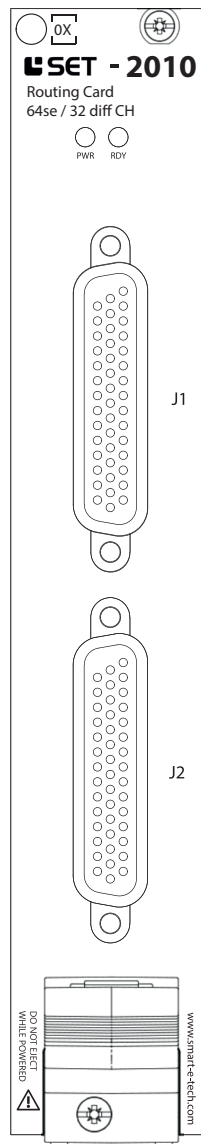


## TECHNICAL DESCRIPTION

# SET-2010

32 differential / 64 single-ended channel routing card



This document is a technical description of the SET-2010.



**Note** Before you begin, complete the software and hardware installation required for your application.



**Note** The guidelines in this document are specific to the SET-2010. The other components in the system might not meet the same safety ratings. Refer to the documentation of each component in the system to determine the safety and EMC ratings for the entire system.

### MORE INFORMATION ON OUR WEBSITE:

[www.smart-e-tech.com/slsc](http://www.smart-e-tech.com/slsc)

# Safety Guidelines

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**Caution** Do not operate the SET-2010 in a manner not specified in this document. Product misuse can result in a hazard. You can compromise the safety protection built into the product if the product is damaged in any way. If the product is damaged, return it for repair.

## Electromagnetic Compatibility Guidelines

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This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC). These requirements and limits provide reasonable protection against harmful interference when the product is operated in the intended operational electromagnetic environment.

This product is intended for use in industrial locations. However, harmful interference may occur in some installations, if the product is connected to a peripheral device or test object, or if the product is used in residential or commercial areas. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions specified in the product documentation.

Furthermore, any changes or modifications to the product not expressly approved by SET GmbH could void your authority to operate it under your local regulatory rules.



**Caution** To ensure the specified EMC performance, operate this product only with shielded cables and accessories.

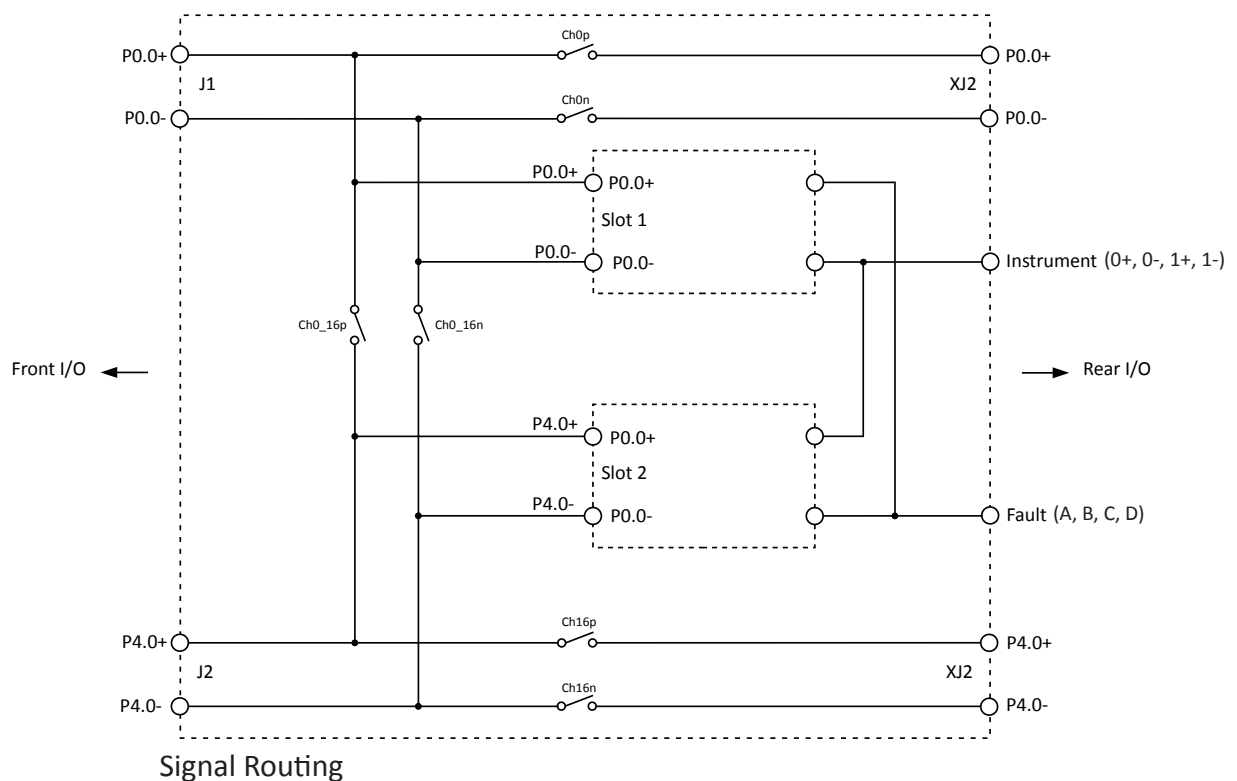


**Caution** To ensure the specified EMC performance, the length of any cable attached to connectors J1 and J2 must not be longer than 3 m (10 ft.)

# Description

The SET-2010 Routing Card is a large-scale, high density switching matrix. With 64 single-ended or 32 differential channels the SET-2010 provides exceptional signal routing capabilities in a small form factor. Unlike traditional routing matrix cards, the SET-2010 is designed specifically for the challenges of signal routing in HIL systems. To maximize customizability, the SET-2010 features two plug-in module slots that can provide features such as line fault insertion and instrument connect. The base card provides multiplexer functions for both front-panel IO and rear connectivity. Additionally the SET-2010 Routing Card comes with a high current fault injection bus.

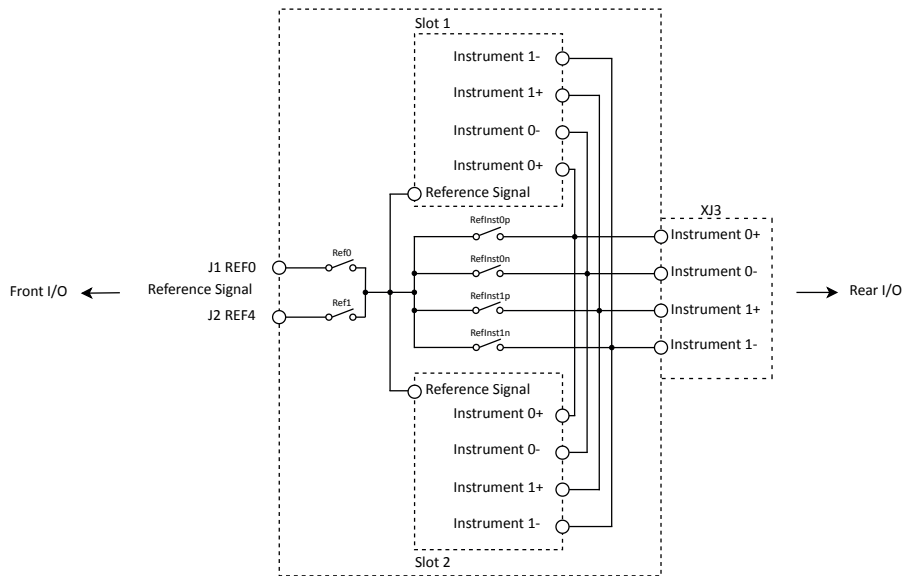
# Circuitry



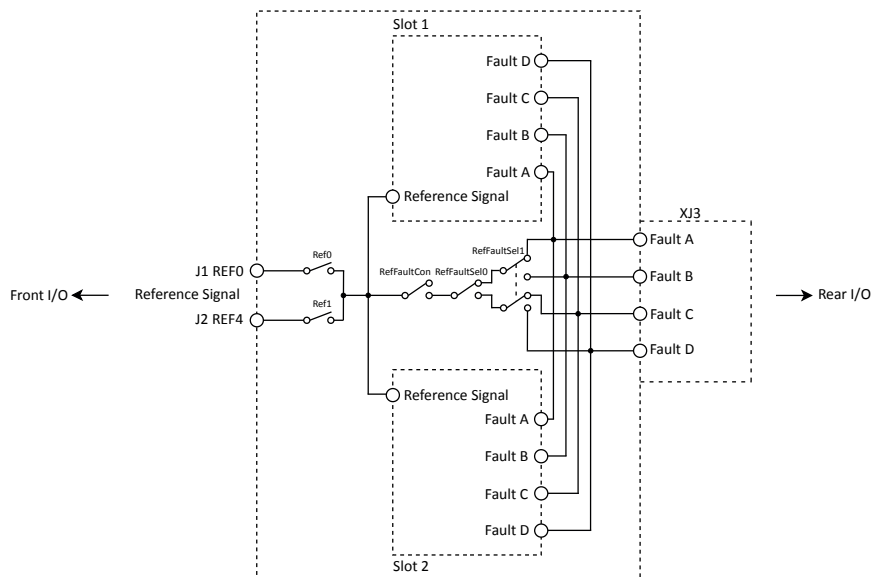
**Note** The diagram only shows one channel for each front connector J1/J2.

P0.x - P3.x: are connected with Slot 1 P0.x - P3.x.  
 P4.x - P7.x: are connected with Slot 2 P0.x - P3.x.

# Circuitry



Reference routing to the instrument bus



Reference routing to the fault bus

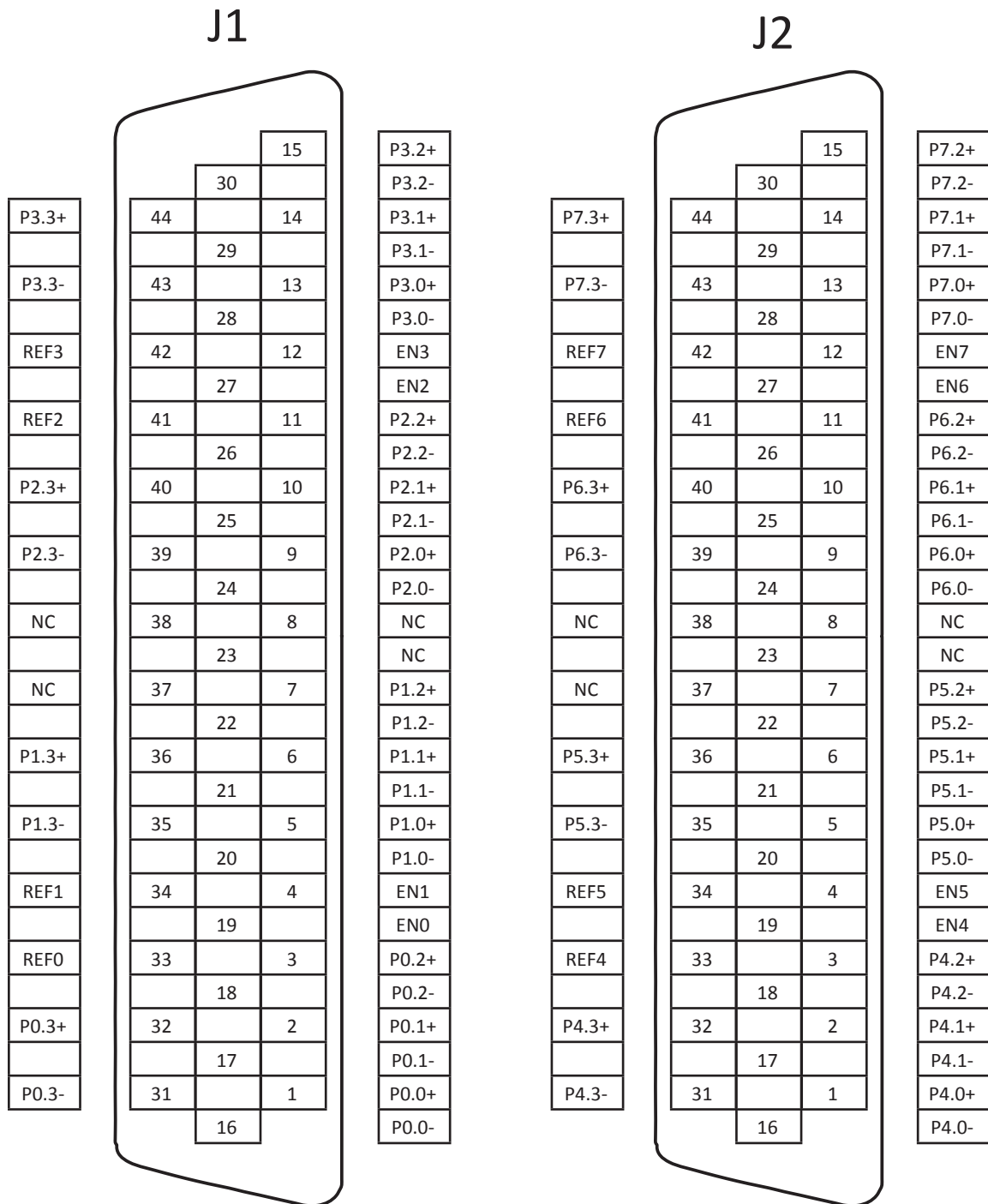


**Note** There is one common reference signal on the Routing Card which can be switched on instrument and fault bus as well as on one reference (REF0/REF4) of each front connector.

- Signal REF<sub>x</sub>/EN<sub>x</sub>: 0, 1, 2 and 3 are connected with Slot 1.
- Signal REF<sub>x</sub>/EN<sub>x</sub>: 4, 5, 6 and 7 are connected with Slot 2.

All voltages are relative to GND unless otherwise noted.

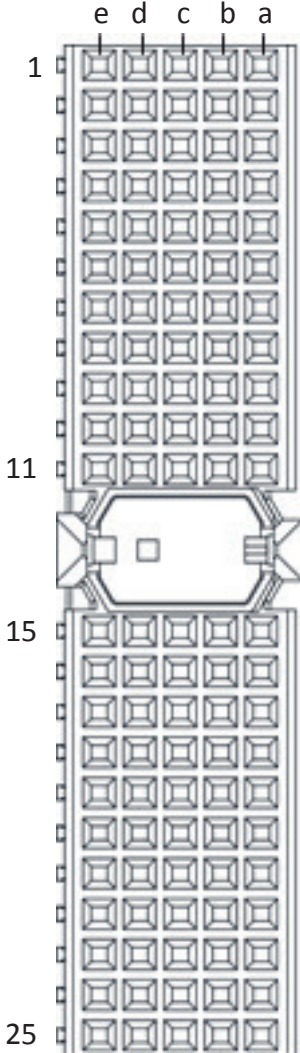
# J1, J2 Pinout (Front)



Signal	Description
Px.y	Line y in Port x
DGND	Ground connection
NC	No connection
EN	Enable
REF	Reference

J1, J2 Connector Pin Assignments

# XJ2 Connector Pinout (Rear)



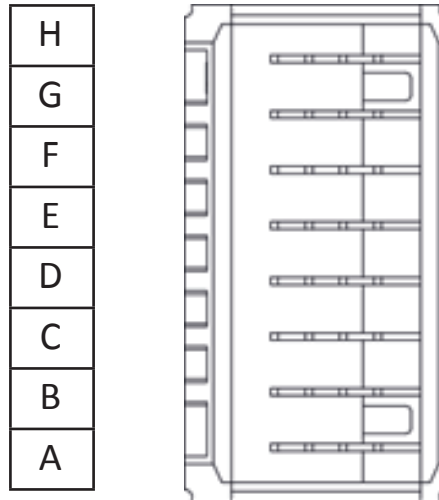
Row	a	b	c	d	e
1	P0.0+ / P4.0+	P0.0- / P4.0-	NC	P0.1+ / P4.1+	P0.1- / P4.1-
2	P0.2+ / P4.2+	P0.2- / P4.2-	NC	P0.3+ / P4.3+	P0.3- / P4.3-
3	GND	GND	GND	GND	GND
4	P1.0+ / P5.0+	P1.0- / P5.0-	NC	P1.1+ / P5.1+	P1.1- / P5.1-
5	P1.2+ / P5.2+	P1.2- / P5.2-	NC	P1.3+ / P5.3+	P1.3- / P5.3-
6	GND	GND	GND	GND	GND
7	P2.0+ / P6.0+	P2.0- / P6.0-	NC	P2.1+ / P6.1+	P2.1- / P6.1-
8	P2.2+ / P6.2+	P2.2- / P6.2-	NC	P2.3+ / P6.3+	P2.3- / P6.3-
9	GND	GND	GND	GND	GND
10	P3.0+ / P7.0+	P3.0- / P7.0-	NC	P3.1+ / P7.1+	P3.1- / P7.1-
11	P3.2+ / P7.2+	P3.2- / P7.2-	NC	P3.3+ / P7.3+	P3.3- / P7.3-
12	NC	NC	NC	NC	NC
13	NC	NC	NC	NC	NC
14	NC	NC	NC	NC	NC
15	P4.0+ / P0.0+	P4.0- / P0.0-	NC	P4.1+ / P0.1+	P4.1- / P0.1-
16	P4.2+ / P0.2+	P4.2- / P0.2-	NC	P4.3+ / P0.3+	P4.3- / P0.3-
17	GND	GND	GND	GND	GND
18	P5.0+ / P1.0+	P5.0- / P1.0-	NC	P5.1+ / P1.1+	P5.1- / P1.1-
19	P5.2+ / P1.2+	P5.2- / P1.2-	NC	P5.3+ / P1.3+	P5.3- / P1.3-
20	GND	GND	GND	GND	GND
21	P6.0+ / P2.0+	P6.0- / P2.0-	NC	P6.1+ / P2.1+	P6.1- / P2.1-
22	P6.2+ / P2.2+	P6.2- / P2.2-	NC	P6.3+ / P2.3+	P6.3- / P2.3-
23	GND	GND	GND	GND	GND
24	P7.0+ / P3.0+	P7.0- / P3.0-	NC	P7.1+ / P3.1+	P7.1- / P3.1-
25	P7.2+ / P3.2+	P7.2- / P3.2-	NC	P7.3+ / P3.3+	P7.3- / P3.3-

### XJ2 Connector Pin Assignments

Signal	Description
Px.y	Line y in Port x
GND	Ground connection
NC	No connection

### XJ2 Connector Signal Descriptions

# XJ3 Connector Pinout (Rear)



Pins	Signal	Slot1/Slot2
H	V1+	Instrument 0+
G	V1-	Instrument 0-
F	V2+	Instrument 1+
E	V2-	Instrument 1-
D	V3+	Fault A
C	V3-	Fault B
B	V4+	Fault C
A	V4-	Fault D

XJ3 Connector Pin Assignments



# LED Behavior

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LED Name	LED Behavior	Defintion of Behavior
PWR	Off	No power on board
	Solid green	Power good state
RDY	Off	Module card is unpowered or reset active
	Solid green	Card is recognized by chassis and ready to communicate
	Amber	Chassis is communicating

# Error Handling

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LED Name	LED Behavior	Actions
PWR	Off	<ul style="list-style-type: none"><li>- Check power supply of chassis</li><li>- Check external power supply if used</li></ul>
PWR	Blinking Red	<ul style="list-style-type: none"><li>- Check plugin module on board</li><li>- Check fuse on board</li></ul>

# Hardware Specifications

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Absolute Maximum Ratings			
Property	Condition	Value	Comment
Max. Input Voltage	Any Pin	60Vdc	
Min. Input Voltage	Any Pin	-60Vdc	
Max. Switching Power	DC, Resistive load	60 W	
Max. Current Rating		1.5A	

Technical Data			
Property	Condition	Value	Comment
Update Time		10ms	SLSC Commit CMD duration
Max Initial Contact Resistance	J1 -> XJ2, J2 -> XJ2, J1 -> J2	500 mOhm	
Expected Electrical Lifetime	1A, 30Vdc resistive	10 <sup>5</sup> operations	
Expected Electrical Lifetime	1,5A, 30Vdc resistive	10 <sup>4</sup> operations	
Bandwith	-3dB, 50 Ohm Termination	≤20 MHz	

# Hardware Specifications

Physical Characteristics			
Property	Condition	Value	Comment
Module Dimensions	Excluding ejector	144.32mm x 30.48mm x 302mm (H x W x D)	Standard SLSC card size
Front Panel Connector		2x female DB -44 high-density D-Sub with 4-40 UNC screw lock	For mating connectors and cables, see below
RTI Connector		2mm hard metric per IEC 61076-101	Any RTI marked

Environmental			
Property	Condition	Value	Comment
Operating Humidity	Relative, non-condensing	10%-90%	
Storage Humidity	Relative, non-condensing	5%-95%	
Operating Temperature	Forced-air cooling from chassis	0°C-40°C	
Storage Temperature		-40°C-85°C	
Maximum Altitude		2000m	