AI-7021 DUAL TEMP ERATURE TRANSMITTER / SIGNAL ISOLATOR

Operation Instruction

Ver. 7.5

CONTENTS

AI-7021   **E8- External Display**

1. SUMMARY

AI-7021 provides two-channel transmitters or signal isolators. It has the following features:

- It provides 2 channels of configurable inputs, and supports multiple voltage, RTD, thermocouple inputs with auto reference junction compensation. If parallel connected to an external precise resistance, it accepts current signal input. Each channel has its own digital filtering and can adjust its filtering degree.
- It generates two isolated current outputs, 4-20mA or 0 – 20mA. The range of retransmission output can be freely defined.
- This model uses high performance hardware, which leads to greatly decreased temperature drift and interference among the two channels. As a result, this multi-channel instrument achieves the same measurement accuracy and anti-interference ability as that of single channel instrument.
- It generates digital adjusted current output without potentiometer, making the current output precise and stable.
- The model is DIN rail mounted. Its width is only 22.5mm. The instrument can be easily configured by connecting to our E8 handset display.
- Universal power supply of 100-240VAC or 24VDC.
- ISO9001 and CE certified and meets EMC standards. Its power and all I/O terminals pass 4KV/5KHz EFT test and can work reliably under interference.

2. TECHNICAL SPECIFICATION

- **Input type:**
  Thermocouple: K, S, R, E, J, T, B, N, WRe5-WRe26
  RTD: Pt100, Cu50
  Linear voltage: 0～20mV, 0～60mV, 0～100mV, 0～1V, 0.2～1V etc.
- **Instrument Input range**
  K(-50～+1300℃), S(-50～+1700℃), R(-50～+1700℃), T(-200～+350℃), E(0～1000℃),
  J(0～1200℃), B(0～1800℃), N(-50～+1300℃), WRe5-WRe26(0～2300℃),
  Pt100(-200～+900)℃, Cu(-50~+150)℃
  Linear Input: -9990～+30000 units defined by user.
- **Retransmission accuracy :** 0.3%FS ± 1 digit (including input and output error)
- **Output Specification:** can be freely defined in the range of 0～22mA with maximum output voltage ≥ 11V
- **Temperature drift :** ≤0.015%FS /℃ (including the temperature drift of input and output)
- **Electromagnetic compatibility (EMC) :** ±4KV/5KHz according to IEC61000-4-4 (EFT); 4KV according to IEC61000-4-5.
- **Isolation withstanding voltage :** voltage between power, signal input and output terminals ≥2300VDC; between inputs or 2 outputs ≥200VDC
- **Power supply :** 100～240VAC, -15%, +10% / 50Hz; or 24VDC/AC.
- **Power consumption:** ≤ 3W
- **Operating Ambient :** Temperature -10～+60℃; humidity ≤90%RH
  Note 1: B thermocouple obtains the above measurement accuracy only at the range of 400～1800℃. Its measurement from 60～400℃. is less accurate.

3. LAYOUT OF TERMINALS AND INDICATION LIGHTS AND WIRING

Layout of AI-7021D5 indication lights and terminals is illustrated below:

Terminal 1 and 2 are for power supply of 100-240VAC or 24VAC/DC.

Terminal 5 and 6 are the positive and negative pole of channel 1 current retransmission output.

Terminal 7 and 8 are the positive and negative pole of channel 2 current retransmission output.

Terminal 14～16 are for channel 1 input.

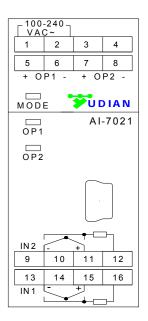Terminal 10～12 are for channel 2 input.

Indication light OP1～OP2: indicate the outputs of channel 1 and 2. The luminosity of the light indicates the magnitude of the output.

Indication light--- MODE:

When the light flickers even faster, at a rate of once every 0.3 second, it indicates severe errors such as input exceeding its acceptable range.

When the light is off, it indicates that the instrument has no power or it is out of order. When the light is on (for at least longer than 8 seconds), it indicates that the instrument has power on but is out of order.
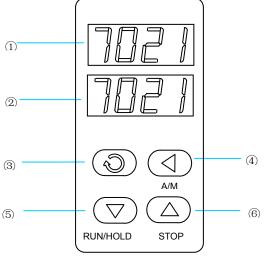
4. DISPLAYS AND OPERATIONS

The parameters of AI-7021D5 can be set by an external E8 display which can be used to configure AI-7021D5 at the initial set up, as well as remain connected to AI-7021D5 and serves as an external display.

The functions of the parts of E8 external display panel is as below:

① Upper display window, displays PV of channel 1 or parameter code, etc. when display keep flashing or the reading abnormal, please check the input specification set correct or not.

② Lower display window, displays PV of channel 2 or parameter value. When display keep flashing or the reading abnormal, please check the input specification set correct or not.

③ Setup key, for accessing parameter table and conforming parameter modification.

④ Data shift key.

⑤ Data decrease key

⑥ Data increase key.

Operation Instructions:

Setting parameters:

When the parameter lock "Loc" isn't locked, pressing ⊙ and holding for about 2 seconds will bring up the full parameter table. Pressing ⊙ will bring up the parameters one by one. Press◄ 、▲ or ▼ to modify the value of a parameter. Pressing ◄ and holding will return to the preceding parameter. Pressing ◄and holding and at the same time ⊙ press key will get out of the parameter table.

When the parameter lock "Loc" is locked, pressing ⊙will bring up field parameter table which just shown INPx, SCLx and SCHx from display and can't modify.

The instrument will automatically leave the parameter table if no key is pressed in the past 25 seconds, and the change of the last parameter will not be saved.

Note: The 1394 socket of the instrument only supports Yudian ADP1 display.

5. SETTING PARAMETERS

x means channel number.   It can be 1~2.

Parameter	Name	Remarks	Setting range
INPx	Input specification	Define the input specification of channel 1~ 2. | INP	Input spec.	INP	Input spec.
0	K	1	S
2	R	3	T
4	E	5	J
6	B	7	N
8	WRe3-WRe25	9	WRe5-WRe26
10	Extended input spec.	11~19	Spare
20	Cu50	21	Pt100
22~24	Spare	25	0~75mV
26~27	Spare	28	0~20mV voltage
29	0~100mV	30	0~60mV voltage
31	0~1V	32	0.2~1V		0 ~ 32
SCLx	Scale low limit	SCL and SCH define the corresponding scale range of linear output. For example, for channel 1, in order to retransmit 0~600℃ to output channel 1, SCL1 = 0, and = 600. For channel 2, to transmit 0~1000℃, then SCL2=0, SCH2=1000.	-999~+3000 units
SCHx	Scale high limit		
Scbx	Input offset	Scb is used to shift input to compensate the error caused by transducer, input signal, or auto cold junction compensation of thermocouple. **PV_after_compensation=PV_before_compensation + Scb** For thermocouple or three-wire RTD inputs, the units of Sc is 0.1℃. For example, when Scb=-100, the actual offset=-10℃, then the measured temperature will be 10℃ lower than that when Scb=0.	-199~+999.0 units or 0.1℃
FILx	Digital filter	The value of FIL will determine the ability of filtering noise. FIL=0, no filtering; FIL=1, filtering with mean; FIL=2~40, filtering with mean and integral. When a large value is set, the measurement input is stabilized but the response speed is slow. Generally, it can be set to 1 to 3. If great interference exists, then you can increase parameter FIL gradually to make momentary fluctuation of measured value less than 2 to 5. When the instrument is being metrological verified, FIL can be set to 0 or 1 to shorten the response time.	0~40
OPn	Retransmission channel assignment	OPn=1, For 1 input 1 output or 2 inputs 2 outputs retransmission application, OPn=2, For 1 input 2 outputs retransmission (Outputs from input channel 1).	0~6
OPL	Low limit of current retransmission of Channel 1	Define the low limit and high limit of current retransmission at OUTP position. The engineering unit is 0.1mA. For example, to retransmit 0~600℃ in input channel 1 to 4~20mA, then the parameter should be set as below: SCL1=0, SCH1=600, OPn=1, OPL=40, OPH=200.	0~110
OPH	High limit of current retransmission of Channel 1		0~220
OPL2	Low limit of current retransmission of Channel 2	Define the low limit and high limit of current retransmission of channel 2. The engineering unit is 0.1mA. For example, to retransmit 0~1000℃ in input channel 2 to 4~20mA, then the parameter should be set as below: SCL1=0, SCH1=1000, OPn=1, OPL=40, OPH=200.	0~100
OPH2	High limit of current retransmission of Channel 2		0~220

IVF1	OP1 current correction (Please record the value when first use)	For adjusting the current of OP1 output. The greater IVF1, the greater current output. Note: This parameter was adjusted before delivery. It is better not to change this value by yourself.	0~3000 Default=(_____)
IVF2	OP2 current correction (Please record the value when first use)	For adjusting the current of OP2 output. The greater IVF1, the greater current output. Note: This parameter was adjusted before delivery. It is better not to change this value by yourself.	0~3000 Default=(_____)
Loc	Parameter Lock	Loc=808, allow to display and modify all parameters. Otherwise, all parameters can't be modify and which just shown INPx, SCLx and SCHx from display	0 ~9999

6. SYMBOL DESCRIPTIONS

Symbol	Description
orAL	Input specification setting is incorrect Or Input wiring is disconnected/ thermocouple problem Or Short circuited
EErr	IC Software error
8888	IC Software error