

DeltaV SIS™ Auxiliary Components

- Enables diagnostics of field wiring all the way to a high-current discrete end device
- Monitors that the relay changed state correctly
- Enables de-energize-to-actuate applications, even with higher current ratings
- Enables energize-to-actuate applications with current ratings above 500 mA



Pair the DTA Inverting module or the ETA Direct module with an Auxiliary Relay Diode module to achieve additional functionality.

Introduction

In most cases, DeltaV SIS system will connect to either 4 – 20 mA analog signal devices or discrete I/O devices rated at up to 500 mA per channel. Almost all the outputs will be De-energize-to-Trip.

However, there will 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 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.

Benefits

Enables energize-to-trip applications including line monitoring to the final device and higher current ratings.

Some applications, especially in fire and gas, require that the output of a safety loop be energized when a hazardous situation occurs. An example is a motor starter on a fire water pump. DeltaV SIS system has a “de-energize-to-trip” design – it turns off its outputs when there is a safety demand. Our De-Energize to Actuate-Inverting Relay (DTA-Inverting) inverts the output of the logic solver. It sends power to the field device when the logic solver output is switched off. This enables DeltaV SIS system to be used in energize-to-trip applications.

Enables enhanced diagnostics on higher-current discrete outputs.

Many safety systems monitor the field wiring from their I/O modules. However, if the I/O channel is connected to a relay, then the monitoring likely only extends as far as the relay in the cabinet. Any wiring failure in the field will go unnoticed until the system is manually tested or fails on demand. These auxiliary components extend DeltaV SIS' automatic testing of field wiring past the interposing relay.

The majority of SIS applications are de-energize-to-trip. If a de-energize-to-trip output requires more current than the DeltaV SIS Logic Solver can provide on a single channel then we use our Energize to Actuate (ETA) relay to switch off the output when the logic solver output is de-energized, and extend line-monitoring diagnostics to the end device.

The DTA-Inverting and the ETA relay modules incorporate additional circuitry to monitor the integrity of the field wiring all the way to the final device, while also ensuring that it is impossible to accidentally trip the output while performing open and short circuit testing. Their design also provides diagnostics that the relay has switched the output on or off as required.

Product Description

Relay Modules for Fire and Gas Applications

DeltaV SIS system can be used with auxiliary equipment to support fire and gas applications (in accordance with the DeltaV SIS Safety Manual) and other energize to actuate applications. The paired modules available for these applications include:

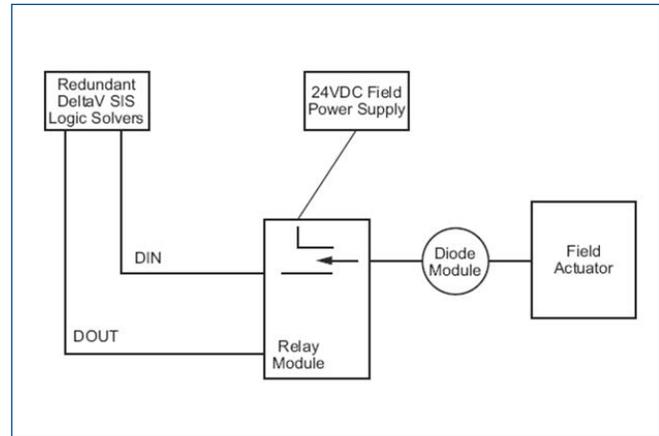
- Auxiliary Relay De-Energize to Actuate-Inverting (DTA-Inverting), 24 V DC module
- Auxiliary Relay Diode, 24 V DC module

Auxiliary Relay

De-Energize to Actuate (DTA-Inverting)

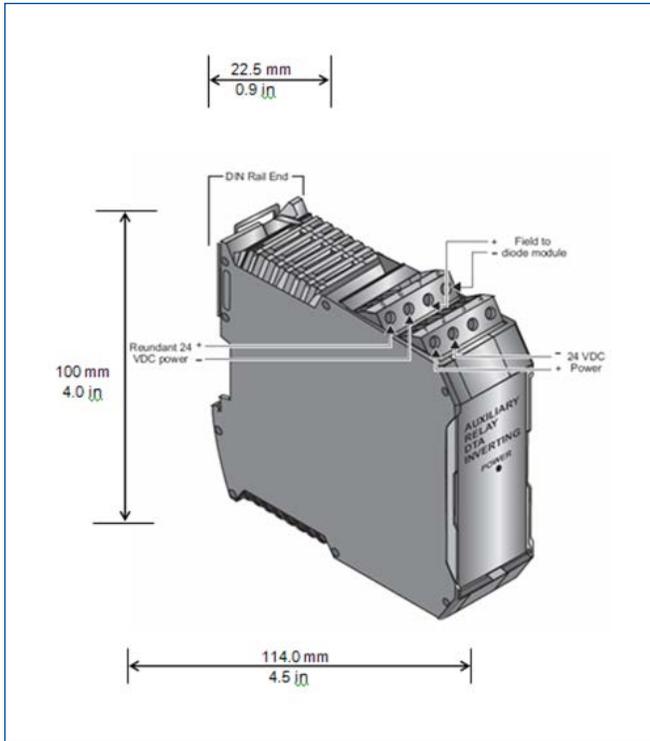
The DTA-Inverting relay module has a connection to a single discrete input and a single discrete output channel on a Logic Solver and a connection to a dual 24 V DC power supply. Two field terminals are used to connect to the diode module that is located next to the field actuator.

The DTA-Inverting relay module energizes the field device when the Discrete Out is turned off. The DTA-Inverting relay module is paired with the Relay Diode module to enable the monitoring of the field wiring and the status of the relay. A switch on the Relay Diode module is used to change between energize to actuate and de-energize to actuate. The Auxiliary Relay DTA-Inverting module's LED shows the state of the relay coil and that power is correctly installed.

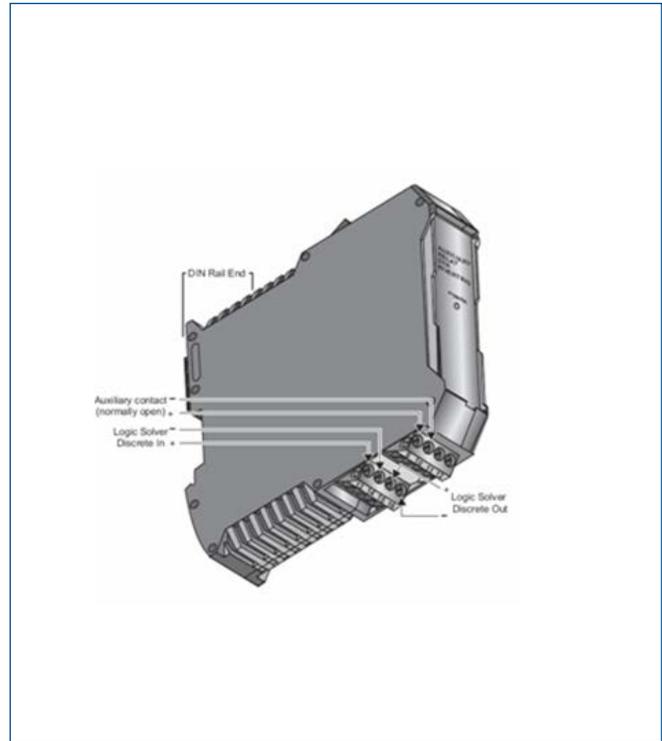


Relay module block diagram.

Auxiliary Relay DTA-Inverting Module	
Item	Specifications
Input Power	24 V DC ± 20% Contains integrated input OR-ing diodes for redundant 24 V DC inputs
Field Power	5 A @ 24 V DC nominal (depends upon actuator used)
Isolation	Power input and logic solvers must be connected to a common ground
Discrete out load current	430 Ω, 55 mA @ 24 V DC input voltage
Mounting	DIN rail-mounted
Operating Temperature	-40 to 60°C (-40 to 140°F)



Top view of the Auxiliary Relay DTA-Inverting module.



Bottom view of the Auxiliary Relay DTA-Inverting module (showing the connectors).

Relay Module for High-Current Applications

DeltaV SIS system can be used with auxiliary equipment to support other applications. The paired modules available for other applications include:

- Auxiliary Relay Energize to Actuate (ETA-Direct), 24V DC module, and
- Auxiliary Relay Diode, 24V DC module.

Auxiliary Relay Energize to Actuate (ETA-Direct)

The ETA-Direct relay module has a connection to a single discrete input and a single discrete output channel on a Logic Solver and a connection to a dual 24V DC power supply. Two field terminals are used to connect to the diode module that is located next to the field actuator.

Auxiliary Relay ETA-Direct Module	
Item	Specifications
Input Power	24V DC ± 20% Contains integrated input OR-ing diodes for redundant 24V DC inputs
Field Power	5 A @ 24V DC nominal (depends upon actuator used)
Isolation	Power input and logic solvers must be connected to a common ground
Discrete out load current	430 Ω, 55 mA @ 24V DC input voltage
Mounting	DIN rail-mounted
Operating Temperature	-40 to 60°C (-40 to 140°F)

The ETA Direct relay module de-energizes the field device when the Discrete Out is turned off. The ETA Direct relay module is paired with the Relay Diode module to enable the monitoring of the field wiring and the status of the relay. A switch on the Relay Diode module is used to change between energize to actuate

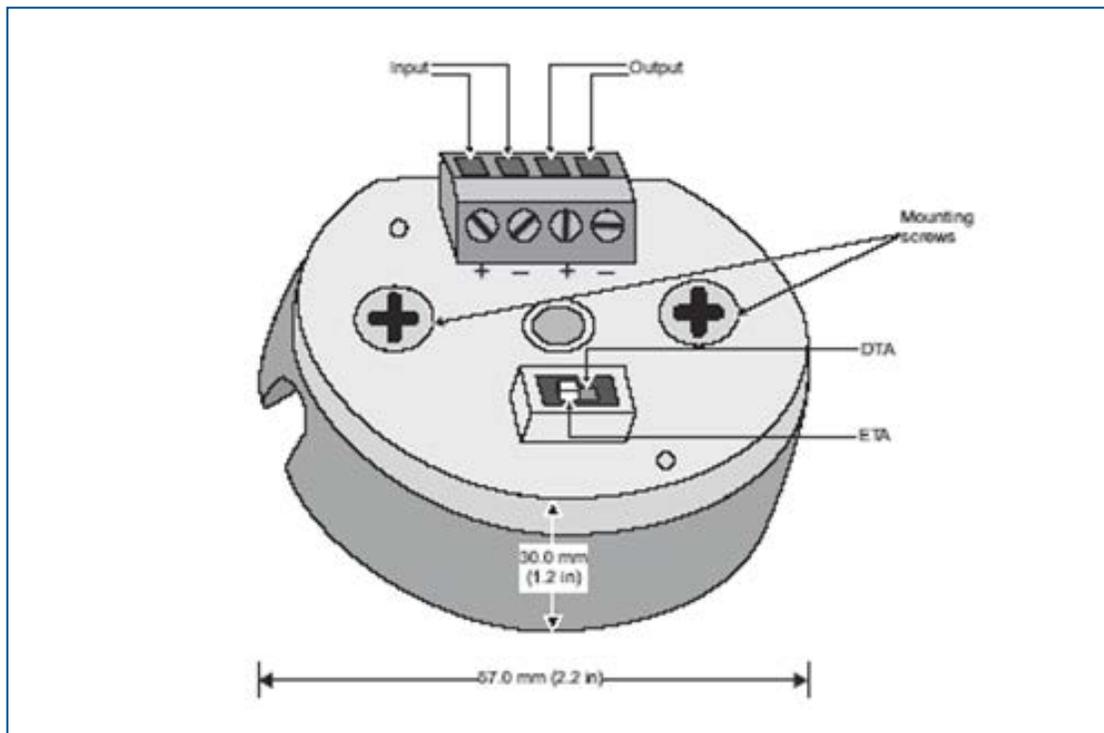
and de-energize to actuate. The Auxiliary Relay DTA-Inverting module's LED shows the state of the relay coil and that power is correctly installed.

The connectors on the Auxiliary Relay ETA-direct module are the same as those for the Auxiliary Relay DTA-Inverting module.

Auxiliary Relay Diode Module

The Auxiliary Relay Diode module must be paired with either of the Auxiliary Relay modules (ETA Direct or DTA-Inverting).

Auxiliary Relay DTA Diode Module	
Item	Specifications
Mode Selection	Switch selectable between ETA and DTA operation
Mounting	Per DIN 43729
Operating Temperature	-40 to 70°C (-40 to 158°F)



Connectors and switch positions on the Relay Diode module.

Use the following table to match the application to the appropriate module

Matching the Application to the Appropriate Module			
Condition of final device in safe state	Application Type	Current rating of final device	Model Number
De-energized (off)	De-energize-to-trip	<= 500 mA	None – wire device to Digital Output channel on DeltaV SIS logic solver
De-energized (off)	De-energize-to-trip	>500 mA	Energize to Actuate (ETA) Relay
Energized (on)	Energize-to-trip	Any	De-Energize to Actuate-Inverting (DTA-Inverting) Relay

Ordering Information

Description	Model Number
Auxiliary Relay ETA-Direct module	VS6901
Auxiliary Relay De-Energize to Actuate (DTA-Inverting), 24V DC module	VS6902
Auxiliary Relay Diode, 24V DC module	VS6903

Prerequisites

- DeltaV v8.3 software or later.

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