# 4-20 mA output infrared temp. IR TEMP TRANSMITTER

## Model: TR-IR430



Your purchase of this IR TEMP. TRANSMITTER marks a step forward for you into the field of precision measurement. Although this meter a complex and delicate instrument, its durable structure will allow many years of use if proper operating techniques are developed. Please read the following instructions carefully and always keep this manual within easy reach.



## **OPERATION MANUAL**

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## **1. FEATURES**

- \* 4-wire installation.
- \* Linear current output .
- \* Easy installation and connection.
- \* Temperature range 0°C~600°C.
- \* Emissivity values range from 0.100 to 1.000
- \* Temperature Unit Seting : °C /  $^\circ\mathrm{F}$  .
- \* Small and robust infrared temperature sensor.

## 2. SPECIFICATIONS

Spectral range	8 to14 µm.		
Distance	D:S = 20:1 (90% energy)		
	* measuring distance / spot size		
Measurement	0°C∼600°C ( 0.026 mA/°C ).		
Temp. range	32 °F to 1112 °F(0.014 mA/°F).		
Analog output	Analog output: 4 to 20 mA.		
	* linear to temperature.		
Loop impedance	Max. 500 Ω@24 V DC.		
Emissivity	0.100~1.000 .		
Response time	150ms (95%)		
Accuracy	±1% of reading		
	or ±1.5°C, which is greater.		
Repeatability	±0.5% of reading or ±1°C,		
	whichever is greater.		
Connection cable	1 m length.		
Power supply	Isolated Power 12VDC to 24VDC@20 mA.		
	* Ripple< 2.5%		
Operation Temp.	0°C to 70°C /32°F to 158°F.		
Operation humidity	Max. 85% RH.		
Housing	Stainless Steel Tube.		
Mounting Nut	M22.		
Dimensions	L= 110 mm x Φ=22 mm .		
Weight	164 g.		
Enclosure rating	IP50 .		

## **3. FRONT PANEL DESCRIPTION**





- 3-1 IR Sensing Head
- 3-2 LCD Display
- 3-3 down (V) key button
- 3-4 up ( $\Lambda$ ) key button
- 3-5 Cable connector
- 3-6 Output Cable
- 3-7 Accessories

## 4. CURRENT LOOP AND TAGET TEMP.

The following table shows the relationship for the Current Loop Output with the Target Temperature. The different Current Loop Output is corresponding to the relevant target temperature.

Table 1: Current Loop Output & Target Temperature					
Code	Current Loop	Target Temp (°C /°F)			
	Output mA				
1	4.00	0°C/ 32°F			
2	6.66	100°C/ 212°F			
3	9.33	200°C/ 392°F			
4	12.00	300°C/ 572°F			
5	20.00	600°C/ 1112°F			

## **5. MEASURING PROCEDURE OF IR TRANSMITTER**

#### 5-1 IR Transmitter Wire connection

The following diagram and table show the proper wiring connections. Each wire is numbered with the number and the relative color. Please follow the function guide when you connect the wire.



Wire No.	Wire Color	Label	Function
1	Red	CLP	24VDC Power plus(V+)
2	Black	CLM	24VDC Power minus(V-)
3	White	OUT	DC Current 4 $\sim$ 20mA signal(+)
4	green	OUT	DC Current 4 $\sim$ 20mA signal( - )
5	bare		Shield Ground

Table 2 : Wire Color & Connection Indication

Warning :

Please pay the special attention to the wire connection for the Red (V+) and Black (V-). Please take care that white wire can not be linked with any Power line (Red (V+), Black (V-)), and the White wire is current output connecting to controller input, The controller wire please connection to power line Black ·

#### 5-2 IR TEMPERATURE MEASURMENT

The IR transmiter sensing head"(Fig1 3-1)" alignment temperature souce to do the temperature measurment ,at the same time the measure value will show in the pannal meter,s. When the IR transmiter measureing, if need to be fixed, please combined the "(Fig1 3-7)" and "(Fig1 3-1)" as Fig, 2.



Fig, 2

#### 5-3 IR TEMPERATURE MEASURMENT unit $\, {}^\circ \! C$ or ${}^\circ \! F$

The IR Temprature measurement unit can be select  $^\circ\!C$  or  $^\circ\!F$  How to select the measurement unit, please ref. p6

## 6. MEASURING CONSIDERATION OF IR TRANSMITTER

#### 6-1 EMISSIVITY SET

The IR Transmitter sensing energy and calculates the tempreture based on the amount of IR energy it receives . The IR Transmittersenses can be adjustment emissivity value  $0.100 \sim 1.000$ , adjustmet ref. p6 The default emissivity of this instrument is set 0.95 at the factory which will cover 90% of the typical applications.

#### 6-2 Measurement Field distance / Spot ( d/s ) value

The optical diagrams indicate the target spot diameter at any given distance between the target object and the sensing head. The spot size will change in longer distance corresponding to the following drawing. In order to prevent measuring errors the object must be as least as big as the spot size.



#### 6-3 Disturbance





Under certain measurement case, if the object is adversely effected by powerful infrared energy radiated jorm nearby objects having high emissivity or high temperature. For example, when such objects are measured in aunlight, erratic measurements can result due to powerful rediated energy from the sun reflecting on the surface of the objectand entering the sensor, then in order to get the exact measuring temperature value, it should install a shielding plate as above Fig. 2.

#### 6-4 Special Surfaces

\* If the surface to be measured is coverd by frost or other material , clear it to expose the surface.

\* If the surface to be measured is highly reflective,

please adjustment emissivity to match your test substance.

#### 6-5 Special Setup

- 1. Pressing and hold the up  $(\Lambda)$  key then press down  $(\vee)$  keys will enter setup function then release key.
- 2. Press the up ( $\wedge$ ) key to select the functional parameter.
- 3. Press the down (V) key, when a ( ) symbol appears at the right side of the selected function confirming into Setting Mode.
- 4. Press the down ( $\vee$ ) or up ( $\wedge$ ) key to setup the functional parameter.
- 5. No action for 7s forces the unit to leave the Setting Mode and save the parameter

Display		Mode	Adjustment Range	
E	0.950	Emissivity	0.100 ~ 1.000	
P	0.0	Signal output Peak hold (inactive)	0.0 ~ 60s	
Ur	nit C	Temperature unit	°C / °F	

#### 6-6 Peak Hold

The mode allows the sensor to continue outputting the highest temperature for a particular time interval until it is exceeded by next higher peak. The signal output will hold the maximum value for the specified hold time (0.1-600s). Once the hold time is exceeded, it will reset and resume tracking the object temperature until a new peak is reached and the algorithm will start over again.

Remark: The function can be applied to Stability application



#### 6-7 Factory Default Setting :

Durring the measurement pressing and hold "down key (V)" then press the "up key( $\Lambda$ )" The display will appear INIT for confirmation then release key.