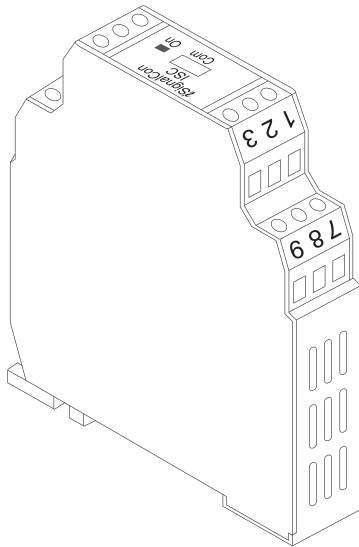# i**SignalCon®**

2-Channel Isolated
## Universal Signal Converter/Conditioner/Isolator

Model ISC

Installation and Operation Guide

iSignalCon® 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 iSignalWin® via PC.

Features

■ The unique Math function

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

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.
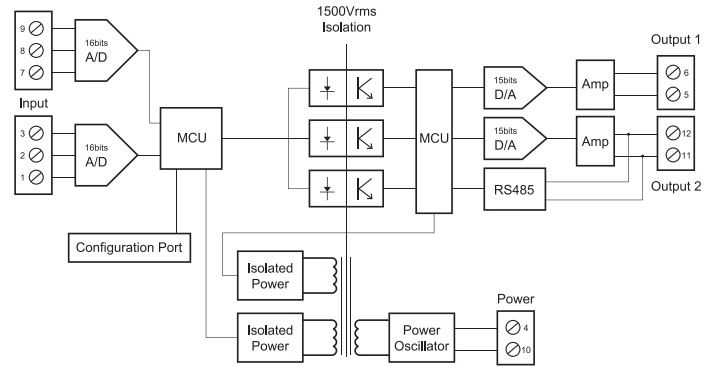
Specification

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 α=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 24mAdc	±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 4/0~20mA 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.

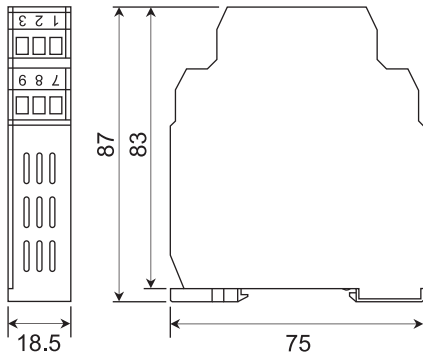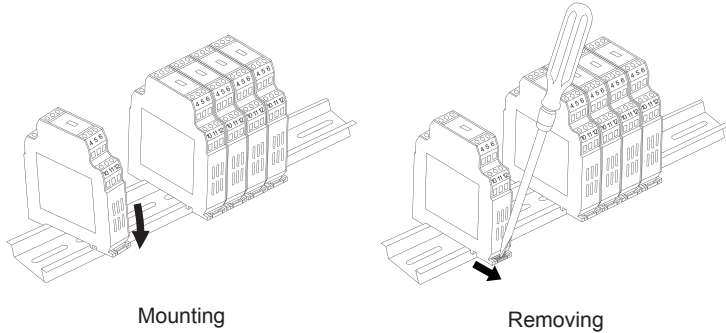**Housing material :** ABS plastic. UL 94V0

Weight : 85g

Figure 1. Dimension in mm

Installation

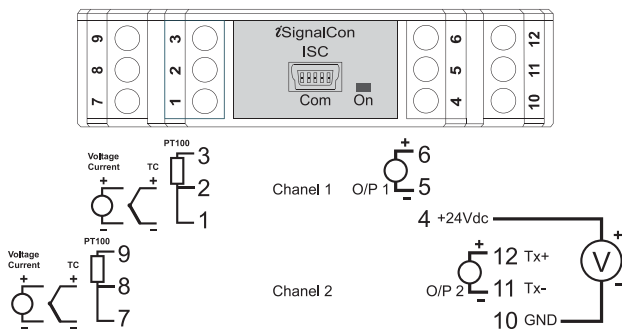Mounting   Removing

Electrical Connection

Figure 2. Terminal connections

Wiring Specification :
Srew 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.
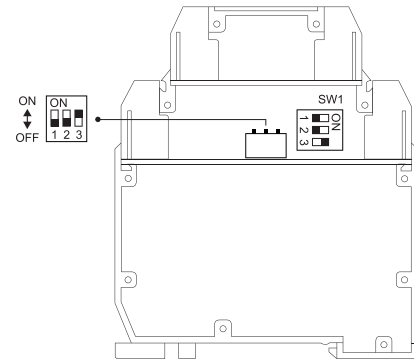

Figure 3. Internal DIP switch

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 lastest 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.
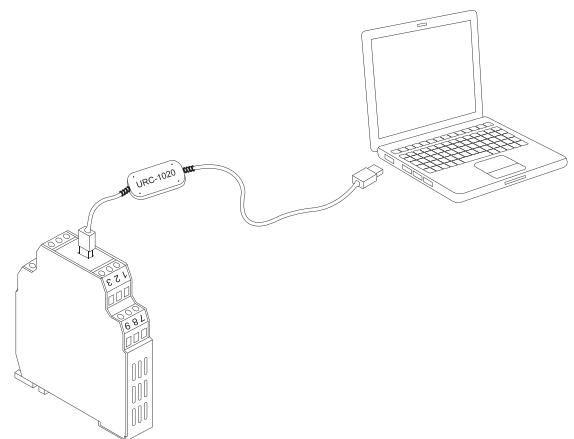

Figure 4. Configuration connection

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.
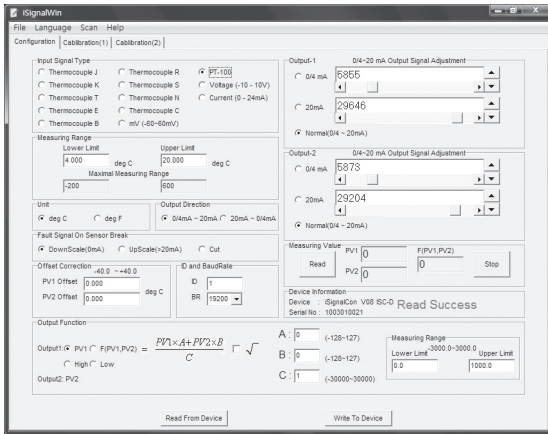

Figure 5. Configuration screen

Accessary

URC-1020 Interface cable

160cm