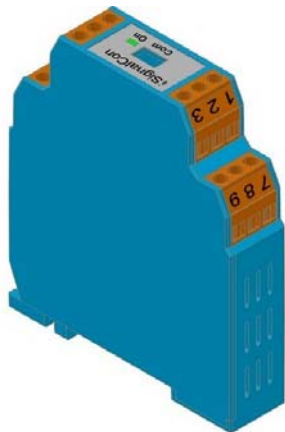


# iSignalCon®

## 2-Channel Isolated Universal Signal Conditioner/Converter

Model ISC-D  
Model ISC-S  
Model ISC-C

## Installation and Operation Manual



iSignalCon® is a user programmable 2-channel isolated universal signal conditioner/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 make it possible to configure as signal addition/subtraction/average/ square-root....converter.

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

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

- Programmable for various input signals, measuring range.

- Configurable with or 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: (Model IST-D)
  - 0/4 to 20 mA or 0~10V analogue output.
- RS485 communication: (Model IST-C)
  - Modbus RTU protocol.
- High accuracy in total ambient temperature range.
- 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 1000°C (-58 to 1832°F)	±1°C
Thermocouple B	0 to 1800°C (32 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 850°C (-58 to 1832°F)	±0.2°C
mV	-60mV to 60mV	±0.01mV
Voltage (Note2)	-10 to 10Vdc	±1mV
Current (Note2)	0 to 24mAdc	±10µA

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

**Note 2** : The internal DIP switch should be set. See Table 2 in detail.

Table 1 Input Signal

**Output device :**

**Model ISC-D:** Two analog output,

**Model ISC-S:** One analog output,

**Model ISC-C:** One analog output with RS485 com port

**Analog Output signal** : 0/4~20mA, (resistive load 600ohms Max.)  
0~10V

**Communication** : RS485 with Modbus RTU protocol

**Output resolution** : 15 bits.

**Output response time** : < 200mS.

**Power supply** : 24 Vdc, internal protection against polarity inversion.

**Common mode rejection ratio** : > 80dB.

**Galvanic isolation** : 4 KV. between input and output/power  
**Input current required** ≤ 50 mA

**Current limit** ≤ 23 mA

**Operating temperature** : -40 to 85°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

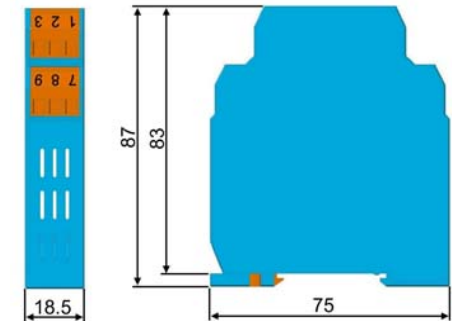


Figure 1. Dimension in mm

### Electrical connection

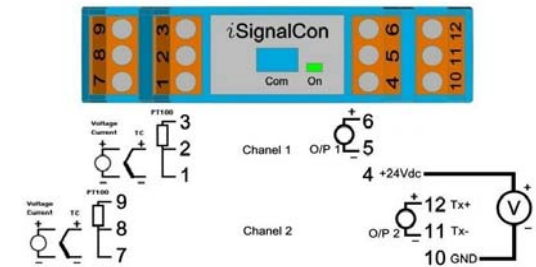


Figure 2. Terminal connections

**Wiring Specification :**

Srew tightening torque : 4.3 lb-in.

Wire range : 12~30 AWG.

Wire strip length : 6~7mm.

**Wiring Precaution :**

- Always keep signal wires away from power or contactor wires.
- 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.

- TC/RTD/mV : Thermocouple type ( J, K, T, E, B, R, S, N, C ),

- Pt100 and voltage input in the range of -60mVdc ~ 60mVdc.
- Current : 0 ~ 24 mA
  - 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.

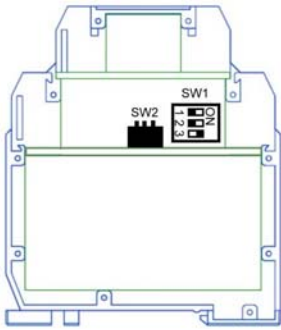


Figure 3. Internal DIP Switch

## Operation

All input signals and the output current are calibrated within the specified accuracy at factory. However, a recalibration is implemented to provide fine adjustments to the output signal in the field. This is accomplished by *iSignalWin*® software.

## Configuration

The *iSignalCon*® can be configuration using a PC with *iSignalWin*® software and **URC-1020 interface cable**.

- iSignalWin*® is user-friendly software. The latest release version can be download free from website. [www.vertex-tw.com](http://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.

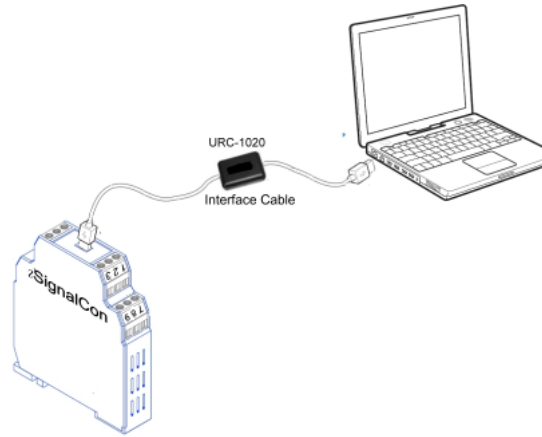


Figure 4. Configuration connection

Figure 5 show the configuration screen of *iSignalWin*®. The Configurable parameters are :

- Input signal type** : Various input signal type can be selected among the available options.
- 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.
- Unit** : Select the unit (° C or °F) of temperature measurement. For linear input ( voltage or current ),it doesn't effect the measurement.
- Output direction** : Defines the scalable analogue output signal to be 4 to 20mA or 20 to 4 mA.
- Fault signal on sensor break** : Defines the output signal to be upscale (>20mA) or downscale (0mA) on sensor break.
- Offset Correction** : Allows to eliminate the offset error of measuring value.
- ID and Baud Rate** : Set device ID and communication baud rate.
- 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
- 0/4~20mA Output Signal Adjustment** : Zero and Span adjustment of output signal. A power source should be connected.
- Measuring value** : Read the measuring value of channel 1 (PV1), channel 2 (PV2) and Math calculation of PV1,PV2 continually.
- Device information** : Indicate the device model, firmware version, series number and communication status.

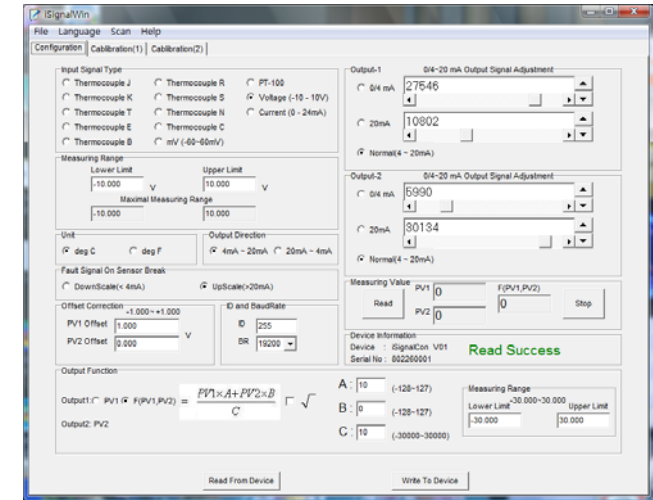


Figure 5. Configuration screen