

FIELD MOUNTED EXPLOSION PROOF TEMPERATURE TRANSMITTER

8080TR

- INPUTS: THERMOCOUPLE, RTD, OHM AND MV
- HIGH ACCURACY
- 2 WIRES, 4-20MA OUTPUT
- EXCELLENT STABILITY
- HIGH EMI-RFI IMMUNITY
- CONFIGURABLE BY PC COMMUNICATOR
- INPUT/OUTPUT ISOLATED
- 4 DIGIT LED DISPLAY
- EXPLOSION PROOF CERTIFIED
- 3 YEAR WARRANTY



Introduction

IME Model 8080TR is a Digital, PC programmable, galvanically isolated 2-wire smart transmitter. The unit converts 13 types of thermocouple sensors; 12 types of RTD sensors, configured as 2, 3 and 4 wires; potentiometer, resistor and millivolt inputs into process current loop. A 24 bit A/D converter is the heart of this outstanding performance.

Description

IME Model 8080TR Universal input Smart transmitters are designed for use in process industries where vibration, inclement weather and corrosive atmospheres prevail. The electronics are enclosed in a copper-free epoxy coated Aluminum housing and for more aggressive environments, a SS316 housing is optionally available. The housings meet the requirements of NEMA 4X & IP68, and are also certified Explosion Proof by FM/CSA/ATEX/IECEx.

The output current is temperature linearized and can be set to be 4 to 20 or 20 to 4mA or any range within these limits. The current is limited to 3.6 and 22mA. The unit updates are 3 times per second for the display and 4 times per second (max) for the current output

Exceptional digital accuracy of typical $\pm 0.1^{\circ}\text{C}$ is provided for all the sensors regardless of the calibrated span. Extremely accurate cold-junction temperature measurement provides precise compensation throughout the entire ambient range. The unit also accurately measures and compensates the RTD sensor leads in the 3-wire connection. The Transmitter can be set and wired to perform differential measurement conversions of temperature sensors as well as mV sources.

The Transmitter is fully configurable by connecting to a PC with no external power supply required. The configuration parameters are stored in a non volatile memory. Digital output data can be obtained via a communication port located on the front panel. Continuous, average and max/min readings can be monitored.

Detection of sensor breakage or disconnection of input leads, forces the output to a pre-defined up/down scale value. The unit continuously monitors the sensor and automatically returns to normal operation mode when the sensor is recovered.

Mounting

A wide choice of stainless steel mounting brackets are available for mounting the Model 8080TR on either a 2" pipe or wall.

Functional Specifications

Sensor

13 types of thermocouple; 12 types of RTD, mv, potentiometer, Ohms

Calibration Accuracy

$\pm 0.05\%$ of span

Output Signal

4~20mA

Polarity Protection

Yes

Isolation

1500V AC between input and output

Burnout Protection

$< 3.6\text{mA}$ or $> 22.1\text{mA}$ (configurable)

Supply Voltage

13~36V DC

Operating Temperature

$-50 \sim +80^{\circ}\text{C}$ / $-45 \sim +185^{\circ}\text{F}$

Weight

0.9Kg (2Lb) for Aluminum unit and 1.4Kg for SS316 Unit

Material of Construction

Enclosure epoxy coated Copper-Free Aluminum or SS316 as specified

O Rings

Buna N

Optional Accessories

Mounting Brackets (IME Model 175PM, 175RC, 175NR, 175MM)

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SPECIFICATIONS 1

Inputs

Input Impedance	>10 ⁷ Ω
Maximum Input Voltage	<1V

Thermocouple and Millivolts

Type	Standard	Input Range		Minimum Span °C / °F	Digital Accuracy °C	D/A Accuracy
		°C	°F			
B Pt30Rh Pt16Rh	IEC584-1 ITS-90	100~1820	212~3308	200 / 360	+/- 0.5	+/- 0.02%
E NiCr-Con	IEC584-1 ITS-90	-200~1000	-328~1832	50 / 90	+/- 0.1	
J Fe-Con	IEC584-1 ITS-90	-200~1200	-328~2192	50 / 90	+/- 0.1	
K NiCr-Ni	IEC584-1 ITS-90	-200~1370	-328~2498	50 / 90	+/- 0.1	
L Fe-Con	IEC584-1 ITS-90	-190~890	-310~1634	25 / 45	+/- 0.1	
N NiCrSi-NiSi	IEC584-1 ITS-90	-200~1300	-328~2372	25 / 45	+/- 0.1	
R Pt13Rh-Pt	IEC584-1 ITS-90	0~1760	-32~3200	200 / 360	+/- 0.5	
S Pt10Rh-Pt	IEC584-1 ITS-90	0~1760	-32~3200	200 / 360	+/- 0.5	
T Cu-Con	IEC584-1 ITS-90	-200~400	-328~752	50 / 90	+/- 0.1	
U Cu-Con	IEC584-1 ITS-90	-190~590	-310~1094	25 / 45	+/- 0.1	
D W3Re-W25Re	ASTM E988-90	0~2230	32~4046	25 / 45	+/- 0.5	
G W-W26Re	ASTM E988-90	0~2160	32~3920	25 / 45	+/- 0.5	
C W5Re-W26Re	ASTM E988-90 ITS-90	-15~2320	5~4208	25 / 45	+/- 0.5	
Millivolt Input		-145~145		2mV	+/- 5μV	
Mode	Single or differential sensor			Voltage: ordinary or differential		
Cold Junction	Internal Pt-100 Sensor					
C.J Accuracy	+/-0.5°C (+/-0.9°F)					
Sampling Rate	Single: 10, differential: 3 (S/sec)			Voltage: 42, differential: 4 (S/sec)		

Total probable accuracy for T/C measurement equals to: $[C.J.E^2+DA^2+(Span \times 2 \times 10^{-4})^{0.5}]$


Where C.J.E is the cold-junction error and DA is the digital accuracy value for the specific T/C


Note: For maximum accuracy for T/C input, all the above error components should be accumulated.

Resistor Temperature Detector (RTD)

Type	Standard	Input Range		Minimum Span °C / °F	Digital Accuracy °C	D/A Accuracy
		°C	°F			
Pt-50	IEC-751 α=0.00385Ω/Ω	-200~850	-328~1562	200 / 360	+/- 0.5	+/- 0.02%
Pt-100		-200~850	-328~1562	50 / 90	+/- 0.1	
Pt-500		-200~690	-328~1274	50 / 90	+/- 0.1	
Pt-1000		-200~690	-328~1274	50 / 90	+/- 0.1	
Pt-50	IEC-751 α=0.00392Ω/Ω	-100~455	-148~851	25 / 45	+/- 0.1	
Pt-100		-100~455	-148~851	25 / 45	+/- 0.1	
Pt-500		-100~455	-148~851	200 / 360	+/- 0.5	
Pt-1000		-100~455	-148~851	200 / 360	+/- 0.5	
Ni-Fe		-200~260	-328~500	50 / 90	+/- 0.1	
Ni-120		-80~260	-112~500	25 / 45	+/- 0.1	
Ni-1000		-50~160	-58~320	25 / 45	+/- 0.5	
Cu-10		-120~260	-184~500	25 / 45	+/- 0.5	
Resistor	Potentiometer	0~2KΩ				
Connection type	2, 3 or 4 wire					
Mode	Single sensor					
Sensor Current	0.3mA					
Sampling Rate	Single sensor; 4 differential; 2 S/sec			Potentiometer; 3 S/sec		

Certification System

	I M2	or	II 2G D
	Ex d I Mb	or	Ex D IIC T6 Gb
	Ex tb IIIC T85°C Db IP68		
	Ta = -40°C to +60°C		

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SPECIFICATIONS 2

Output

Output Signal	Proportional DC current 4~20mA or 20~4mA (User configurable)
Under Range	Linear to 3.97mA
Over Range	Linear to 20.8mA
Burnout	<3.6mA or >22.1mA (User configurable)
Isolation	>1500V AC between input and output
Output Linearity	For temperature sensors - linear with temperature For potentiometer - linear with potentiometer ratio For millivolt input - linear with the measured voltage
Maximum Loop Resistance	According to $R_{max} (\Omega) = (V_{supply}-13)/0.02$
Calibration Accuracy	At 24V supply, at room temperature: 0.05% of span
Damping Factor	1~100 seconds
Analog Step-Response	200~500ms (Depends on the sensor and the mode of operation)
Setup Time	5 seconds after power on

Supply

Supply Voltage	13~36V DC
Supply Variation Effect	negligible (1µA/V)
Polarity Protection	Yes
CMR	>110 db

Environmental Influence

Operating Temperature Range	-50~+85°C / -122~185°F
Temperature Stability	< +/- 0.004% / 1°C
Humidity	10%~90%, RH, non-condensing
EMC	

Programming

Software Package	UstCal
Modem	IME Model 8080-030, 2-wire Smart Transmitter Config/Debug System with 9-pin D-Type Connector
Configured Parameters	Tag information, Sensor type, Input range, Selection of connection type, Output Offset, Output curve correction, Damping factor, Burnout Type, Output current mode, Sensor Calibration.

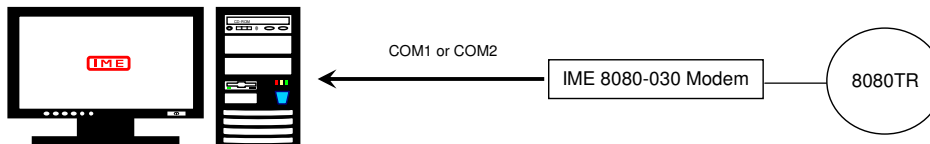
Transmitter Configuration

The USTCAL configuration and calibration software is PC-based software package.

The PC is connected to the transmitter via MC232 communication cable, which contains the electronic interface circuitry. This cable which contains the electric interface circuitry. This features makes the configuration process very easy, as it does not require the transmitter to be wired to an external power supply. It is called "DRY CONFIGURATION". The Windows based software conducts the user to the configuration steps in a friendly and simple interactive way.

Minimum System Requirement:

- Pentium Processor or above (Pentium III, 450MHz Recommend).
- Windows® 95 or above (Windows XP Professional Recommend).
- 64MB RAM or above
- 15MB Free Disk Space or above
- Resolution 800 x 600 (1024 x 768 Recommend)
- CD-ROM 2X or above



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Both the Aluminum and the SS316 housing are certified NEMA 4X & IP68. As indicated below. IME Model 8080TR can be optionally provided with certification and a stainless steel name plate for use in Hazardous Area applications.

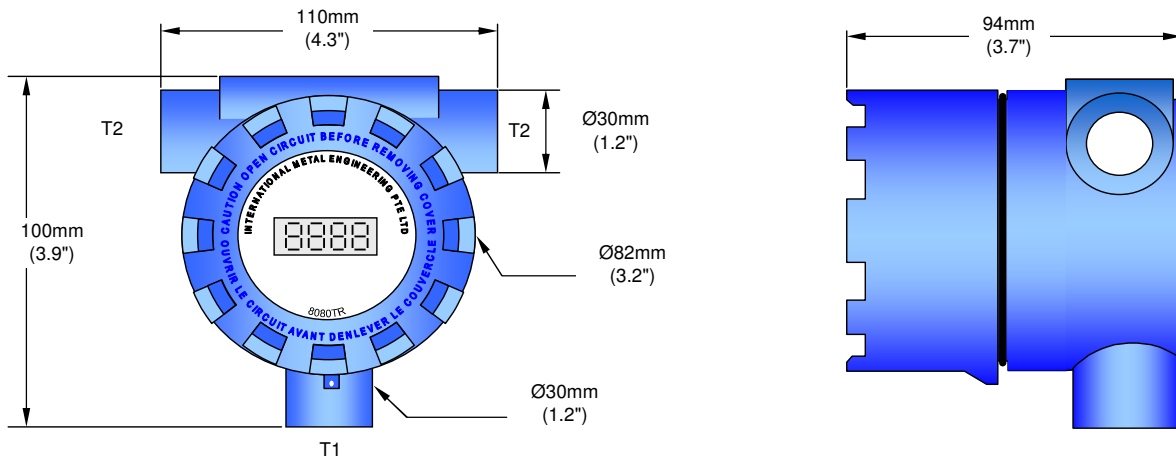
Ordering Information

Model	Description																																																			
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8080TR	A	02	E1	PM	02	← Typical Model Number
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Note:

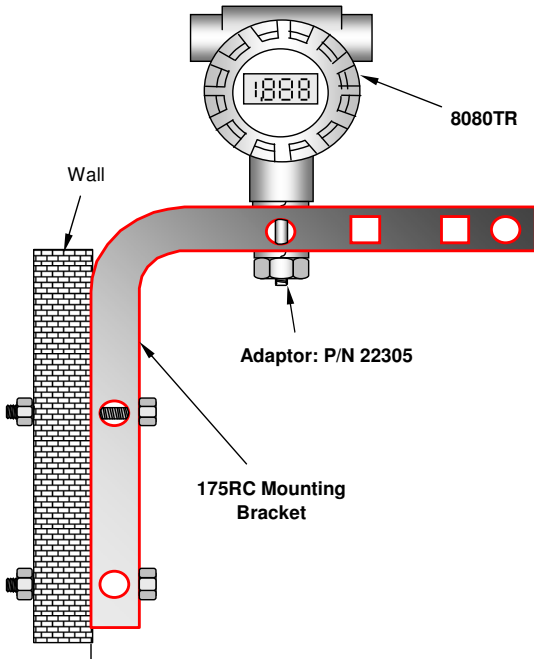
1 Ports with M16 x 2P thread are not through holes, they are for Mounting only.



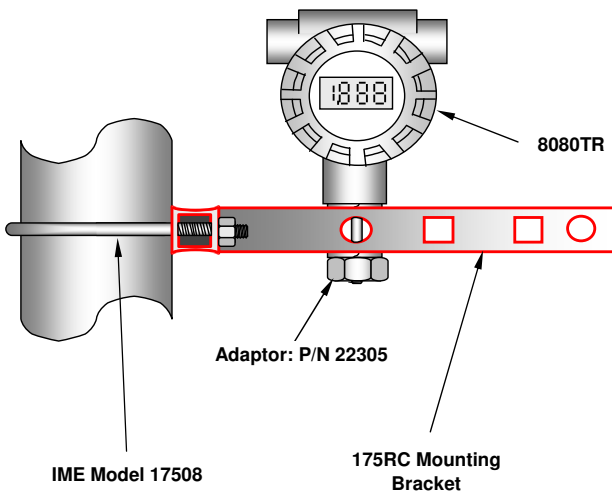
MODEL 175RC MOUNTING BRACKET

IME MODEL 175RC

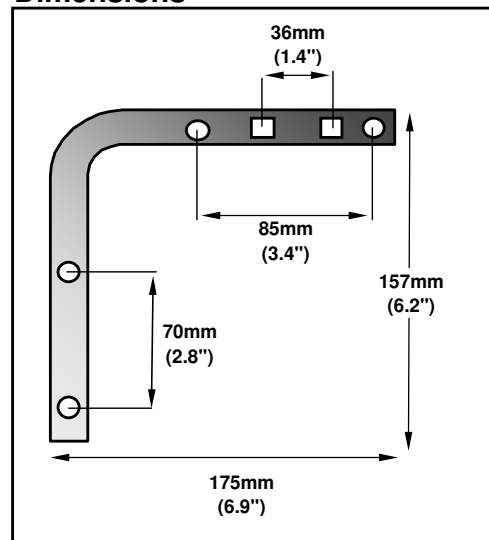
PANEL / WALL MOUNTING CONFIGURATION
 9 mm or 5/16 bolts for mounting bracket to wall or panel
 (Not Supplied)
 Adaptor P/N: 22305 (Optional)



2" PIPE MOUNTING CONFIGURATION
 2 Inch "U" Bolt with Nuts and Washers (Optional)
 Adaptor P/N: 22305 (Optional)



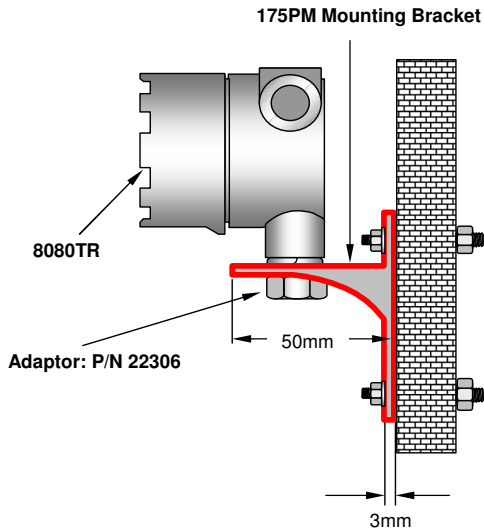
Dimensions



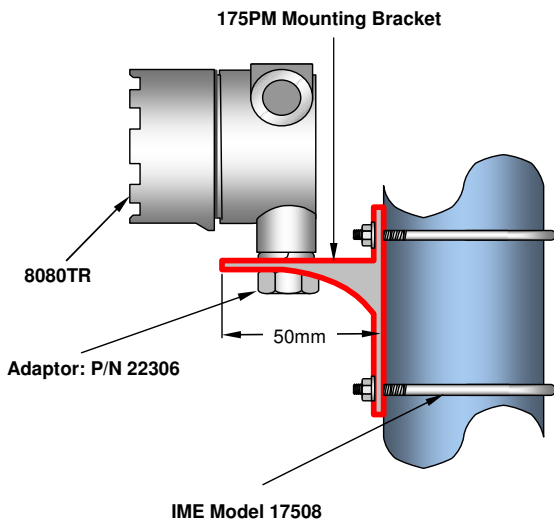
MODEL 175PM MOUNTING BRACKET

IME MODEL 175PM

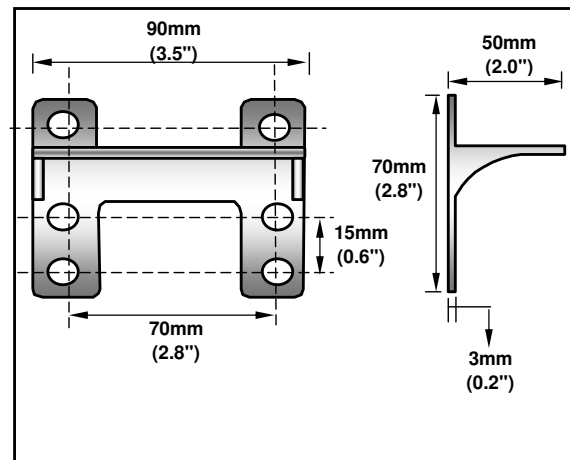
PANEL / WALL MOUNTING CONFIGURATION
 9 mm or 5/16 bolts for mounting bracket to wall or panel
 (Not Supplied)
 Adaptor P/N: 22306 (Optional)



2" PIPE MOUNTING CONFIGURATION
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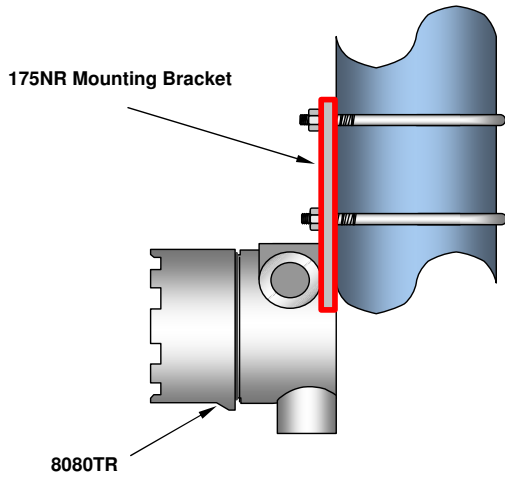
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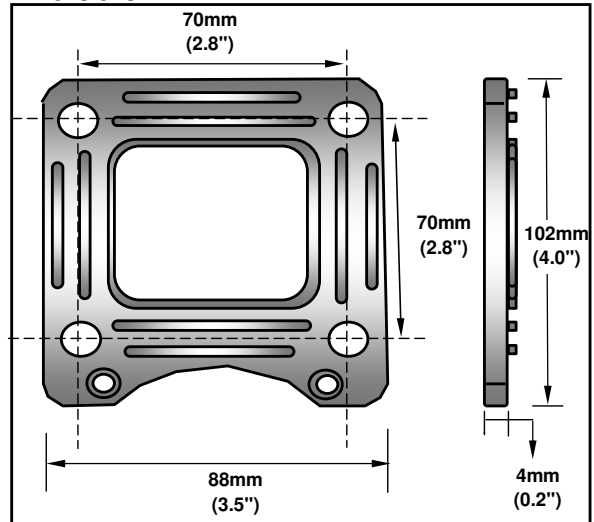
MODEL 175NR AND 175MM MOUNTING BRACKET

IME MODEL 175NR

2" PIPE MOUNTING CONFIGURATION
2 Inch "U" Bolt with Nuts and Washers

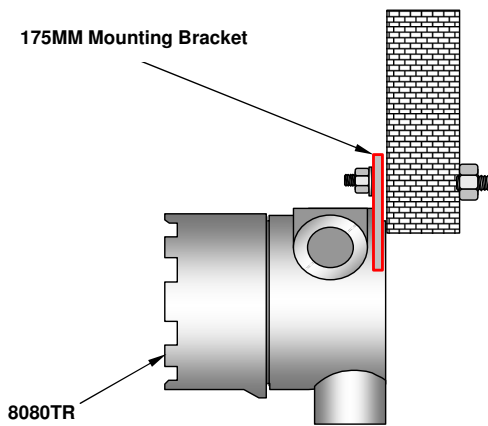


Dimensions



IME MODEL 175MM

PANEL / WALL MOUNTING CONFIGURATION
9 mm or 5/16 bolts for mounting bracket to wall or panel
(Not Supplied)



Dimensions

