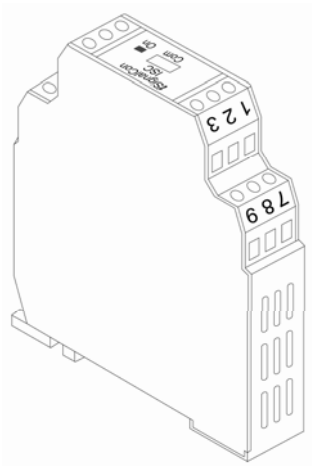
iSignalCon®

2-Channel Isolated Universal Signal Converter/Conditioner/Isolator

Model ISC-D
Model ISC-C

Installation and Operation Manual



iSignalCon® 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

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

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 analogOutput (ISC-D) :
0/4 to 20 mA 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)	±2˚C
Thermocouple K	-50 to 1370˚C (-58 to 2498˚F)	±2C
Thermocouple T	-270 to 400˚C (-454 to 752˚F)	±2˚C
Thermocouple E	-50 to 700˚C (-58 to 1832˚F)	±2˚C
Thermocouple B	250 to 1750˚C (-58 to 1832˚F)	±2˚C **(Note1)**
Thermocouple R	-50 to 1750˚C (-58 to 1832˚F)	±2˚C
Thermocouple S	-50 to 1750˚C (-58 to 1832˚F)	±2˚C
Thermocouple N	-50 to 1300˚C (-58 to 1832˚F)	±2˚C
Thermocouple C	-50 to 1800˚C (-58 to 1832˚F)	±2˚C
Pt100*	-200 to 600˚C (-58 to 1832˚F)	±0.2˚C
mV	-60.00mVto 60.00mV	±0.01mV
Voltage **(Note2)**	-10.000 to 10.000Vdc	±1mV
Current **(Note2)**	0.000 to 24.000mAdc	±3μA

***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 : DC4/0~20mA 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 : 85 g

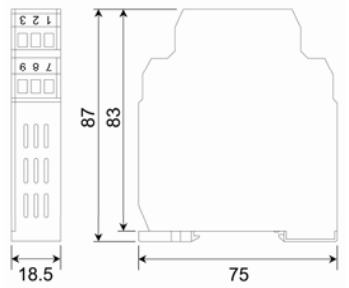
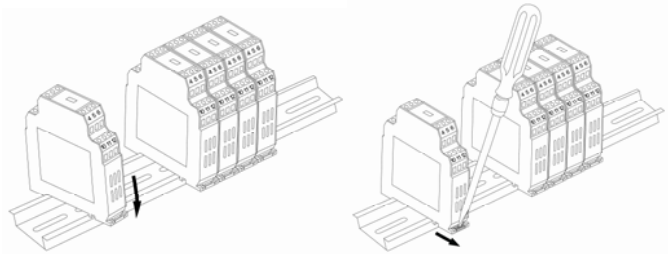


Figure 1. Dimension in mm

Installation



Mounting Removing

Electrical connection

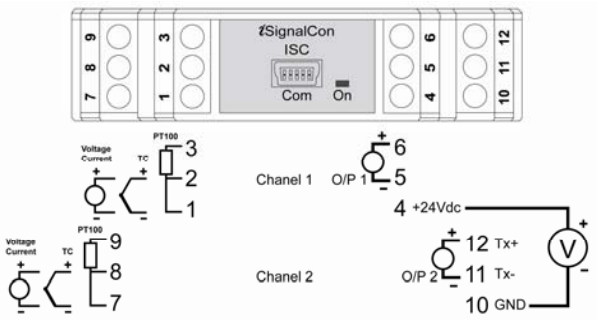


Figure 2. Terminal connections

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 ~ 24 mA
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.

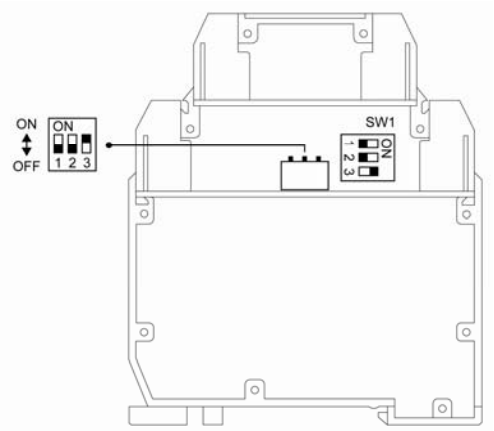


Figure 3. Internal Jumper Setting

Communication

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

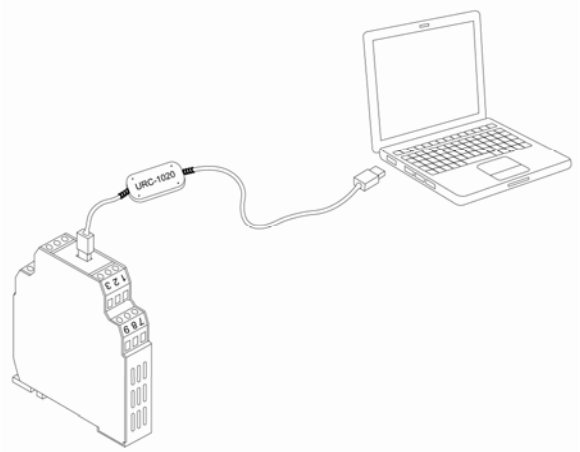


Figure 4. Configuration connection

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 4 mA.
5. **Fault signal on sensor break :** Defines the output signal to be upscale (>20mA) or downscale (0mA) on sensor break.
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 proportional to channel 1 measuring value (PV1) or Math function of PV1 and PV2. With Math function, the iSignalCon® can be used as signal addition/subtraction/division/square-root converter
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.

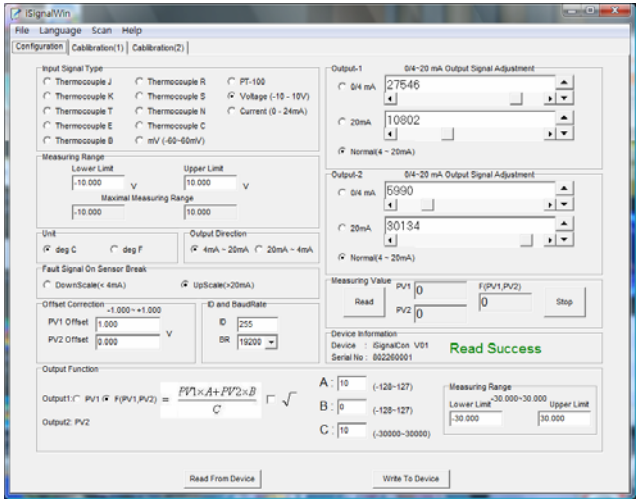
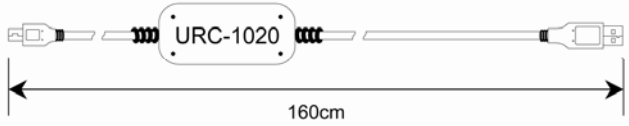


Figure 5. Configuration screen

Accessary

URC-1020 Interface cable



EzPro hand held programmer