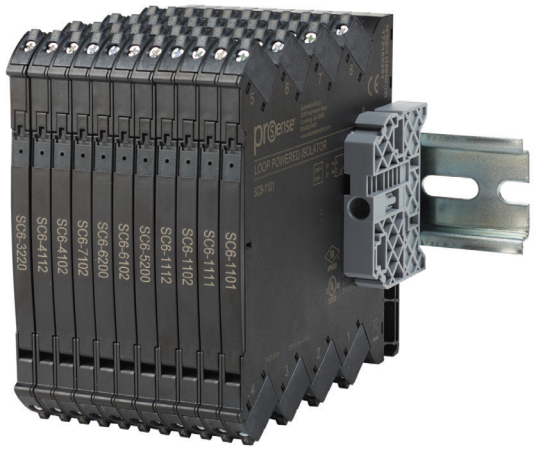
ProSense SC6 Series Signal Conditioners User Manual



This product manual covers the following part numbers:

0068060	SC6-1100	SC6-1110	SC6-2200	SC6-3220	SC6-5200	SC6-7102
0068061	SC6-1101	SC6-1111	SC6-2220	SC6-4102	SC6-6102	SC6-PCU1
0068062	SC6-1102	SC6-1112	SC6-3200	SC6-4112	SC6-6200	

ProSense SC6 Series Signal Conditioners User Manual

Please include the Manual Number and the Manual Issue, both shown below, when communicating with Technical Support regarding this publication.

Manual Number: ProSense SC6 Series Signal Conditioners Manual
Issue: 1st Edition
Issue Date: 06/18

Publication History		
Issue	**Date**	**Description of Changes**
1st Edition	06/18	Original

ProSense SC6 Series Signal Conditioners User Manual

1 - Warnings

General

To avoid the risk of electric shock and fire, the safety instructions of this guide must be observed and the guidelines followed. The specifications must not be exceeded, and the device must only be applied as described in the following. Prior to the commissioning of the device, this installation guide must be examined carefully. Only qualified personnel (technicians) should install this device. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired. Until the device is installed, do not connect hazardous voltages to the device.

Caution

To avoid explosion and serious injury, modules having mechanical failures must not be used.

Modules are not repairable.

In applications where hazardous voltage is connected to in-/outputs of the device, sufficient spacing or isolation from wires, terminals and enclosure - to surroundings (incl. neighboring devices), must be ensured to maintain protection against electric shock.

Potential electrostatic charging hazard. To avoid the risk of explosion due to electrostatic charging of the enclosure, do not handle the units unless the area is known to be safe, or appropriate safety measures are taken to avoid electrostatic discharge.

2 - Symbol Identification

Triangle with an exclamation mark: Read the manual before installation and commissioning of the device in order to avoid incidents that could lead to personal injury or mechanical damage.

The CE mark indicates device is in compliance with the essential requirements of the directives.

3 - Safety Instructions

3.1 - Receipt and unpacking

Unpack the device without damaging it and check whether the device type corresponds to the one ordered. The packing should always follow the device until the unit has been permanently installed.

3.2 - Environment

Avoid direct sun light, dust, high temperatures, mechanical vibrations and shock, as well as heavy moisture and rain. If necessary, heating in excess of the stated limits for ambient temperatures should be avoided by way of ventilation. The device can be used for Measurement Category II and Pollution Degree 2. The modules are designed to operate safely at an altitude of 2000m or less.

3.3 - Installing

Only technicians who are familiar with the technical terms, warnings, and instructions in the manual and who are able to follow these should connect the device.

Should there be any doubt as to the correct handling of the device, please contact AutomationDirect.com.

Installation and connection of the device should comply with national legislation for installing of electric materials, e.g. wire cross section, protective fuse, and location.

Descriptions of input / output and supply connections are shown in this installation guide and on the side label.

The device is provided with field wiring terminals and shall be supplied from a Power Supply having double or reinforced insulation. A power switch should be readily accessible and close to the device. The power switch shall be marked as the disconnecting unit for the device.

The SC6 Series must be installed on a DIN rail that complies with EN 60715. Note: No mounting orientation restrictions.

UL installation

Use 60°C/75°C copper conducters only.

Wire size . . . . . .AWG 26-12

UL file number E498965

The device is an Open Type Listed Process Control Equipment. To prevent injury resulting from accessability to live parts the equipment must be installed in an enclosure.

The power supply unit must comply with NEC Class 2, as described by the National Electrical Code® (ANSI / NFPA 70).

cFMus installation in Division 2 or Zone 2

FM18US0045X	Cl I, Div. 2, Group A, B, C, D T4 or Cl I, Zone 2, AEx nA IIC T4
FM18CA0023X	Cl I, Div. 2, Group A, B, C, D T4 or Cl I, Zone 2, Ex nA IIC T4

In Class I, Division 2 or Zone 2 installations, the subject equipment shall be installed within a tool-secured enclosure which is capable of accepting one or more of Class I, Division 2 wiring methods specified in the National Electrical Code (ANSI/NFPA 70) or in Canada in the Canadian Electrical Code (C22.1).

The SC6 Series Isolators and Converters must be connected to limited output NEC Class 2 circuits, as outlined in the National Electrical Code® (ANSI / NFPA 70), only. If the devices are connected to a redundant power supply (two separate power supplies), both must meet this requirement.

When installed in outdoor or potentially wet locations the enclosure shall at a minimum meet the requirements of IP54.

Warning: Substitution of components may impair suitability for Zone 2 / Division 2.

Warning: To prevent ignition potential in an explosive atmosphere, disconnect power before servicing. Do not separate connectors while circuit is energized in a potentially explosive atmosphere.

Warning: Do not install or remove devices from a live power rail when an explosive gas mixture is present.

3.4 - Cleaning

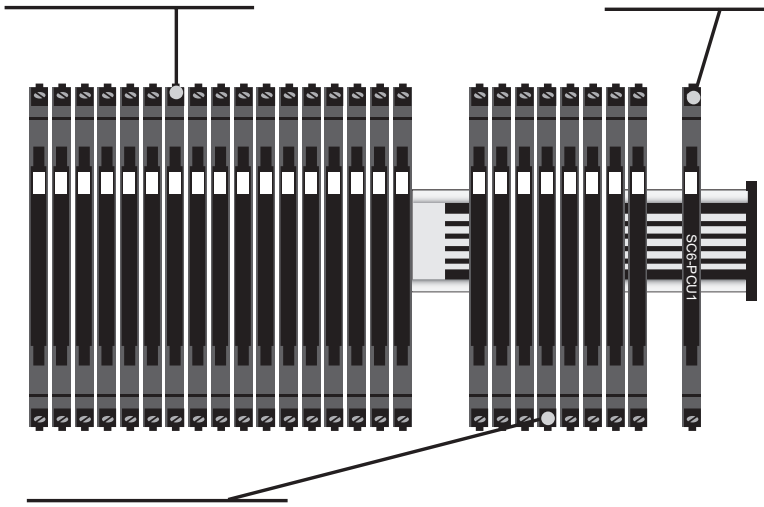
When disconnected, the device may be cleaned with a cloth moistened with distilled water.

4 - Supply Voltage Options

The technical specifications specify the maximum required power at nominal operating values, e.g. 24V supply voltage, 60°C ambient temperature, 600 Ω load, and 20mA output current.

DIN rail solution - device daisy chain:
The units can be supplied with 24VDC ±30% via direct wiring and a loop between the devices.
Protective fuse: 2.5 A.

Power rail solution #2:
The SC6-PCU1 power connector unit allows easy connection of a 24 VDC / 2.5 A source to the power rail.
Protective fuse: 2.5 A.



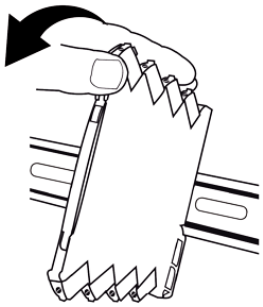
Protective fuse: 0.4 A.

Power rail solution #1:
Alternately, you can connect 24VDC to any one SC6 Series device with power rail connector which will then energize other units on the rail. The terminals can pass a current of 400mA maximum.

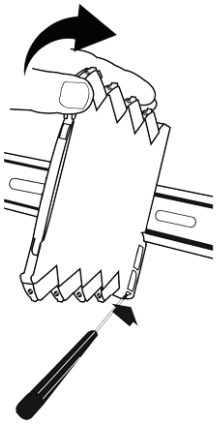
Note: SC6-1101, -1102, -1111, -1112, -4102, -4112, -6102, -7102 are not supplied via the DIN rail solution. Direct terminal wiring to each device is required for these models

External fuse characteristics:
The 2.5 A fuse must break after not more than 120 seconds at 6.4 A.

5 - Installing and Uninstalling the SC6 Series

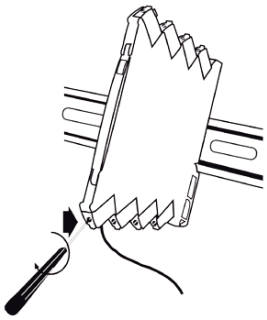


Picture 1:
Installing on DIN rail / power rail. Click the device onto the rail.



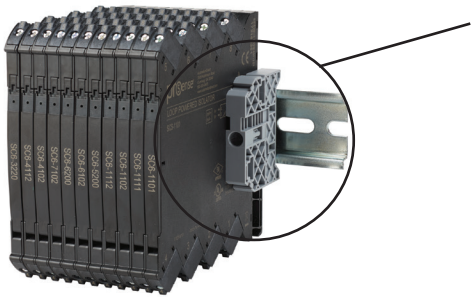
Picture 2:
Uninstalling from DIN rail / power rail.
First, remember to uninstall the connectors with hazardous voltages. Detach the device from the DIN rail by lifting the bottom lock.

Note: Always use a screwdriver to uninstall units and avoid excessive force to prevent damaging the unit.



Picture 3:
Wire size AWG 26-12 / 0.13 - 2.5 mm2 stranded wire. Screw terminal torque 0.5 N·m.

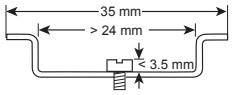
6 - Installation on DIN rail / power rail



End Bracket
(part number KN-EB7-10)

The devices in the SC6 Series can be installed on a DIN rail or on a power rail (only SC6-1100, -1110, -2200, -2220, -3200, -3220, -5200 and -6200). It is recommended that the modules be supported by end brackets (part number KN-EB7-10). Power supply units can be installed on the power rail according to customer requirements.

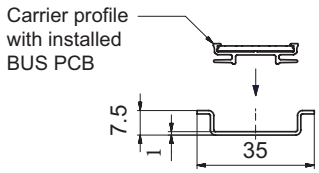
If you want to install a SC6 Series device with power rail connectors on a standard DIN rail, the head of the screws holding the 7.5 mm DIN rail shall be no more than 3.5 mm high in order to avoid short circuit between the power rail connectors on the SC6 Series device and the screws.



6.1 - In-Rail-Bus-Set Installation

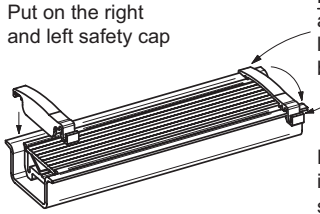
Step 1

Put the BUS PCB into the carrier profile and then put the carrier profile into the DIN rail



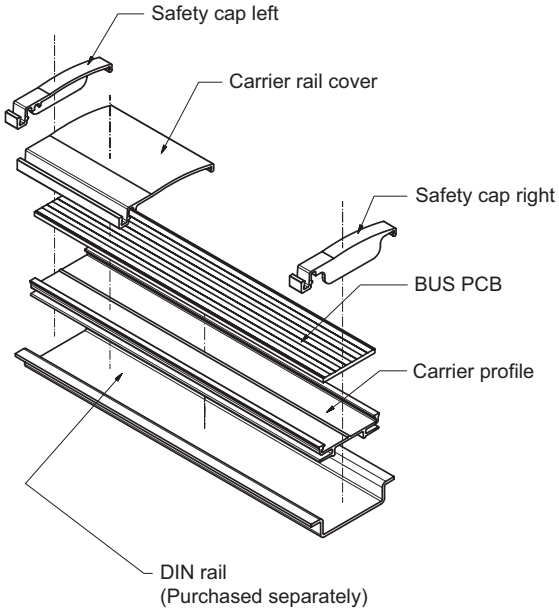
Step 2

Put on the right
and left safety cap



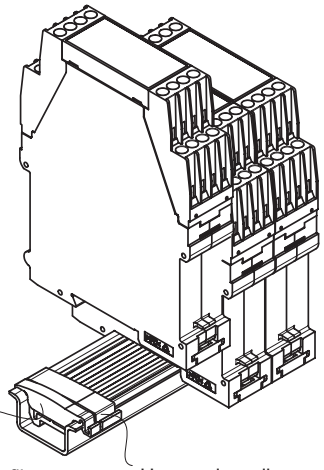
Pay attention to the sequence:
a) put the cap in from above laid on the carrier profile
b) snap the cap on below

Dismantling in reversed sequence



Step 3

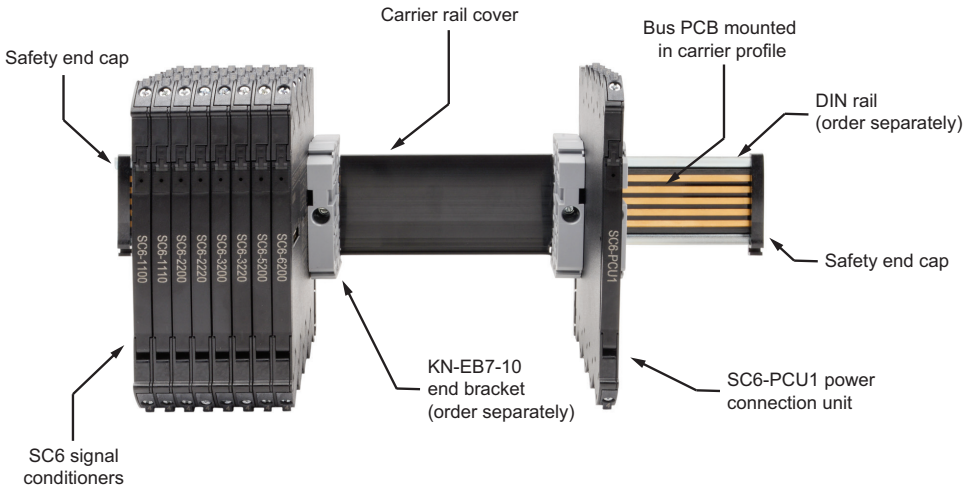
Snap the devices on the In-Rail-Bus



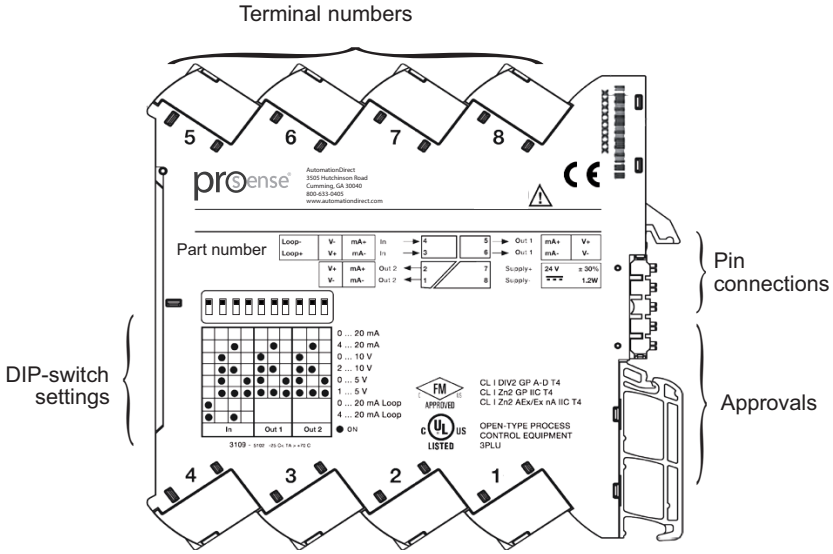
Safety cap on both sides tight to the carrier profile
The safety cap fixes the carrier profile in the DIN rail and protects the ends of the BUS

Use carrier rail cover provided to protect exposed sections of the BUS PCB

Part No.	In-Rail-Bus-Set / 250mm 0068060	In-Rail-Bus-Set / 500mm 0068061	In-Rail-Bus-Set / 750mm 0068062
Each Set Includes	BUS-PCB 250mm	BUS-PCB 500mm	BUS-PCB 750mm
	Carrier profile 250mm	Carrier profile 500mm	Carrier profile 750mm
	Carrier rail cover 250mm	Carrier rail cover 500mm	Carrier rail cover 750mm
	Safety cap right	Safety cap right	Safety cap right
	Safety cap left	Safety cap left	Safety cap left


Carrier rail cover
Bus PCB mounted
in carrier profile
Safety end cap
DIN rail
(order separately)
Safety end cap
KN-EB7-10
end bracket
(order separately)
SC6-PCU1 power
connection unit
SC6 signal
conditioners
SC6-1100
SC6-1110
SC6-2200
SC6-2220
SC6-3200
SC6-3220
SC6-5200
SC6-6200
SC6-PCU1

7 - Side Label


Terminal numbers
5
6
7
8
Part number
Pin
connections
DIP-switch
settings
Approvals
4
3
2
1

8 - Common Technical Specifications

SC6 Series Common Technical Specifications		
Environmental Conditions		
Operating Temperature	-25°C to +70°C (-13°F to +158°F)	
Storage Temperature	-40°C to +85°C (-40°F to +185°F)	
Calibration Temperature	+20°C to +28°C (+68 to +82.4°F)	
Relative Humidity	< 95% RH (non-cond.)	
Protection Degree	IP20*	
Mechanical Specifications		
Dimensions (HxWxD)	113 x 6.1 x 115 mm	
Weight Approx.	70g	
DIN Rail Type	DIN EN 60715 - 35mm	
Wire Size	0.13...2.5 mm2 / AWG 26...12 stranded wire	
Screw Terminal Torque	0.5 N·m	
Vibration	2 to 25 Hz	± 1.6 mm
	25 to 100 Hz	± 4g
Observed Authority Requirements	EMC	2014/30/EU
	LVD	2014/35/EU
	RoHS 2	2011/65/EU
Approvals	cULus, Standard for Safety	UL 61010-1, File E498965
	cFMus	FM18US0045X, FM18CA0023X
	Safe Isolation	EN 61140
* Installation in pollution degree 2 & overvoltage category II, No corrosive gases		

9 - 4-Wire, External Powered Analog Signal Input Modules - Technical Specifications

4- Wire, External Powered Analog Signal Input Modules - Technical Specifications						
Part No.	***SC6-1100***	***SC6-2200***	***SC6-1110***	***SC6-2220***	***SC6-3200***	***SC6-3220***
Application	One channel	One channel	Signal splitter	Signal splitter	One channel	Signal splitter
DIP switch configurable	No	Yes	No	Yes	Yes	Yes
Supply voltage	16.8 - 31.2 VDC (terminals or bus rail)					
Max. required power*	0.80 W	1.20 W	0.80 W	1.20 W	0.80 W	1.20 W
Max. power dissipation**	0.60 W	0.55 W	0.48 W	0.60 W	0.43 W	0.43 W
Isolation voltage, test	2.5 kVAC					
Isolation voltage, working	300VAC (reinforced) / 250VAC (Zone 2, Div. 2)					
Double isolation	Input / Output 1 / Output 2 / Supply					
Signal dynamics, input / output	Analog signal chain					
Signal / noise ratio	> 60dB					
Cut-off frequency (3 dB)	> 100Hz				>100Hz or 10Hz (DIP switch selectable)	
Response time filter (0-90%, 100-10%)	< 7ms				< 7ms or < 44ms (DIP switch selectable)	
Accuracy	< +/-0.05% of span					
Temperature coefficient	< +/-0.01% of span / °C					
EMC immunity influence	< +/-0.5% of span					
Extended EMC immunity:						
NAMUR NE 21, A criterion, burst	< +/-1% of span					
Current input						
Overall measurement range	0-23 mA				- 23mA to + 23mA	
Selectable measurement ranges	0-20 mA, 4-20 mA				+/- 10mA, +/- 20mA	
Input voltage drop	< 1.5 VDC				< 1VDC	
Input resistance	190Ω nominal @ 4mA 70Ω nominal @ 20mA				40Ω nominal	
Transmitter (Tx) auxiliary supply	None	> 17VDC / 20mA	None	> 17VDC / 20mA	None	
Voltage input						
Overall measurement range	0-10.25 VDC				- 11.5 VDC to + 11.5 VDC	
Selectable measurement range	0-10 VDC, 2-10 VDC, 0-5 VDC, 1-5 VDC				+/-5 VDC, +/- 10 VDC	
Input resistance	≥ 500 kohms				≥ 1 Mohms	
Current output						
Overall signal range (span)	0-23 mA					
Selectable signal ranges	0-20 mA, 4-20 mA				0-20 mA, 4-20 mA or +/-10 mA, +/-20 mA	
Load	≤ 600 ohms		≤ 300 ohms / channel		≤ 600 ohms	≤ 300 ohms / channel
Load stability	< 0.002% of span / 100 ohms					< 0.02% of span / 100 ohms
Current limit	≤ 28mA					
Voltage output						
Overall signal range (span)	None	0-10 VDC	None	0-10 VDC		
Selectable signal ranges	None	0-10 VDC, 2-10 VDC, 0-5 VDC, 1-5 VDC	None	0-10 VDC, 2-10 VDC, 0-5 VDC, 1-5 VDC		
Load (minimum)	None	> 10 kohms	None	> 10 kohms		

*Max. required power is the maximum power needed at power supply terminals or rail connector.
**Max. power dissipation is the maximum power dissipated at nominal operating values.
"of span" = of the seleted range

10 - 2-Wire, Loop Powered Analog Signal Input Modules - Technical Specifications

2-Wire, Loop Powered Analog Signal Input Modules - Technical Specifications						
Part No.	***SC6-1101***	***SC6-1111***	***SC6-4102***	***SC6-4112***	***SC6-1102***	***SC6-1112***
Application	One channel	Two channel	One channel	Two channel	One channel	Two channel
DIP switch configurable	No	No	No	No	No	No
Loop supply voltage	None (powered by input signal)		6-35 VDC			
Power dissipation	30mW / channel		50mW / channel		V terminal x I / channel	
Isolation voltage, test	2.5 kVAC					
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)					
Double isolation	Input 1 / Input 2 / Output 1 / Output 2					
Signal dynamics, input / output	Analog signal chain					
Signal / noise ratio	> 60dB					
Cut-off frequency (3 dB)	100Hz					
Response time (0-90%, 100-10%)	< 5ms					
Accuracy	≤ +/-10uA + 0.05% of max. value of span		≤ ± 8uA			
Temperature coefficient	≤ ± 2uA / °C		Vloop supply ≤ 24V: ± 0.48 uA/°C (>25°C); ± 1.68 uA/°C (< 25°C) Vloop supply > 24V: ± 0.02 uA/°C x Vloop supply (> 25°C); +/-0.047 uA/degC x Vloop supply (<25°C)		Vloop supply ≤ 24V: ± 0.48 uA/°C (> 25°C); ± 1.12 uA/°C (< 25°C) Vloop supply >24V: ± 0.02 uA/°C x Vloop supply (> 25°C); ± 0.047 uA/°C x Vloop supply (< 25°C)	
EMC immunity influence	< ± 0.5% of span					
Extended EMC immunity:						
NAMUR NE 21, A criterion, burst	< ± 1% of span					
Current input						
Overall measurement range	0-23 mA		3.5-23 mA			
Nominal measurement range	0-20.5 mA 10uA start up current, typical		3.8-20.5 mA			
Signal conversion	1:1					
Input voltage drop	1.35 + (0.02335*Rout load) @ 23mA max. Rout load 600Ω: 15.36 V Rout load 250Ω: 7.19 V		2.5 VDC input to output		≤ 3VDC	
Input resistance	Rout load @ 600Ω: 668Ω* Rout load @250Ω: 313Ω*		Not applicable		130Ω nominal	
Transmitter (Tx) auxiliary supply	None		3.5-32.5 VDC (Loop supply voltage - Input voltage drop)		None	
Current output						
Overall signal range (span)	0-23 mA		3.5-23 mA			
Nominal signal range	0-20.5 mA		3.8-20.5 mA			
Load	≤ 600 ohms		900 ohms max at 24 Vloop supply 1450 ohms max at 35 Vloop supply See derating chart above 60°C ambient		900 ohms max at 24 Vloop supply 1450 ohms max at 35 Vloop supply See derating charts above 50°C ambient	
Load stability	<0.01% of span / 100 ohms		N/A			

"of span" = 0-20 mA

* Because the input signal drives both the SC6 unit and the output signal loop, the input resistance changes with the output load. Calculate the input voltage drop using the formula shown and divide by the maximum current signal of 23mA to determine the Input resistance.

11 - Temperature Input Modules - Technical Specifications

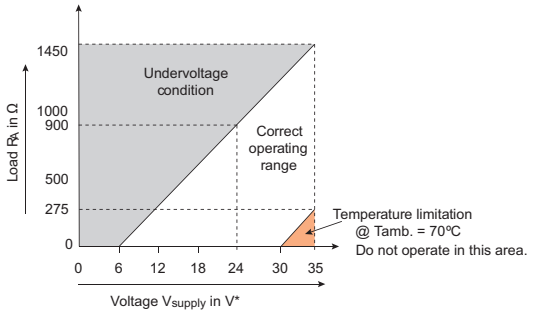
Temperature Input Modules - Technical Specifications				
Part No.	***SC6-5200***	***SC6-6200***	***SC6-7102***	***SC6-6102***
Application	One channel	One channel	One channel	One channel
DIP switch configurable	Yes	Yes	Yes	Yes
Supply voltage	16.8 - 31.2 VDC (terminals or bus rail)		5.5 - 35 VDC	3.3 - 35 VDC
Max. power dissipation	0.7 W	0.7 W	0.8 W	0.8 W
Isolation voltage, test	2.5 kVAC			None
Isolation voltage, working	300VAC (reinforced) / 250VAC (Zone 2, Div. 2)			None
Double isolation	Input / Output 1 / Supply			None
Signal dynamics, input / output	23bit / 18bit			
Signal / noise ratio	> 60dB			
Response time (0-90%, 100-10%)	< 30ms or < 300ms, DIP switch selectable			
Accuracy	Basic: ≤ 0.5°C; General: ≤ ±0.05% of span	Basic: ≤ 0.1°C; General: ≤ ±0.05% of span	Basic: ≤ 0.1°C (Pt100), ≤ 0.5°C (TC); General: ≤ ±0.05% of span	Basic: ≤ 0.2°C; General: ≤ ±0.1% of span
Temperature coefficient	0.1°C/°C (basic) or ≤ ±0.01% of span/°C	0.02°C/°C (basic) or ≤ ±0.01% of span/ºC	0.1°C/°C (basic) or ≤ ±0.01% of span/°C	0.02°C/°C (basic) or ≤ ±0.01% of span/°C
EMC immunity influence	< ±0.5% of span			
Extended EMC immunity:				
NAMUR NE 21, A criterion, burst	< ±1% of span			
RTD (Pt100) input				
Overall measurement range	N/A	-200 to 850°C (IEC 60751)		
Min. measurement span	N/A	10°C		
Sensor current	N/A	< 150uA		
Sensor cable resistance	N/A	< 50 ohms per wire		
Effect of sensor cable resistance 3/4-wire	N/A	< 0.002 ohm/ohm		
Sensor error detection	N/A	Yes, DIP switch selectable		
Broken sensor	N/A	> 800 ohms		
Shorted sensor	N/A	< 18 ohms		
Thermocouple (TC) input				
Overall mesasurement range, Type J	-100 to 1200°C (IEC60584-1)	N/A	-100 to 1200°C (IEC60584-1)	N/A
Overall mesasurement range, Type K	-180 to 1372°C (IEC60584-1)	N/A	-180 to 1372°C (IEC60584-1)	N/A
Selectable measurement range	See temperature range programming table			
Min. measurement span	50°C	N/A	50°C	N/A
Sensor cable resistance	< 5 kohm per wire	N/A	< 5 kohm per wire	N/A
External Pt100 CJC sensor accuracy	< ±0.15°C	N/A	< ±0.15°C	N/A
Internal CJC sensor accuracy	< ±2.5°C	N/A	<+/-2.5°C	N/A
Open thermocouple detection	Yes, DIP switch selectable	N/A	Yes, DIP switch selectable	N/A
External CJC error detection	Yes, DIP switch selectable	N/A	Yes, DIP switch selectable	N/A
Internal CJC error detection	Yes	N/A	Yes	N/A
Current output				
Overall signal range (span)	0 / 3.8-20.5 mA		3.8-20.5 mA	
Nominal signal range	0 / 4-20 mA DIP switch selectable		4-20 mA or 20-4 mA, DIP switch selectable	
Load	≤ 600 ohms		Rload=(Vsupply-5.5) / 0.023 ohms	Rload=(Vsupply-3.3) / 0.023 ohms
Sensor error output	Downscale: 0 / 3.5 mA, Upscale: 23mA DIP switch selectable		Downscale: 3.5 mA, Upscale: 23mA DIP switch selectable	
Voltage output				
Overall signal range (span)	0 / 0.875-5.125 V, 0 / 1.75-10.25 V		N/A	
Nominal signal range	0 / 1-5 V, 0 / 2-10 V DIP switch selectable		N/A	
Load	≥ 10 kohms		N/A	
Sensor error output	Downscale: 0V, Upscale: 5.5 / 11V DIP switch selectable		N/A	
Load stability	≤ 0.01% of span / 100 ohms			
Updating time	10ms			

12 - Power Connector Module - Technical Specifications

Power Connection Module - Technical Specifications	
Part No.	***SC6-PCU1***
Supply voltage	16.8-31.2 VDC
Internal power dissipation	0.25 W max.
Required external fuse	2.5 A

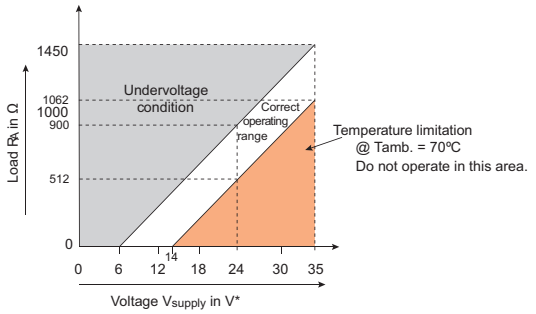
13 - Output Load Deratings

SC6-4102, -4112 Output Load Derating @ $T_{amb.}$ = 70°C:

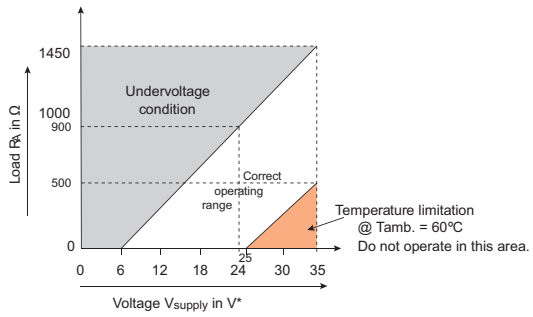


SC6-4102, -4112 Output Load Derating @ $T_{amb.}$ = 60°C . . . No limiting issues within operating range

SC6-1102, -1112 Output Load Derating @ $T_{amb.}$ = 70°C:



SC6-1102, -1112 Output Load Derating @ $T_{amb.}$ = 60°C:



SC6-1102, -1112 Output Load Derating @ $T_{amb.}$ = 50°C . . . No limiting issues within operating range

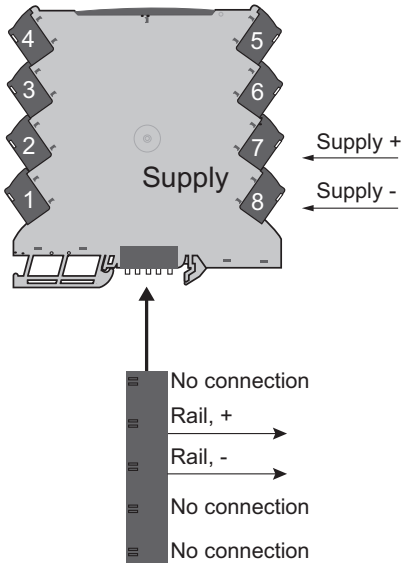
* V_{supply}: The supply voltage for the loop covering both the SC6 output terminal voltage and the voltage across the load resistor R_A.

R_A = The input impedance in the PLC + the load in the loop (incl. the cable resistance).

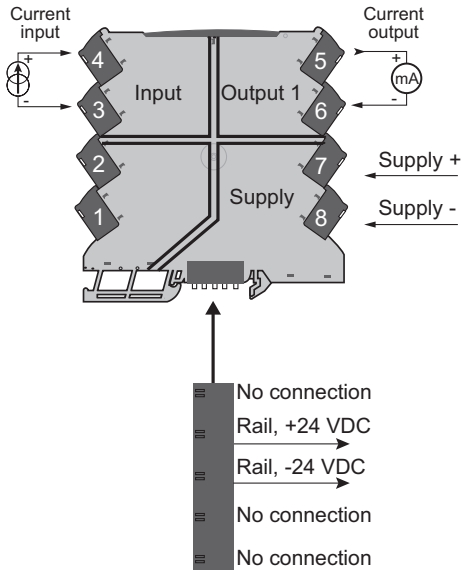
14 - Wiring Diagrams

Note: The SC6 2-wire Transmitter Input is a current input which provides an excitation voltage to the input device, otherwise known as an active or sourcing input, while the SC6 Current Input requires the input device be provided with an external excitation voltage, otherwise known as a passive or sinking input.

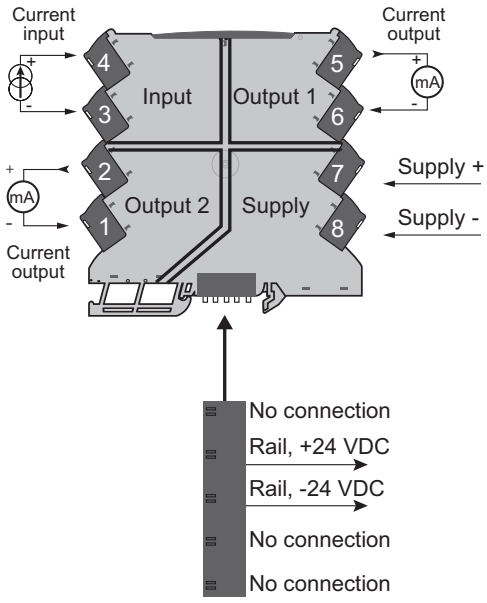
SC6-PCU1



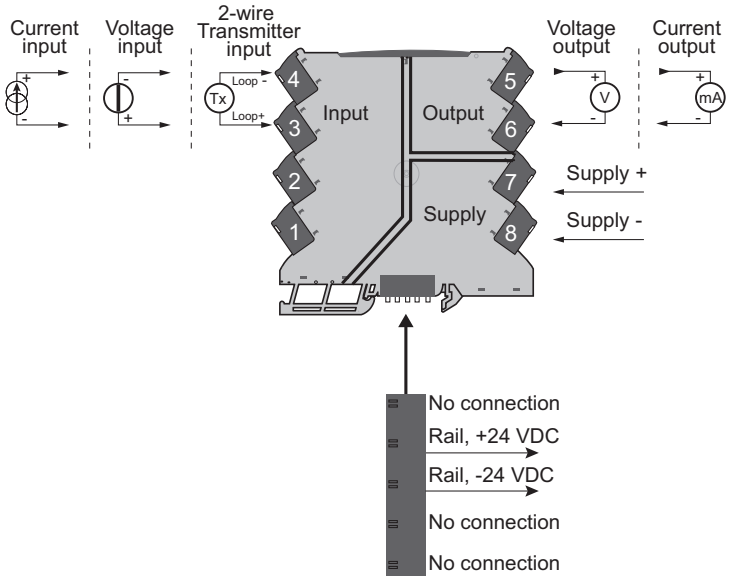
SC6-1100



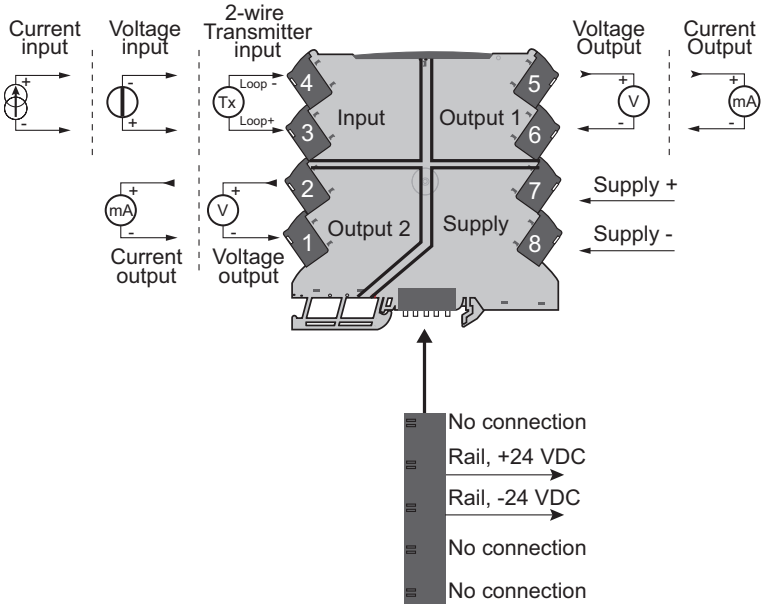
SC6-1110



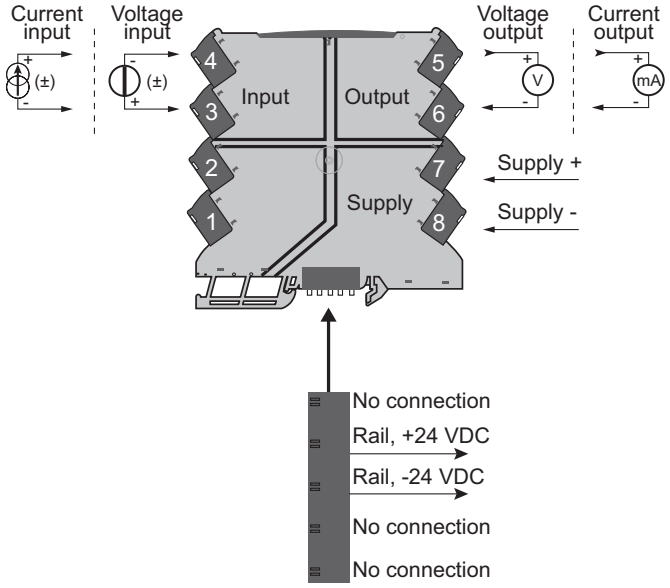
SC6-2200



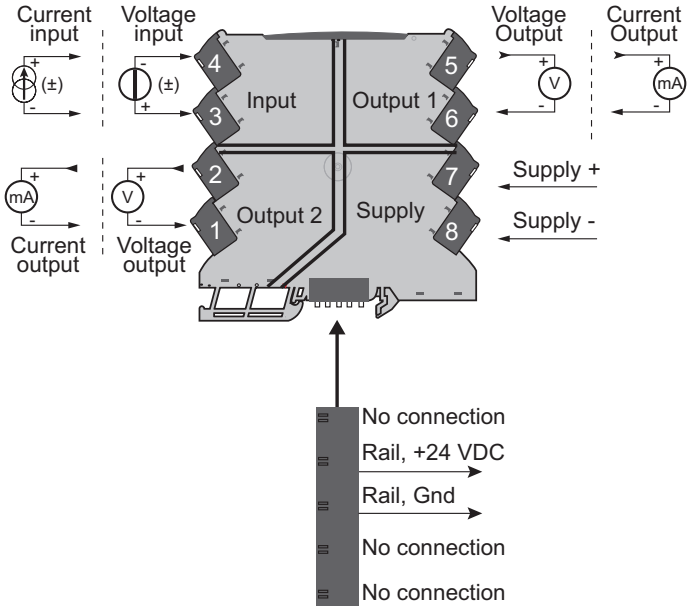
SC6-2220



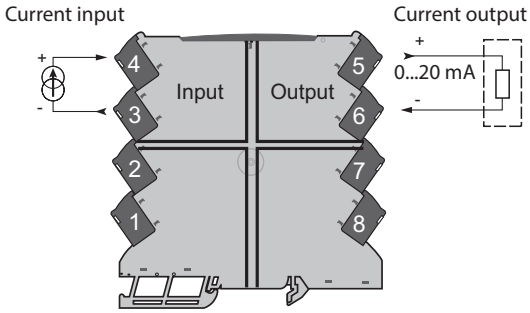
SC6-3200



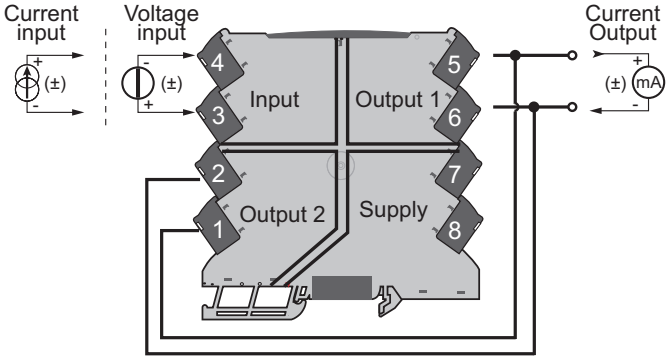
SC6-3220



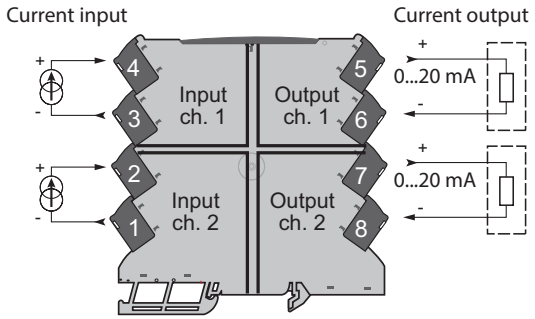
SC6-1101



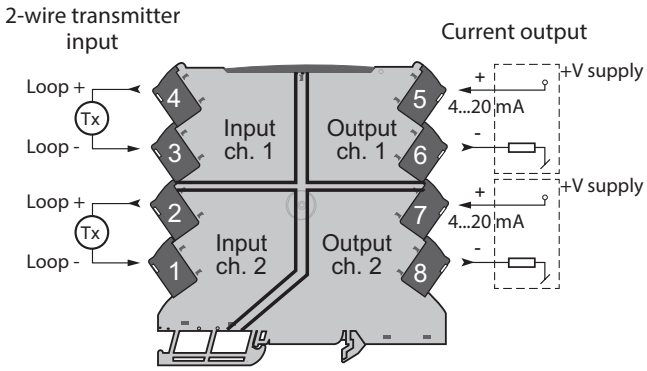
Bipolar Input to bipolar output wiring set-up:



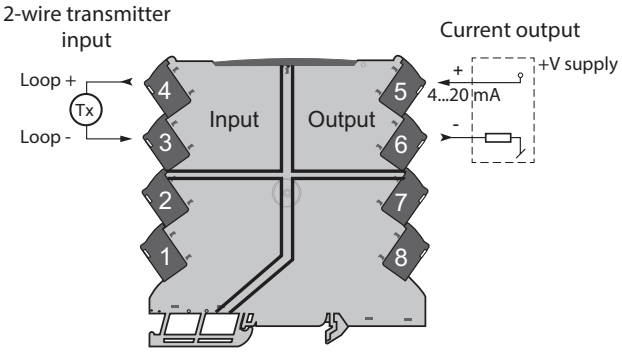
SC6-1111



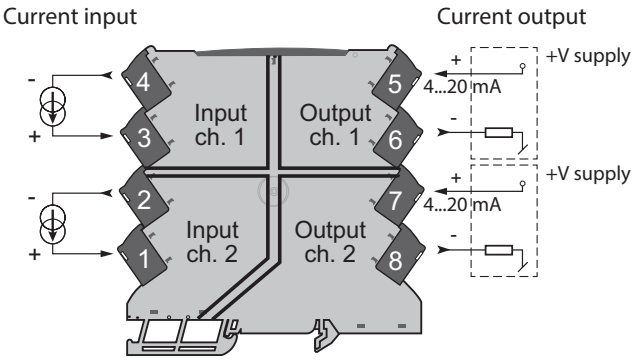
SC6-4112



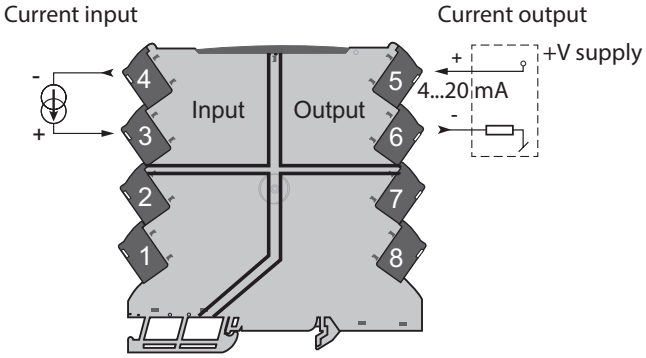
SC6-4102



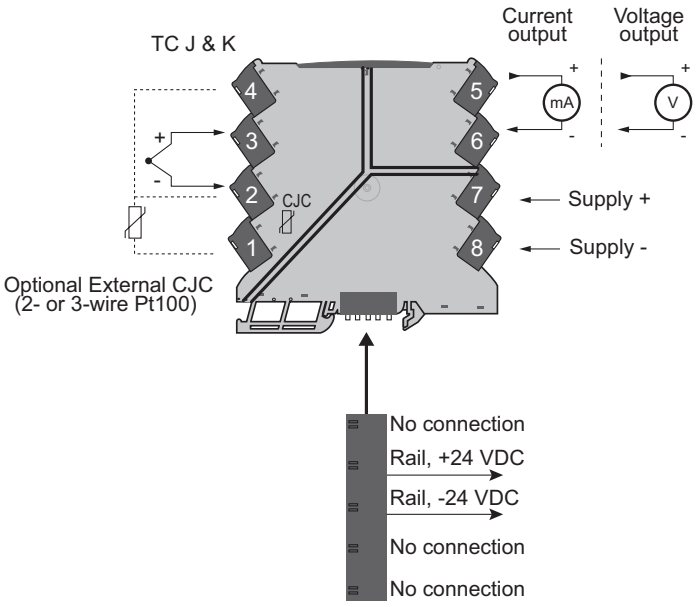
SC6-1112



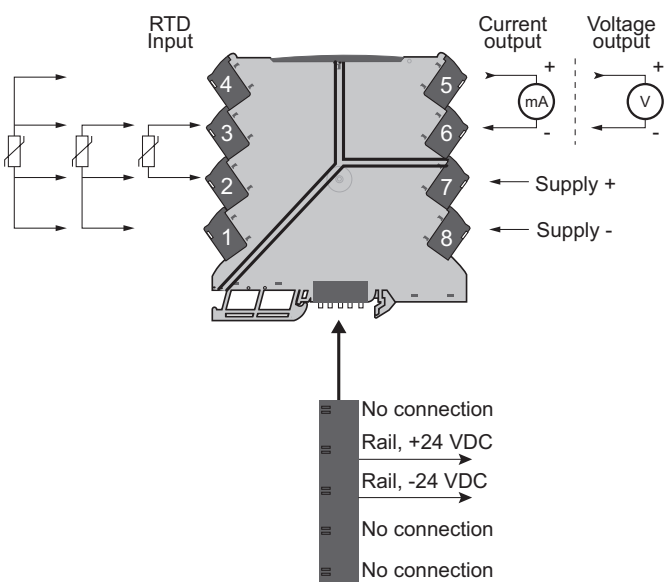
SC6-1102



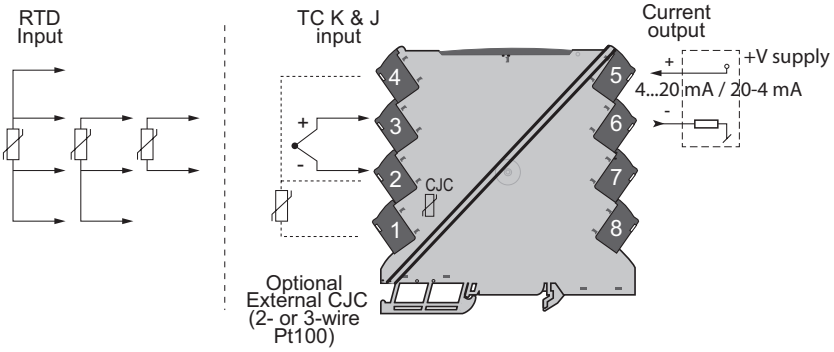
SC6-5200



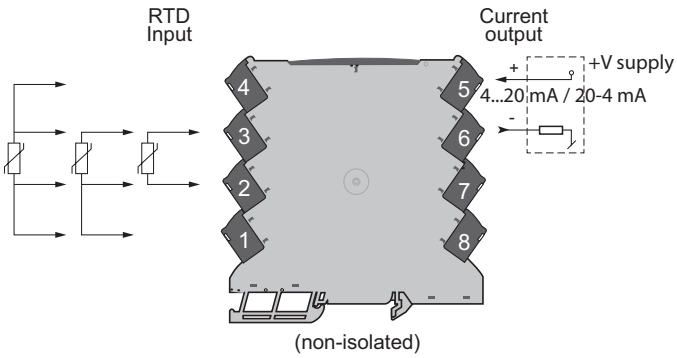
SC6-6200



SC6-7102



SC6-6102



15 - DIP Switch Settings

The part numbers listed below are configured with DIP switches which are located on the side of the module and can be adjusted with a small screw driver or other implement.

SC6-2200

1	2	3	4	5	6	7	8	9	10	DIP Switch
		•			•					0...20mA
							•			4...20mA
	•			•						0...10V
	•	•		•	•					2...10V
	•		•	•		•				0...5V
	•	•	•	•	•	•				1...5V
•										0...20mA Loop
•		•								4...20mA Loop
In				Out						• = ON

SC6-2220

1	2	3	4	5	6	7	8	9	10	DIP Switch
		•			•			•		0...20mA
										4...20mA
	•			•			•			0...10V
	•	•		•	•		•	•		2...10V
	•		•	•		•	•		•	0...5V
	•	•	•	•	•	•	•	•	•	1...5V
•										0...20mA Loop
•		•								4...20mA Loop
In				Out1			Out2			• = ON

SC6-3200

1	2	3	4	5	6	7	8	9	10	DIP Switch
On •										0...20mA
Off					•					4...20mA
Filter				•						0...10V
				•	•					2...10V
				•		•				0...5V
				•	•	•				1...5V
	•	•								-20...+20mA
	•	•	•							-10...+10mA
										-10...+10V
			•							-5...+5V
	In			Out						• = ON

SC6-3220

1	2	3	4	5	6	7	8	9	10	DIP Switch
On •										0...20mA
Off					•			•		4...20mA
Filter				•			•			0...10V
				•	•		•	•		2...10V
				•		•	•		•	0...5V
				•	•	•	•	•	•	1...5V
	•	•				•			•	-20...+20mA
	•	•	•		•	•		•	•	-10...+10mA
										-10...+10V
			•							-5...+5V
		In			Out 1			Out 2		• = ON

SC6-5200

Sensor S1	1	2	3
TC J (Int. CJC)			•
TC K (Int. CJC)	•		•
TC J (Ext. CJC)		•	•
TC K (Ext. CJC)	•	•	•

Output S1	4	5	6
0...20 mA			
4...20 mA	•		
0...10 V			•
2...10 V	•		•
0...5 V		•	•
1...5 V	•	•	•

• = ON

Sensor Error Detection S1	7
None	
Enable	•

Output Error Level	S1	8
Downscale		
Upscale		•

Noise Supp.S1	9	Resp.T. S1	10
50 Hz		< 30 ms	
60 Hz	•	300 ms	•

SC6-6102

Sensor S1	1	2	3
Pt100, 2w	•		
Pt100, 3w		•	
Pt100, 4w	•	•	

Output S1	4	5	6
4...20 mA	•		
20...4 mA	•	•	

• = ON

Sensor Error Detection S1	7
None	
Enable	•

Output Error Level	S1	8
Downscale		
Upscale		•

Noise Supp.S1	9	Resp.T. S1	10
50 Hz		< 30 ms	
60 Hz	•	300 ms	•

SC6-6200

Sensor S1	1	2	3
Pt100, 2w	•		
Pt100, 3w		•	
Pt100, 4w	•	•	

Output S1	4	5	6
0...20 mA			
4...20 mA	•		
0...10 V			•
2...10 V	•		•
0...5 V		•	•
1...5 V	•	•	•

• = ON

Sensor Error Detection S1	7
None	
Enable	•

Output Error Level	S1	8
Downscale		
Upscale		•

Noise Supp.S1	9	Resp.T. S1	10
50 Hz		< 30 ms	
60 Hz	•	300 ms	•

SC6-7102

Sensor S1	1	2	3
Pt100, 2w	•		
Pt100, 3w		•	
Pt100, 4w	•	•	
TC J (Int. CJC)			•
TC K (Int. CJC)	•		•
TC J (Ext. CJC)		•	•
TC K (Ext. CJC)	•	•	•

Output S1	4	5	6
4...20 mA	•		
20...4 mA	•	•	

• = ON

Sensor Error Detection S1	7
None	
Enable	•

Output Error Level	S1	8
Downscale		
Upscale		•

Noise Supp.S1	9	Resp.T. S1	10
50 Hz		< 30 ms	
60 Hz	•	300 ms	•

SC6-5200, SC6-6200, SC6-6102, SC6-7102 Models:

Temperature Range Programming

DIP S2 • = ON Temperature Range ºC (°F)

Start Temp.	1	2	3	4
-200°C (-328°F)				
-180°C (-292°F)				•
-150°C (-238°F)			•	
-100°C (-148°F)			•	•
-50°C (-58°F)		•		
-25°C (-13°F)		•		•
-10°C (14°F)		•	•	
-5°C (23°F)		•	•	•
0°C (32°F)	•			
5°C (41°F)	•			•
10°C (50°F)	•		•	
20°C (68°F)	•		•	•
25°C (77°F)	•	•		
50°C (122°F)	•	•		•
100°C (212°F)	•	•	•	
200°C (392°F)	•	•	•	•

End Temp.	5	6	7	8	9	10
0°C (32°F)						
5°C (41°F)						•
10°C (50°F)					•	
15°C (59°F)					•	•
20°C (68°F)				•		
25°C (77°F)				•		•
30°C (86°F)				•	•	
35°C (95°F)				•	•	•
40°C (104°F)			•			
45°C (113°F)			•			•
50°C (122°F)			•		•	
55°C (131°F)			•		•	•
60°C (140°F)			•	•		
65°C (149°F)			•	•		•
70°C (158°F)			•	•	•	
75°C (167°F)			•	•	•	•
80°C (176°F)		•				
85°C (185°F)		•				•
90°C (194°F)		•			•	
95°C (203°F)		•			•	•
100°C (212°F)		•		•		

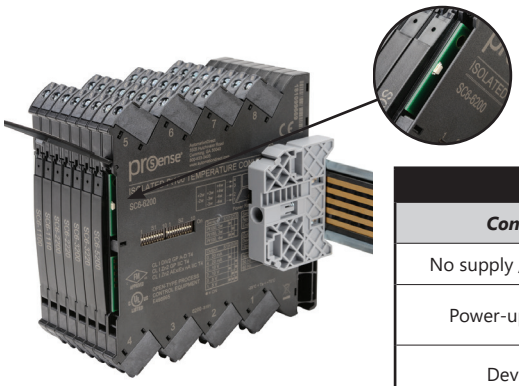
End Temp.	5	6	7	8	9	10
105°C (221°F)		•		•		•
110°C (230°F)		•		•	•	
115°C (239°F)		•		•	•	•
120°C (248°F)		•	•			
125°C (257°F)		•	•			•
130°C (266°F)		•	•		•	
135°C (275°F)		•	•		•	•
140°C (284°F)		•	•	•		
145°C (293°F)		•	•	•		•
150°C (302°F)		•	•	•	•	
160°C (320°F)		•	•	•	•	•
170°C (338°F)	•					
180°C (356°F)	•					•
190°C (374°F)	•				•	
200°C (392°F)	•				•	•
225°C (437°F)	•			•		
250°C (482°F)	•			•		•
275°C (527°F)	•			•	•	
300°C (572°F)	•			•	•	•
325°C (617°F)	•		•			
350°C (662°F)	•		•			•

End Temp.	5	6	7	8	9	10
375°C (707°F)	•		•		•	
400°C (752°F)	•		•		•	•
450°C (842°F)	•		•	•		
500°C (932°F)	•		•	•		•
550°C (1022°F)	•		•	•	•	
600°C (1112°F)	•		•	•	•	•
650°C (1202°F)	•	•				
700°C (1292°F)	•	•				•
750°C (1382°F)	•	•			•	
800°C (1472°F)	•	•			•	•
850°C (1562°F)	•	•		•		
900°C (1652°F)	•	•		•		•
950°C (1742°F)	•	•		•	•	
1000°C (1832°F)	•	•		•	•	•
1050°C (1922°F)	•	•	•			
1100°C (2012°F)	•	•	•			•
1150°C (2102°F)	•	•	•		•	
1200°C (2192°F)	•	•	•		•	•
1250°C (2282°F)	•	•	•	•		
1300°C (2372°F)	•	•	•	•		•
1350°C (2462°F)	•	•	•	•	•	
1372°C (2502°F)	•	•	•	•	•	•

Sens.Type	Temp. Range
Pt100	-200°C (-328°F) to 850°C (1562°F)
TC J	-100°C (-148°F) to 1200°C (2192°F)
TC K	-180°C (-292°F) to 1372°C (2502°F)

Note: °F values are calculated equivalents for °C values

16 - LED Indication for Analog Input Modules (SC6-1100, -1110, -2200, -2220, -3200, -3220)



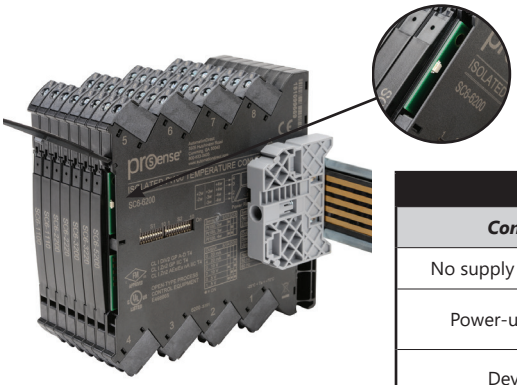
LED Indication

The device is equipped with a green power LED in the front to indicate the operation status, see the table below:

LED Indication for Analog Input Modules

Condition	*LED*	*Output and Loop Supply*	*Action Required*
No supply / device error	OFF	De-energized	Connect supply / replace device
Power-up or restart	1 Flash (0.5 s OFF + 0.5 s ON)	De-energized	-
Device OK	Flashing 13Hz (15ms ON)	Energized	-
Incorrect DIP-switch setting	Flashing 1Hz (15ms ON)	De-energized	Correct setting and re-power device
Restarting due to: Supply error/hardware. RAM or program flow error	Flashing 1Hz (0.5 s ON)	De-energized	Adjust supply / replace device

17 - LED Indication for Temperature Input Modules (SC6-5200, -6200)



LED Indication

The device is equipped with a green power LED in the front to indicate the operation status, see the table below:

LED Indication for Temperature Input Modules

Condition	*LED*	*Output and Loop Supply*	*Action Required*
No supply / device error	OFF	De-energized	Connect supply / replace device
Power-up or restart	1 Flash (0.5 s OFF + 0.5 s ON)	De-energized	-
Device OK	Flashing 13Hz (15ms ON)	Energized	-
Incorrect DIP-switch setting	Flashing 1Hz (500ms ON)	De-energized	Correct setting and re-power device
Sensor error indication	Flashing 1Hz (15ms ON)	Up- or Downscale	Check sensor

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