

Universal Smart Transmitter

TX69



- ✓ High Accuracy
- ✓ Integral LED display
- ✓ Inputs: T/C, RTD, Ω , and mV
- ✓ Galvanic Isolation
- ✓ Configuration and Calibrations are PC-Based Software

The TX69 is a digital, PC programmable, galvanic isolated two-wire smart transmitter, that converts 13 types of thermocouple sensors; 12 types of RTD sensors, configured as 2, 3 and 4 wires; potentiometer, resistor and millivolt inputs, single or differential—into process current loop.

A 3½ digit LED display is integrated forming a transmitter field monitor unit which is visible in dark installations. A 24 bit A/D converter is the heart of the outstanding performance. The light intensity varies as a function of the current loop, which serves as the light energy source.

The transmitter can be set and wired to perform differential measurement conversions of temperature sensors as well as mV sources.

The output current is temperature linearized and can be set to be 4 to 20/20 to 4 mA—or any range within these limits. The current is limited to 3.6 and 22 mA. The TX69 samples and updates the output current in a rate of 2 to 4 samples per second depending on the sensor type.

It is fully configurable in dry-configuration mode by which the connection to PC is performed with no voltage needed, and the configuration parameters are stored in a non-volatile memory.

Exceptional digital accuracy of typical $\pm 0.1^\circ\text{C}$ is provided for most sensors regardless of the calibrated span. Extremely accurate cold-junction temperature measurement

provides precise compensation throughout the entire ambient range.

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.

The TX69 is housed in a Aluminum enclosure, and the front panel has a special red filter for optimal view.

Specifications

Input

Input Impedance: $>10^7 \Omega$

Maximum Input Voltage: $<1\text{V}$

Output

Output Signal: Proportional dc current 4 to 20 mA or 20 to 4 mA (user configurable)

Under Range: Linear to 3.97 mA

Over Range: Linear to 20.8 mA

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

Isolation: $>1500\text{V}$ 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

Long Term Stability:

$< \pm 0.1\%$ of span for 12 months

Maximum Loop Resistance: According to: $R_{\text{max}}(Q) = (V_{\text{supply}} - 8.5)/0.02$

Calibration Accuracy: At 24V supply, at room temperature: 0.05% (*)

Damping Factor: 1 to 100 seconds

Analog Step-Response:

200 to 500 mS (depends on the sensor and the mode of operation)

Set-Up Time: 5 seconds after power on



TX69 shown smaller than actual size.

Supply

Supply Voltage: 13 to 36 Vdc

Supply Variation Effect: Negligible ($<11.1\text{AN}$)

Polarity Protection: Yes

CMR: $>110 \text{ db}$

Environmental Influence

Operating Temperature Range:

-40 to 80°C (-40 to 185°F)

Storage Temperature Range:

-50 to 90°C (-45 to 185°F)

Temperature Stability:

$< \pm 0.004\%/1^\circ\text{C}$ (*)

Humidity: 10 to 90% RH, non-condensing

Housing

Material: Aluminum

Process Connection: $\frac{1}{4}$ NPT

Wiring Connection: M20x1.5

Dimensions: 118 x 79 x 100 mm (4.6 x 3.1 x 3.9")

Weight: 750 gr (1.65 lb)

Programming

Software Package: CONCAL

Modem Cord: USB cable (1.5 m L) with 3.5 mm stereo plug

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



OMEGACARESM extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order. OMEGACARESM covers parts, labor and equivalent loaners.

Thermocouple and Millivolts					
Type	Input Range °C	Input Range °F	Minimum Span °C (°F)	Digital Accuracy	D/A Accuracy
B	100 to 1820	212 to 3308	200 (360)	±0.5°C	±0.02%
E	-200 to 1000	-328 to 1832	50 (90)	±0.1°C	
J	-200 to 1200	-328 to 2192	50 (90)	±0.1°C	
K	-200 to 1370	-328 to 2498	50 (90)	±0.1°C	
L	-190 to 890	-310 to 1634	25 (45)	±0.1°C	
N	-200 to 1300	-328 to 2372	25 (45)	±0.1°C	
R	0 to 1760	32 to 3200	200 (360)	±0.5°C	
S	0 to 1760	32 to 3200	200 (360)	±0.5°C	
T	-200 to 400	-328 to 752	50 (90)	±0.1°C	
U	-190 to 590	-310 to 1094	25 (45)	±0.1°C	
D	0 to 2230	32 to 4046	25 (45)	±0.5°C	
G	0 to 2160	32 to 3920	25 (45)	±0.5°C	
C	15 to 2320	5 to 4208	25 (45)	+0.5°C	
Millivolt Input	-145 to 145		2 mV	±51 uV	
Mode	T/C: Single or differential sensor		Voltage: Single or differential ended		
Cold Junction	Internal Pt-100 sensor				
C.J Accuracy	±0.5°C (±0.9°F)				
Sampling Rate	T/C: Single: 4, Differential: 2 (S/sec)		Voltage: 4, Differential: 2 (S/sec)		

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

Resistor Temperature Detector (RTD)						
Type	Standard	Input Range °C	Input Range °F	Minimum Span °C (°F)	Digital Accuracy	D/A Accuracy
Pt-50		-200 to 850	-328 to 1562	10 (18)	±0.15°C	±0.02%
Pt-100	a=0.00385	-200 to 850	-328 to 1562	10 (18)	±0.1°C	
Pt-500	Ω/Ω/°C	-200 to 690	-328 to 1274	10 (18)	±0.1°C	
Pt-1000	ITS-90	-200 to 690	-328 to 1274	10 (18)	±0.1°C	
Pt-50		-100 to 455	-148 to 851	10 (18)	±0.15°C	
Pt-100	a=0.00392	-100 to 455	-148 to 851	10 (18)	±0.1°C	
Pt-500	Ω/Ω/°C	-100 to 455	-148 to 851	10 (18)	±0.1°C	
Pt-1000		-100 to 455	-148 to 851	10 (18)	±0.1°C	
Ni-Fe		-200 to 260	-328 to 500	10 (18)	±0.1°C	
Ni-120		-80 to 260	-112 to 500	10 (18)	±0.1°C	
Ni-1000		-50 to 160	-58 to 320	10 (18)	±0.1°C	
Cu-10		-120 to 150	-184 to 302	10 (18)	±0.1°C	
Resistor	Potentiometer	0 to 2 kΩ		4 Ω	±0.1%1	
Connection Type		2, 3 or 4-wire				
Mode		Single sensor				
Sensor Current		<0.2 mA				
Sampling Rate		Single sensor 3, Differential: 2 S/sec			Potentiometer: 2 S/sec	

To Order Visit omega.com/tx69 for Pricing and Details

Model No.	Description
TX69	Universal smart transmitter (TX69 cable required to configure unit)
TX69-CABLE	Communication cable
NB1TX69	T/C probe, 12" long, 1/4" OD, ungrounded junction, 304 SS sheath with TX69 transmitter
PRTX69	RTD probe, 12" long, 1/4" OD, 304 SS sheath with TX69 transmitter

Note: The digital readout can be accessed via the programming communication port.

Comes complete with operator's manual and software.

Ordering Example: TX69, universal smart transmitter. OCW-3, OMEGACARESM extends standard 1-year warranty to a total of 4 years.