

# Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!



## User's Guide

### TEMPERATURE

- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

### PRESSURE, STRAIN AND FORCE

- Transducers & Strain Gauges
- Load Cells & Pressure Gauges
- Displacement Transducers
- Instrumentation & Accessories

### FLOW/LEVEL

- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine / Paddlesheel Systems
- Totalizers & Batch Controllers

### pH/CONDUCTIVITY

- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters
- Controllers, Calibrators, Simulators & Pumps
- Industrial pH & Conductivity Equipment

### DATA ACQUISITION

- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

### HEATERS

- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

### ENVIRONMENTAL

### MONITORING AND CONTROL

- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments



An OMEGA Technologies Company

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## TX802R SERIES PROGRAMMABLE RESISTANCE TRANSMITTER



OMEGAnet <sup>SM</sup> On-Line Service http://www.omega.com	Internet e-mail info@omega.com
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OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

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1. P.O. number to cover the COST of the repair,
2. Model and serial number of product, and
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## The Proper Installation & Maintenance of LPI-K.

### MOUNTING.

- (1) Mount in a clean environment in an electrical cabinet on DIN or EN mounting rail.
- (2) Do not subject to vibration or excess temperature or humidity variations.
- (3) Avoid mounting in cabinets with power control equipment.
- (4) To maintain compliance with the EMC Directives the LPI-K is to be mounted in a fully enclosed steel cabinet. The cabinet must be properly earthed, with appropriate input / output entry points and cabling.

### WIRING.

- (1) All cables should be good quality overall screened INSTRUMENTATION CABLE with the screen earthed at one end only.
- (2) Signal cables should be laid a minimum distance of 300mm from any power cables.
- (3) For 2 wire current loops and 2 wire voltage signals or 2 wire current signals, Austral Standard Cables B5102ES is recommended. For 3 wire transmitters, RTDs, and resistance sensors, Austral Standard Cables B5103ES is recommended.
- (4) It is recommended that you do not ground current loops and use power supplies with ungrounded outputs.
- (5) Lightning arrestors should be used when there is a danger from this source.
- (6) Refer to diagrams for connection information.

### COMMISSIONING.

- (1) Once all the above conditions have been carried out and the wiring checked apply power to the LPI-K loop and allow five minutes for it to stabilize.
- (2) Due to differences in cable resistance in the resistance sensor legs or errors within the resistance sensor itself a small error may occur (usually less than 1%). To remove this error take a low (approx 10%) and a high (approx 90%) reading of the variable being measured by the transducer supplying the signal to the LPI-K, and ensure that this agrees with the level being indicated by the EXPO3 or indicator, etc. that the LPI-K is connected into. Adjust for any difference using the Zero and Span trimpots in the top of the LPI-K enclosure with a small screwdriver, until the two levels agree. (Clockwise to increase the output and anti-clockwise to decrease the output reading.)

### MAINTENANCE.

- (1) Repeat (2) of Commissioning.
- (2) Do it regularly - at least once every 12 months.

# TX802R Resistance Transmitter.

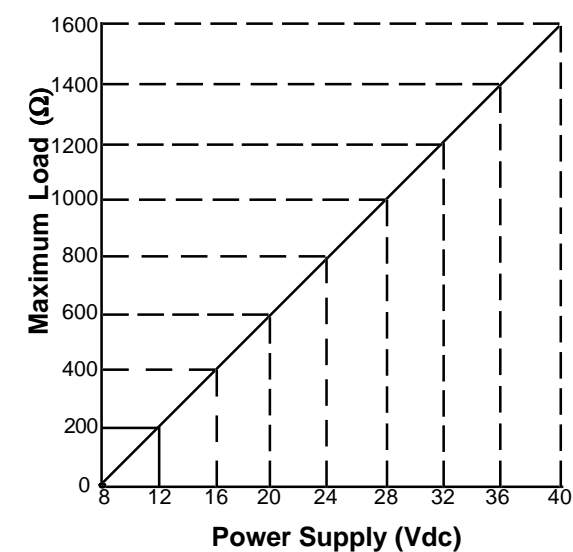
Isolating, Resistance Input  
to 4~20mA Output,  
Loop Powered Transmitter.

### Features.

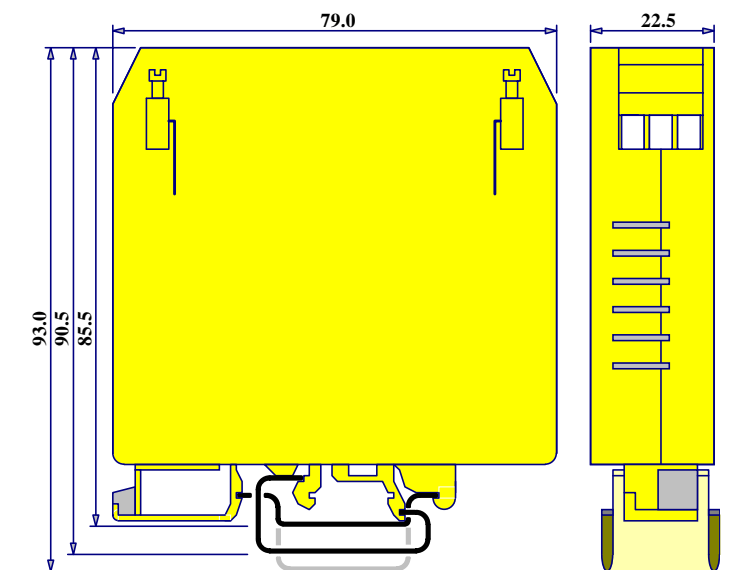
- Field Programmable Input Ranges.
- High Accuracy.
- Linear With Temperature
- 40~200mV Output Test Signal.
- LED Indication of Loop Current.
- Low Cost.
- Easy to Install.
- Compact DIN Rail Mount Enclosure.
- Available Standard or Special Calibration.
- Reverse Polarity Protection.
- Corrosion Proofed Circuit Board & Components by Isonel 642. (Except Terminals & DIP Switches)



Graph Of Maximum Load Versus Power Supply.



Enclosure Dimensions.

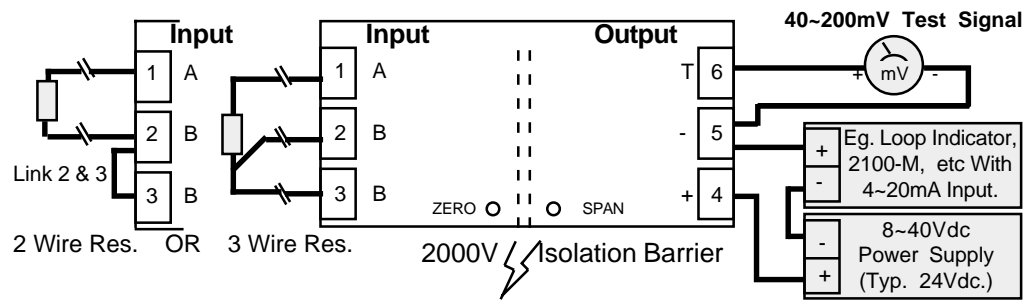


### TX802R Specifications.

Resistance Input	3 Wire Resistance. Excitation = 0.8mA / 0.08mA. Lead Wire Resistance = 10Ω/Wire Max. Field Programmable Zero: 5Ω to 2kΩ. Field Programmable Span: 10Ω to 2kΩ. Suitable for 2 Wire Connection. (Offset Calibration needed.)
Output	-mA 2 wire 4~20mA. (Loop Powered.) -mV 40~200mV ∝ 4~20mA. (Indicative Test Signal Only.) Other Output Voltages Available. eg 1~5V.
Power Supply	8~40Vdc.
Supply Voltage Sensitivity	<±0.005%/V FSO.
Output Load Resistance	800Ω @ 24Vdc. (50Ω/V Above 8Vdc.)
Maximum Output Current	Limited to <28mA.
Accurate to	<±0.1% FSO Typical.
Linearity & Repeatability	<±0.1% FSO Typical.
Ambient Drift	<±0.02%/C FSO Typical.
Noise Immunity	125dB CMRR Average. (2.0kVac RMS Limit.)
R.F. Immunity	<1% Effect FSO Typical.
Isolation Voltage	2.0kVac/dc Input to Output for 60sec.
Response Time	200msec Typical. (10 to 90% 50msec Typical.)
Operating Temperature	0~70C.
Storage Temperature	-20~80C.
Operating Humidity	90%RH Max. Non-Condensing.
Construction	6.6 Polyamide Thermoplastic Rail Mount Enclosure.

Note 1. Specifications based on Standard Calibration Unit, unless otherwise specified.  
 Note 2. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification.  
 No liability will be accepted for errors, omissions or amendments to this specification.

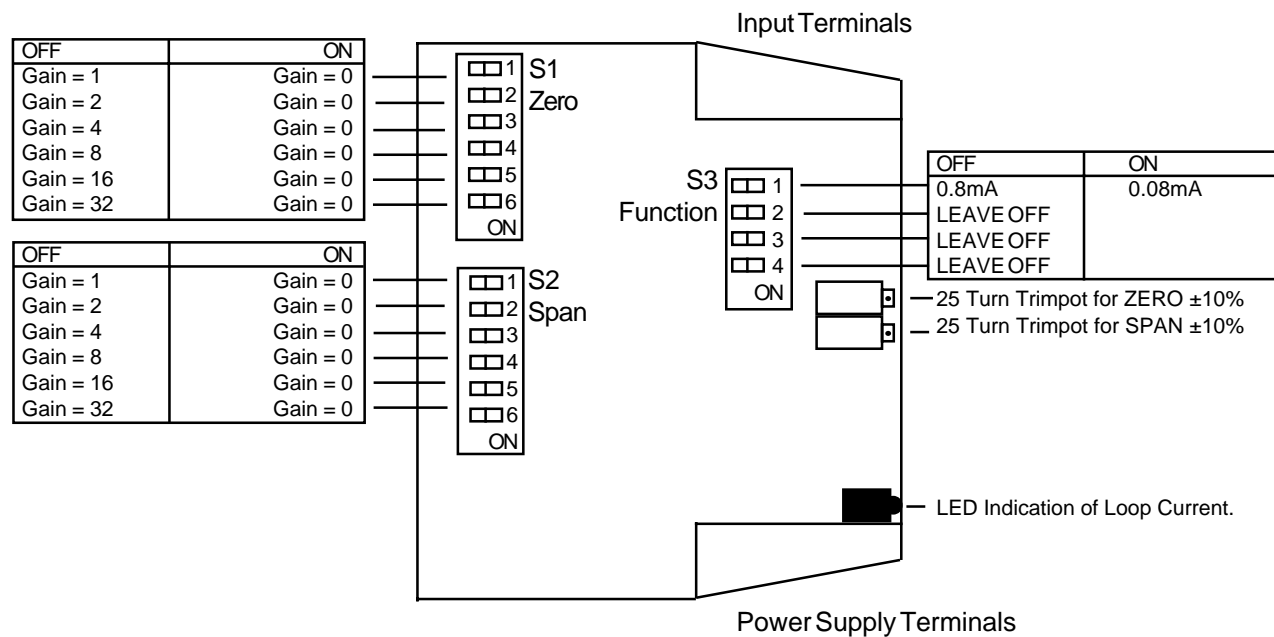
### Examples of Input Connection.



### Terminations.

Input	1	A
	2	B
	3	B
Output	4	+mA
	5	-mA
	6	mV TEST

### Plan View of TX802R Adjustments.



### TX802R Input Programming.

If the input range is not listed in the programming table, use the following formulae to work out the Zero and Span DIP switch settings for gain.

$$\text{Span Gain} = \frac{600 \times \text{Pregain}}{\text{Resist High} - \text{Resist Low}}$$

$$\text{Zero Gain} = \frac{\text{Resist Low}}{5 \times \text{Pregain}}$$

- Note:**
- (a) Enter ranges as their whole number. Eg. Enter 2KΩ as 2000Ω.
  - (b) Use the same pregain value in both the Span and Zero gain formulae.
  - (c) Enter the Zero or Span gain value into the appropriate Zero or Span DIP switch.

EFFECTIVE INPUT RANGE (ie Resist High - Resist Low)	S3-1	PREGAIN
10R <= Range < 200R	0	1
200R <= Range < 2k	1	10

Gain Value	1	2	4	8	16	32
DIP Switch No.	1	2	3	4	5	6

If a gain value of 28 is required, put DIP switch No's 3, 4, 5 OFF (ie, gains of 4 + 8 + 16 = 28) and all the other DIP switches ON. TX801R / TX802R enclosure.

### TX802R Input Range Programming Table.

**Notes:** 1/ Switch status 1 = ON, 0 = OFF, X = DON'T CARE.  
 2/ Input ranges with '\*' beside them require more adjustment by the Zero & Span trimpots.

Input Range Resistance	S1-Zero						S2-Span						S3-Function			
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4
0~10Ω	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
0~12Ω	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0
0~15Ω	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0
0~20Ω	1	1	1	1	1	1	1	0	0	0	0	0	1	0	0	0
0~22Ω *	1	1	1	1	1	1	0	0	1	0	0	0	1	0	0	0
0~25Ω	1	1	1	1	1	1	1	1	1	0	0	0	1	0	0	0
0~47Ω *	1	1	1	1	1	1	0	1	0	0	0	1	1	0	0	0
0~50Ω	1	1	1	1	1	1	1	1	0	0	1	1	0	0	0	0
0~75Ω	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0
0~100Ω	1	1	1	1	1	1	1	0	0	1	1	1	0	0	0	0
0~120Ω	1	1	1	1	1	1	0	1	0	1	1	1	0	0	0	0
0~150Ω	1	1	1	1	1	1	1	1	0	1	1	1	0	0	0	0
0~200Ω	1	1	1	1	1	1	1	0	0	0	0	0	1	1	0	0
0~220Ω *	1	1	1	1	1	1	0	0	1	0	0	0	1	1	0	0
0~250Ω	1	1	1	1	1	1	1	1	1	0	0	0	1	1	0	0
0~470Ω *	1	1	1	1	1	1	0	1	0	0	0	1	1	1	0	0
0~500Ω	1	1	1	1	1	1	1	1	0	0	0	1	1	1	0	0
0~750Ω	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0
0~1kΩ	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	0
0~1.2kΩ	1	1	1	1	1	1	0	1	0	1	1	1	1	1	0	0
0~1.5kΩ	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0
0~2kΩ	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0	0
5~15Ω	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
10~20Ω	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
10~50Ω	1	0	1	1	1	1	0	0	0	0	1	1	0	0	0	0
25~75Ω	0	1	0	1	1	1	1	1	0	0	1	1	0	0	0	0
50~100Ω	1	0	1	0	1	1	1	1	0	0	1	1	0	0	0	0
50~150Ω	1	0	1	0	1	1	1	0	0	1	1	1	0	0	0	0
75~225Ω	0	0	0	0	1	1	1	1	0	1	1	1	0	0	0	0
100~200Ω	1	1	0	1	0	1	1	0	0	1	1	1	0	0	0	0
150~250Ω	1	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0
250~500Ω	0	1	0	1	1	1	1	1	1	0	0	1	1	0	0	0
500~1kΩ	1	0	1	0	1	1	1	1	0	0	1	1	1	0	0	0
1k~1.5kΩ	1	1	0	1	0	1	1	1	0	0	1	1	1	0	0	0
1k~2kΩ	1	1	0	1	0	1	1	0	0	1	1	1	1	0	0	0