

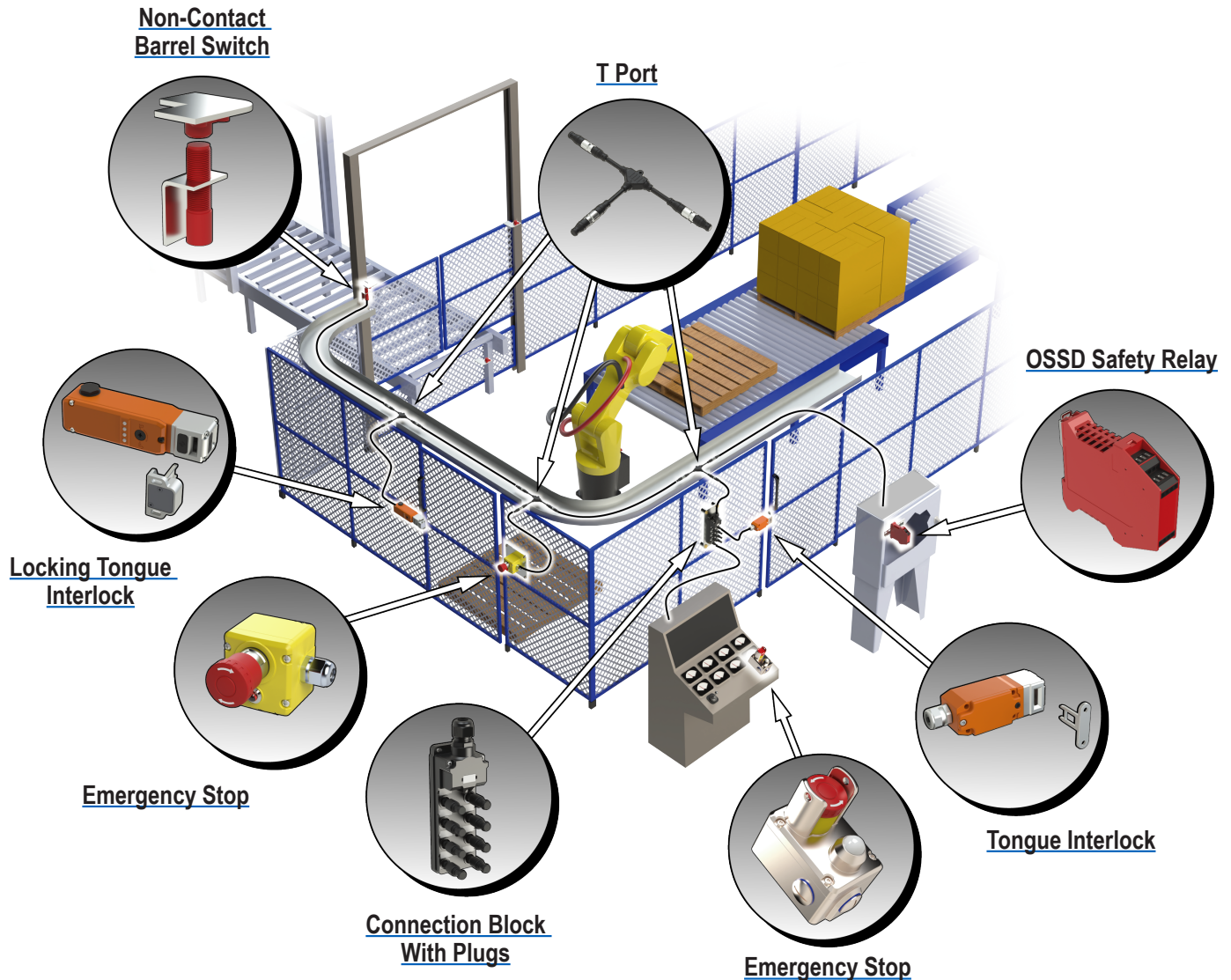


# IDEM Z-Range Safety Switches

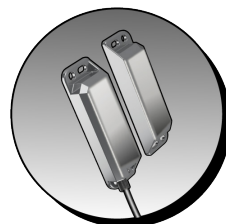
IDEM's Z-Range of products have one set of dual OSSD outputs and one set of dual OSSD inputs. This enables the devices to be wired in series, reducing cost and time associated with wiring back to the panel. Up to 30 Z-Range devices can be connected to one safety relay. These safety switches feature self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



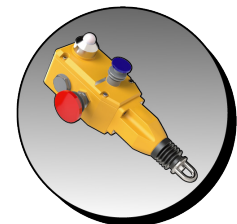
Set-ups similar to the one illustrated here may also include these other Z-Range safety components:



Non-Contact Rectangular Switch



Hinge Switch



Cable Pull

# IDEM Z-Range (HS-SS/HSM) Hinge Safety Switches



## Description

HS-SS-Z and HSM-Z hinge switches are designed to be fitted to the hinged axis of machine guard doors and provide a robust hinge function in addition to interlock position sensing. Enclosures are protected to IP67/ IP69K with a low profile, hygienic design for washdown.

When used in combination with an OSSD safety relay or control device, the hinge safety switches can be used to provide protection up to Category 4 and PLe to ISO13849-1, and they can maintain PLe level protection with other IDEM Z-Range switches connected in series due to internal test functions of the switches.

In addition, each switch provides input, output and guard state LEDs. It is recommended to limit the number of switches connected in series to a maximum of 30.

## Features

- Designed to provide a safety interlock on a hinge door
- Suitable for use in extreme temperature or moisture environments
- Adjustable guard open detection of 0 to 10 degrees
- Provides a high level of anti-tamper protection
- Suitable for use in high-hygiene requirement areas (e.g. food industry hosedown) IP67 / IP69K
- Long mechanical life (no moving or touching parts)
- Designed to conform to EN60947-5-3
- For use as directed by ISO14119 and EN ISO12100

IDEM Z-Range (HS-SS/HSM Series) Hinge Safety Switches Selection Guide							
Part Number	Price	Body Material	Coding	Connection	Cable Length (Dim A)	Outputs	Drawing
<a href="#">HS-SS-Z-RH-352001</a>	\$307.00	316 stainless steel	Right hand	Pigtail	5m [16.4 ft]	2 OSSD and 1 Status	<a href="#">PDF</a>
<a href="#">HS-SS-Z-RH-352002</a>	\$314.00			Pigtail	10m [32.8 ft]		<a href="#">PDF</a>
<a href="#">HS-SS-Z-RH-352003</a>	\$330.00			8-pin M12 quick-disconnect	250mm [9.8 in]		<a href="#">PDF</a>
<a href="#">HS-SS-Z-LH-352004</a>	\$307.00		Left hand	Pigtail	5m [16.4 ft]		<a href="#">PDF</a>
<a href="#">HS-SS-Z-LH-352005</a>	\$314.00			Pigtail	10m [32.8 ft]		<a href="#">PDF</a>
<a href="#">HS-SS-Z-LH-352006</a>	\$330.00			8-pin M12 quick-disconnect	250mm [9.8 in]		<a href="#">PDF</a>
<a href="#">HSM-Z-RH-353001</a>	\$239.00	Die-cast aluminum alloy	Right hand	Pigtail	5m [16.4 ft]		<a href="#">PDF</a>
<a href="#">HSM-Z-RH-353002</a>	\$246.00			Pigtail	10m [32.8 ft]		<a href="#">PDF</a>
<a href="#">HSM-Z-RH-353003</a>	\$262.00			8-pin M12 quick-disconnect	250mm [9.8 in]		<a href="#">PDF</a>
<a href="#">HSM-Z-LH-353004</a>	\$239.00		Left hand	Pigtail	5m [16.4 ft]		<a href="#">PDF</a>
<a href="#">HSM-Z-LH-353005</a>	\$246.00			Pigtail	10m [32.8 ft]		<a href="#">PDF</a>
<a href="#">HSM-Z-LH-353006</a>	\$262.00			8-pin M12 quick-disconnect	250mm [9.8 in]		<a href="#">PDF</a>

## Blank Hinge

IDEM Z-Range (HS-SS/HSM Series) Blank Hinge Selection Guide				
Part Number	Price	Body Material	Handing	Drawing
<a href="#">HS-SS-Z-350020</a>	\$136.00	316 stainless steel	None	<a href="#">PDF</a>
<a href="#">HSM-Z-351020</a>	\$69.00	Die-cast aluminum alloy		<a href="#">PDF</a>



**HS-SS-Z-350020**  
Works with either right- or left-handed doors

## Mounting Plate

IDEM Z-Range (HS-SS/HSM Series) Mounting Plate Selection Guide				
Part Number	Price	Description	Handing	Drawing
<a href="#">HSM-Z-350025</a>	\$31.50	Door hinge switches mounting bracket	None	<a href="#">PDF</a>



**HSM-Z-350025**

# IDEM Z-Range Hinge Safety Switches



IDEM Z-Range Hinge Safety Switches General Specifications	
<i>HSM-Z / HS-SS-Z</i>	
<b>Safety Classification and Reliability Data</b>	
Switching Reliability (B10d)	N/A - no mechanical parts are implemented
ISO 13849-1	Up to Category 4 with Safety Relay 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
MTTFd	771 years
Max Response Time (Actuator Removed)	60ms
Max Response Time (Input Off)	20ms
Agency Approvals	cULus E258676, CE
<b>Electrical and General Specifications</b>	
Rated Operating Voltage	20.4 VDC to 26.4 VDC
Power Consumption	0.7 W
Output Current	Max = 0.2 A Min = 1mA
Switching Angle Window	Fixed at 10 degrees
Fixed Switching Angle	Typical is 0 to 10 degrees. Alternate installations could be (for example) 90 to 100 degrees, or 355 to 5 degrees, or any other 10-degree range. See illustration below and refer to operating instructions for additional information.
Enclosure Protection	IP67
Operating Temperature	-25°C to +80°C [-13°F to +176°F] For UL applications: -25 to 45°C [-13 to 113°F]
Recommended Mounting Screws/Torque	7 x M5 screws; 1N•m [0.74 lb•ft]

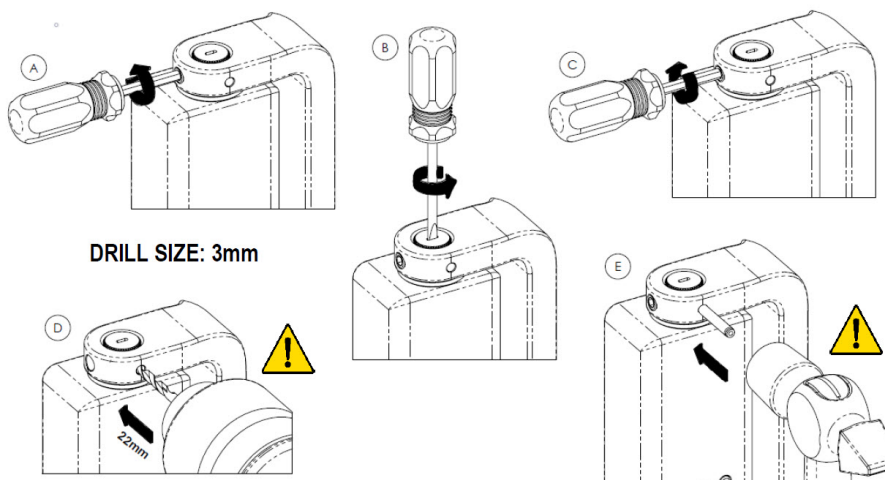
## LED Operation

Guard	
Guard Closed	Green
Guard Open	Red

Input	
Safety Inputs On	Green (steady)
Safety Input Missing	Green (flashing)
Safety Inputs Off	Off
Internal Fault	Red (steady)

Output	
Safety Outputs On	Green (steady)
Safety Outputs Off	Off
External Fault	Red (flashing)

## Final Setting After Installation



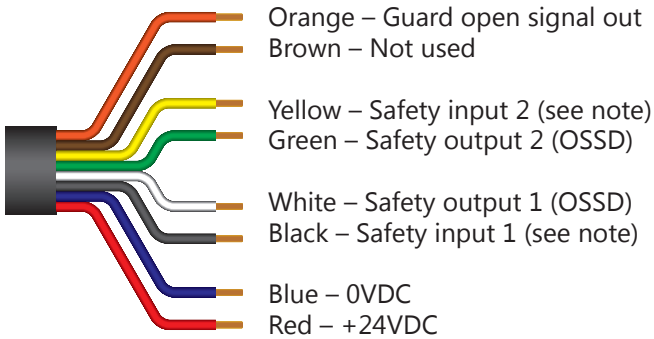
**Installer MUST drill and pin switch in final switching position. Installer must not rely only on adjustment grub screw for safety. See operating instructions for additional information on switching angle window adjustment.**

# IDEM Z-Range Safety Switches Electrical Connections

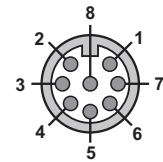


## Wiring

### IDEM Quick Disconnect Leads Color Coding



### Connection Colors

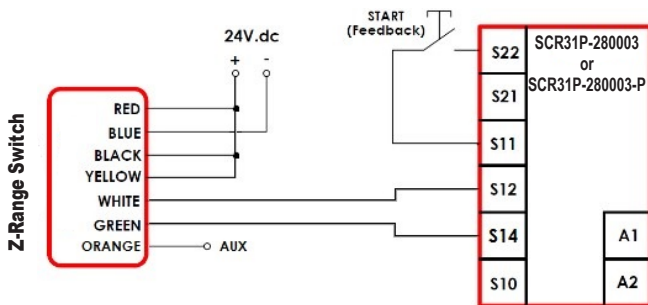


Pin View from Switch  
M12 Male

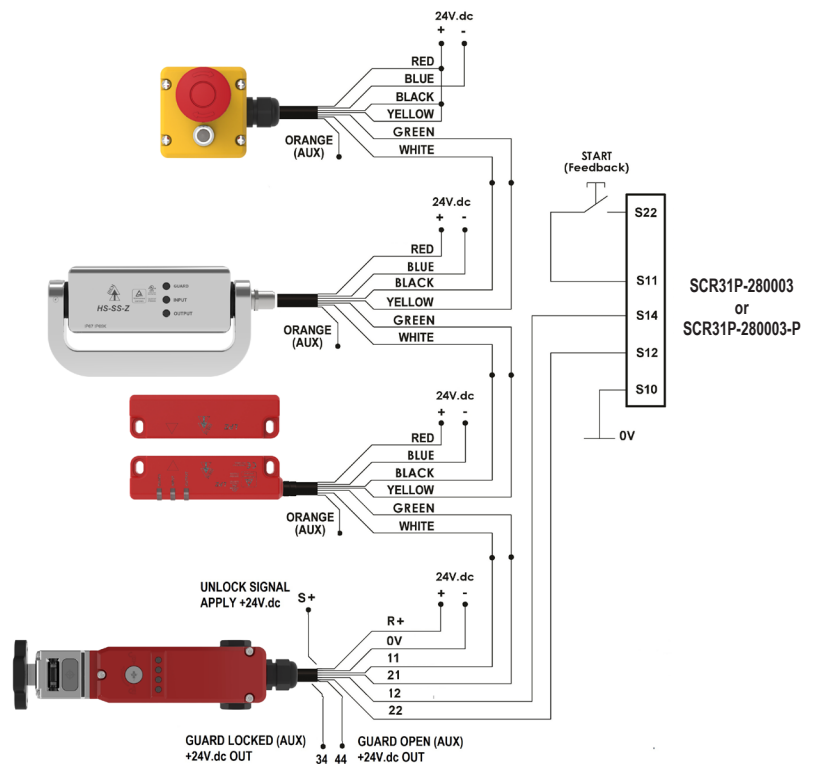
Coded Magnetic Switches Electrical Connections			
Quick Disconnect Connector Pin Out	IDEM Quick Disconnect Leads Color Coding	Terminal	Switch Circuit
2	Red	R+	Supply +24 VDC
3	Blue	0V	Supply 0VDC
7	Black	11	Safety Input 1
1	White	12	Safety Output 1
4	Yellow	21	Safety Input 2
6	Green	22	Safety Output 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



### Multiple Switches to SCR31P-280003 or SCR31P-280003-P



# 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**

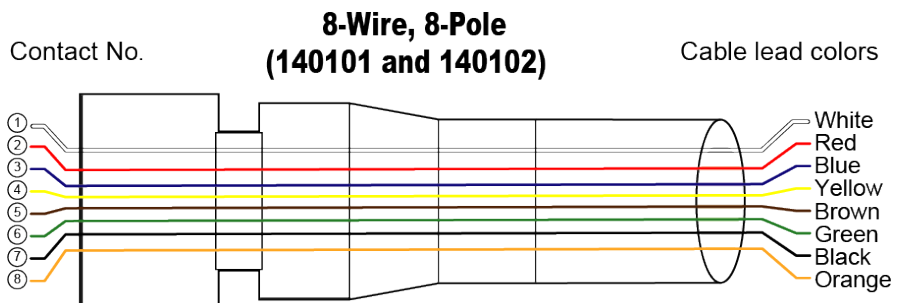
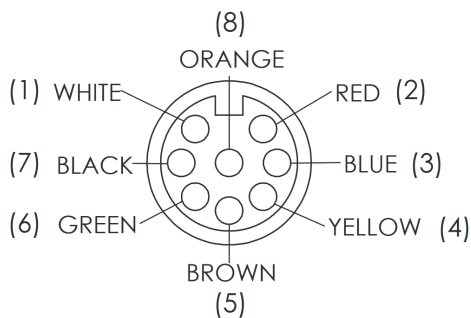
IDEM Connection Cables Selection Chart					
Part Number	Price	Description	Connection	Length	Cable Jacket
<b>140201</b>	\$41.00	Connection cable	8-pin M12 axial female to 8-pin M12 axial male	2m [6.56 ft]	Black PVC
<b>140202</b>	\$51.00	Connection cable	8-pin M12 axial female to 8-pin M12 axial male	5m [16.40 ft]	Black PVC
<b>140203</b>	\$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
<b>140101</b>	\$59.00	8-pin M12 female quick disconnect	Pigtail, 5m [16.4 ft]
<b>140102</b>	\$88.00		Pigtail, 10m [32.8 ft]



**140101**

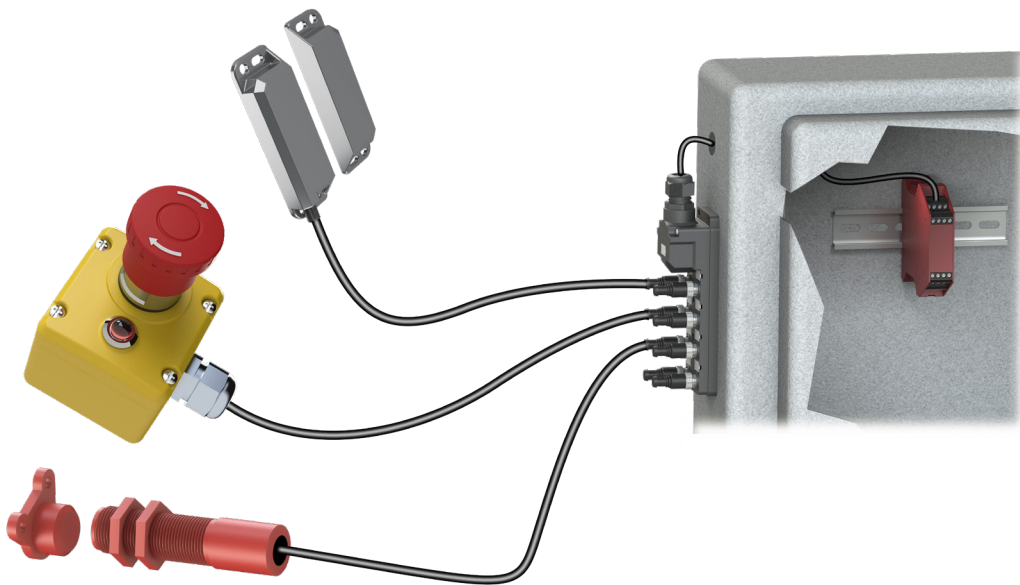
### CONNECTION DETAIL (VIEW X)



**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
<a href="#"><u>140210-Z</u></a>	\$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	<a href="#"><u>PDF</u></a>
<a href="#"><u>140205</u></a>	\$22.00	Shorting plug, 8 pole, for use with IDEM Z-Range connection blocks	-	-	-	-	<a href="#"><u>PDF</u></a>
<a href="#"><u>140204</u></a>	\$41.00	T-port for use with Z-Range safety switches	-	2 8-pole M12 axial male	1 8-pole M12 axial female	-	<a href="#"><u>PDF</u></a>

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



[140210-Z](#)



[140204](#)



[140205](#)

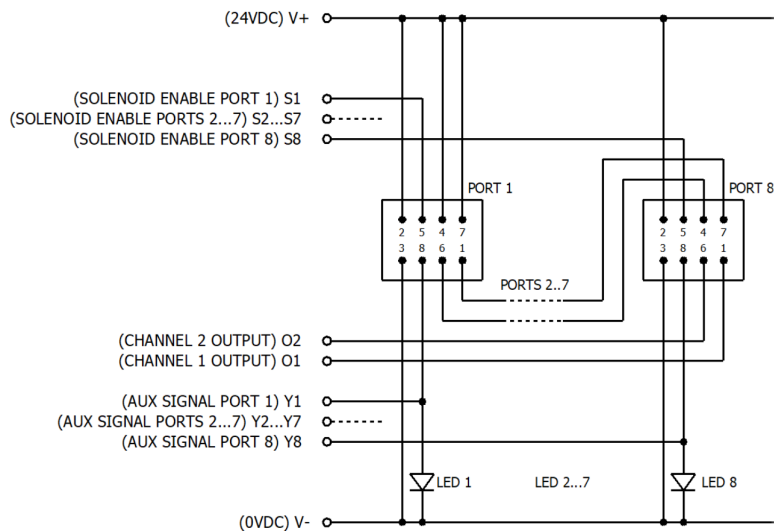
# IDEM Connection Box For Use With Z-Range Switches



## IDEM M12 Connection Box For Use With Z-Range Switches Specifications

<b>Port Connection Type</b>	8-pin M12 female sockets (qty 8)
<b>Operating Temperature</b>	-20 to +40°C [-4 to +104°F]
<b>Supply Voltage</b>	24VDC ±10%
<b>Maximum Current</b>	500mA (each port) if solenoid feed is used
<b>Body Material</b>	Polyester
<b>Internal Terminals</b>	Spring-type clamp for 22-30 AWG conductors
<b>Cable Exit</b>	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])
<b>Mounting</b>	2xM4 bolts, 4.6 mm [0.18 in] diameter clearance holes
<b>Accessory</b>	Shorting plug for unused ports
<b>LEDs (1-8)</b>	Red, auxiliary indication of switch open

## Connections (140210-Z) for Z-Range Switches Only



## Output Terminal Connections

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

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