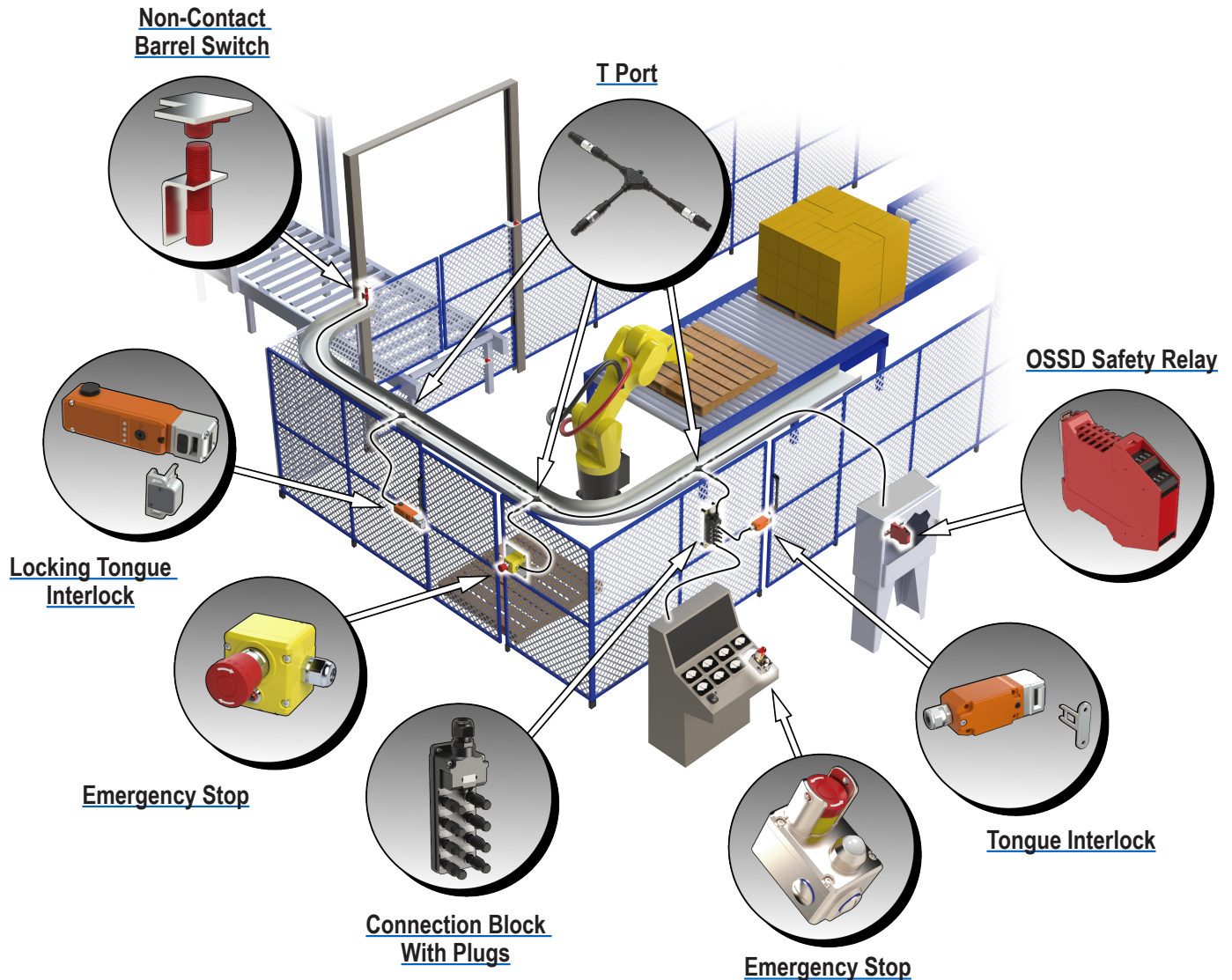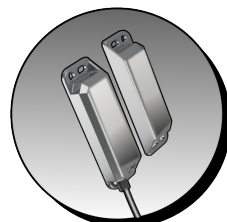# IDEM Z-Range Safety Switches

IDEM's Z-Range of products have one set of dual OSSD outputs and one set of dual OSSD inputs. This enables the devices to be wired in series, reducing cost and time associated with wiring back to the panel. Up to 30 Z-Range devices can be connected to one safety relay.

These safety switches feature self monitoring OSSD outputs to achieve CAT 4 PLe, according to ISO 13849-1, and SIL3, according to IEC 62061, even when connected in a series.

Components in the Z-Range consists of non contact switches, hinge switches, emergency stop control stations, solenoid locking RFID tongue interlocks, and non-locking tongue interlocks, along with t-port cables, connection blocks and accessories.
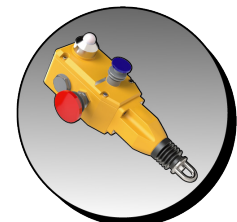
Z-Range Safety Switch Installation Example

Non-Contact Barrel Switch

T Port

OSSD Safety Relay

Locking Tongue Interlock

Emergency Stop

Connection Block With Plugs

Emergency Stop

Tongue Interlock

Set-ups similar to the one illustrated here may also include these other Z-Range safety components:

Non-Contact Rectangular Switch

Hinge Switch

Cable Pull

IDEM Z-Range GLx-Z Safety Cable-Pull Switches

Description

Safety cable-pull emergency stop switches are mounted on machines and sections of plant conveyors which cannot be protected by guards. In contrast to traditional mushroom head type emergency stop buttons, safety cable-pull switches can initiate the emergency command from any point along the installed rope length. In combination with any dual channel safety monitoring controllers, IDEM safety cable-pull systems can be used as emergency stop devices and monitored for up to Category PLe/Cat.4 to ISO13849-1. It is the responsibility of the user to ensure the correct overall functionality of its systems and machines. IDEM, its subsidiaries and affiliates, are not in a position to guarantee all of the characteristics of a given system or product not designed by IDEM.

Operation

All IDEM safety cable-pull emergency stop switches conform to Standards ISO13850 and IEC60947-5-5. They have a positive mechanical linkage between the switch circuits and the wire rope as per IEC60947-5-1. The emergency stop switches are brought into the operational condition by pre-tensioning the rope by use of a tensioner/gripper device which clamps the rope and then hooks to the switch eyebolts. Correct tension can be observed by viewing the tension indicator on the switch housing. Once tensioned, the switch circuit blocks can be set to the operational condition (safety circuits closed, auxiliary circuits open) by pressing a blue reset button on the switch cover.

All of the safety cable-pull switches have wire-breakage monitoring. On pulling or breakage (tension loss) of the rope, the safety circuits are positively opened and the auxiliary circuits are closed. The switches are mechanically latched and can then only be returned to the operating condition by pressing the reset button as required by ISO13850.

Features

- Three 1/2 in. NPT female fittings
- Includes one tamper-proof T20 Torx bit
- Rope Pull kits sold separately and recommended for increased reliability
- 50m [164ft], 80m [262ft], 100m [328ft], 125m [410ft] and 250m [820ft] maximum length systems

GLM-143300-Z

GLS-142300-Z

GLS-SS-144300-Z

GLHL-SS-145301-Z (left hand)

GLHD-141300-Z (dual head)

IDEM Z-Range GLx-Z Safety Cable-Pull Switches Selection Guide

Part Number	Price	Maximum Rope Length	Construction Material	E-Stop	LED	Outputs	Drawings
GLM-143300-Z	$350.00	50m [164ft]*	Die-cast aluminum	Yes	Dual color	2 OSSD and 1 Status	PDF
GLM-SS-148300-Z	$512.00	50m [164ft]*	316 stainless steel				PDF
GLS-142300-Z	$367.00	80m [262ft]*	Die-cast aluminum				PDF
GLS-SS-144300-Z	$583.00	100m [328ft]	316 stainless steel				PDF
GLHL-141301-Z	$379.00	125m [410ft]	Die-cast aluminum				PDF
GLHL-SS-145301-Z	$621.00	125m [410ft]	316 stainless steel				PDF
GLHR-141302-Z	$379.00	125m [410ft]	Die-cast aluminum				PDF
GLHR-SS-145302-Z	$621.00	125m [410ft]	316 stainless steel				PDF
GLHD-141300-Z	$525.00	250m [820ft]	Die-cast aluminum				PDF
GLHD-SS-145300-Z	$725.00	250m [820ft]	316 stainless steel				PDF

*See Recommended Rope Span Options and Fittings for number of switches recommended with specific maximum rope lengths.

Safety Classification and Reliability Data

Mechanical Reliability B10d	1.5 x 106 operations at 100mA load
ISO 13849-1	Up to PLe depending upon system architecture
EN 62061	Up to SIL3 depending upon system architecture
Safety Data - Annual Usage	8 cycles per hour / 24 hours per day / 365 days
PFHd	8.8×10^{-5}
Proof Test Interval (Life)	20 years
MTTFd	771 years

IDEM Z-Range Safety Switches

IDEM Z-Range General Specifications			
	GLx-Z (Cable Pull)	**KM-Z / KM-SS-Z (Interlock Switch)**	**ES-P-Z/ESL-SS-Z (E-Stop Station)**
Enclosure / Cover	Polyester or stainless steel 316		
IP Rating / NEMA	IP67 plastic / IP69K stainless steel / NEMA 6		
Mounting	4 x M4		
Torque Settings	Mounting: M4 4.0 N·m Lid: T20 Torx M4 1.5 N·m		
Ambient Temperature	-25 to 50°C [-13 to 122°F]		
Weight	Plastic: 250g [0.55 lb] Stainless steel: 1000g [2.20 lb]		
Rated Operating Voltage	20.4 VDC to 26.4 VDC		
Withstand Voltage (U_{imp})	250V		
Power Consumption	0.7 W		
Output Voltage / Min and Max Current	24VDC /1mA to 0.2 A		
Input Voltage / Current	24VDC / 2mA		
Response Time (Device Activated)	60ms max		
Response Time (Inputs Off)	20ms max		

IDEM Z-Range Safety Switches Electrical Connections

Wiring

IDEM Quick Disconnect Leads Color Coding

Orange – Guard open signal out
Brown – Not used

Yellow – Safety input 2 (see note)
Green – Safety output 2 (OSSD)

White – Safety output 1 (OSSD)
Black – Safety input 1 (see note)

Blue – 0VDC
Red – +24VDC
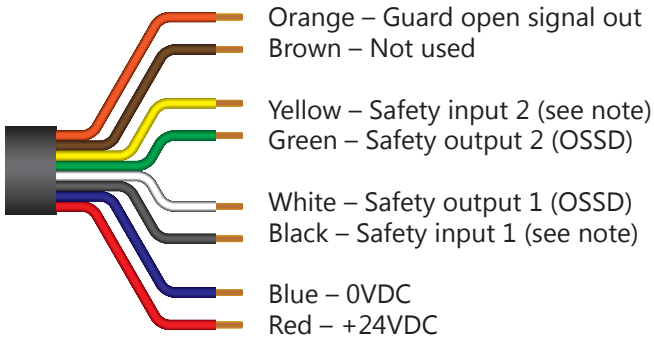
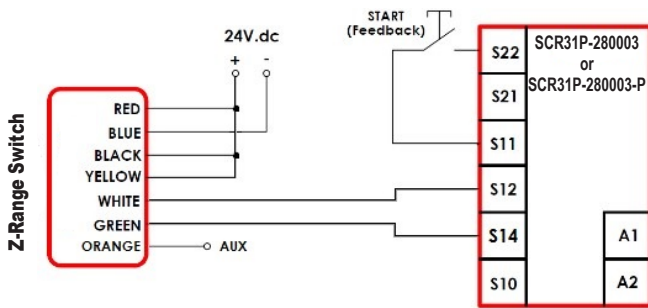**Connection Colors**

8
2   1
3   7
4   6
5
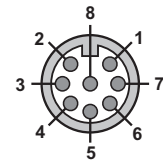
**Pin View from Switch**
M12 Male

Coded Magnetic Switches Electrical Connections

Quick Disconnect Connector Pin Out	IDEM Quick Disconnect Leads Color Coding	Terminal	Switch Circuit
2	Red	R+	Supply +24 VDC
3	Blue	0V	Supply 0VDC
7	Black	11	Safety Input 1
1	White	12	Safety Output 1
4	Yellow	21	Safety Input 2
6	Green	22	Safety Output 2
8	Orange	44	Guard open signal +24VDC out
N/A	–	34	Guard unlocked signal +24VDC out
5	Brown	Not used	Not used

**NOTE: Safety outputs 1 and 2 are OSSD signals
Safety inputs 1 and 2 are 24VDC if not in series or OSSD inputs if in series**

Single Switch to SCR31P-280003 or SCR31P-280003-P

Mulitple Switches to SCR31P-280003 or SCR31P-280003-P

Safety Electrical Components tESC-229
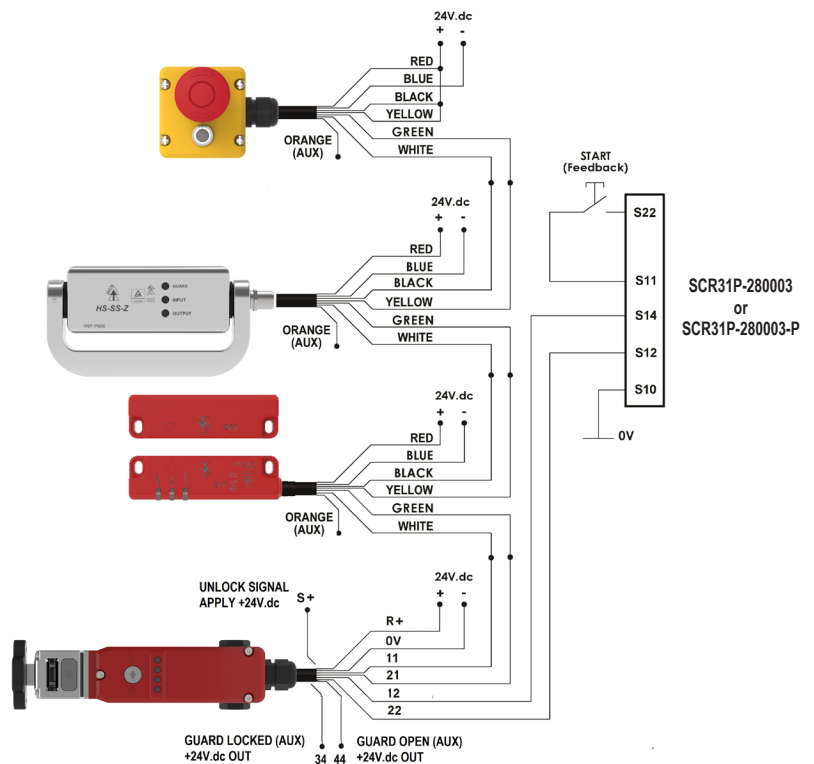
IDEM Cables

Connection Cables

IDEM connection cables are sold as a complete cable that is not meant to be cut into, so the manufacturer doesn't guarantee the internal wire colors will always be the same. It will always be pin 1 to pin 1, pin 2 to pin 2, etc., but the internal colors might change.

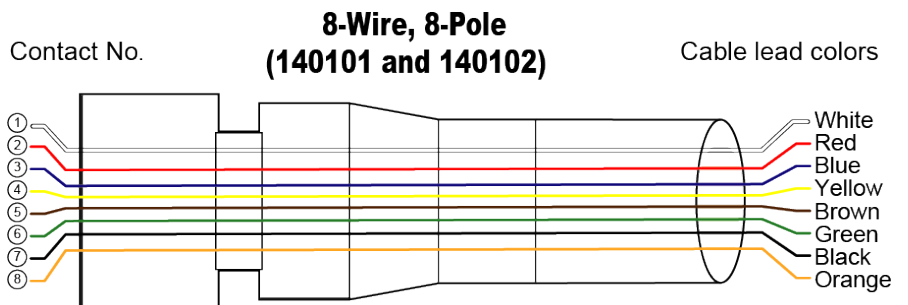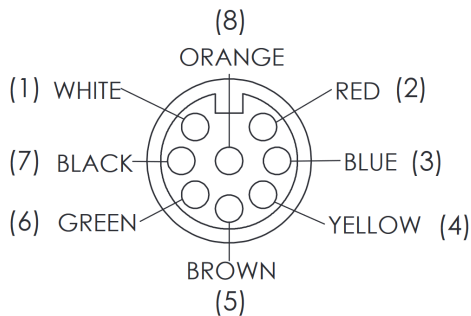Only the pigtail cables have fixed wire colors.

140201

IDEM Connection Cables Selection Chart

Part Number	Price	Description	Connection	Length	Cable Jacket
140201	$41.00	Connection cable	8-pin M12 axial female to 8-pin M12 axial male	2m [6.56 ft]	Black PVC
140202	$51.00	Connection cable	8-pin M12 axial female to 8-pin M12 axial male	5m [16.40 ft]	Black PVC
140203	$62.00	Connection cable	8-pin M12 axial female to 8-pin M12 axial male	10m [32.81 ft]	Black PVC

Female Quick Disconnect Lead

Part Number	Price	Description	Exit Type/Cable Length
140101	$59.00	8-pin M12 female quick disconnect	Pigtail, 5m [16.4 ft]
140102	$88.00	8-pin M12 female quick disconnect	Pigtail, 10m [32.8 ft]

140101

CONNECTION DETAIL (VIEW X)

(8) ORANGE
(1) WHITE
(2) RED
(7) BLACK
(3) BLUE
(6) GREEN
(4) YELLOW
(5) BROWN

8-Wire, 8-Pole (140101 and 140102)

Contact No.

Cable lead colors

① White
② Red
③ Blue
④ Yellow
⑤ Brown
⑥ Green
⑦ Black
⑧ Orange

NOTE: Only the pigtail cables have fixed wire colors.

IDEM Connection Cables General Specifications

Temperature Rating	105°C [221°F]
Core	22 strands of 0.12 mm bare copper
Inner insulation (Core) Diameter	1.35 (±0.1) mm
Outer Sheath (Jacket) Color	Black (printed)
Outer Insulation	PVC
Inner Insulation	PVC
Number of cores	8 cores (24AWG) UL style 2517
Rated Voltage/Current	250V / 3A

IDEM M12 Connection Box For Use With Z-Range Switches
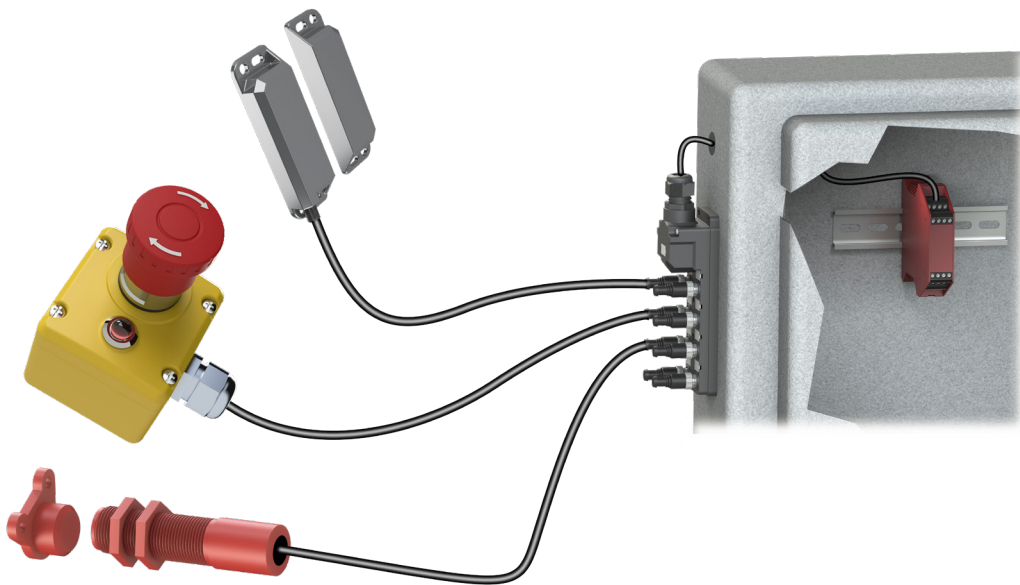
Features

- When combined with the T-port, allows you to connect up to 30 Z-Range devices in series to a single safety controller
- Configured for dual channel to a safety controller
- Shorting plugs must be inserted into all unused ports
- M20 conduit exit; M20 cable gland accepts cable OD 6.5-12.0 mm [0.26-0.47 in]

IDEM M12 Connection Box For Use With Z-Range Switches Selection Chart							
Part Number	Price	Description	Ports	Input Connections	Output Connection	Indicators	Drawing
140210-Z	$262.00	IDEM junction block for use with IDEM Z-Range switches only	8	8-pin M12 sockets	Cable clamp for field-wired connection	24VDC LED	PDF
140205	$22.00	Shorting plug, 8 pole, for use with IDEM Z-Range connection blocks	–	–	–	–	PDF
140204	$41.00	T-port for use with Z-Range safety switches	–	2 8-pole M12 axial male	1 8-pole M12 axial female	–	PDF

NOTE: The appropriate shorting plug must be inserted into all unused ports.


140210-Z

140204

140205

IDEM Connection Box
For Use With Z-Range Switches

IDEM M12 Connection Box For Use With Z-Range Switches Specifications	
Port Connection Type	8-pin M12 female sockets (qty 8)
Operating Temperature	-20 to +40°C [-4 to +104°F]
Supply Voltage	24VDC ±10%
Maximum Current	500mA (each port) if solenoid feed is used
Body Material	Polyester
Internal Terminals	Spring-type clamp for 22-30 AWG conductors
Cable Exit	M20 x 1.5 mm cable gland (M20 cable gland accepts cable OD 6.5 mm to 12.0 mm [0.26 in to 0.47 in]
Mounting	2xM4 bolts, 4.6 mm [0.18 in] diameter clearance holes
Accessory	Shorting plug for unused ports
LEDs (1-8)	Red, auxiliary indication of switch open

Connections (140210-Z) for Z-Range Switches Only
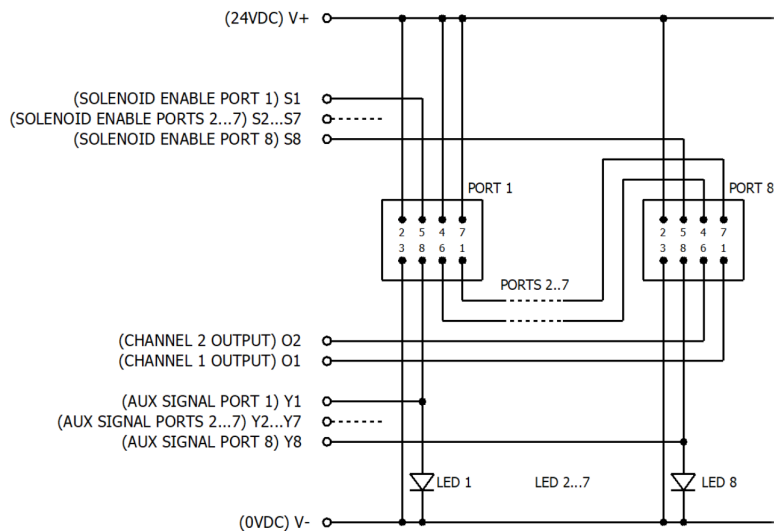
Output Terminal Connections			
Terminal	Output	Indication	LED Status
Y1	Auxiliary out +24VDC	Switch 1 open	LED 1 on
Y2	Auxiliary out +24VDC	Switch 2 open	LED 2 on
Y3	Auxiliary out +24VDC	Switch 3 open	LED 3 on
Y4	Auxiliary out +24VDC	Switch 4 open	LED 4 on
Y5	Auxiliary out +24VDC	Switch 5 open	LED 5 on
Y6	Auxiliary out +24VDC	Switch 6 open	LED 6 on
Y7	Auxiliary out +24VDC	Switch 7 open	LED 7 on
Y8	Auxiliary out +24VDC	Switch 8 open	LED 8 on
V+	Supply +24VDC		
V-	Supply 0VDC		
S1	Solenoid energize (apply +24VDC (if used)		Port 1
S2	Solenoid energize (apply +24VDC (if used)		Port 2
S3	Solenoid energize (apply +24VDC (if used)		Port 3
S4	Solenoid energize (apply +24VDC (if used)		Port 4
S5	Solenoid energize (apply +24VDC (if used)		Port 5
S6	Solenoid energize (apply +24VDC (if used)		Port 6
S7	Solenoid energize (apply +24VDC (if used)		Port 7
S8	Solenoid energize (apply +24VDC (if used)		Port 8
O1	Safety output channel 1		
O2	Safety output channel 2		

Safety Products

Warning: Safety products sold by AutomationDirect are Safety components only. The purchaser/installer is solely responsible for the application of these components and ensuring all necessary steps have been taken to assure each application and use meets all performance and applicable safety requirements and/or local, national and/or international safety codes as required by the application. AutomationDirect cannot certify that our products, used solely or in conjunction with other AutomationDirect or other vendors' products, will assure safety for any application. Any person using or applying any products sold by AutomationDirect is responsible for learning the safety requirements for their individual application and applying them, and therefore assumes all risks, and accepts full and complete responsibility, for the selection and suitability of the product for their respective application.

AutomationDirect does not provide design or consulting services, and cannot advise whether any specific application or use of our products would ensure compliance with the safety requirements for any application.