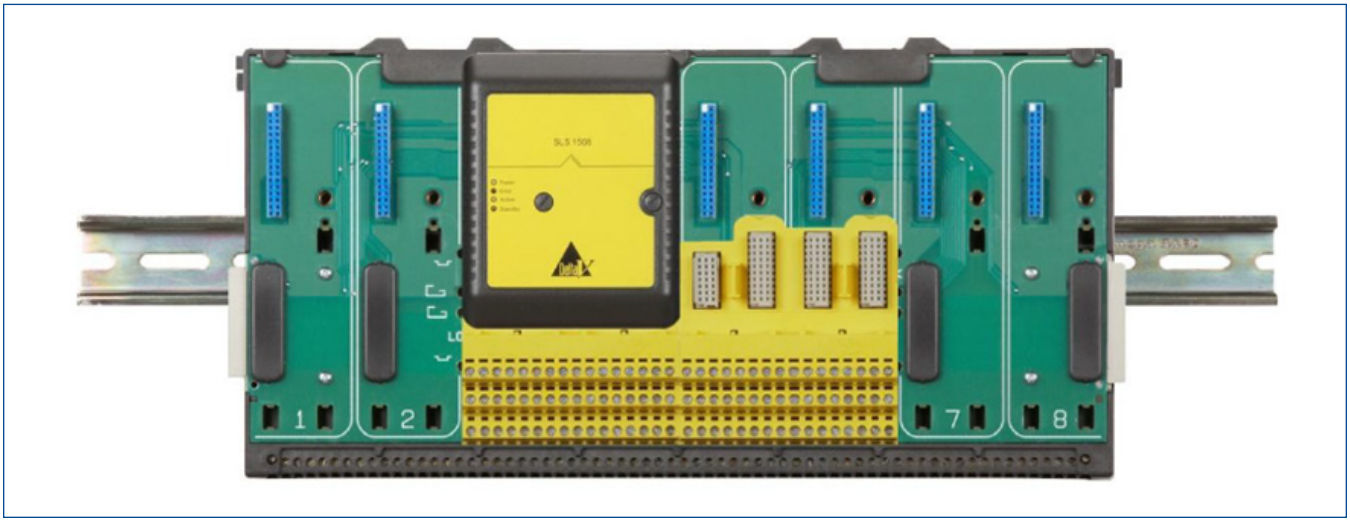
DeltaV SIS™ Hardware Carriers



The DeltaV SIS™ modular architecture is easy to install and maintain.

Provides an additional level of economical cyber-protection to your DeltaV™ controllers.

- Flexible installation options
- Online expansion capability
- DeltaV process control system I/O on same carrier

Introduction

The DeltaV SIS™ process safety system has a uniquely scalable modular architecture that is based on the Smart Logic Solver (SLS). DeltaV SIS logic solvers are mounted on carriers for plug-and-play installation. The logic solver carriers can be installed in the best orientation to meet your needs.

The SIS controller is the interface to engineering, operations and maintenance. While the SIS controller is mounted on a separate carrier, it is plugged into the logic solver carrier for easy installation.

Benefits

Flexible installation options. The DeltaV SIS logic solver carriers support both simplex and redundant logic solvers. Each carrier can handle a mixture of simplex and redundant logic solvers. Logic solver carriers can be mounted in a horizontal or vertical orientation, depending on your cabinet design.

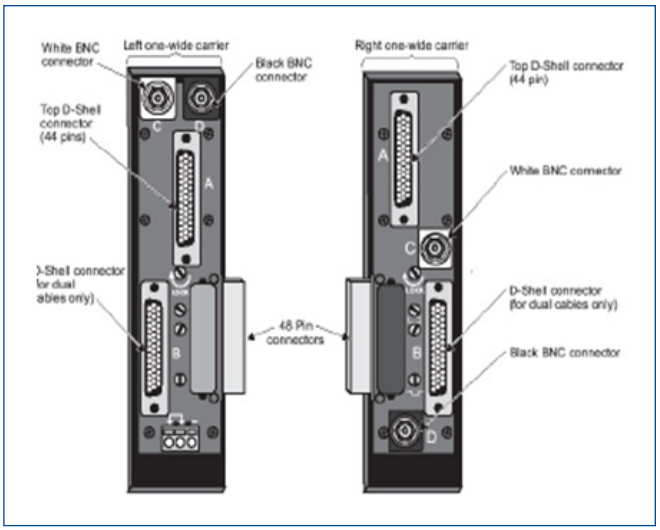
Online expansions. Additional carriers may be added online as needed, with no effect on the existing installation.

Integrated but separate architecture

DeltaV I/O on same carrier. If the DeltaV system is used as your basic process control system (BPCS), the DeltaV I/O may be mounted on the same carrier as the DeltaV SIS logic solvers. The BPCS network is completely separate from the safety network, meeting the IEC 61511 requirements for separation, while reducing space and hardware costs by utilizing the same carrier.

DeltaV SIS logic solvers mounted vertically.

DeltaV SIS logic solvers mounted horizontally.



Front view of dual carrier extenders.

Product Description

There are three types of carriers used for DeltaV SIS hardware – the logic solver carrier, the SIS controller carrier and the SISNet Repeater carrier. All hardware carriers are mounted on a T-type DIN rail.

Logic Solver Carriers

The logic solver carrier provides individual connections to each logic solver (or redundant pair) for bussed field power. There are two logic solver carrier sizes – an 8-wide carrier and a 4-wide carrier. Each 8-wide logic solver carrier can hold up to four simplex or up to two redundant pairs of logic solvers and each 4- wide logic solver carrier can hold up to two simplex or one redundant pair of logic solvers. A total of eight logic solver carriers are supported in one DeltaV SIS node. The logic solver carrier can also be used for DeltaV M-series I/O, when the DeltaV process control system is used.

The DeltaV SIS logic solvers may be mounted on either VerticalPlus carriers or Horizontal carriers. Both styles of logic solver carriers are designed to use the same logic solver terminal blocks.

For the horizontal-mount solution, 'one-wide' local SISNet extenders allow continuation of the SISNet on a different row of carriers. These dual carrier extenders have two, 44-pin D-Shell connectors which support dual cables for a fault tolerant configuration. The two connectors are in parallel so either port may be used.

The vertical-mount solution has similar carrier extenders to connect carriers that cannot be mounted next to each other. The VerticalPlus connectors also have two, 44-pin D-Shell connectors for a fault tolerant solution with dual cables.

SIS Controller Carrier

The SIS controller sends and receives information from maintenance, operations, and engineering stations. This SIS controller is certified by TÜV as being non-interfering and physically separate and independent from the execution of the safety system. The SIS controller may be designated as redundant for increased availability.

There are horizontal- and vertical-mount options for the SIS controller carrier as well. For either installation option, the SIS controller carrier plugs right into the logic solver carriers.

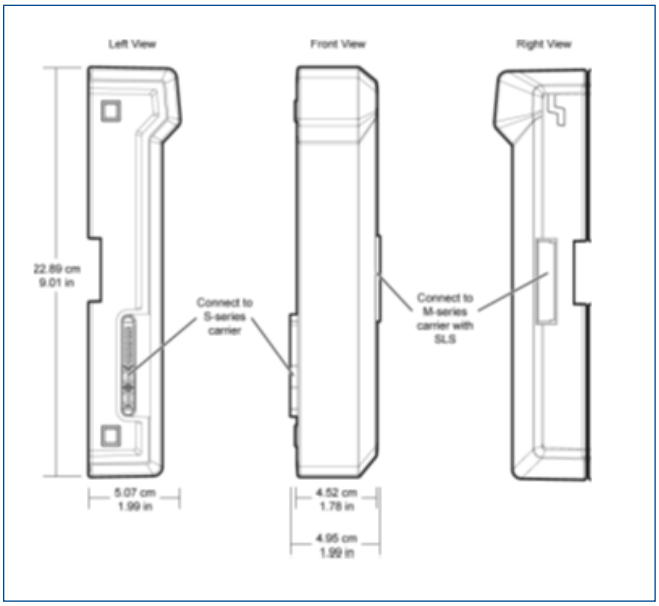
The VerticalPlus carrier for the SIS controller carrier has the capacity for redundant SIS controllers and associated power supplies. The horizontal carrier has the capacity for one SIS controller and associated power supply. For redundancy, two horizontal carriers can be connected.

SISNet Repeater Carrier

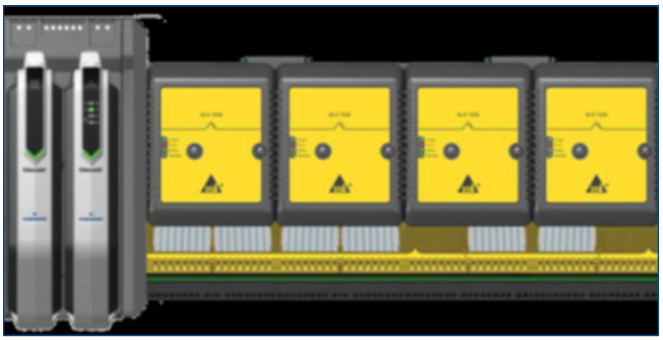
The SISNet Repeater carrier provides pass through connections for railbus signals and power required if DeltaV I/O cards are installed. There is a primary and a secondary SISNet Repeater on each carrier. The carrier provides peer-to-peer signal connection from the SISNet Repeater to the rest of the system and a communication signal connection between the two SISNet Repeaters.

For vertical-mount installations, the SISNet Repeater carrier is installed on the top of a vertical system. This is a '4-wide' carrier.

For horizontal-mount installations, the SISNet Repeater carrier may be installed anywhere between the SIS controller carrier and the system's terminator. The '2-wide' SISNet Repeater carrier may be plugged into the SIS controller carrier or the logic solver carrier.



Front and side views and dimensions of the DeltaV SIS S-series adapter.



DeltaV SIS logic solvers using S-series controller as the interface to engineering, maintenance and operations.

DeltaV SIS S-series Adapter

Using the DeltaV SIS system with DeltaV S-series hardware with a horizontal carrier is accomplished with the use of a DeltaV SIS S-series Adapter.

With this adapter, the DeltaV SIS logic solver carrier can be connected to either an S-series power/controller carrier or an S-series I/O carrier. The adapter is needed if the project selects S-series SIS controllers to interface to the engineering and operator stations.

The adapter is also needed if the DeltaV BPCS has S-series I/O cards on the same node as the DeltaV SIS logic solvers. For the latter case, the DeltaV SIS logic solver carrier must be the end carriers.

DeltaV SIS logic solvers on the same node as DeltaV S-series I/O cards.

DeltaV SIS Hardware Carrier Specifications

Dimensional Specifications – Horizontal Carriers

Dimension	Specifications
M-series Horizontal SIS Controller Carrier	
Height	16.5 cm / 6.5 in
Width	8.4 cm / 3.3 in
Depth	3.1 cm / 1.2 in
Connector To Connector Width	9.1 cm / 3.6 in
S-series Horizontal SIS Controller Carrier	
Height	22.9 cm / 9.02 in
Width	9.0 cm / 3.54 in
Depth	6.5 cm / 2.56 in
Connector To Connector Width	10.3 cm / 4.05 in
8-wide Horizontal Logic Solver Carrier	
Height	16.5 cm / 6.5 in
Width	33.6 cm / 13.2 in
Depth	3.1 cm / 1.2 in
4-wide Horizontal Logic Solver Carrier	
Height	16.9 cm / 6.7 in
Width	17.0 cm / 6.7 in
Depth	3.1 cm / 1.2 in
Carrier Extender	
Height	16.5 cm / 6.5 in
Width	4.2 cm / 1.7 in
Depth	3.1 cm / 1.2 in

Dimensional Specifications – VerticalPlus Carriers

Dimension	Specifications
VerticalPlus SIS Controller Carrier	
Height	17.86 cm / 7.03 in
Width	22.78 cm / 8.96 in
Depth	2.81 cm / 1.11 in
VerticalPlus Logic Solver Carrier	
Height	50.8 cm / 20.0 in
Width	22.78 cm / 8.96 in
Depth	2.81 cm / 1.11 in

VerticalPlus SISNet Repeater Carrier	
Height	17.86 cm / 7.03 in
Width	22.78 cm / 8.96 in
Depth	2.81 cm / 1.11 in

Common Environmental Specifications

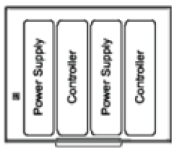
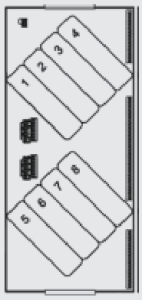
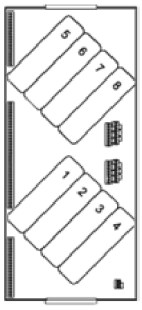
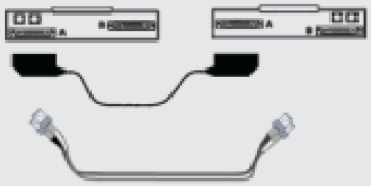
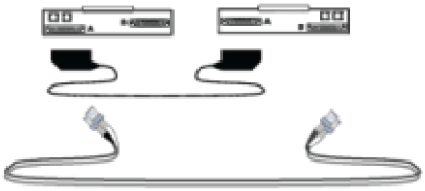
Category	Specifications
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature*	-40 to 70°C (-40 to 158°F)
Relative Humidity	5 to 95% , non-condensing
Airborne Contaminants	ISA-S71.04-1985 Airborne Contaminants Class G3 Conformal Coating
Protection Rating	IP 20
Hazardous Area/Location	Class 1, Div 2, Groups A, B, C, D, T4 hazardous locations ATEX II 3G Ex ec IIC T4 Gc
Shock	10 g ½-sine wave for 11 ms
Vibration	1 mm peak-to-peak from 5 to 16 Hz; 0.5 g from 16 to 150

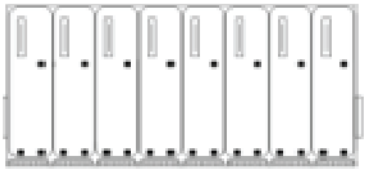
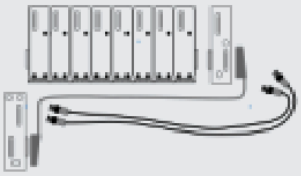
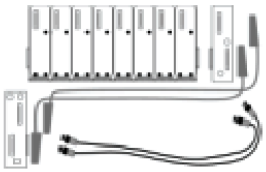
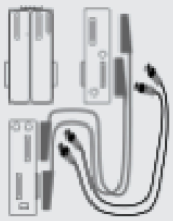
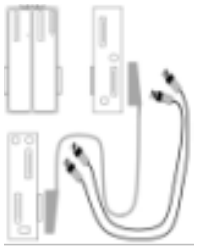
**Operating any electronics at the higher end of its temperature range for long periods of time will shorten its expected lifetime,*

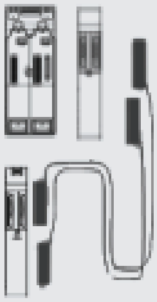
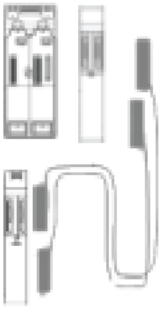
see **Effects of Heat and Airflow Inside an Enclosure White Paper** *for more information.*

*** See actual certificates for exact product markings for each product.*

Ordering Information

VerticalPlus Carriers		
Description	**View**	**Model Number**
4-wide VerticalPlus SIS controller carrier		VE3056
8-wide VerticalPlus logic solver carrier; left side *Notes:* *- Each logic solver covers two slots on the carrier.* *- Logic solvers may be inter-mixed with DeltaV M-series I/O cards on the carrier*		VE4054S1C0
8-wide VerticalPlus logic solver carrier; left side *Notes:* *- Each logic solver covers two slots on the carrier.* *- Logic solvers may be inter-mixed with DeltaV M-series I/O cards on the carrier*		VE4054S2C0
VerticalPlus logic solver carrier extension assembly, 0.4 meter (consists of Start Extender, End Extender, 0.4 meter (17 inch) Railbus Cable, redundant pair of 0.8 meter (33 inch) SISNet coax cables)		VS4015R17
VerticalPlus logic solver Carrier extension assembly, 1.1 meter (consists of Start Extender, End Extender, 1.1 meter (43 inch) railbus cable, redundant pair of 1.2 meter (46 inch) SISNet coax cables)		VS4015R43

Horizontal Carriers		
Description	**View**	**Model Number**
8-Wide logic solver horizontal carrier with carrier shield bar		VE4050S2K1C0
8-Wide logic solver horizontal carrier with carrier shield bar, single enhanced carrier extender cable, and redundant SISNet coax cables		VE4050E1C2
8-Wide logic solver horizontal carrier with carrier shield bar, dual enhanced carrier extender cables, and redundant SISNet coax cables		VE4050E2C2
4-Wide logic solver horizontal carrier with carrier shield bar		VE4040E0C0
2-Wide, horizontal SIS controller carrier		VE3051C0
2-Wide, horizontal SIS controller carrier with dual enhanced extender cables and redundant SISNet coax cables		VE3051C4
2-Wide, horizontal SIS controller carrier with single enhanced extender cable and redundant SISNet coax cables		VE3051C5

S-series 2-Wide, horizontal SIS controller carrier		SE3051C0
S-series 2-Wide, horizontal SIS controller carrier with dual extender cables		SE3051C2
S-series 2-Wide, horizontal SIS controller carrier with single extender cable		SE3051C3
Carrier blank cap for logic solver carrier		VE6101

Related Products

For detailed information about the following products, refer to the appropriate product data sheet:

- **DeltaV SIS Logic Solvers.** The DeltaV SIS process safety system has a uniquely scalable modular architecture that is based on the Smart Logic Solver (SLS). Each logic solver provides I/O processing, SIL 3-capable logic solving, and diagnostics in a single module.
- **DeltaV SIS Engineering Tools.** A standards-based approach makes configuring safety instrumented functions (SIF) in the DeltaV SIS system unique. Certified to comply with IEC 61508, the function blocks are designed to make the implementation and management of the safety configuration as efficient as possible.
- **DeltaV SIS Auxiliary Components.** There may be some output signals that require higher currents and some devices, mainly in fire and gas applications, that require energize-to-trip functionality. For applications that simply need high current, DeltaV SIS offers the Auxiliary Relay Energize to Actuate (ETA Direct) module. For applications where the current to the final device needs to be switched on when the system trips, there is the Auxiliary Relay De-energize to Actuate (Inverting), or DTA-Inverting relay. Either of these relay modules, paired with the Auxiliary Relay Diode module, allows DeltaV SIS platform to meet higher-current discrete output requirements while maintaining its field wiring monitoring and ensuring that the relay changes states correctly.
- **DeltaV SIS Conditioning Components.** There may be some output signals that require higher currents (> 500mA) and in some applications, non-incendive outputs are required. For applications that simply need high current, the SIS Relay Module should be used. For applications where the current to the final device needs to be limited for non-incendive ratings, there is the Current Limiter Module. Using the RC Compensator Module ensures that the monitoring of field wiring is performed correctly when using inductive loads. Using the SLS End of Line Module ensures that monitoring of field wiring is performed correctly when using discrete switches.
- **SISNet Repeaters.** Extend communication beyond the local logic solvers connected to one node and broadcast global messages to remote logic solvers through a fiber optic ring.
- **SISNet Distance Extenders.** Use SISNet Distance Extenders to enable SISNet Repeaters to communicate over distances greater than a few kilometers.

Prerequisites

- The DeltaV 2-wide interface (power/controller) carrier must have a part number of KJ4001X1-BA3 or higher. This version of carrier has a small white rectangle printed on the board between the power supply and controller slots. The old version, with a white dot in place of the rectangle, will not work with DeltaV SIS.

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