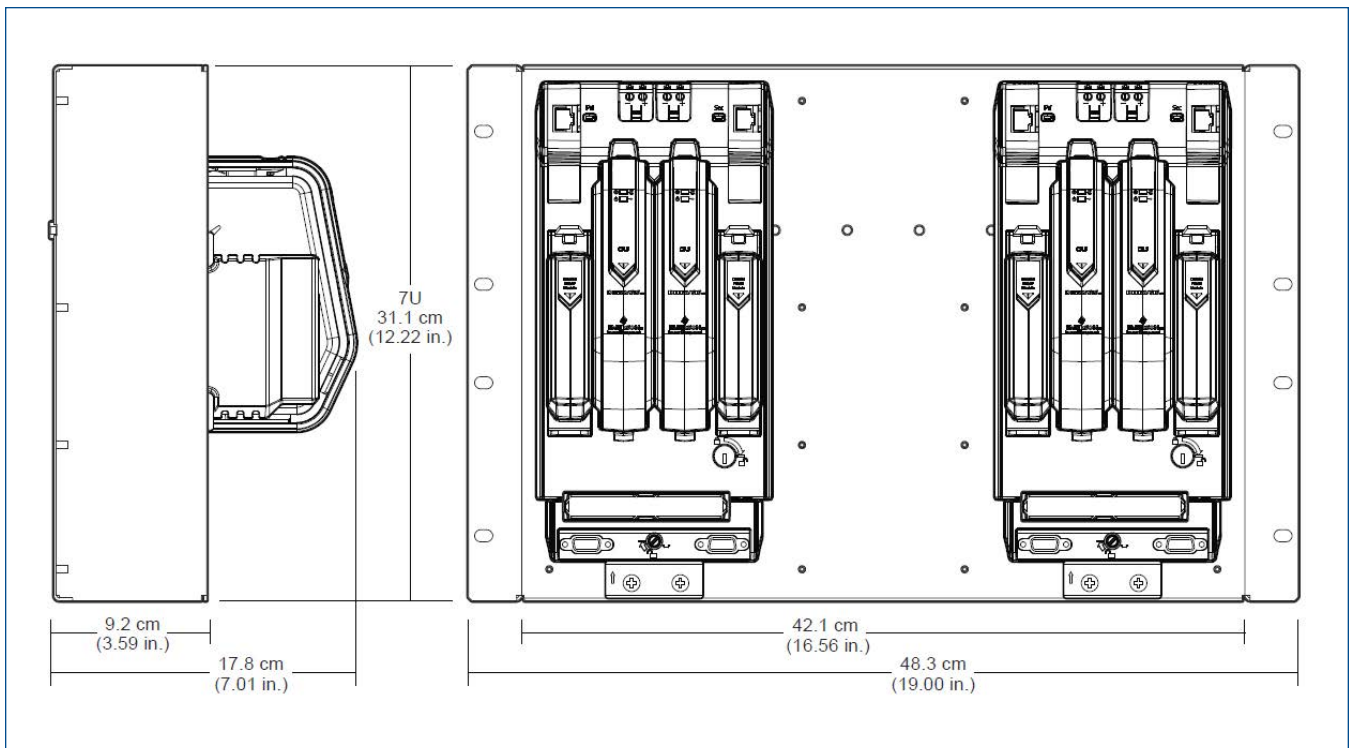
See **PDS S-series Electronic Marshalling** and **PDS S-series IS Electronic Marshalling** for a complete description of DeltaV SIS Hardware.

## Hardware Specifications

CSLS Migration Panel	
Environmental Specifications	
Operating Temperature	-40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95%, non-condensing
Protection Rating	IP 20, NEMA 12
Airborne Contaminants	ISA-S71.04-1985 Airborne Contaminants Class G3 Conformal coating
Shock	10 g ½-sine wave for 11 ms
Vibration	1 mm peak-to-peak from 5 to 13.2 Hz; 0.7 g from 13.2 to 150 Hz
Dimensions	
Height	12.2 in (31.1 cm)
Depth	7.01 in (17.8 cm)
Width	19 in (48.3 cm)
Mounting	19 in (48.3 cm) EIA rails 7 Rack Units (U) high

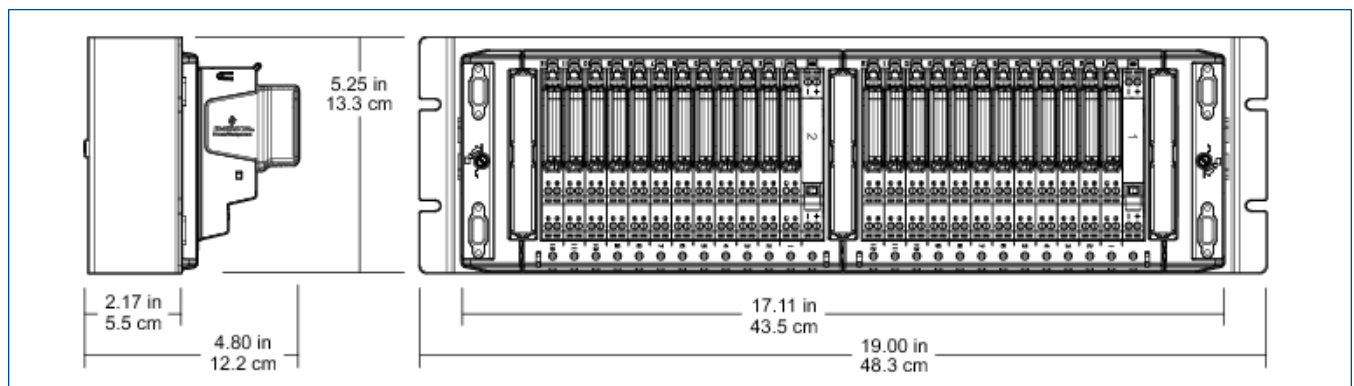


CSLS Safety Network Port.

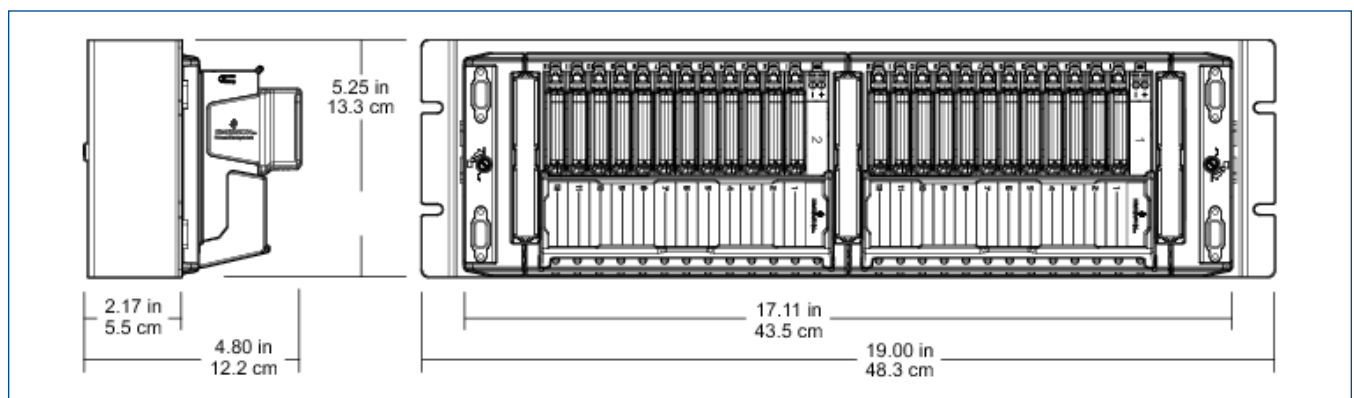


CSLS Migration Panel.

CHARM Baseplate Migration Panel	
Environmental Specifications	
Operating Temperature	-40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% , non-condensing
Protection Rating	IP 20, NEMA 12
Airborne Contaminants	ISA-S71.04-1985 Airborne Contaminants Class G3 Conformal coating
Shock	10 g ½-sine wave for 11 ms
Vibration	1 mm peak-to-peak from 5 to 13.2 Hz; 0.7 g from 13.2 to 150 Hz
Dimensions	
Height	5.25 in (13.3cm)
Depth	4.8 in (12.2 cm)
Width	19 in (48.3 cm)
Mounting	19 in (48.3 cm) EIA rails 3 Rack Units (U) high

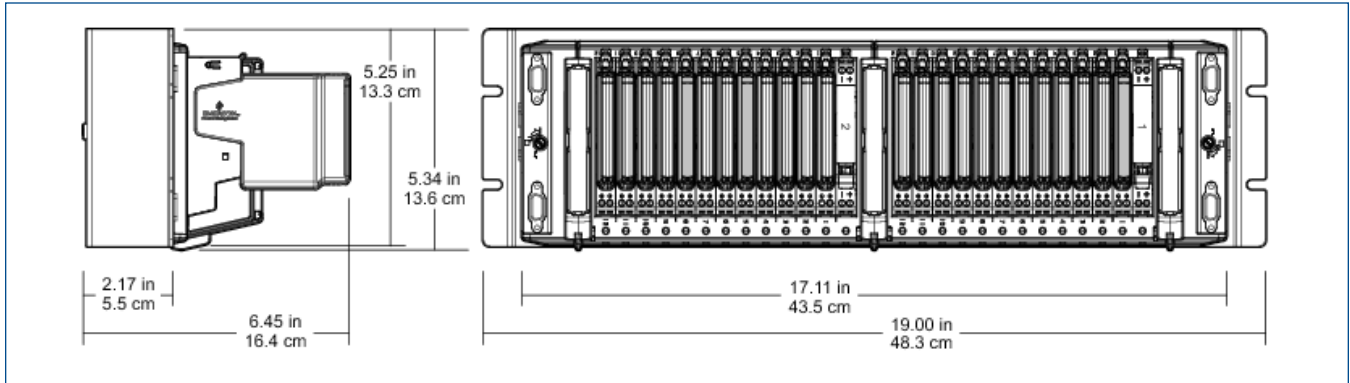


DeltaV SIS Baseplate Migration Panel without Channel Identifier Labels.

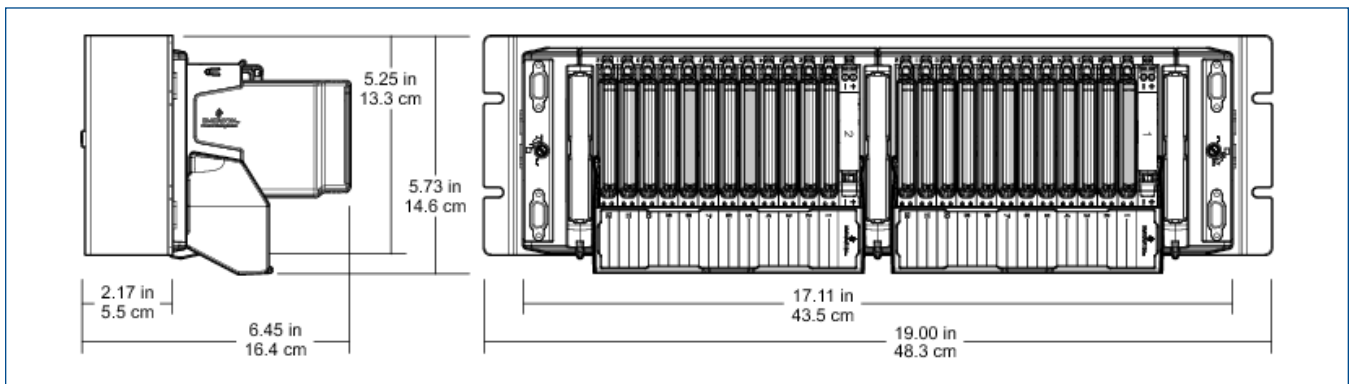


DeltaV SIS Baseplate Migration Panel with Channel Identifier Labels.

<b>IS CHARM Baseplate Migration Panel</b>	
<b>Environmental Specifications</b>	
Operating Temperature	-40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% , non-condensing
Protection Rating	IP 20, NEMA 12
Airborne Contaminants	ISA-S71.04-1985 Airborne Contaminants Class G3 Conformal coating
Shock	10 g ½-sine wave for 11 ms
Vibration	1 mm peak-to-peak from 5 to 13.2 Hz; 0.7 g from 13.2 to 150 Hz
<b>Dimensions without Channel Identifier Labels</b>	
Height	5.34 in (13.6 cm)
Depth	6.45 in (16.4 cm)
Width	19 in (48.3 cm)
Mounting	19 in (48.3 cm) EIA rails 3 Rack Units (U) high
<b>Dimensions with Channel Identifier Labels</b>	
Height	5.73 in (14.6 cm)
Depth	6.45 in (16.4 cm)
Width	19 in (48.3 cm)
Mounting	19 in (48.3 cm) EIA rails 3 Rack Units (U) high



DeltaV SIS IS Baseplate Migration Panel without Channel Identifier Labels for IS CHARMs.



DeltaV SIS IS Baseplate Migration Panel with Channel Identifier Labels for IS CHARMs.

### System Compatibility (Optional)

See PDS S-series Electronic Marshalling and PDS S-series IS Electronic Marshalling for a complete description of CHARMs Compatibility.

### Certifications (Optional)

See PDS S-series Electronic Marshalling and PDS S-series IS Electronic Marshalling for a complete description of CHARMs certification.



## Ordering Information

CSLS for Migrations	
Description	Model Number
<b>Redundant CSLS Assembly for SIS Migration</b> , includes CSLS Carrier, 2 CSLSs, 2 Power Modules, 2 single Safety Network Ports for twisted copper, 2 Power Plugs, Baseplate Extender with bottom Cable Connectors, Baseplate Identifier and Baseplate Separation Wall	SS6501T03
<b>CHARMs Migration CSLS Panel</b> 19-Inch Migration panel with DIN-rail support for 2 redundant migration CSLSs  <b>Important Note:</b> This 19-Inch Migration Panel arrives with a premounted Printed Wire Board. The Printed Wire Board is mounted with screws on swage nuts, so disassembling of the Printed Wire Board is required to allow DIN-Rail mounting on the swage nuts using the provided screws. Each vertical DIN-rail requires a DIN Rail stop to lock baseplates in position. Order VE4054DRS, which is a box of 5.	SS6503T01
CSLS Baseplates for Migrations	
Description	Model Number
<b>CSLS Migration Baseplate Assembly:</b> <ul style="list-style-type: none"> <li>■ Two CHARM Baseplates</li> <li>■ Two CHARM Address Terminal Blocks with screw terminals</li> <li>■ 24 Standard CHARM Terminal Blocks</li> <li>■ CHARM Baseplate Extender with Cable Connectors – Top</li> <li>■ CHARM Baseplate Extender with Cable Connectors – Bottom</li> <li>■ 19" migration panel with DIN-rail</li> <li>■ 3 Baseplate Identifiers</li> </ul>	SS4601T03
<b>CSLS Migration Baseplate Assembly with 3-wire DI Fused-Injected Field Power:</b> <ul style="list-style-type: none"> <li>■ Two CHARM Baseplates</li> <li>■ Two CHARM Address Terminal Blocks with screw terminals</li> <li>■ 24 3-wire DI Fused-Injected Power CHARM Terminal Blocks</li> <li>■ CHARM Baseplate Extender with Cable Connectors – Top</li> <li>■ CHARM Baseplate Extender with Cable Connectors – Bottom</li> <li>■ 19" migration panel with DIN-rail</li> <li>■ 3 Baseplate Identifiers</li> </ul>	SS4601T10
<b>CSLS Migration Baseplate Assembly with Fused-Injected Field Power:</b> <ul style="list-style-type: none"> <li>■ Two CHARM Baseplates</li> <li>■ Two CHARM Address Terminal Blocks with screw terminals</li> <li>■ 24 Fused-Injected Power CHARM Terminal Blocks</li> <li>■ CHARM Baseplate Extender with Cable Connectors – Top</li> <li>■ CHARM Baseplate Extender with Cable Connectors – Bottom</li> <li>■ 19" migration panel with DIN-rail</li> <li>■ 3 Baseplate Identifiers</li> </ul>	SS4601T04
CSLS for Migrations	
Description	Model Number
<b>CSLS Migration Baseplate Panel:</b> 19" Migration panel with DIN-rail support for 2 CHARM Baseplates and Cable Extenders	KL4504X1-BA1

IS CHARM Baseplates for Migrations	
Description	Model Number
<p><b>CSLS IS Migration Baseplate Assembly:</b></p> <ul style="list-style-type: none"> <li>■ Two IS CHARM Baseplates</li> <li>■ Two IS CHARM Address Terminal Blocks</li> <li>■ 24 IS CHARM Standard Terminal Blocks</li> <li>■ CHARM Baseplate Extender with Cable Connectors – Top</li> <li>■ CHARM Baseplate Extender with Cable Connectors – Bottom</li> <li>■ 19” migration panel with DIN-rail</li> <li>■ 3 Baseplate Separation Walls</li> </ul> <p><b>Important Note:</b> The LS IS CHARMS have dimensional differences from non-LS IS CHARMS. The IS CHARM Base plates are supposed to be mounted on the same 19” migration panel as the non-IS Base plates, therefore the LS IS CHARMS will stick 45 mm further out of the 19” frame than non-LS IS CHARMS!</p>	SS4608T02
CHARM I/O Baseplate Address Plugs	
Description	Model Number
<b>CHARM Addressing Plugs</b> , includes Address Plugs 1 through 8	SS4602
<b>CHARM Addressing Plugs</b> , includes Address Plugs 1 through 4	SS4613

## Prerequisites

DeltaV SIS with Electronic Marshalling hardware requires DeltaV v12.3 or later software.

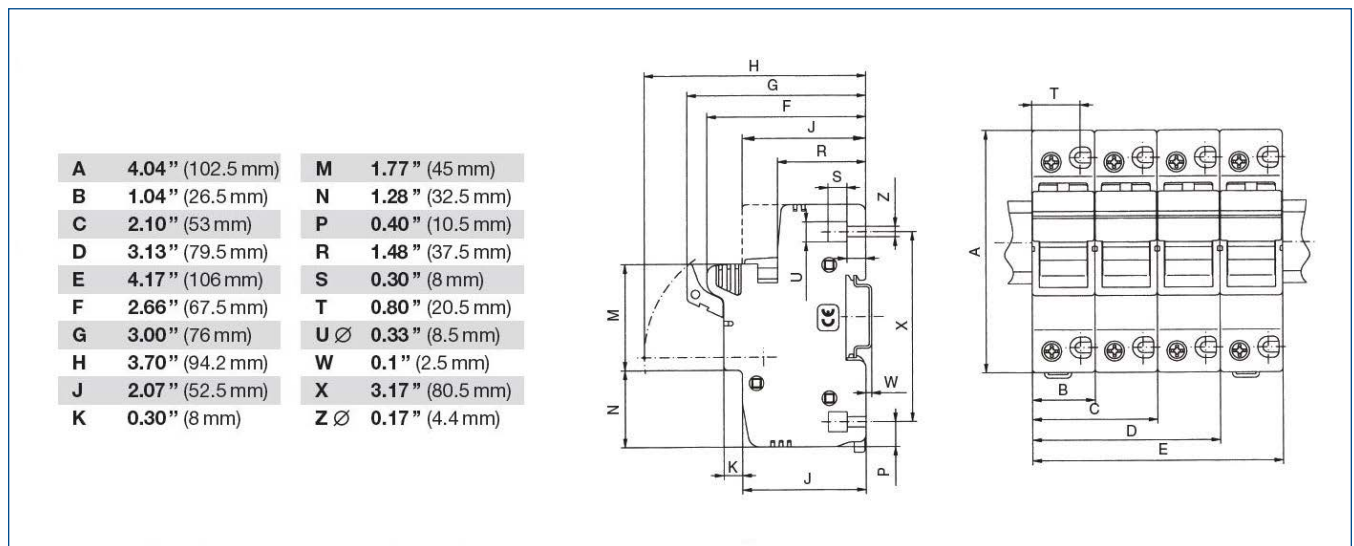
- \* LS IS Thermocouple/mV CHARM requires DeltaV SIS v13.3. or later software to be able to configure and use the CHARM
- \* LS IS RTD CHARM requires DeltaV SIS v13.3. or later software to be able to configure and use the CHARM
- Only DeltaV SIS Smart Switches are supported on the Local Safety Network.

CHARM I/O Baseplate Extender, Terminator and Cables	
Description	Model Number
<b>CSLS Baseplate Extender with Cable Connectors, Top (Male)</b> includes a Baseplate Identifier and a Baseplate Separation Wall	SS4603T05
<b>CSLS Baseplate Extender with Cable Connectors, Bottom (Female)</b> includes a Baseplate Identifier and a Baseplate Separation Wall	SS4603T06
<b>CSLS Baseplate Terminator, Top (Male)</b> includes a Baseplate Identifier and a Baseplate Separation Wall	SS4604T03
<b>CSLS Baseplate Terminator, Bottom (Female)</b> includes a Baseplate Identifier and a Baseplate Separation Wall	SS4604T04
<b>CSLS Baseplate Cables</b> , includes two 0.5m cables	SS4605T02
<b>CSLS Baseplate Cables</b> , includes two 1m cables	SS4605T03
<b>CSLS Baseplate Cables</b> , includes two 2m cables	SS4605T04

Each vertical DIN-rail requires a DIN-rail stop to lock baseplates in position. Order VE4054DRS, which is a box of 5.

IS CHARM FUSE	
Description	Model Number
<b>Fuse Holder and Fuse Assembly for 24V DC Power Supply of CHARM I/O CARD</b>	SS4610T01 *

\* Two of these Fuse Assemblies have to be ordered with any SE6501T03 or SE6501T04, when used with IS CHARM baseplates.



## LS CHARM I/O Labeling and Spare part ordering Information

LS CHARM I/O Labeling and Spare Parts	
Description	Model Number
Channel Identifier Labels for CSLS Baseplates; Package of 8	SS4606T02
CSLS Charm Baseplate Identifier; Package of 9	SS4606T03
250V 2A Fuse for Fused Terminal Block; Box of 20	KJ4010X1-BC1
Power Terminal Plug for SZ or CSLS Carrier	KJ4005X1-BF1
Ethernet Isolation Port; twisted copper; for SZ ControllerCarriers	KL1604X1-BA1
Power Module for CSLS Carriers	KL1501X1-BA1
Safety Network Ports twisted copper; for CSLS Carriers	KL1603X1-BA1

## LS IS CHARM I/O Labeling and Spare part ordering Information

LS IS CHARM I/O Labeling and Spare Parts	
Description	Model Number
Channel Identifier Labels for CSLS IS CHARM Baseplates; Package of 8	SS4609T01
CSLS IS Charm Baseplate Separation Wall; Package of 9	SS4609T02
Replacement Fuse for SE4610T01 Fuseholder Assembly	KL4510X1-FA1
Replacement Fuseholder for SE4610T01 Fuseholder Assembly	KL4510X1-GA1

### Emerson

#### North America, Latin America:

+1 800 833 8314 or  
+1 512 832 3774

#### Asia Pacific:

+65 6777 8211

#### Europe, Middle East:

+41 41 768 6111

[www.emerson.com/deltav](http://www.emerson.com/deltav)

©2016, Emerson Process Management. All rights reserved.

The Emerson logo is a trademark and service mark of Emerson Electric Co. The DeltaV logo is a mark of one of the Emerson Process Management family of companies. All other marks are the property of their respective owners.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice.