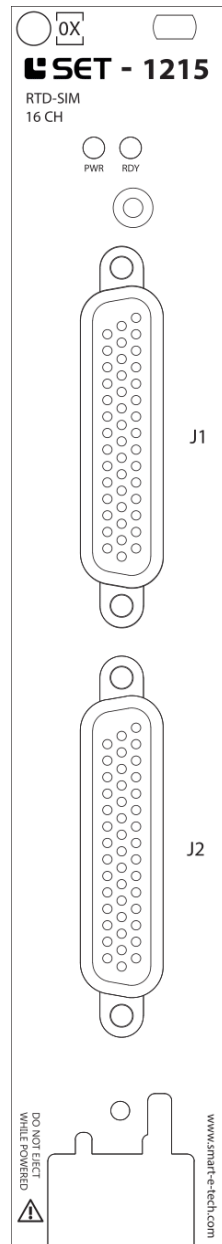



## TECHNICAL DESCRIPTION


# SET-1215

16 Channel RTD simulation card PT100/PT1000



This document 9040TDD0550 is a technical description of the SET-1215.

 **Note** Before you begin, complete the software and hardware installation procedures applicable to your application.

 **Note** The guidelines in this document are specific to the SET-1215. 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-1215 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, when 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 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 be no longer than 3 m (10 ft.).

# Description

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The SET-1215 RTD simulation card is a high precision 16 channel resistance temperature detector simulator. The simulation range is from 90R to 410R and 450R to 2050R with an accuracy up to 1°C. It contains 16 galvanic isolated channels which can be connected in 2-terminal sensing and 4-terminal sensing.

Each channel of the SET-1215 car can simulate the common short circuit and open circuit conditions, which can be experienced in a system due to faulty wiring or sensors. To maximize customizability, the SET-1215 has two plug-in module slots that can provide features like line fault insertion and instrument connect.

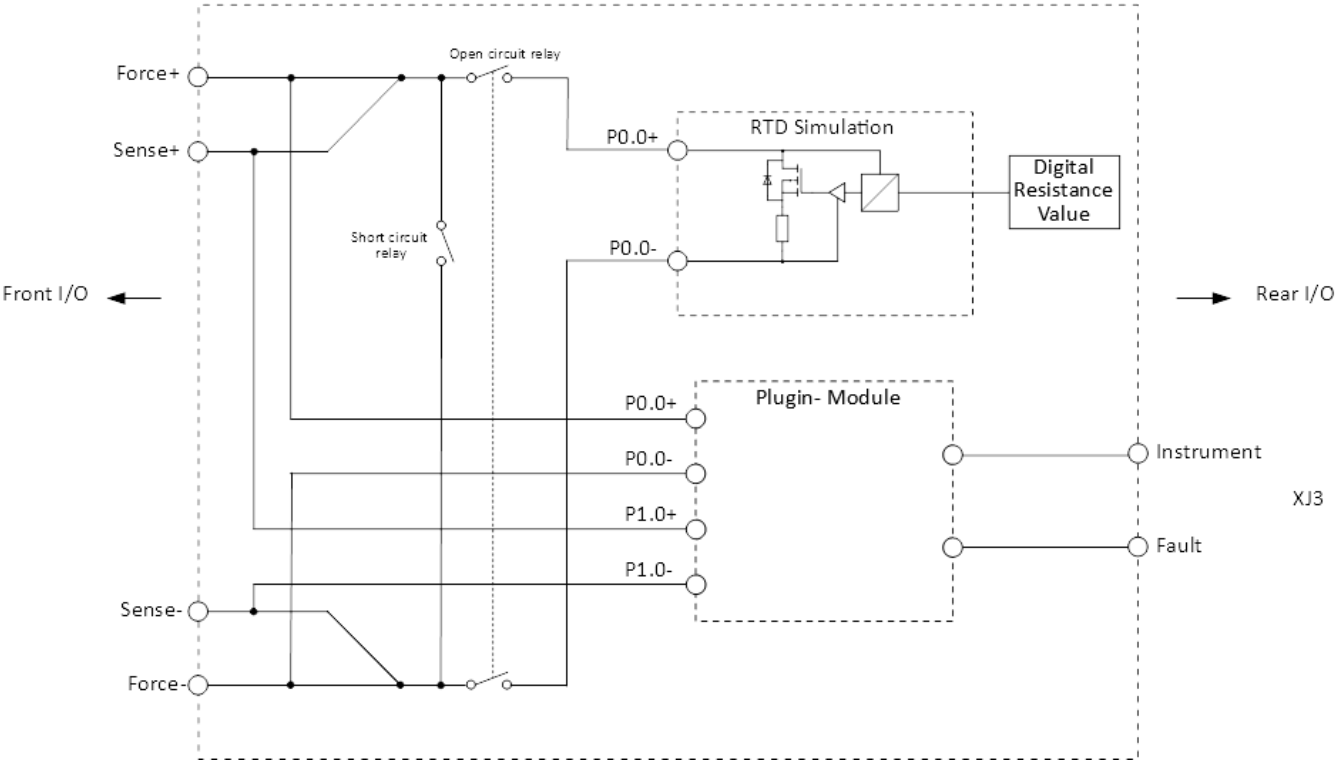
Simulation Accuracy PT100:


Resistance Range [Ohm]	Temperature Range [°C]	Resistance Accuracy [Ohm]	Temperature Accuracy [°C]
90 to 200	-20 to 267	< 0.3	< 1
200 to 350	267 to 716	< 0.6	< 2
350 to 400	716 to 880	< 0.8	< 2.7

Simulation Accuracy PT1000:

Resistance Range [Ohm]	Temperature Range [°C]	Resistance Accuracy [Ohm]	Temperature Accuracy [°C]
450 to 1000	-20 to 267	< 3	< 1
1000 to 1750	267 to 716	< 6	< 2
1750 to 2000	716 to 880	< 8	< 2.7

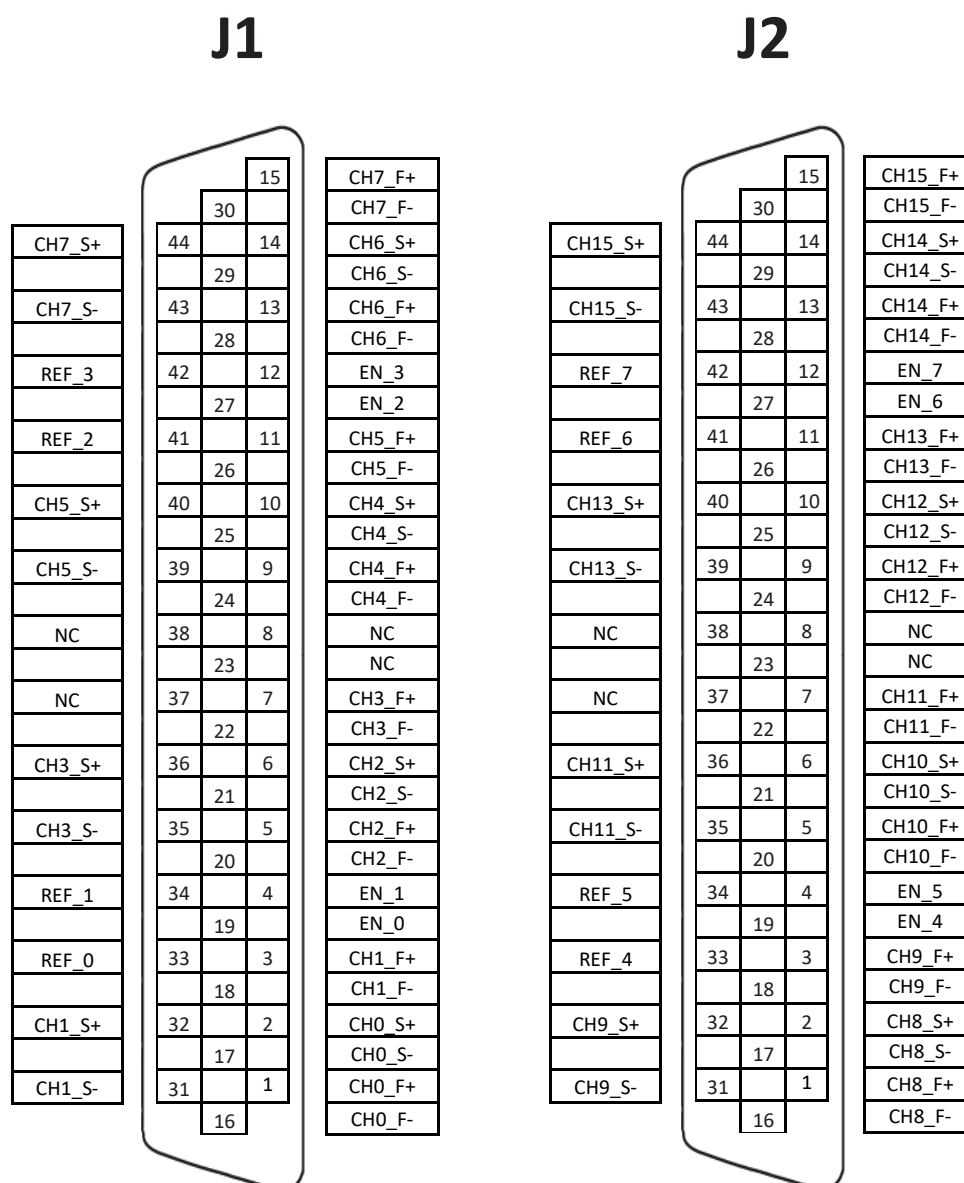
# Circuitry



 **Note** Diagram only shows one channel per front connector J1/J2.



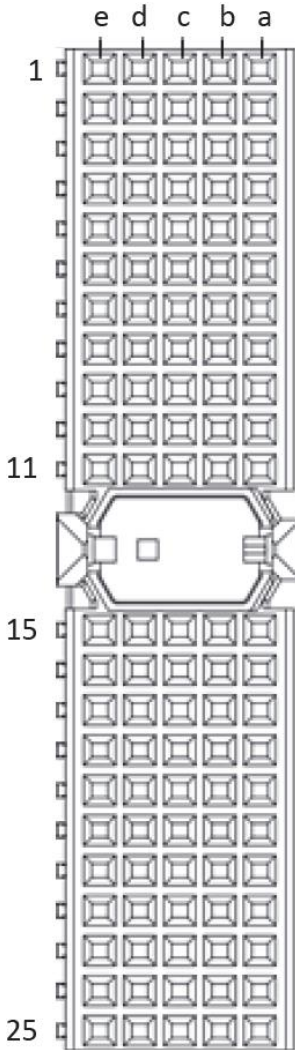
# J1, J2 Pinout (Front)



Signal	Description
CHx_F+ / Chx_F-	Channel x positive and negative force line
CHx_S+ / Chx_S-	Channel x positive and negative sense line
NC	No connection
EN_x	Enable of channel x Only connected to plug-in module slot
REF_x	Reference of channel x Only connected to plug-in module slot

J1, J2 Connector Pin Assignments

# XJ2 Connector Pinout (Rear)



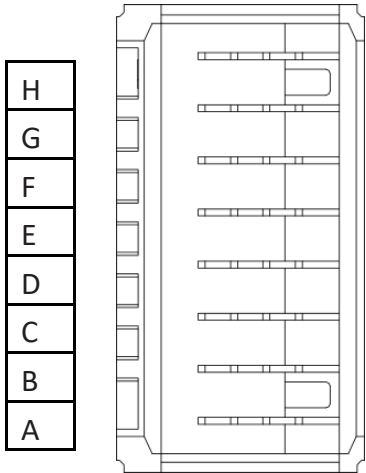
Row	e	d	c	b	a
1	NC	NC	Trigger Input 0	NC	NC
2	NC	NC	NC	NC	NC
3	GND	GND	GND	GND	GND
4	NC	NC	Trigger Input 1	NC	NC
5	NC	NC	NC	NC	NC
6	GND	GND	GND	GND	GND
7	NC	NC	Trigger Input 2	NC	NC
8	NC	NC	NC	NC	NC
9	GND	GND	GND	GND	GND
10	NC	NC	Trigger Input 3	NC	NC
11	NC	NC	NC	NC	NC
12	NC	NC	NC	NC	NC
13	NC	NC	NC	NC	NC
14	NC	NC	NC	NC	NC
15	NC	NC	NC	NC	NC
16	NC	NC	NC	NC	NC
17	GND	GND	GND	GND	GND
18	NC	NC	NC	NC	NC
19	NC	NC	NC	NC	NC
20	GND	GND	GND	GND	GND
21	NC	NC	NC	NC	NC
22	NC	NC	NC	NC	NC
23	GND	GND	GND	GND	GND
24	NC	NC	NC	NC	NC
25	NC	NC	NC	NC	NC

XJ2 Connector Pin Assignments

Signal	Description
Trigger Input x	Trigger input for plug-in modules
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

Signal	Description
Instrument X+/-	Instrumentation bus signals. Only connected to plug-in module slot
Fault_X	Fault bus signals. Only connected to plug-in module slot

XJ3 Connector Signal Descriptions



# LED Behavior

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

# Error Handling

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

Absolute Maximum Ratings			
Property	Condition	Value	Comment
Max. Input Voltage	Any Pin to Chassis GND	60 VDC	Transient 65 V, Limited by connector
Min. Input Voltage	Any Pin to Chassis GND	-60 VDC	
Max. Input Voltage	Between CHx_F+ and Chx_F-	15 V	
Min. Input Voltage	Between CHx_F+ and Chx_F-	-0.3 V	
Max. Short Circuit Current		1.5 A	
Max. Simulation Current		10 mA	
Min. Simulation Current		100 $\mu$ A	
Max. Switching Power	DC, Resistive load	60 W	
Max. Simulation Power		400 mW	

Technical Data			
Property	Condition	Value	Comment
Max. Simulation Voltage	Between CHx_F+ and Chx_F-	10 V	
Min. Simulation Voltage	Between CHx_F+ and Chx_F-	0 V	
Resistor Value Update Time		50 $\mu$ s	SLSC communication delay not included
Simulation Resolution	PT100 configuration	0.1 $\Omega$	
	PT1000 configuration	1 $\Omega$	
Initial Resistance		< 10 M	
Expected Electrical Relay Lifetime	1 A, 30 V <sub>DC</sub> resistive	Min 10 <sup>5</sup> operations	
	2 A, 30 V <sub>DC</sub> resistive	Min 10 <sup>4</sup> operations	

Physicals Characteristics			
Property	Condition	Value	Comment
Module Dimensions	Excluding ejector	144.32 mm x 30.48 mm x 302 mm (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, contact us
RTI Connector		2 mm 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		2000 m	