

DeltaV™ S-series Traditional I/O

- Modular and flexible construction
- Reduced installation time and expense
- Easy online expansion
- Field-mounted capable hardware
- 1:1 Redundancy for traditional I/O
- Plug-and-Play I/O



The DeltaV™ I/O interfaces are easy to install and maintain.

Introduction

S-series traditional I/O interfaces provide improved ease of installation with the same proven features of M-series I/O interfaces. This modular I/O subsystem offers flexibility during installation and is designed for extreme environmental conditions of field installations. S-series traditional I/O is equipped with a snap-in retention system for quick installation. The I/O interfaces can be installed in any of the possible 64 slots.

All wiring is through the carriers and terminal blocks so that modules can easily be removed without disconnecting any wires. Modularity, fast installation, online expansion, and environmentally robust hardware make DeltaV™ S-series traditional I/O a smart choice for your process control system.

Benefits

Modular and flexible construction: The S-series traditional I/O subsystem is designed with your investment in mind. Each controller supports up to eight I/O carriers that form a robust, passive bus for up to 64 I/O interfaces. Each interface has a matching I/O terminal block and can be installed in any I/O slot on the bus. Carriers and interfaces can be added online, without interruption to the existing I/O communication.

This modular design enables you to purchase the exact amount of I/O cards, eight-wide carriers, power/controllers, and two-wide carriers you need and add more DeltaV I/O as your system grows.

Reduced installation time and expense: The DeltaV system's S-series I/O interfaces are designed for quick assembly and error proof maintenance. All carriers snap onto T-DIN rails and interfaces snap into the I/O slots without the use of any tools.

Each I/O interface has a separate wiring terminal block, which connects field wiring to the interface. The I/O card can easily be removed without touching the I/O wiring on the terminal block. Some I/O cards can also use the fused terminal block, which is equipped with in-line fuses that can be pulled to isolate power to the field circuit.

Traditional I/O interfaces have I/O function keys that allow the terminal block to be set to receive a specific I/O card. These keys ensure that the correct I/O card is always plugged into the corresponding terminal block. The keys provide a safety measure by preventing the wrong I/O card being installed. It's incredibly easy to use and gives you time to do more.



S-series terminal blocks.

The I/O carriers provide integrated bussed field power distribution to the I/O interfaces. The integrated bus is divided into primary and secondary power for odd- and even-numbered slots. Each slot is individually fused to protect power to other cards. This significantly reduces the external power distribution circuits while still providing each card with fused 24V DC bussed field power.

Easy online expansion: The S-series I/O carriers and interfaces can easily be added online, without disruption of existing I/O communication. I/O carriers can be extended online, either by directly connecting them to the right side of the existing carrier, or using extender cables to mount the new carrier on a different DIN rail. The controller automatically detects new carriers and interfaces and allows these to be auto-sensed into the configuration database.

Field-mounted capable hardware: All S-series traditional I/O interfaces are rated for extreme operating temperature ranges of -40 to 70°C (-40 to 158°F). The interfaces can be installed in field mounted enclosures so you significantly reduce the footprint of your equipment and increase valuable control room space for other uses. This also allows you to save on wiring expenses by eliminating the need for long runs of multi-cores. The integrated design of the I/O subsystem can eliminate the need for marshaling panels. This saves you even more in your total capital costs.

1:1 Redundancy for traditional I/O cards: Increased system availability is easy with S-series traditional I/O cards. Four traditional I/O card types are available with redundant terminal blocks for critical field circuits. Simply install a pair of cards on the prescribed redundant terminal block and the DeltaV Distributed Control System (DCS) will automatically recognize them as a redundant pair. There is no configuration other than to autosense the redundant pair.

Plug-and-play I/O: All S-series traditional I/O components plug into the I/O interface carrier and are auto sensed by the controller. There are no addressing switches or jumpers. Cards can be installed in any order simplifying the I/O subsystem design. New I/O interfaces are detected by the system and added to the engineering database automatically. Additional features can be enabled as needed and downloaded without disruption to existing I/O communication, allowing you to install the I/O you need today with the ability to expand tomorrow.

Product Description

The S-series traditional I/O subsystem includes:

- I/O interface carrier (DIN-rail surface mounted) on which all I/O related components are installed.
- Bulk AC to 24V DC power supply for field devices.
- A variety of analog and discrete I/O interfaces, consisting each of an I/O card enclosed in a common form factor and an associated I/O terminal block, which easily plug into the I/O interface carrier.
- Cable extenders that provide flexibility in carrier mounting.



S-series traditional I/O Interface.

The I/O cards are connected to the field with a terminal block, which allows removal of I/O cards without disconnecting any field wiring.

I/O Cards

A variety of analog and discrete I/O interfaces are available to meet your specific requirements. The following cards support simplex or redundant installation:

- AI 4-20 mA HART, eight channels
- AO 4-20 mA HART, eight channels
- DI Dry Contact, eight channels
- DO 24V DC High Side, 8channels
- AI (Plus) 4-20 mA HART, 16channels
- AO (Plus) 4-20 mA HART, 16channels
- DI (Plus) 24V DC, Dry Contact, 32channels
- DO (Plus) 24V DC, High-Side, 32channels

The following I/O cards are supported in simplex format to meet your field wiring needs.

- AI Isolated, four channels
- RTD, eight channels
- Thermocouple, eight channels
- Millivolt, eight channels
- DI 24V DC Isolated, eight channels
- Pulse Count Input, four channels (Isolated DI)
- Sequence of Event, 16 channels (DI 24V DC)
- DI 120V AC Low Side Detection, eight channels
- DI 120V AC Isolated, eight channels
- DO 24V DC Isolated, eight channels
- DO 120/230V AC High Side, eight channels
- DO 120/230 Isolated, eight channels

All I/O cards are enclosed in a common form factor that plugs into the I/O interface carrier. The housing is clearly labeled with the enclosed I/O card type. All cards have power and internal error indicators. Eight-channel cards have clearly visible channel status LEDs.

All cards meet ISA G3 corrosion specifications by the careful selection of superior electronic components and the use of conformal coating.

Pulse Counters are available on most DI cards. The supported maximum frequency varies from 0.1 Hz on AC signals to 75 or 120 Hz on 24V DC inputs, and up to 50 KHz on the High-speed Pulse input card.

DeltaV DCS provides control module level time stamping for log events and alarms. For greater event resolution the 16-channel Sequence of Event DI card can provide signal driven events to a resolution of +/- 0.25 ms per card, or within 1 ms per controller. Please refer to the Sequence of Events PDS for more information on Sequence-of-event data collection and system options for this feature.

I/O Card Redundancy

Redundant I/O cards are available for critical applications. The same card can be used in simplex or redundant applications. When installed on a two-wide redundant terminal block, the cards are recognized as a redundant pair by the controller. The controller scans each card and determines which card is acting as the active interface. When a fault is detected, the system automatically switches to the standby I/O card.

DeltaV control modules reference simplex and redundant I/O channels identically and there is no special configuration required to take advantage of redundancy.

Switchover of a redundant I/O card is completed within two scans of the I/O bus. Make-before-break contacts ensure digital field instruments remain powered and the process is undisturbed. Analog output signals are briefly driven by both cards for <5 ms during switchover of the card.

Hardware alerts automatically report hardware integrity errors for both the primary and secondary cards. Any event that causes a switchover is also reported automatically through the system hardware alerts and is logged in the Event Chronicle.

Events that can cause a switchover include:

- Hardware failure within the active card.
- Communications failure between the active card and the controller.
- Detection of a fault in the field wiring.

A switchover may also be initiated from the diagnostics explorer, and the health and status of both cards and their channels are available in the diagnostics explorer.

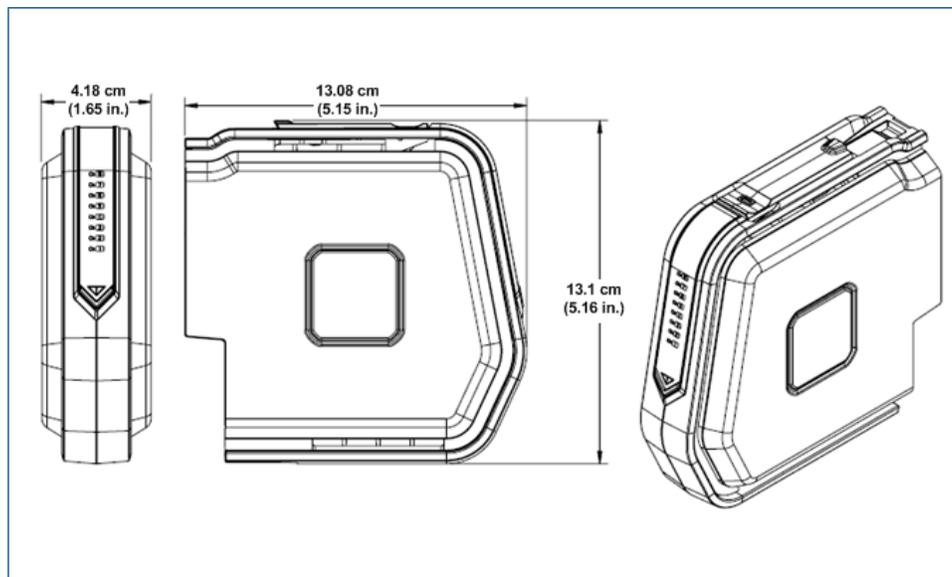
The system automatically commissions a new standby card. In safe areas, failed cards can be replaced under power.

In hazardous areas, appropriate installation procedures must be followed.

Hardware Specifications

Common Environmental Specifications for all I/O Interfaces	
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
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

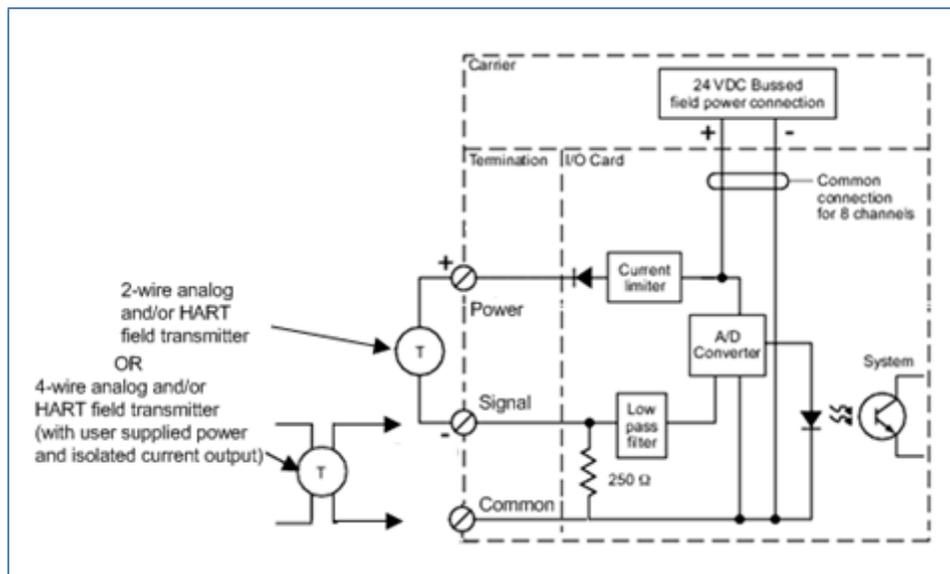
*Operating any electronics at the higher end of its temperature range for long periods of time will shorten its expected lifetime, see **Effects of Heat and Airflow Inside an Enclosure White Paper** for more information.



S-series traditional I/O interface enclosure.

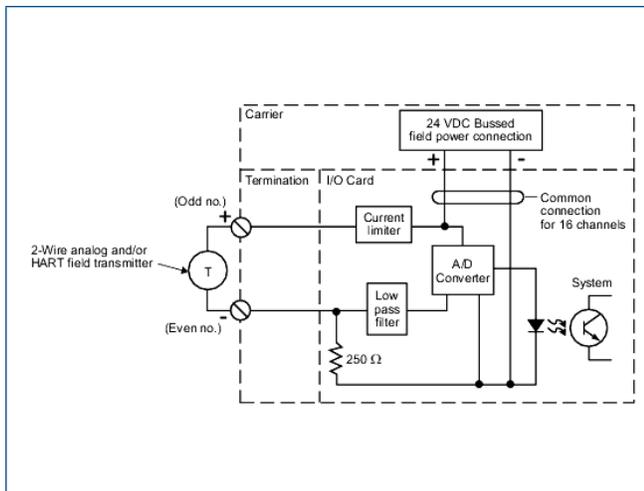
Analog Input signals

Specifications for AI Card, 8-channel, 4 to 20 mA, HART	
Number of Channels	Eight
Input Sensor Types	4 to 20 mA (span), 2-wire and 4-wire
Full Signal Range	1 to 22.5 mA, with over range checking
Transmitter Power (2-wire)	13.5V minimum at 20 mA (current limited at 29 mA max)
Accuracy Over Temperature Range	0.1% of span
Repeatability	0.05% of span
Resolution	16 bit A/D converter
Roll-off Frequency (Anti-aliasing)	-3 dB at 2.7 Hz, -20.5 dB at 1/2 the sampling frequency
Calibration	None required
Local Bus Current per Card (12V DC nominal)	Simplex: 120 mA typical, 150 mA maximum Redundant: 175 mA typical, 250 mA maximum (per card)
Field Circuit Power per Card	300 mA maximum @ 24V DC (+/-10%)
Isolation	Each channel is optically isolated from the system and factory tested to 1500V DC.
Optional Fuse	2.0 A (Terminal block option)
HART Communications Support	HART pass-through for AMS Device Manager. HART variable and status reporting for control functions.
Hart Scan Time	600 – 800 ms (typical) per enabled channel

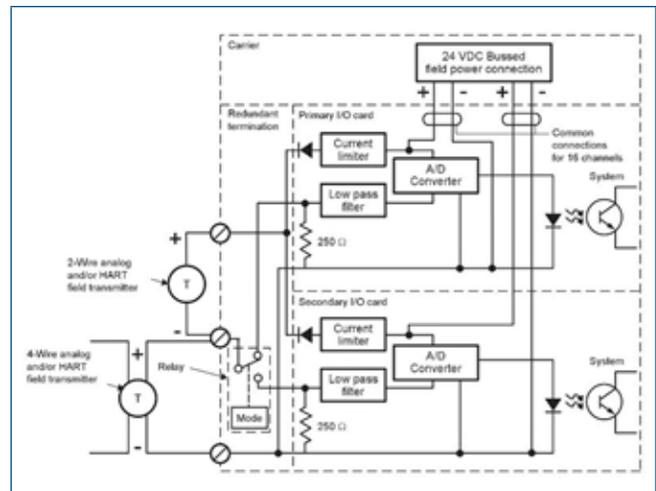


Simplified circuit and connection diagram for AI card, 8-channel, 4 to 20 mA, HART.

Specifications for AI and AI Plus Card, 16-channel, 4 to 20 mA, HART	
Number of Channels	16
Input Sensor Types	4 to 20 mA (span), 2-wire (and 4-wire for Plus Card)
Full Signal Range	2 to 22 mA, with over range checking
Transmitter Power	13.5 V minimum at 20 mA (max current limited at 29 mA)
Accuracy Over Temperature Range	0.2% of span
Repeatability	0.05% of span
Resolution	16 bit A/D converter
Roll-off Frequency (Anti-aliasing)	-3 dB at 2.7 Hz; -20.5 dB at 20 Hz
Calibration	None required
Local Bus Current per Card (12V DC nominal)	Simplex: 85 mA typical, 150 mA maximum Redundant: 110 mA typical, 200 mA maximum
Field Circuit Power per Card	500 mA maximum @ 24V DC (+/-10%)
Isolation	Each channel is optically isolated from the system and factory tested to 1000V DC.
HART Communications Support	HART pass-through for AMS Device Manager. HART variable and status reporting for control functions.
Hart Scan Time	600 – 800 ms (typical) per enabled channel



Simplified circuit and connection diagram for simplex AI card, 16-channel, 4 to 20 mA, HART.

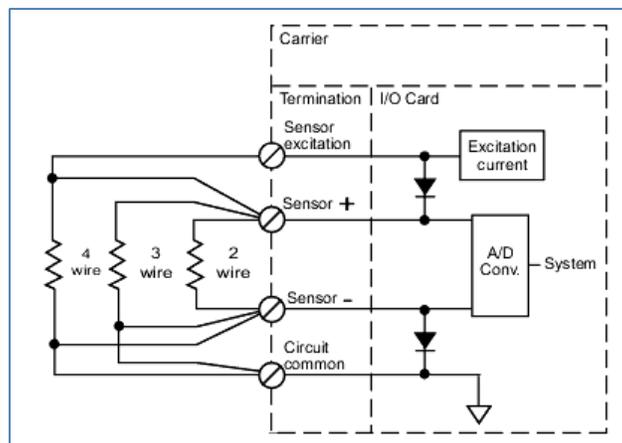


Simplified circuit and connection diagram for redundant AI Plus card, 16-channel, 4 to 20 mA, HART.

Specifications for RTD Input Card, 8-channel	
RTD Channels per Card	Eight
Sensor Types	Resistance, Pt100, Pt200, Pt500, Ni120, Cu10, User Defined.
Sensor Configuration	2-wire, 3-wire, or 4-wire
Full Scale Signal Range	See Table next page
Accuracy	See Table next page
Repeatability	0.05% of span
Resolution	16-bit A/D converter
Calibration	None required
Units	Degrees C, Degrees F
Sensor Excitation Current	100 μ A
Common Mode Rejection	120 dB at 50/60 Hz
Local Bus Current (12V DC nominal)	160 mA
Open Sensor Detection	Yes

RTD, ohms Sensor Type Specifications					
Sensor Type	Full Scale	Operating Range	25° Reference Accuracy	Temperature Drift	Resolution
Resistance	0 to 2,000 Ω	0 to 2,000 Ω	$\pm 06.2 \Omega$	$\pm 0.112 \Omega/^{\circ}\text{C}$	$\sim 0.02 \Omega$
Pt100	-200 to 850 $^{\circ}\text{C}$	-200 to 850 $^{\circ}\text{C}$	$\pm 0.5^{\circ}\text{C}$	$\pm 0.018^{\circ}\text{C}/^{\circ}\text{C}$	$\sim 0.05^{\circ}\text{C}$
Pt200	-200 to 850 $^{\circ}\text{C}$	-200 to 850 $^{\circ}\text{C}$	$\pm 0.5^{\circ}\text{C}$	$\pm 0.012^{\circ}\text{C}/^{\circ}\text{C}$	$\sim 0.05^{\circ}\text{C}$
Pt500	-200 to 850 $^{\circ}\text{C}$	-200 to 850 $^{\circ}\text{C}$	$\pm 3.5^{\circ}\text{C}$	$\pm 0.063^{\circ}\text{C}/^{\circ}\text{C}$	$\sim 0.18^{\circ}\text{C}$
Ni120	-70 to 300 $^{\circ}\text{C}$	70 to 300 $^{\circ}\text{C}$	$\pm 0.2^{\circ}\text{C}$	$\pm 0.006^{\circ}\text{C}/^{\circ}\text{C}$	$\sim 0.02^{\circ}\text{C}$
Cu10	-30 to 140 $^{\circ}\text{C}$	-30 to 140 $^{\circ}\text{C}$	$\pm 2.0^{\circ}\text{C}$	$\pm 0.157^{\circ}\text{C}/^{\circ}\text{C}$	$\sim 0.23^{\circ}\text{C}$
User Defined*	0 to 1000 Ω	0 to 1000 Ω	$\pm 0.4 \Omega$	$\pm 0.009 \Omega/^{\circ}\text{C}$	$\sim 0.05 \Omega$

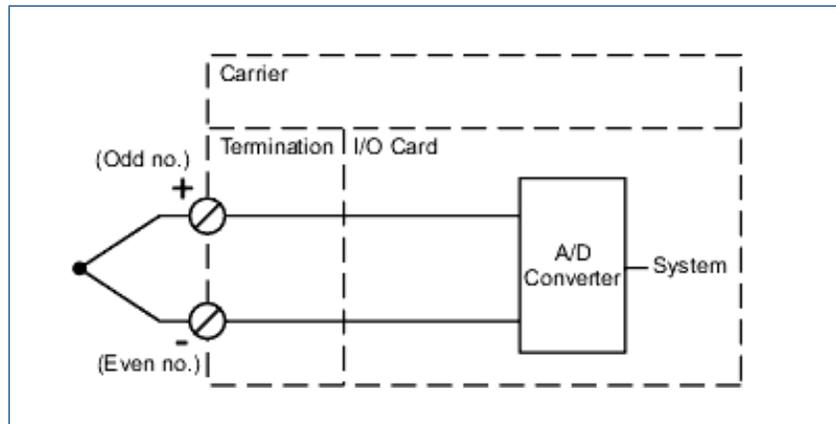
* The Callendar-Van Dusen linearization equation can be used with user defined Pt RTDs. Refer to Recommended I/O Practices in DeltaV Books online for usage information.



Simplified circuit diagram for RTD Input card, 8 channels.

Specifications for Thermocouple/mV Input Card, 8-channel	
Channels per Card	Eight
Sensor Types <ul style="list-style-type: none"> ■ Thermocouple ■ mV 	B, E, J, K, N, R, S, T, uncharacterized low-level voltage source
Sensor Ranges	See table next page
Repeatability	0.05% of span
Resolution	16-bit A/D converter
Calibration	None required
Units	Degrees C, Degrees F
Cold Junction Compensation (Not Available on mV Channels)	$\pm 1^{\circ}\text{C}$
Isolation	<p>Each channel is optically isolated from the system and factory tested to 1500V DC.</p> <ul style="list-style-type: none"> ■ Channels 1, 2, 3, and 4 are isolated from channels 5, 6, 7, and 8 (verified by 1500V DC factory test). ■ Thermocouples attached to channels 1, 2, 3, and 4 are not electrically isolated and should be within + 0.7V DC of each other. ■ Thermocouples attached to channels 5, 6, 7, and 8 are not electrically isolated and should be within + 0.7V DC of each other.
Common Mode Rejection	120 dB at DC/50/60 Hz
Local Bus Current (12V DC Nominal)	210 mA
Open Sensor Detection	Yes

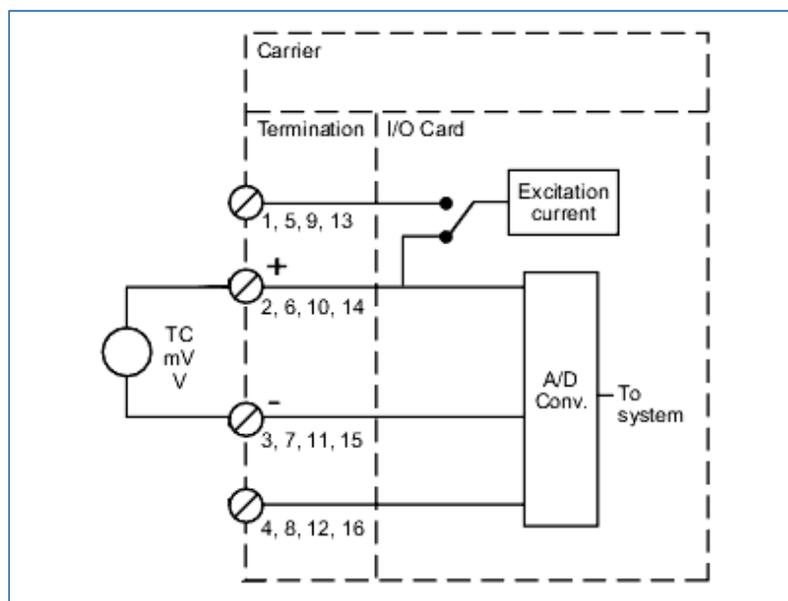
Sensor Type Specifications					
Sensor Type	Full Scale	Operating Range	25° Reference Accuracy	Temperature Drift	Resolution
B	250 to 1810°C	500 to 1810°C	± 2.4°C	± 0.056°C/°C	~0.18°C
E	-200 to 1000°C	-200 to 1000°C	± 0.6°C	± 0.008°C/°C	~0.07°C
J	-210 to 1200°C	-190 to 1200°C	± 0.8°C	± 0.011°C/°C	~0.05°C
K	-270 to 1372°C	-200 to 1372°C	± 0.5°C	± 0.016°C/°C	~0.18°C
N	-270 to 1300°C	-190 to 1300°C	± 1.0°C	± 0.007°C/°C	~0.10°C
R	-50 to 1768°C	-50 to 1768°C	± 2.1°C	± 0.013°C/°C	~0.14°C
S	-50 to 1768°C	-40 to 1768°C	± 2.2°C	± 0.067°C/°C	~0.24°C
T	-270 to 400°C	-200 to 400°C	± 0.7°C	± 0.001°C/°C	~0.04°C
mV Source/ Uncharacterized (no linearization or cold junction compensation.)	-100 to 100 mV	-100 to 100 mV	0.1 mV	± 0.002 mV/°C	~0.003mV



Simplified circuit diagram of Thermocouple/mV card, 8 channels.

Specifications for Isolated Input Card,4 channel	
Number of Channels	Four
Sensor Types <ul style="list-style-type: none"> ■ Thermocouple ■ RTD Sensor Types ■ mV and V Ranges 	B, E, J, K, N, R, S, T, Uncharacterized PT100, PT200, Ni120, Cu10, Resistance, User Defined Refer to following tables.
Input Type Mix	Independently configurable
Resolution	16-bit A/D converter
Calibration	None required
Isolation	Channel-to-system - 600V AC double insulation. Each channel is optically isolated from the system and factory tested to 5000V DC. Channel-to-channel - 600V basic insulation. Each channel is optically isolated from each other and factory tested to 3100V DC. CAN/CSA-C22.2 No.1010.1-92
Common Mode Rejection	120 dB at DC/50/60 Hz
Input Impedance	10 MΩ
Roll-off Frequency (Anti-aliasing)	-3dB at 2.7 Hz
Local Bus Current (12V DC nominal)	350 mA
Isolated Input Card, Thermocouple and mV Input Specifications	
Linearization Error	+/- 0.003% full scale
Cold Junction Comp. Accuracy	+/- 1.0°C
Cold Junction Compensation (Not Available on mV Channels)	Local: Integrally mounted in terminal block. External: Specified channel.
Cold Junction Compensation Range	-40 to 85°C
Open Circuit Detection (Thermocouple Only)	Yes
Open Sensor Detection Time	1 second

Isolated Input Thermocouple/mV/V Sensor Type Specifications					
Sensor Types	Full Scale	Operating Range	25°C Reference Accuracy	Temperature Drift	Nominal Resolution
B	250 to 1810°C	500 to 1810°C	±1.2°C	±0.116°C/°C	0.09°C
E	-200 to 1000°C	-200 to 1000°C	±0.5°C	±0.004°C/°C	0.05°C
J	-210 to 1200°C	-190 to 1200°C	±0.6°C	±0.005°C/°C	0.06°C
K	-270 to 1372°C	-140 to 1372°C	±0.5°C	±.013°C/°C	0.05°C
N	-270 to 1300°C	-190 to 1300°C	±1.0°C	±.015°C/°C	0.05°C
R	-50 to 1768°C	0 to 1768°C	±1.7°C	±.083°C/°C	0.06°C
S	-50 to 1768°C	0 to 1768°C	±1.8°C	±.095°C/°C	0.08°C
T	-270 to 400°C	-200 to 400°C	±0.7°C	±.025°C/°C	0.04°C
Uncharacterized (No Linearization or CJC)	-100 to 100 mV	-100 to 100 mV	±0.05 mV	±0.0003 mV/°C	0.0031 mV
20 mV Source	-20 to 20 mV	-20 to 20 mV	±0.02 mV	±0.001 mV/°C	0.0008 mV
50 mV Source	-50 to 50 mV	-50 to 50 mV	±0.03 mV	±0.0005 mV/°C	0.0017 mV
100 mV Source	-100 to 100 mV	-100 to 100 mV	±0.05 mV	±0.0003 mV/°C	0.0031 mV
0 - 5V	0 to 5V	0 to 5V	±0.005V	±0.0002V/°C	0.00009V
0 - 10V	0 to 10V	0 to 10V	±0.010V	±0.0004V/°C	0.00016V
1 - 5V	1 to 5V	1 to 5V	±0.0005V	±0.0002V/°C	0.00009V
1V	+/- 1V	+/- 1V	±0.0025V	±0.0002V/°C	0.00015V
5V	+/- 5V	+/- 5V	±0.005V	±0.0002V/°C	0.00017V
10V	+/- 10V	+/- 10V	±0.010V	±0.0004V/°C	0.0003V

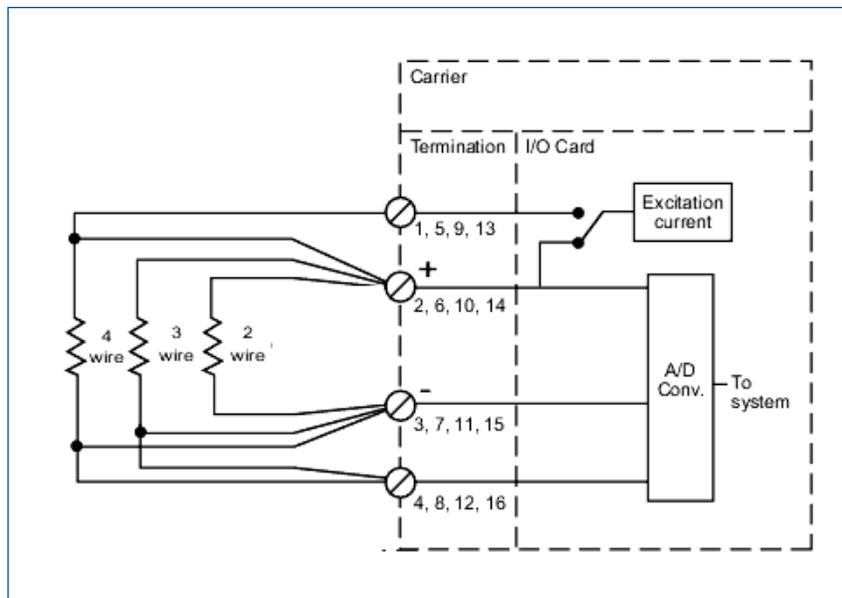


Simplified circuit diagram of Isolated Input card, Thermocouple, mV, V, 4 channels.

Isolated Input Cards, RTD, ohms Input Specifications	
Sensor Configurations	2-, 3-, and 4-wire (and 4-wire for Plus Card)
Excitation Current	100 μ A DC
Open Sensor Detection Time	1 second
Shorted Sensor Detection Time	1 second
Pt 100 and Pt 200 alpha	0.00385

Isolated Input Card, RTD, ohms Sensor Type Specifications				
Sensor Type	Sensor Input Range	25°C Reference Accuracy	Temperature Drift	Resolution
Pt100	-200 to 850°C	$\pm 0.5^\circ\text{C}$	$\pm 0.018^\circ\text{C}$	0.05°C
Pt200	-200 to 850°C	$\pm 0.5^\circ\text{C}$	$\pm 0.012^\circ\text{C}$	0.05°C
Ni120	-70 to 300°C	$\pm 0.2^\circ\text{C}$	$\pm 0.006^\circ\text{C}$	0.02°C
Cu10	-30 to 140°C	$\pm 2.0^\circ\text{C}$	$\pm 0.076^\circ\text{C}$	0.23°C
Resistance	1 to 1000 ohm	± 0.5 ohms	± 0.018 ohms/°C	0.02 ohms
User Defined*	0 to 1000 ohms	± 0.4 ohms	± 0.009 ohms/°C	~ 0.05 ohms

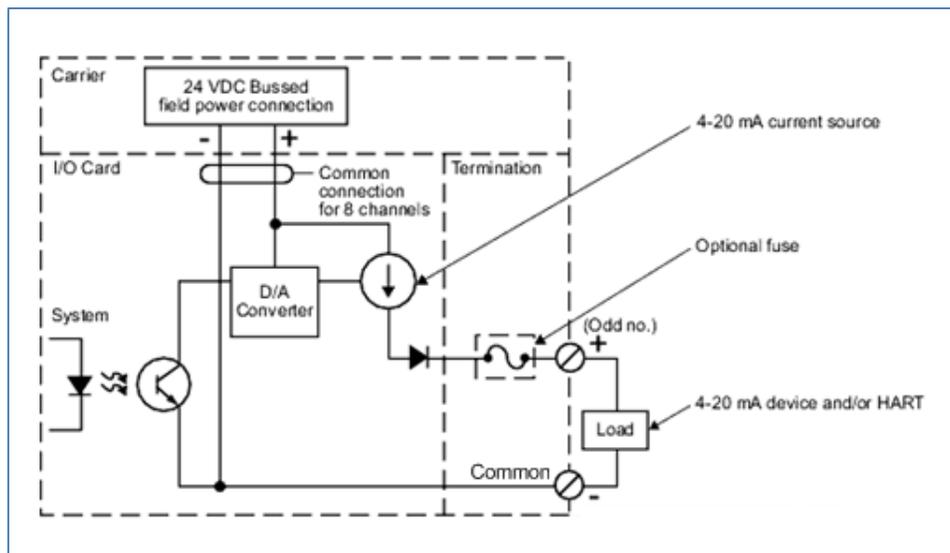
*The Callendar-Van Dusen linearization equation can be used with user defined Pt RTDs. Refer to Recommended I/O Practices in DeltaV Books online for usage information.



Simplified circuit diagram of Isolated Input card, RTD, 4 channels.

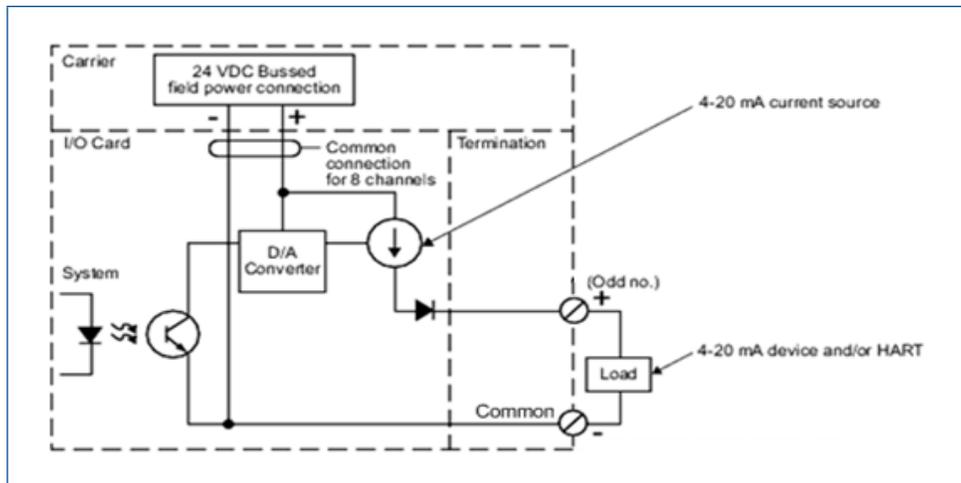
Analog Output Signals

Specifications for AO Card, 8-channel, 4 to 20 mA, HART	
Number of Channels	Eight
Device Types	4 to 20 mA
Full Signal Range	1 to 23 mA
Accuracy Over Temperature Range	0.25% of span (-40 to 60°C) 0.4% of span (60 to 70°C)
Resolution	14-bit D/A converter
Calibration	None Required
Local Bus Current per Card (12V DC Nominal)	Simplex: 120 mA typical, 150 mA maximum. Redundant: 175 mA typical, 250 mA maximum.
Field Circuit Power per Card	300 mA maximum @ 24V DC (+/-10%)
Isolation	Each channel is optically isolated from the system and factory tested to 1500V DC.
Output Compliance Voltage	20 mA at 21.6V DC supply into 700 Ω load
Open-Loop Detection	<0.70 mA
Optional Fuse	2.0 A (Terminal block option)
HART Communications Support	HART pass-through for AMS Device Manager. HART variable and status reporting for control functions.
Hart Scan Time	600 – 800 ms (typical) per enabled channel



Simplified circuit and connection diagram for simplex AO card, 8-channel, 4 to 20 mA, HART.

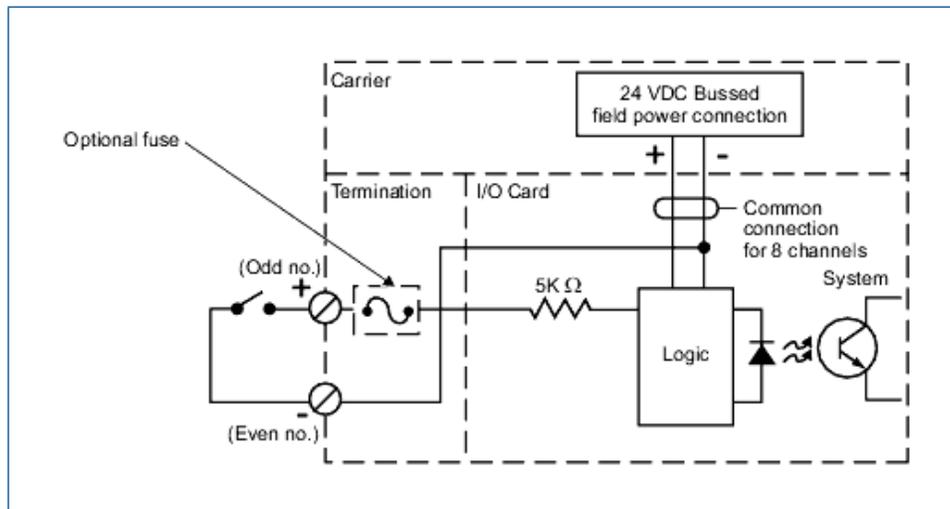
Specifications for AO (Plus) Card, 16-Channel, 4 to 20 mA, HART	
Number of Channels	16
Device Types	4 to 20 mA
Full Signal Range	1 to 23 mA
Accuracy Over Temperature Range	0.25% of span
Resolution	14-bit A/D converter
Calibration	None required
Local Bus Current per Card (12V DC nominal)	Simplex: 85 mA typical, 150 mA maximum. Redundant: 110 mA typical, 260 mA maximum.
Field Circuit Power per Card	400 mA maximum @ 24V DC (+/-10%)
Isolation	Each channel is optically isolated from the system and factory tested to 1000V DC.
HART Communications Support	HART pass-through for AMS Device Manager. HART variable and status reporting for control functions.
Hart Scan Time	600 – 800 ms (typical) per enabled channel



Simplified circuit and connection diagram for simplex AO (Plus) card, 16-channel, 4 to 20 mA, HART.

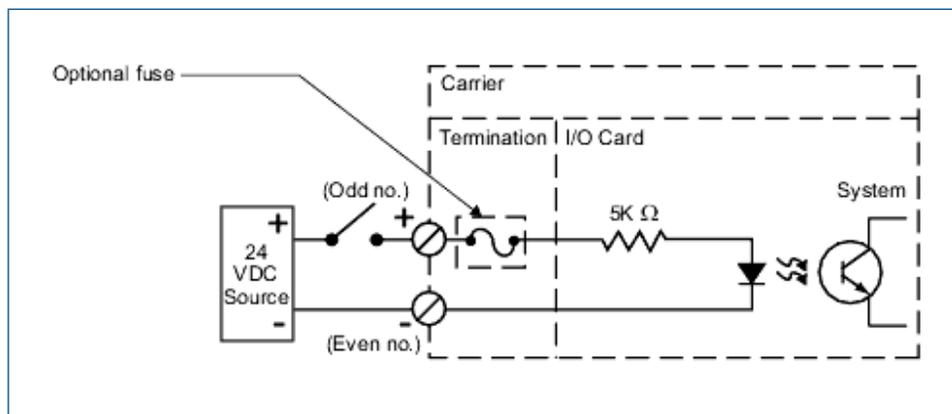
DC Voltage Discrete Input Cards

Specifications for DI Card, 8-channel, 24V DC, Dry Contact	
Number of Channels	Eight
Input Compatibility	Dry contact (known to operate with many NAMUR sensors)
Detection Level for On	>2.2 mA
Detection Level for Off	<1 mA
Input Impedance	5 K Ω (approximate)
Wetting Voltage	15 Volts
Fault Detection Capable	Field resistor pack (known to operate with many NAMUR sensors)
Configurable Channel Types:	Input
<ul style="list-style-type: none"> ■ Discrete Input ■ Pulse Count 	Dry contact or discrete state sensor changing <2 Hz. Pulse train <75 Hz
Local Bus Current (12V DC nominal)	Simplex: 75 mA typical, 100 mA maximum Redundant: 90 mA typical, 150 mA maximum
Field Circuit Power per Card	100 mA at 24V DC (\pm 10%)
Isolation	Each channel is optically isolated from the system and factory tested to 1500V DC.
Optional Fuse	2.0 A (Terminal block option)



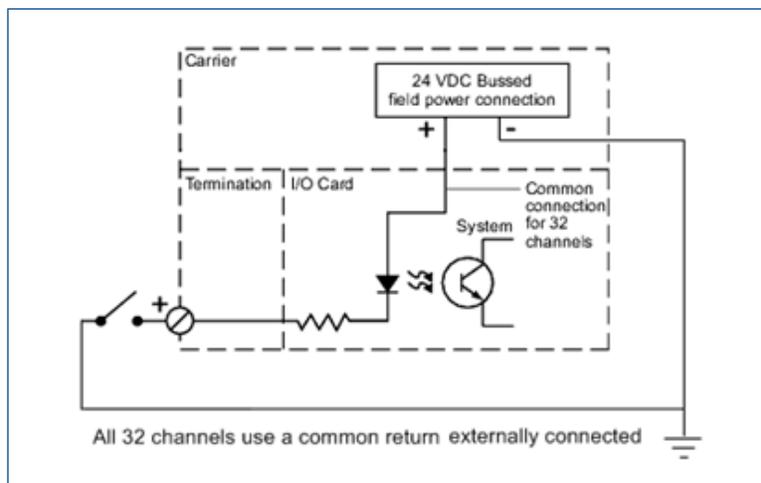
Simplified circuit and connection diagram for DI card, 8-channel, 24V DC, Dry Contact.

Specifications for DI Card, 8-channel, 24V DC, Isolated	
Number of Channels	Eight
Detection Level for On	>10V DC
Detection Level for Off	<5V DC
Input Impedance	5K Ω (approximately)
Wetting Current	6 mA at 24V DC
Configurable Channel Types:	Input signal profile
<ul style="list-style-type: none"> ■ Discrete Input ■ Pulse Count 	Dry contact or discrete state sensor changing <2 Hz. Pulse train <120 Hz
Local Bus Current (1V DC nominal)	75 mA typical, 100 mA maximum
Field Circuit Power per Card	None
Isolation	Each channel is optically isolated from the system and from each other and factory tested to 1500V DC.
Optional Fuse	2.0 A

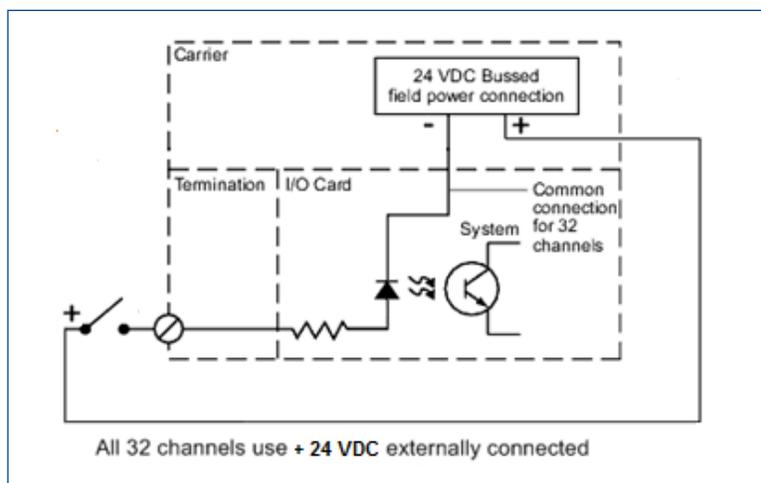


Simplified circuit and connection diagram for DI card, 8-channel, 24V DC, Isolated.

Specifications for DI (Plus) Card, 32-channel, 24V DC, Dry Contact	
Number of Channels	32
Detection Level for On	>2 mA
Detection Level for Off	<0.25 mA
Termination Fault Detection (A Mass Terminal Block Feature Only)	Only available on Plus Cards when used with the S-series Mass Connection Solutions or P+F HiC barriers and boards.
Input Impedance	5K ohm (approximate)
Wetting Voltage	24V DC
Local Bus Current (12V DC Nominal)	50 mA typical, 75 mA maximum
Field Circuit Power per Card	150 mA maximum @ 24V DC (+20%/-15%)
Isolation	Each channel is optically isolated from the system and factory tested to 1500V DC.



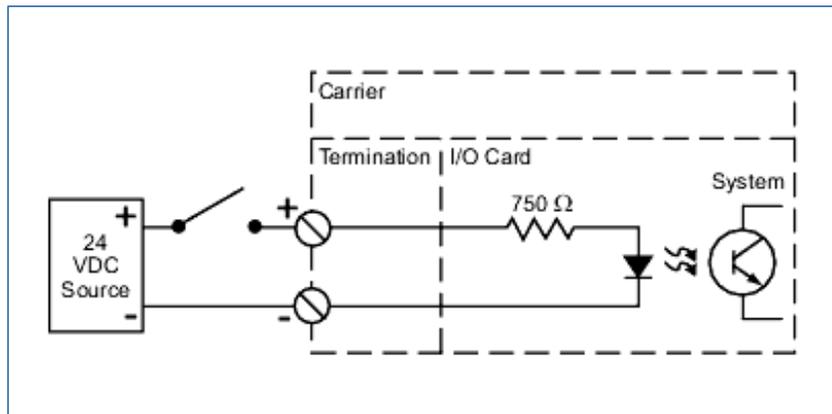
Simplified circuit and connection diagram for DI Card, 32-channel, 24V DC, Dry contact.



Simplified circuit and connection diagram for simplex DI Plus Card, 32-channel, 24V DC, Dry contact.

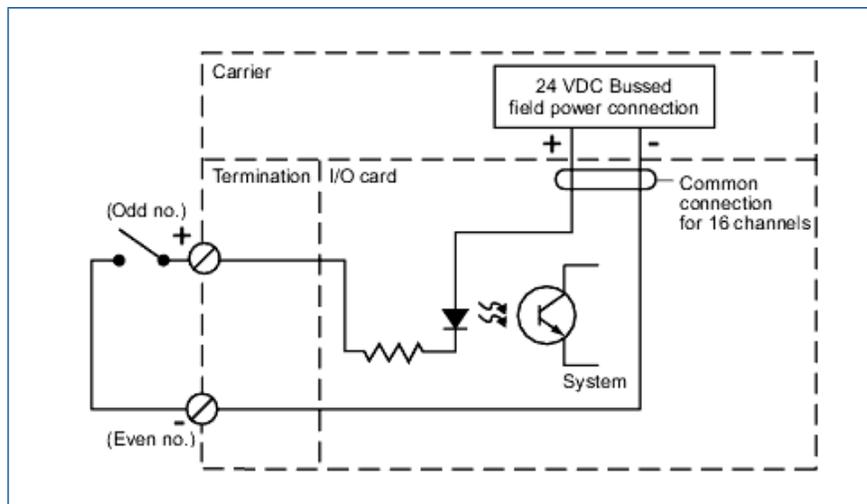
Specifications for PCI Card, 4-channel, 24V DC, Dry Contact	
Number of Channels	Four
Detection Level for On (Min.)	>4.8V DC (>5 mA)
Detection Level for Off (Max.)	<1.0V DC (<1 mA)
Input Impedance	25 mA at 24V DC (960 Ohms)
Input Accuracy	0.1% reading (over 10 Hz to 50 kHz) ¹
Resolution	+/- 1 pulse
Minimum Pulse Width	10 μS
Pulse Count Register	32-bit unsigned integer
Input Frequency	Sine wave 10 Hz to 50kHz. Square wave 0.1 Hz to 50 kHz.
Maximum Input Voltage	26.4V DC
Wetting Voltage	24V DC
Local Bus Current (12V DC nominal)	150 mA maximum
Isolation	Each channel is optically isolated from the system at and from other channels at 1500V DC.

¹ Filtering may be required to meet the accuracy specification for a pulse input channel.



Simplified circuit and connection diagram for PCI card, 4 channel, 24V DC, Isolated.

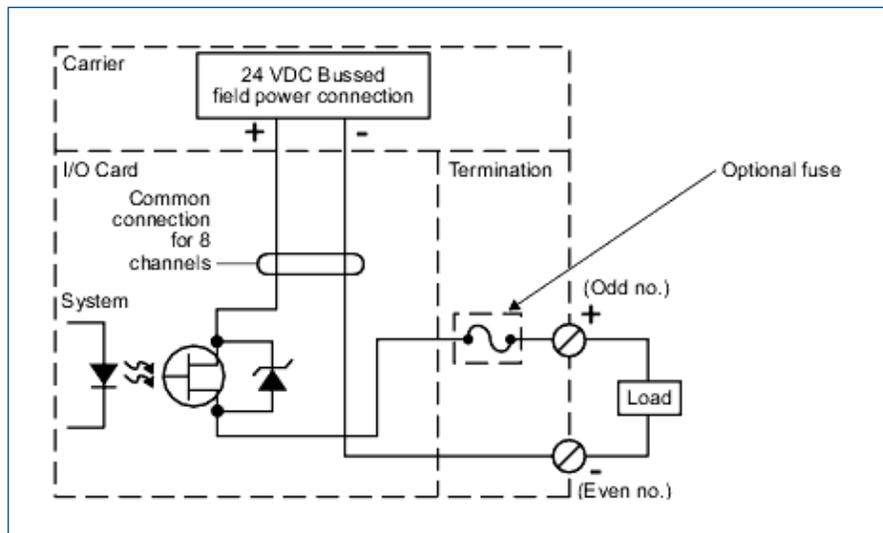
Specifications for SOE Card, 16-channel, 24V DC, Dry Contact	
Number of Channels	16
Detection Level for On	>2 mA
Detection Level for Off	<0.25 mA
Input Impedance	5K ohm (approximate)
Wetting Voltage	24V DC
Channel Scan Rate	0.25 msec for all 16 channels.
Time Stamp Accuracy (For SOE Enabled Channels Only)	0.25 msec from same card. 1 msec from same controller.
Local Bus Current (12V DC Nominal)	75 mA typical, 100 mA maximum.
Field Circuit Power per Card	75 mA at 24V DC
Isolation	Each channel is optically isolated from the system and factory tested to 1500V DC.



Simplified circuit and connection diagram for SOE card, 16-channel, 24V DC, Dry contact.

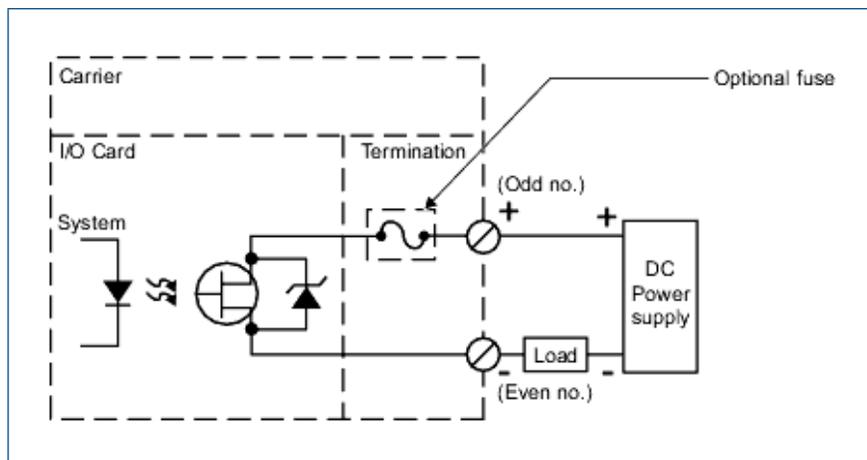
DC Voltage Discrete Output Cards

Specifications for DO Card, 8-channel, 24V DC, High Side	
Number of Channels	Eight
Output Range	24V DC +/- 10%
Output Rating	1.0 A maximum continuous per channel; 3.0 A maximum per I/O Interface. (Inrush 4.0A for <100mSec, 6.0A for <20 mSec)
Off-State Leakage	1.2 mA maximum
Configurable Channel Types:	Output signal profile.
<ul style="list-style-type: none"> ■ Discrete Output ■ Momentary Output ■ Continuous Pulse Output 	Output stays in last state submitted by the control logic. Output remains active for a pre-configured time period. Output is active as a percentage of a pre-configured base time period (100 ms to 100 s). Resolution = 5 ms.
Local Bus Current (12V DC Nominal)	75 mA typical, 100 mA maximum
Field Circuit Power per Card	3.0 A at 24 V DC per I/O Interface (internal 10-Amp fast acting non-resettable fuse).
Isolation	Each channel is optically isolated from the system and factory tested to 1500V DC.
Optional Fuse	2.0 A



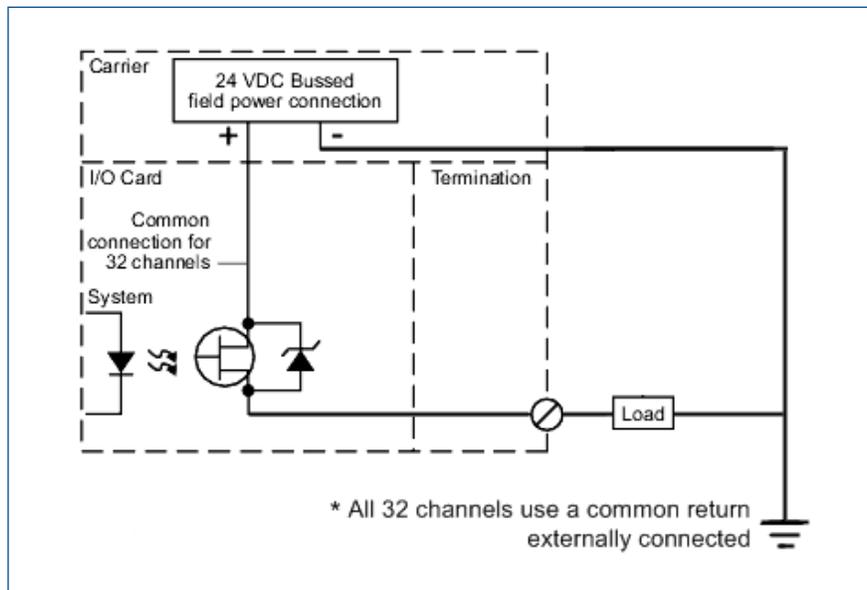
Simplified circuit and connection diagram for DO card, 8-channel, 24V DC, High Side.

Specifications for DO Card, 8-channel, 24V DC, Isolated	
Number of Channels	Eight
Output Range	2V DC to 60V DC
Output Rating	1.0 A (inrush 4.0 A for <100 ms; 6A for <20 ms)
Off State Leakage	1.2 mA maximum
Configurable Channel Types: <ul style="list-style-type: none"> ■ Discrete Output ■ Momentary Output ■ Continuous Pulse Output 	Output signal profile. Output stays in last state submitted by the control logic. Output remains active for a pre-configured time period. Output is active as a percentage of a pre-configured base time period (100 ms to 100 s). Resolution = 5 ms.
Local Bus Current (12V DC Nominal)	100 mA typical, 150 mA maximum
Field Circuit Power per Card	None
Isolation	Each channel is optically isolated from the system and from each other and factory tested to 1500V DC.



Simplified circuit and connection diagram for DO card, 8-channel, 24V DC, Isolated.

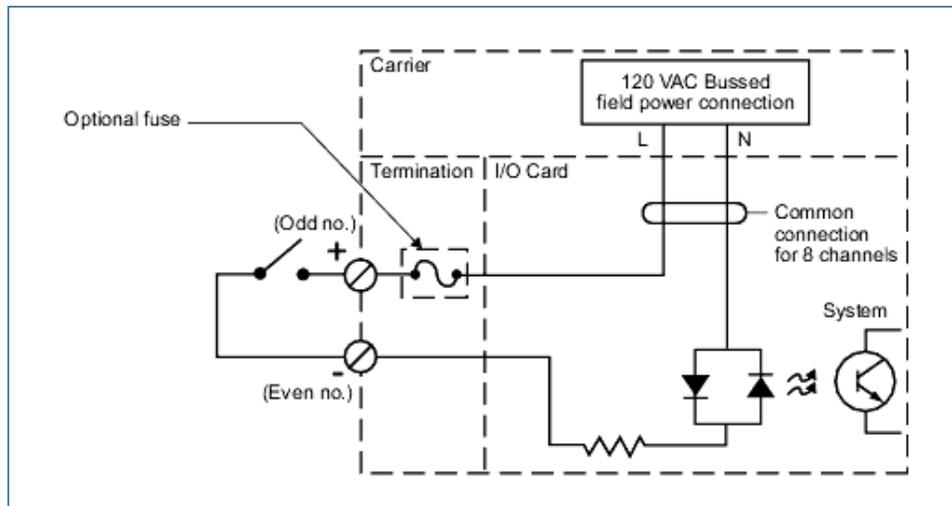
Specifications for DO (plus) Card, 32-channel, 24V DC, High-Side	
Number of Channels	32
Output Rating	100 mA per channel
Output Range	24V DC \pm 10%
Off-State Leakage	0.1 mA maximum
Termination Fault Detection (A Mass Terminal Block Feature Only)	Only available on Plus Cards when used with the S-series Mass Connection Solutions or P+F HiC barriers and boards.
Local Bus Current (12V DC Nominal)	100 mA typical, 150 mA maximum.
Field Circuit Power per Card	3.2 A @ 24V DC (+20%/-15%)
Isolation	Each channel is optically isolated from the system and factory tested to 1500V DC.



Simplified circuit and connection diagram for simplex DO (Plus) Card, 32-channel, 24V DC, High-Side.

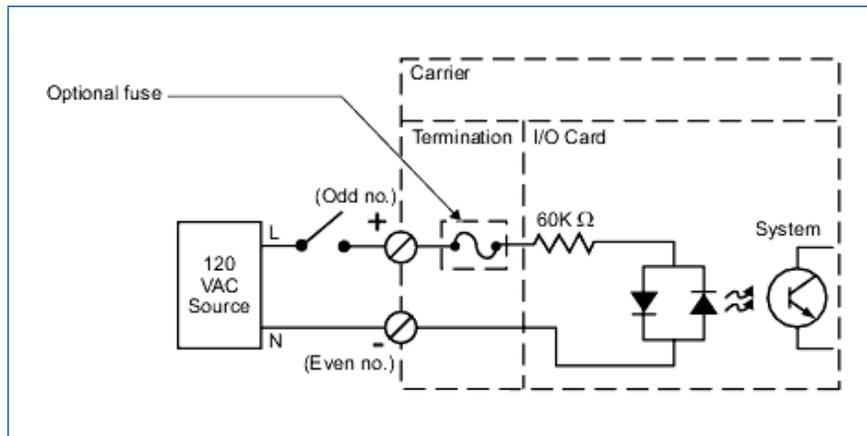
AC Voltage Discrete Input Cards

Specifications for DI Card, 8-channel, 120V AC, Dry Contact	
Number of Channels	Eight
Detection Level for On	>1.4 mA
Detection Level for Off	<0.56 mA
Wetting Current	2 mA at 120V AC
Output Impedance	60 KΩ (approximately)
Local Bus Current (12V DC Nominal)	75 mA typical, 100 mA maximum
Field Circuit Power per Card	15 mA at 120V AC
Isolation	Each channel is optically isolated from the system at 250V AC.
Optional Fuse	2.0 A



Simplified circuit and connection diagram for DI card, 8-channel, 120V AC, Dry Contact.

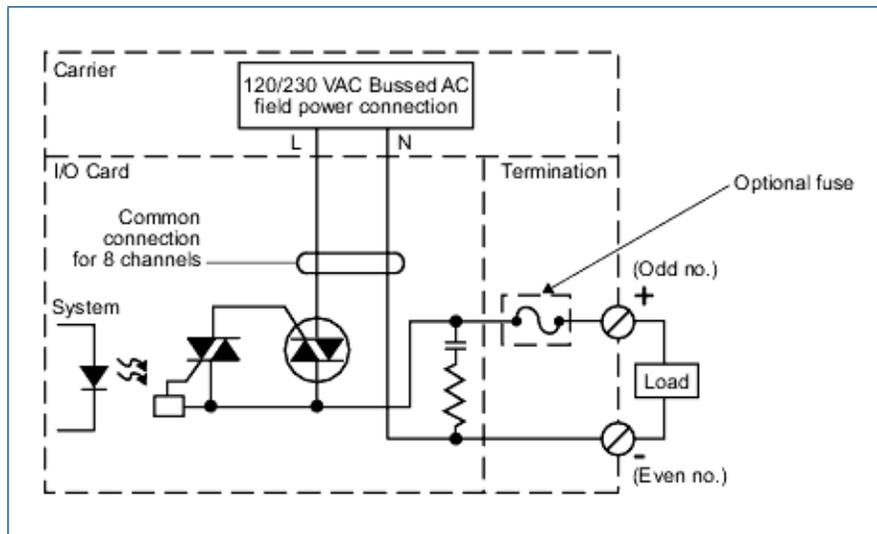
Specifications for DI Card, 8-channel, 120V AC, Isolated	
Number of Channels	Eight
Detection Level for On	84 to 130V AC
Detection Level for Off	0 to 34V AC
Wetting Current	2 mA at 120V AC
Input Impedance	60 K Ω (approximately)
Local Bus Current (12V DC Nominal)	75 mA typical, 100 mA maximum.
Field Circuit Power per Card	None
Isolation	Each channel is optically isolated from the system at 250V AC and from other channels at 250V AC.
Optional Fuse	2.0 A (Terminal block option)



Simplified circuit and connection diagram for DI card, 8-channel, 120V AC, Isolated.

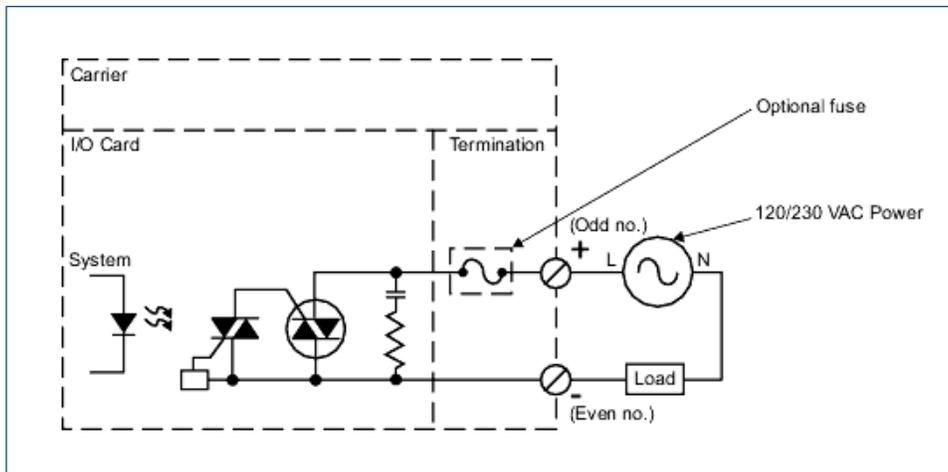
AC Voltage Discrete Output Cards

Specifications for DO Card, 8-channel, 120/230V AC, High Side	
Number of Channels	Eight
Output Range	20 to 250V AC
Output Rating	375mA average per channel. 1.0 A maximum continuous per channel (inrush 5 A for <100 ms; 20 A for <20 ms) 3.0 A maximum per card.
Off-State Leakage	2 mA maximum at 120V AC. 4 mA maximum at 230V AC.
Configurable Channel Types: <ul style="list-style-type: none"> ■ Discrete Output ■ Momentary Output ■ Continuous Pulse Output 	Output signal profile. Output stays in last state submitted by the control logic. Output remains active for a pre-configured time period. Output is active as a percentage of a pre-configured base time period (100 ms to 100 s). Resolution = 5 ms.
Local Bus Current (12V DC Nominal)	100 mA typical, 150 mA maximum.
Field Circuit Power per Card	3.0 A at 120V AC or 230V AC.
Isolation	Each channel is optically isolated from the system at 250V AC.
Optional Fuse	2.0 A (inrush 5A for <10 ms at 0.1% duty cycle).



Simplified circuit and connection diagram for DO card, 8-channel, 120/230V AC, High Side.

Specifications for DO Card, 8-channel, 120/230V AC, Isolated	
Number of Channels	Eight
Off-State Leakage	2 mA maximum at 120V AC. 4 mA maximum at 230V AC.
Output Range	20 to 250V AC.
Output Rating	375mA average per channel. 1.0A maximum continuous per channel; (inrush 5A for <100 ms; 20A for <20 ms). 3.0A maximum per card.
Configurable Channel Types: <ul style="list-style-type: none"> ■ Discrete Output ■ Momentary Output ■ Continuous Pulse Output 	Output signal profile. Output stays in last state submitted by the control logic. Output remains active for a pre-configured time period. Output is active as a percentage of a pre-configured base time period (100 ms to 100 s). Resolution = 5 ms.
Local Bus Current (12V DC Nominal)	100 mA typical, 150 mA maximum.
Field Circuit Power per Card	None
Isolation	Each channel is optically isolated from system at 250V AC and from other channels at 250V AC.
Optional Fuse	2.0 A (inrush 5A for <10 ms at 0.1% duty cycle).



Simplified circuit and connection diagram for DO card, 8-channel, 120/230V AC, Isolated.

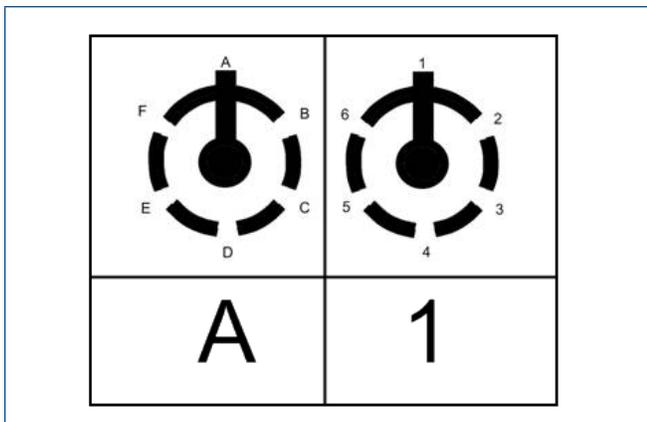
I/O Terminal Blocks

A variety of I/O terminal blocks is available to meet specific functionality and environmental requirements of the installation. The I/O interface is a combination of the I/O card and the I/O terminal block. Each I/O interface is uniquely keyed so that once installed in a carrier slot with a terminal block, that terminal block will only accept like replacement card.



8-channel standard terminal block.

The keying mechanism consists of two keying posts that rotate and lock into the terminal block base. Each post has six positions: A-F and 1-6. Each card is assigned a unique key which is marked on the side of the I/O card:



Keying position for HART AI, 4-20 mA, 8-channel.

The keys prevent installation of an incorrect card, and the graphical information on the card makes it easy to determine if a keyed slot will accept a particular card.

There are nine different simplex I/O terminal blocks available to meet the wiring needs of field signals.

- 8-channel terminal block
- Fused 8-channel terminal block
- AI 8-channel terminal block
- AI 16-channel terminal block
- AO 16-channel terminal block
- Discrete 32-channel terminal block
- Isolated Input terminal block
- RTD/Resistance terminal block
- Thermocouple terminal block

The following redundant I/O terminal blocks are available on some I/O interfaces, allowing a pair of cards to be installed as a redundant pair.

- Redundant AI 8-Channel terminal block
- Redundant AI Plus 16-Channel terminal block
- Redundant AO 8-Channel terminal block
- Redundant AO Plus 16-Channel terminal block
- Redundant Discrete 8-Channel terminal block
- Redundant DI Plus 32-Channel terminal block
- Redundant DO Plus 32-Channel terminal block

The table on the following page lists the compatible terminal blocks for each card, along with the cards unique key positions. The first terminal block listed is the recommended terminal block.

In addition to standard signal wiring, some cards may also be ordered with Mass Terminal blocks that allow these cards to be connected to the S-series Mass Connection Solutions or third party wiring solutions from Phoenix or if IS Barriers are required from Pepperl and Fuchs, mounted in an adjacent cabinet to meet special signal conditioning or for optimizing field wiring solutions. Please refer to the Alliance Program website for details on approved third party products.

- 16-pin Mass Terminal Block (simplex only)
- 24-pin Mass Terminal Block (simplex only)
- 40-pin Mass Terminal Block (simplex and redundant)
- 48-pin Mass Terminal Block (simplex and redundant)

Low Voltage Traditional I/O and Terminal Block Compatibility

I/O Card	I/O Card Keying	Traditional I/O Terminal Blocks	Mass Terminal Blocks
AI, 8-channel, 4–20 mA, HART	A1	AI 8-Channel Terminal Block (Supports 2 and 4 wire devices). Redundant AI 8-channel Terminal Block. Fused 8-Channel Terminal Block. 8-Channel Terminal Block.	16-pin Mass Terminal Block (Supports 2-wire Devices). 24-pin Mass Terminal Block (Supports 4-wire Devices).
AI, 16-channel, 4-20 mA HART	A2	AI 16-Channel Terminal Block.	NA
AI Plus, 16-channel, 4-20 mA HART	A6	NA	48-pin AI Mass Terminal Block. Redundant 48-pin Mass AI Term. Block (Supports 2 and 4-wire Devices).
AO, 8-channel, 4–20 mA, HART	A4	8-Channel Terminal Block. Redundant AO 8-Channel Terminal Block. Fused 8-Channel Terminal Block.	16-pin Mass Terminal Block.
AO Plus, 16-channel, 4-20 mA HART	A5	AO 16-Channel Terminal Block.	48-pin AO Mass Terminal Block. Redundant 48-pin. Mass AO Term. Block.
Thermocouple, mV	C1	Thermocouple Terminal Block. 8-Channel Terminal Block.	NA
RTD, 8-channel	C3	RTD/Resistance Terminal Block.	NA
Isolated Input Card	C2	Isolated Input Terminal Block.	NA
DI, 8-channel, 24V DC, Dry Contact	B1	8-Channel Terminal Block. Redundant Discrete. 8-Channel Terminal Block. Fused 8-Channel Terminal Block.	16-pin Mass Terminal Block.
DI, 8-channel, 24V DC, Isolated	B2	8-Channel Terminal Block. Fused 8-Channel Terminal Block.	16-pin Mass Terminal Block.
DI, 32-channel, 24V DC Dry contact	B3	Discrete 32-Channel Terminal Block.	40-pin Mass Terminal Block.
DI Plus, 32-channel, 24V DC Dry contact	E3	NA	Redundant 40-pin Mass DI Term. Block (Supports Termination Fault Detection).
PCI, 4-channel	C6	Discrete 32-Channel Terminal Block.	NA
SOE, 16-channel, 24V DC	C5	Discrete 32-Channel Terminal Block.	40-pin Mass Terminal Block.
DO, 8-channel, 24V DC, High-Side	B6	8-Channel Terminal Block. Redundant Discrete 8-Ch. Terminal Block. Fused 8-Channel Terminal Block.	16-pin Mass Terminal Block.
DO, 8-channel, 24V DC, isolated	B5	8-Channel Terminal Block. Fused 8-Channel Terminal Block.	16-pin Mass Terminal Block.
DO, 32-channel, 24V DC High-Side	B4	Discrete 32-Channel Terminal Block.	40-pin Mass Terminal Block.
DO Plus, 32-channel, 24V DC High-Side	B4	NA	Redundant 40-pin Mass DO Term. Block (Supports Termination Fault Detection).

High Voltage Traditional I/O and Terminal Block Compatibility

I/O Card	I/O Card Keying	Traditional I/O Terminal Blocks	Mass Terminal Blocks
DI, 8-channel, 120V AC, Dry contact	E1	8-Channel Terminal Block Fused 8-Channel Terminal Block	NA
DI, 8-channel, 120V AC, isolated	E4	8-Channel Terminal Block Fused 8-Channel Terminal Block	NA
DO, 8-channel, 120V/ 230V AC, high side	F1	8-Channel Terminal Block Fused 8-Channel Terminal Block	NA
DO, 8-channel, 120V/ 230V AC, isolated	F4	8-Channel Terminal Block Fused 8-Channel Terminal Block	NA

System Compatibility

S-series traditional I/O hardware requires:

- SQ or SX controllers.
- S-series horizontal carriers.

S-series and M-series controllers can be installed on the same DeltaV Area Control Network in v11.3.1 and beyond. Control modules can be assigned to any controller and inter-controller references are fully supported.

DeltaV SIS Safety Logic Solvers can be installed under an S-series controller using SIS horizontal and verticalplus carriers. Refer to PDS_SLS_1508_LogicSolver and PDS_S-series_Horizontal_Carriers and as well to the PDS_S-series_VerticalPlus Carriers product data sheets for more information.

The following traditional I/O Plus cards require v13.3 or higher Software:

- AI Plus, 4-20 mA HART, 16 channels.
- AO Plus, 4-20 mA HART, 16 channels.
- DI Plus, 32-channel, 24V DC Dry contact.
- DO Plus, 32-channel, 24V DC High-Side.

Termination Fault Detection is a feature that only works within the following cards:

- DI Plus, 32-channel, 24V DC Dry contact.
- DO Plus, 32-channel, 24V DC High-Side.

when used with the redundant 40-pin Mass DI or DO Terminal Block combined with the S-series Mass Connection Solutions or P+F HiC IS barriers and termination boards for DeltaV DCS.

All other approved third party mass termination products may be used with both non Plus S-series and M-series I/O interfaces.

S-series traditional I/O does not install on vertical carriers. For vertical I/O applications, use Electronic Marshalling with CHARMS I/O.

S-series traditional I/O horizontal carriers are not physically compatible with M-series horizontal controller carriers. Install S-series I/O interfaces with S-series controllers and M-series I/O interfaces with M-series controllers.

Certifications

The following certifications are available for S-series traditional I/O (see actual certificates for exact certifications for each product):

- **CE**
EMC-EN 61326-1
- **FM**
FM 3600
FM 3611
- **CSA**
CSA C22.2 No. 213
CSA C22.2 No. 1010-1
- **ATEX**
EN60079-0
EN60079-7
- **IEC-Ex**
IEC60079-0
EN60079-7
IEC60079-15
- **Marine Certifications: IACS E10**
ABS Certificate of Design Assessment
DNV Marine Certificate

Hazardous Area/Location

S-series traditional I/O Cards can be installed and used based on the following standards (see actual certificates for exact product markings for each product):

- **FM (USA)**
Class I, Division 2, Groups A, B, C, D, T4
- **cFM (Canada)**
Class I, Division 2, Groups A, B, C, D, T4
- **ATEX**
Installation and Field Circuits:
II 3G Ex ec IIC T4 Gc
II 3G Ex ec [ic] IIC T4 Gc
II 3G Ex nA nC IIC T4 Gc
- **IEC-Ex**
Installation and Field Circuits:
II 3G Ex ec IIC T4 Gc
II 3G Ex ec ic IIC T4 Gc
II 3G Ex nA nC IIC T4 Gc

Regarding the Installation instructions please refer to the following Documents:

<i>Class 1 Division 2 Installation Instructions DeltaV S-series</i>	<i>12P5402</i>
<i>Zone 2 Installation Instructions DeltaV S-series</i>	<i>12P5404</i>

Ordering Information

Analog Input Cards and Terminal Blocks	
Description	Model Number
Analog Input, 8 channels 4-20 mA, HART	
AI Card: 8 channels 4-20 mA, HART, AI 8-Channel Terminal Block.	SE4003S2B1
AI Card: 8 channels 4-20 mA, HART, Fused 8-channel Terminal Block.	SE4003S2B2
AI Card: 8 channels 4-20 mA, HART, 16-Pin Mass I/O Terminal Block.	SE4003S2B4
AI Card: 8 channels 4-20 mA, HART, 24-Pin Mass I/O Terminal Block.	SE4003S2B5
Redundant Analog Input, 8 channels 4-20 mA, HART	
2 x AI Card, 8 Ch, 4-20 mA, HART, AI 8-channel redundant Terminal Block.	SE4033S2B1
Analog Input 16 channels 4-20 mA, HART	
Analog Input Card: 16 channels 4-20 mA, HART, AI 16-Channel Terminal Block.	SE4003S2B6
Analog Input Plus Card: 16 channels 4-20 mA, HART, 48 Pin AI Mass Terminal Block (to be used with P+F HiC IS barriers and termination boards for DeltaV DCS).	SE4003S2B11
Analog Input Plus Card: 16 channels 4-20 mA, HART, 48 Pin AI Mass Terminal Block including 16-channel AI Mass Connection Board* supporting 2- & 4-wire Devices.	SE4053S2B11
Redundant Analog Input 16 channels 4-20 mA, HART	
2 x AI Plus Card: 16 channels 4-20 mA, HART, Red. 48 Pin AI Mass Terminal Block (to be used with P+F HiC IS barriers and termination boards for DeltaV DCS).	SE4033S2B11
2 x AI Plus Card: 16 channels 4-20 mA, HART, Red. 48 Pin AI Mass Terminal Block including 16-channel AI Mass Connection Board* supporting 2- & 4-wire Devices.	SE4083S2B11
RTD/Resistance, 8 channels	
RTD Card: 8 channels, RTD/ Resistance Terminal Block.	SE4003S6B1
Thermocouple/mV, 8 channels	
mV Card: 8 channels; 8-Channel Terminal Block.	SE4003S4B1
Thermocouple Card: 8 channels; Thermocouple Terminal Block.	SE4003S5B1
Isolated Input, 4 Channels (Thermocouple/mV/V, RTD)	
Isolated Input Card, 4 Channels; Isolated Input terminal Block.	SE4003S7B1

*For more details on the Mass Connection Boards and connection cables, please refer to the *S-series Mass Connection Solutions PDS*.

Analog Output Cards and Terminal Blocks	
Description	Model Number
Analog Output, 8 channels 4-20 mA, HART	
AO Card: 8 channels 4-20 mA, HART, 8-Channel Terminal Block.	SE4005S2B1
AO Card: 8 channels 4-20 mA, HART, Fused 8-Channel Terminal Block.	SE4005S2B2
AO Card: 8 channels 4-20 mA, HART, 16-Pin Mass Terminal Block.	SE4005S2B3
Redundant Analog Output, 8 channels 4-20 mA, HART	
2 x AO Card, 8 Ch, 4-20 mA, HART, Redundant AO 8-Channel Terminal Block.	SE4035S2B1
Analog Output 16 channels 4-20 mA, HART	
Analog Output Plus Card: 16 channels 4-20 mA, HART, AO 16-Channel Terminal Block.	SE4005S2B4
Analog Output Plus Card: 16 channels 4-20 mA, HART, 48 Pin AO Mass Terminal Block (to be used with P+F HiC IS barriers and termination boards for DeltaV DCS).	SE4005S2B5
Analog Output Plus Card: 16 channels 4-20 mA, HART, 48 Pin AO Mass Terminal Block including 16-channel AO Mass Connection Board*.	SE4055S2B5
Redundant Analog Output 16 channels 4-20 mA, HART	
2 x AO Plus Card: 16 channels 4-20 mA, HART, Red. 48 Pin AO Mass Terminal Block (to be used with P+F HiC IS barriers and termination boards for DeltaV DCS).	SE4035S2B5
2 x AO Plus Card: 16 channels 4-20 mA, HART, Red. 48 Pin AO Mass Terminal Block including 16-channel AO Mass Connection Board*.	SE4085S2B5

*For more details on the Mass Connection Boards and connection cables, please refer to the **S-series Mass Connection Solutions PDS**.

V DC Discrete Input Cards and Terminal Blocks	
Description	Model Number
Discrete Input Card: 8 channels, 24V DC, Dry Contact	
DI Card: 8 channels, 24V DC, Dry Contact, 8-Channel Terminal Block.	SE4001S2T2B1
DI Card: 8 channels, 24V DC, Dry Contact, Fused 8-Channel Terminal Block.	SE4001S2T2B2
DI Card: 8 channels, 24V DC, Dry Contact, 16-Pin Mass Terminal Block.	SE4001S2T2B3
Redundant Discrete Input, 8 channels, 24V DC, Dry Contact	
2 x DI Card, 8 Ch, Redundant Discrete 8-Channel Terminal Block.	SE4031S2T2B1
Discrete Input Card: 8 channels, 24V DC, Isolated	
DI Card: 8 channels, 24V DC, Isolated, 8-Channel Terminal Block.	SE4001S2T1B1
DI Card: 8 channels, 24V DC, Isolated, Fused 8-Channel Terminal Block.	SE4001S2T1B2
DI Card: 8 channels, 24V DC, Isolated, 16-Pin Mass Terminal Block.	SE4001S2T1B3
Discrete Input Card: 32 channels, 24 V DC, Dry Contact	
DI Card: 32 channels, 24V DC, Dry Contact, Discrete 32-Channel Terminal Block.	SE4001S2T2B4
DI Card: 32 channels, 24V DC, Dry Contact, 40-pin Mass Terminal Block (to be used with P+F HiC IS barriers and termination boards for DeltaV DCS).	SE4001S2T2B5
DI Card: 32 channels, 24V DC, Dry Contact, 40-pin Mass Terminal Block including 2 x 16-channel DI Mass Connection Boards*.	SE4051S2T2B5

V DC Discrete Input Cards and Terminal Blocks	
Description	Model Number
Redundant Discrete Input Card: 32 channels, 24V DC, Dry Contact	
2 x DI Plus Card: 32 channels, 24V DC, Dry Contact, Red. 40-pin DI Mass Terminal Block (to be used with P+F HiC IS barriers and termination boards for DeltaV DCS).	SE4031S2T2B7
2 x DI Plus Card: 32 channels, 24V DC, Dry Contact, Red. 40-pin DI Mass Terminal Block including 2 x 16-channel DI Mass Connection Boards*.	SE4081S2T2B7
Pulse Count Input Card: 4 channels, 24V DC, Dry Contact	
PCI Card: 4 Channels, 24V DC Dry Contact; Discrete 32-channel Terminal Block.	SE4015
Sequence of Event Input Card: 16 channels, 24V DC Dry Contact	
SOE Card: 16 channels, 24V DC, Dry Contact; Discrete 32-Channel Terminal Block.	SE4001S5T2B4
SOE Card: 16 channels, 24V DC, Dry Contact; 40-pin Mass Terminal Block.	SE4001S5T2B5

V DC Discrete Output Cards and Terminal Blocks	
Description	Model Number
Discrete Output Card: 8 channels 24V DC, High Side	
DO Card: 8 channels 24V DC, High Side, 8-Channel Terminal Block.	SE4002S1T2B1
DO Card: 8 channels 24V DC, High Side, Fused 8-Channel Terminal Block.	SE4002S1T2B2
DO Card: 8 channels 24V DC, High Side, 16-Pin Mass Terminal Block.	SE4002S1T2B3
Redundant Discrete Output, 8 channels, 24V DC, High Side	
2 x DO Card, 8 Ch, High Side, Redundant Discrete 8-Channel Terminal Block.	SE4032S1T2B1
Discrete Output Card: 8 channels 24V DC, Isolated	
DO Card: 8 channels 24V DC, Isolated, 8-Channel Terminal Block.	SE4002S1T1B1
DO Card: 8 channels 24V DC, Isolated, Fused 8-Channel Terminal Block.	SE4002S1T1B2
DO Card: 8 channels 24V DC, Isolated, 16-Pin Mass Terminal Block.	SE4002S1T1B3
Discrete Output Card, 32 channels, 24V DC, High Side	
DO Card, 32 channels, 24V DC, High Side, Discrete 32-Channel Terminal Block.	SE4002S1T2B5
DO Card, 32 channels, 24V DC, High Side, 40-Pin Mass I/O Terminal Block (to be used with P+F HiC IS barriers and termination boards for DeltaV DCS).	SE4002S1T2B6
DO Card: 32 channels, 24V DC, High Side, 40-Pin Mass I/O Terminal Block including 4 x 8-channel DO Mass Connection Boards*.	SE4052S1T2B6
Redundant Discrete Output Card, 32 channels, 24V DC, High Side	
2 x DO Plus Card, 32 channels, 24V DC, High Side, 40-Pin DO Mass I/O Terminal Block (to be used with P+F HiC IS barriers and termination boards for DeltaV DCS).	SE4032S1T2B8
2 x DO Plus Card: 32 channels, 24V DC, High Side, 40-Pin DO Mass I/O Terminal Block including 4 x 8-channel DO Mass Connection Boards*.	SE4082S1T2B8

*For more details on the Mass Connection Boards and connection cables, please refer to the *S-series Mass Connection Solutions PDS*.

V AC Discrete Input Cards and Terminal Blocks	
Description	Model Number
Discrete Input Card: 8 channels, 120V AC, Isolated	
DI Card: 8 channels, 120V AC, Isolated, 8-Channel Terminal Block (1 Power Terminal Plug incl. for dedicated to disconnect 24V DC Power supply through the 8-Wide I/O Carrier).	SE4001S3T1B1
DI Card: 8 channels, 120V AC, Isolated, Fused 8-Channel Terminal Block (1 Power Terminal Plug incl. to disconnect 24V DC Power supply through the 8-Wide I/O Carrier).	SE4001S3T1B2
Discrete Input Card: 8 channels, 120V AC, Dry Contact	
DI Card: 8 channels, 120V AC, Dry Contact, 8-Channel Terminal Block (1 Power Terminal Plug incl. for dedicated Power supply through the 8-Wide I/O Carrier).	SE4001S3T2B1
DI Card: 8 channels, 120V AC, Dry Contact, Fused 8-Channel Terminal Block (1 Power Terminal Plug incl. for dedicated Power supply through the 8-Wide I/O Carrier).	SE4001S3T2B2

V AC Discrete Input Cards and Terminal Blocks	
Description	Model Number
Discrete Output Card: 8 channels 120V/230V AC, Isolated	
DO Card: 8 channels 120V/230V AC, Isolated, 8-Channel Terminal Block (1 Power Terminal Plug incl. to disconnect 24V DC Power supply through the 8-Wide I/O Carrier).	SE4002S2T1B1
DO Card: 8 channels 120V/230V AC, Isolated, Fused 8-Channel Terminal Block (1 Power Terminal Plug incl. to disconnect 24V DC Power supply through the 8-Wide I/O Carrier).	SE4002S2T1B2
Discrete Output Card: 8 channels 120V/230V AC, High Side	
DO Card: 8 channels 120V/230V AC, High Side, 8-Channel Terminal Block (1 Power Terminal Plug incl. for dedicated Power supply through the 8-Wide I/O Carrier).	SE4002S2T2B1
DO Card: 8 channels 120V/230V AC, High Side, Fused 8-Channel Terminal Block (1 Power Terminal Plug incl. for dedicated Power supply through the 8-Wide I/O Carrier).	SE4002S2T2B2

Spare Part Ordering Information

Description	Model Number
250V 2A Fuse for Fused Terminal Block; Box of 20	KJ4010X1-BC1

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