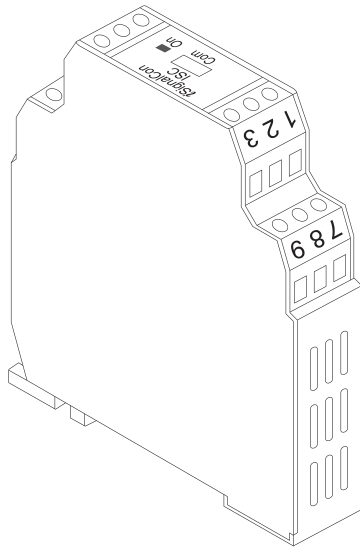




2-Channel Isolated Universal Signal Converter/Conditioner/Isolator

Model ISC

Installation and Operation Guide



SignalCon® Model ISC is a user programmable 2-channel isolated universal signal converter. Microprocessor based designed make it flexible to accept various input signals including mV, V, mA, PT100 and 9 different thermocouples. The measuring unit and range are also configurable with a user-friendly software SignalWin® via PC.

Features

- The unique Math function

$$f(PV_1, PV_2) \propto \sqrt{\frac{PV_1 \times A \times PV_2 \times B}{C}}$$

PV1, PV2 is the measuring value of Channel 1 and Channel 2 separately. A, B, C is a constant set by user.

- The unique High/Low comparison output

The output 1 will scale to PV1 or PV2 whichever is higher/lower than the other.

- Programmable for various input signals, measuring range.

- Easy configuration without external power connected.

- Dual channel Input :

Resistance thermometer (Pt100)

Thermocouple (J, K, T, E, B, R, S, N, C)

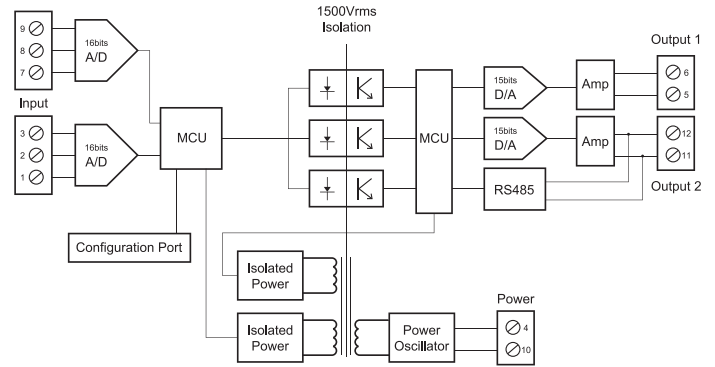
Voltage/Current transmitter (mV/V/mA)

- Dual analog output (ISC-D) :

0/4 to 20mA or 0~10V analogue output.

- RS485 communication with Modbus RTU protocol. (ISC-C)

- Fault signal on sensor break presettable.



Specification

Input signal : User programmable. refer to table 1.

- Thermocouple (T/C) : industry standard thermocouple types, J, K, T, E, B, R, S, N, C (ITS-90).

- Pt100 : Excitation 180uA. 2 or 3 wire connection (ITS-90 $\alpha=0.00385$).

- Voltage : -60mVdc to 60mVdc or -10Vdc to 10Vdc.

- Current : 0mA to 24mA

Measuring range : User programmable. Maximum range refer to table 1.

Measuring accuracy : refer to Table 1. the accuracy is tested under the operating condition of 24°C±3°C.

Input sampling rate : 200mS.

Input signal	Maximum Range	Accuracy
Thermocouple J	-50 to 1000°C (-58 to 1832°F)	±1°C
Thermocouple K	-50 to 1370°C (-58 to 2498°F)	±1°C
Thermocouple T	-270 to 400°C (-454 to 752°F)	±1°C
Thermocouple E	-50 to 700°C (-58 to 1292°F)	±1°C
Thermocouple B	0 to 1750°C (32 to 3182°F)	±2°C (Note1)
Thermocouple R	-50 to 1750°C (-58 to 3182°F)	±2°C
Thermocouple S	-50 to 1750°C (-58 to 3182°F)	±2°C
Thermocouple N	-50 to 1300°C (-58 to 2372°F)	±2°C
Thermocouple C	-50 to 1800°C (-58 to 3272°F)	±2°C
Pt100	-200 to 600°C (-328 to 1112°F)	±0.2°C
MV	-60mV to 60mV	±0.01mV
Voltage (Note2)	-10 to 10Vdc	±1mV
Current (Note2)	0 to 24mA	±10µA

*Factory Setting

Note 1 : Accuracy is not guaranteed between 0 and 400°C (0 and 752°F) for type B, R and S.

Note 2 : The internal jumper should be set. See Table 2 in detail.

Table 1 Input Signal

Output signal : DC 4~20mA or DC 0~10V

Output resolution : 0.6uA.

Output response time : <200mS.

Communication : Modbus RTU protocol, 2400~38400 bps

Power supply : 18~36 Vdc, internal protection against polarity inversion.

Power Consumption : 2W max.

Galvanic isolation : 2 KV 1min. between input and output

Operating temperature : 0 to 55°C

Humidity : 0 to 90% RH

Electromagnetic compatibility (EMC) : En 50081-2, En 50082-2

Dimension : shown in Figure 1.

Housing material : ABS plastic. UL 94V0

Weight : 85g

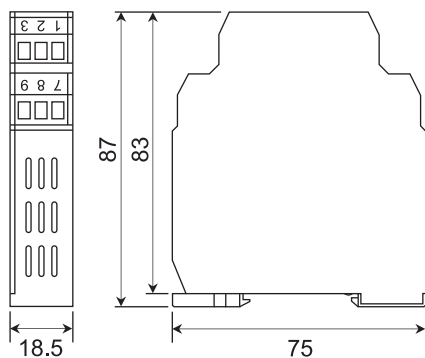
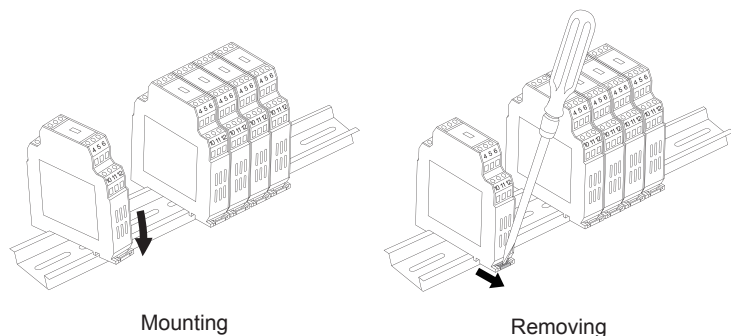


Figure 1. Dimension in mm

Installation



Electrical Connection

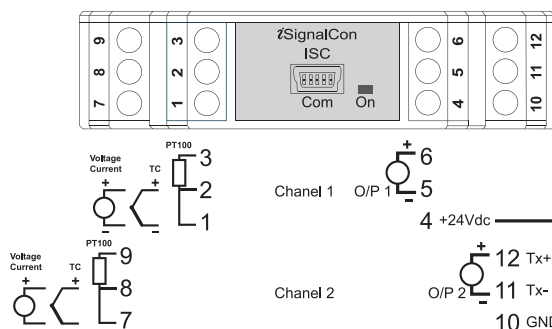


Figure 2. Terminal connections

Wiring Specification :

Screw tightening torque : 4.3 lb-in.

Wire range : 12~30 AWG.

Wire strip length : 7mm.

Wiring Precaution :

1. Always keep signal wires away from power or contactor wires.
2. The power supply of iSignalCon® should not be shared with contactors, electrical motor and other inductive devices.

The various input signals are divided into three groups.

1. TC/RTD/mV : Thermocouple type (J, K, T, E, B, R, S, N, C), Pt100 and voltage input in the range of -60mVdc~60mVdc.
2. Current : 0~24mA
3. Voltage : -10~10Vdc.

For the three different groups of input signal type, The SW1 and SW2 should be set according to the Table 2 for each channel separately.

	1	2	3
TC/RTD/mV*	OFF	OFF	ON
0~24mA	ON	OFF	ON
-10V~10V	OFF	ON	OFF

*Factory Setting

Table 2. Internal DIP switch setting

To change the DIP switch setting, please open the iSignalCon® cover as shown in Figure 3.

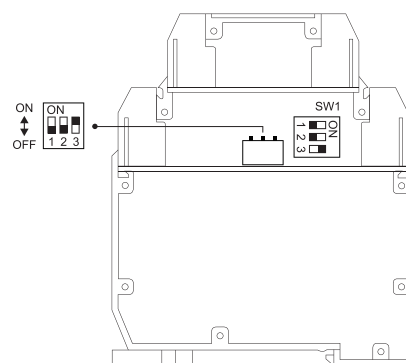


Figure 3. Internal DIP switch

Communication

The iSignalCon® can be optional equipped with RS-485 interface. Further information about the communication please refer to "ISC Operation manual".

Configuration

All input signals and the output are calibrated within the specified accuracy at factory. However, a recalibration is implemented to provide fine adjustments to the output signal in the field.

The iSignalCon® is user configurable by the PC software iSignalWin® along with the URC-1020 interface cable or the EzPro hand held programmer.

■ iSignalWin® is user-friendly software. The latest release version can be download free from www.vertex-tw.com

■ URC-1020 Interface cable consist of interface converter and USB plug. It can be purchased separately from iSignalCon® supplier.

During configuration the iSignalCon® can work alone without connecting to a power source. The configuration connection is shown in Figure 4.

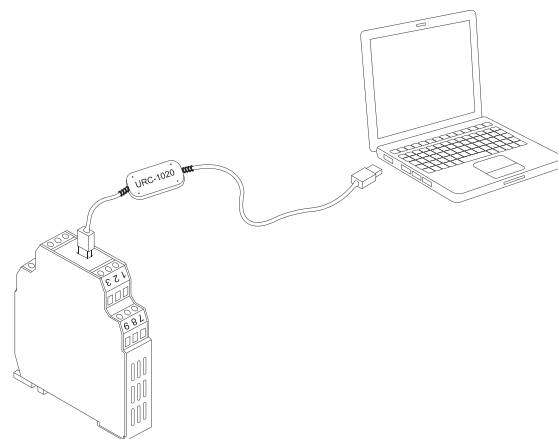


Figure 4. Configuration connection

Figure 5 show the configuration screen of iSignalWin®. The help menu provides further detail information about the software and the ISC converter. The Configurable parameters are :

1. **Input signal type** : Various input signal type can be selected among the available options.
2. **Measuring range** : Defines the lowest and highest value of measuring range. Within the range, the iSignalCon® converting input signals into an scalable analogue output signal.
3. **Unit** : Select the unit (°C or °F) of temperature measurement. For linear input (voltage or current), it doesn't effect the measurement.

4. **Output direction** : Defines the scalable analogue output signal to be 4 to 20mA or 20 to 4mA.
5. **Fault signal on sensor break** : Defines the output signal to be
- (1) Downscale (<4mA).
 - (2) upscale (>20mA).
 - (3) Cut. Limit the output signal within the output range when the input is out of measuring range.
6. **Offset Correction** : Allows to eliminate the offset error of measuring value.
7. **ID and Baud Rate** : Set device ID and communication baud rate.
8. **Output Function** : Select output 1 to be
- (1) scale to channel 1 measuring value (PV1).
 - (2) Math function, which make it possible to be used as signal addition/subtraction/division/square-root converter.
 - (3) High/Low comparison of PV1, PV2 the output 1 will scale to PV1 or PV2 whichever is higher/lower than the other.
9. **0/4~20mA Output Signal Adjustment** : Zero and Span adjustment of output signal. A power source should be connected.
10. **Measuring value** : Read the measuring value of channel 1 (PV1), channel 2 (PV2) and Math calculation of PV1, PV2 continually.
11. **Device information** : Indicate the device model, firmware version, series number and communication status.

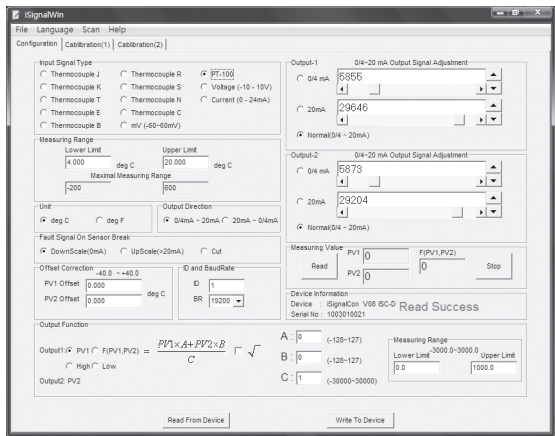


Figure 5. Configuration screen

Accessory

URC-1020 Interface cable

