

SG-3013 Isolated RTD Input Module

User's Manual

Introduction

The SG-3013 is a RTD input signal conditioning module to transform RTD input to voltage or current output. SG-3013 uses a microprocessor-based transducer, which integrating two high resolution ADCs and an MCU, to acquire the RTD signal. The supported RTD types are Pt100 , Pt1000 , Ni 120 ,Cu100 ,and Cu1000.

The SG-3013 supports 3000Vdc isolation. The power supply that drives the module's input and output circuitry is internally isolated, enabling SG-3013 to offer true channel - to - channel isolation.

It's easy to mount the SG-3013 on a standard DIN rail and can operate in environment with wide temperature range.

Specifications

Signal Input :

- **Input Type:** Pt100 $\alpha=0.00385$ / Pt100 $\alpha=0.003916$ / Ni 120 / Pt1000 $\alpha=0.00385$
- **RTD Type and Temperature Ranges:**

RTD Type	α	Temperature range(°C)
Pt100	0.00385	-200~600
Pt100	0.003916	-200~600
Pt1000	0.00385	-200~600
Ni 120		-80~300
Cu 100 at 0°C	$\alpha= 0.00421$	-20~150
Cu 100 at 25°C	$\alpha= 0.00427$	0~200
Cu 1000 at 0°C	$\alpha= 0.00421$	-20~150

- **Input Connections:**2 / 3 / 4 wires

Voltage output:

- Unipolar: 0~5V, 0~10V
- Output impedance: <50 Ω

Current output:

- Current: 0~20mA, 4~20mA
- Current load resistor:0~500 Ω (Source)

General

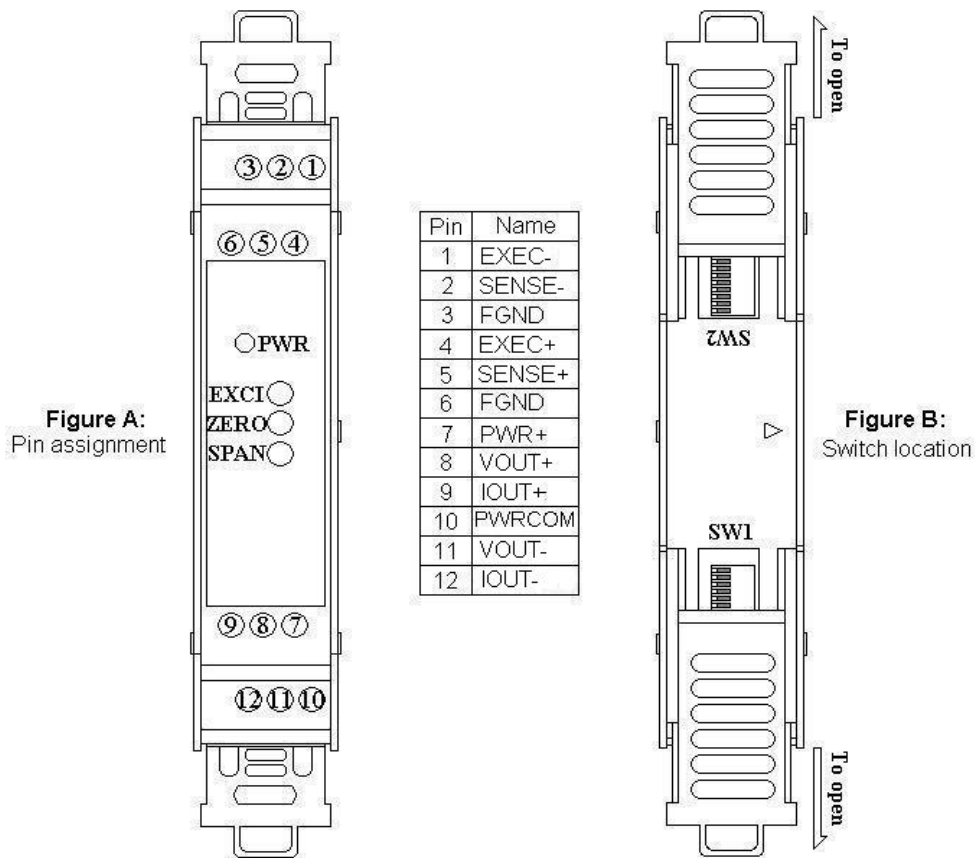
- Three-way isolation: 3000Vdc
- Accuracy: $\pm 0.1\%$ of full range
- Operation temperature range:-25°C~75°C
- Storage temperature range:-30°C~85°C
- Weight: 94 gram

Supply Voltage

- Input Range: 10~30Vdc
- Consumption: < 1.2W

Configuration

The terminal wiring for the SG-3013 is shown in Figure A. The SG-3013 uses a power input range of 10~30Vdc. Table 1 and table 2 show the switch positions used to configure the input and output range. The I/O configuration switches are located inside the module. And can be accessed by removing the DIN-rail bracket covers by sliding them in the direction shown in Figure B.



Switch Setting

SW1	Dip switch							
	1	2	3	4	5	6	7	8
N.O	1	2	3	4	5	6	7	8
Function	2^0	2^1	2^2	2^3	2^4	2^5	2^6	+/-

Table 1: Offset setting (SW1)

◆offset 0.1 °C

SW2	Dip switch							
N.O	1	2	3	4	5	6	7	8
Function	RTD Type Set					Short Circuit Protection	Current output	Voltage output
	2 ⁰	2 ¹	2 ²	2 ³	2 ⁴	0V/0mA 10V/20mA	0-20mA 4-20mA	10V 5V

Table 2: In/Output type setting (SW2)

RTD Type Setting

switch			Temperature Range °C	switch			Temperature Range °C
RTD Type Platinum 100,α= 0.00385				RTD Type Platinum 100,α= 0.003916			
1	0x00	00000	-200~200	17	0x10	00001	-50~150
2	0x01	10000	-200~600	18	0x11	10001	0~100
3	0x02	01000	-100~100	19	0x12	01001	0~200
4	0x03	11000	-100~0	20	0x13	11001	0~600
5	0x04	00100	-100~200	RTD Type Platinum 1000,α= 0.00385			
6	0x05	10100	-50~50	21	0x14	00101	-200 ~ 600
7	0x06	01100	-50~150	RTD Type Nickel 120			
8	0x07	11100	0~100	22	0x15	10101	-80 ~ 100
9	0x08	00010	0~200	23	0x16	01101	0 ~ 100
10	0x09	10010	0~600	24	0x17	11101	0~300
RTD Type Platinum 100,α= 0.003916				25	0x18	00011	-80~300
11	0X0A	01010	-200~200	RTD Type Cu 100 at 0°C,α= 0.00421			
12	0X0B	11010	-200~600	26	0x19	10011	-20 ~ 150
13	0X0C	00110	-100~100	RTD Type Cu 100 at 25°C,α= 0.00427			
14	0X0D	10110	-100~0	27	0x1A	01011	0 ~ 200
15	0X0E	01110	-100~200	RTD Type Cu 1000 at 0°C,α= 0.00421			
16	0X0F	11110	-50~50	28	0X1B	11011	-20 ~ 150

Label :

SG3013 Configuration		SW2-6 Open RTD: <input type="checkbox"/> 0V/0mA <input checked="" type="checkbox"/> 10V/20mA SW2-7 Current Output: <input type="checkbox"/> 0~20mA <input checked="" type="checkbox"/> 4~20mA SW2-8 Voltage Output: <input type="checkbox"/> 0~10V <input checked="" type="checkbox"/> 0~5V												
Switch (SW) Setting: <input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF					Temperature Offset Switch									
RTD Type		Range(°C)		(SW2-) 1 2 3 4 5					(SW1-) 1 2 3 4 5 6 7 8					(°C)
Pt100 $\alpha = 0.00385$		-200~+200		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>					12.7
Pt100 $\alpha = 0.00385$		-200~+600		<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>					12.6
⋮		⋮		⋮					⋮					⋮
Pt100 $\alpha = 0.003916$		0~+100		<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>					<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					0.1
Pt100 $\alpha = 0.003916$		0~+200		<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>					<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					0.0
Pt100 $\alpha = 0.003916$		0~+600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>					<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>					-0.1
Pt1000 $\alpha = 0.00385$		-200~+600		<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>					<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>					-0.2
Ni120		-80~+100		<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>					<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>					-0.3
Ni120		0~+100		<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>					<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>					-0.4
⋮		⋮		⋮					⋮					⋮
Cu100 $\alpha = 0.00427$		0~+200		<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>					<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>					-12.6
Cu1000 $\alpha = 0.00421$		-20~+150		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>					<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>					-12.7
10 PWR COM		7 PWR+		6 IOUT+		9 IOUT+		4 EXC+		5 SENSE+		3 F GND		1 EXC-
11 VOUT-		8 VOUT+		5 IOUT+		8 IOUT+		6 F GND		4 EXC+		5 SENSE-		2 SENSE-
12 IOUT-		9 IOUT+		6 IOUT+		9 IOUT+		5 F GND		6 F GND		7 SENSE-		3 F GND

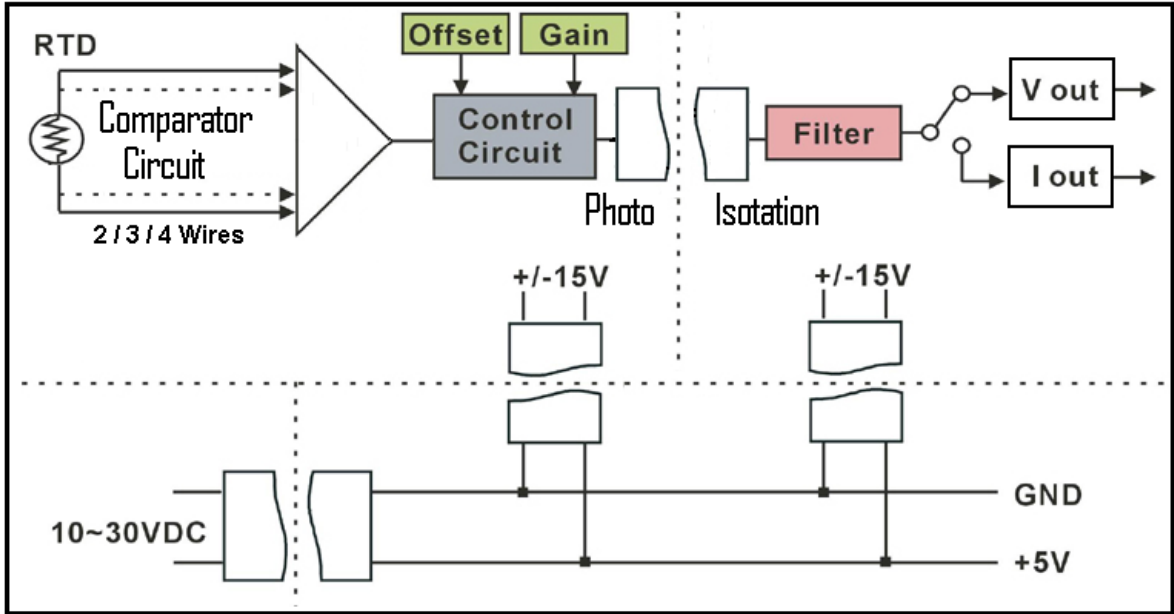
Factory default setting

SW1	Dip switch							
N.O	1	2	3	4	5	6	7	8
On/Off	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

=>In
put Pt100,
 $\alpha = 0.00385$,
-200°C
~ +600°C
/ Output
0~10V or
4~20mA

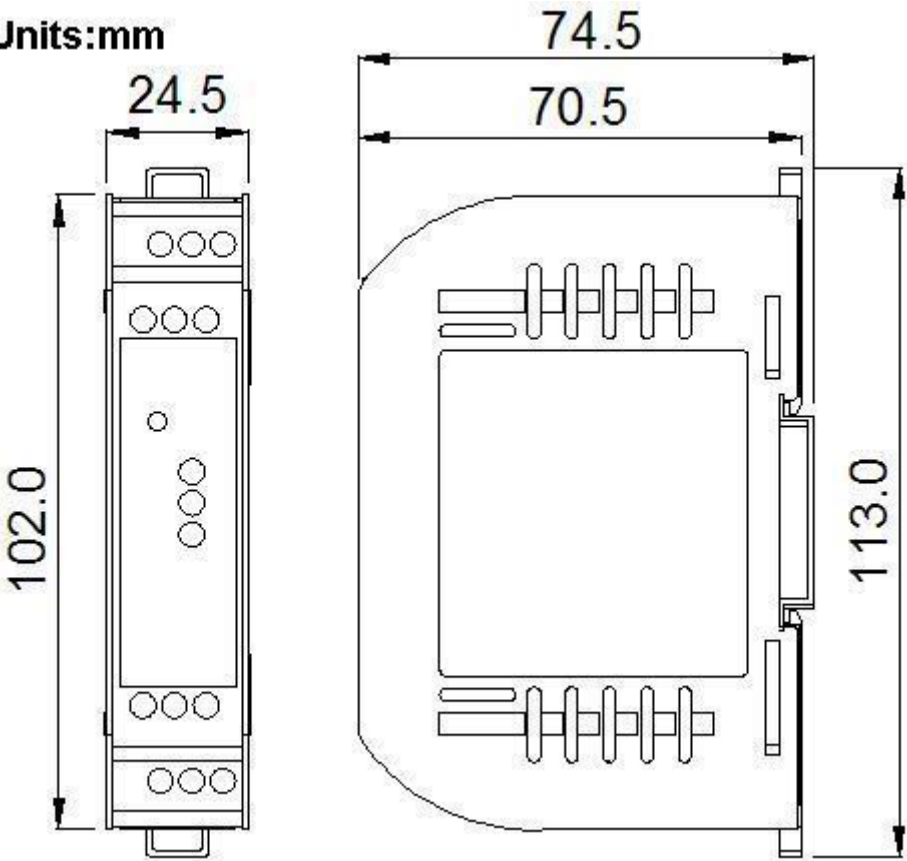
SW2	Dip switch							
N.O	1	2	3	4	5	6	7	8
On/Off	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Block Diagram



Dimensions

Units:mm



Technical Service:

Please E-mail your problem description to service@icpdas.com if you have any questions.

More detail information : WWW.icpdas.com