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

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

M-3460/0899

CE

User's Guide

OMEGA ENGINEERING, INC.
An OMEGA Technologies Company

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TX802RTD SERIES

2 WIRE RTD TRANSMITTER

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It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.
WARNING: These products are not designed for use in, and should not be used for, patient connected applications.

WARRANTY/DISCLAIMER

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.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.
The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:
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.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:
1. P.O. number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.
OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

The Proper Installation & Maintenance.

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 transmitter must be mounted in a fully enclosed steel cabinet. The cabinet must be properly earthed, with appropriate input \ output entry points, filtering, 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 Austral Standard Cables B5102ES is recommended. For 3 wire transmitters and RTD's 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.

RTD'S.

(1) Avoid locating the RTD where it will be in a direct flame.
(2) Locate it where the average temperature will be measured. It should be representative of the mass.
(3) Immerse the RTD far enough so that the measuring point is entirely in the temperature to be measured; nine to ten times the diameter of the protection tube is recommended. Heat that is conducted away from the measuring point causes an error in reading.

COMMISSIONING.

(1) Once all the above conditions have been carried out and the wiring checked apply power to the transmitter loop and allow five minutes for it to stabilize.
(2) Due to differences in cable resistance in the RTD legs or errors within the RTD itself a small zero error may occur (usually less than 0.5C). To remove this error use a calibration standard RTD at the same immersion depth and adjust the Zero trimpot in the top of the transmitter enclosure with a small screwdriver, until the two levels agree. (Clockwise to increase the output reading and anticlockwise to decrease the output reading)

MAINTENANCE.

(1) Check RTD's in place - with a calibration RTD at the same immersion depth.
(2) Do it regularly - at least once every 6 months.
(3) Replace defective protection tubes - even if they look good they may not be air or gas tight.
(4) Check cables entering the RTD sensor head.

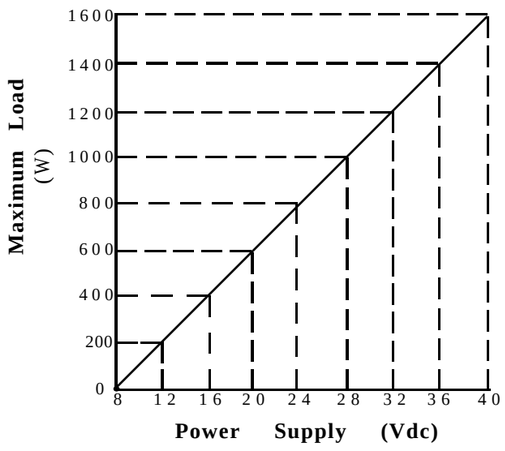
TX802RTD(F) Transmitter.

Isolating Linearised, 3 Wire RTD Input, to 4~20 Output Loop Powered Transmitter.

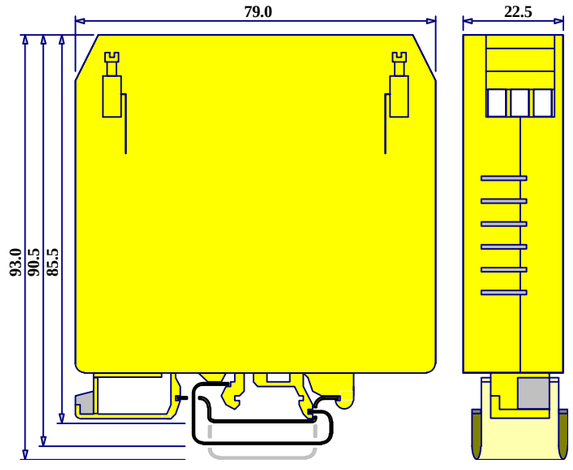
Features.

- **Pt100 RTD Standard Input.**
- **Isolated Input to Output 2.0kV**
- **Field Programmable Input Ranges. TX802RTD**
- **High Accuracy.**
- **Linear With Temperature**
- **40~200mV Output Test Signal.**
- **LED Indication of Loop Current.**
- **Low Cost.**
- **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.



Quality Assurance Programme.

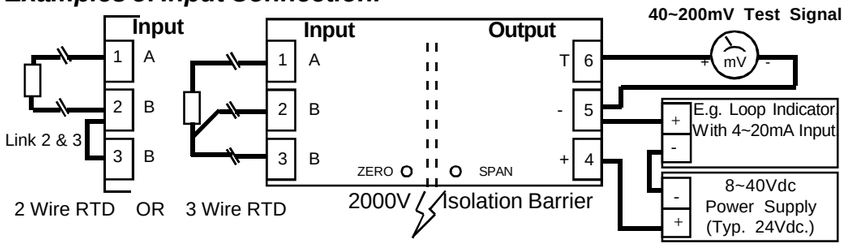
The modern technology and strict procedures of the ISO9001 Quality Assurance Programme applied during design, development, production and final inspection grant the long term reliability of the instrument.

TX802RTD Specifications.

RTD Input		Pt100 DIN (3 Wire Type) Standard.
		Sensor Current = 0.8mA.
		Lead Wire Resistance = 10Ω/Wire Max.
		Field Programmable Zero: -200C (-400F) to 200C (400F). (TX802RTD Only.)
		Field Programmable Span: 20C (40F) to 400C (800F). (TX802 RTD Only.)
		Suitable for 2 Wire Connection. (Offset Calibration needed.)
		Other Types of RTD Available. JIS Pt100, Pt250, Pt500,
		Pt1000, CU10, CU100, Ni100 or specify.
Output	-mA	2 wire 4~20mA. (Loop Powered.)
	-mV	40~200mV µ 4~20mA. (Indicative Test Signal Only.)
		Other Output Voltages Available. e.g. 1~5V.
Power Supply		8~40Vdc.
Supply Voltage Sensitivty		<±0.005%/V FSO.
Output Load Resistance		800W @ 24Vdc. (50W/V Above 8Vdc.)
Maximum Output Current		Limited to <28mA.
Sensor Fail	-Upscale	23mA Min.
	-Downscale	3.6mA Max.
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.

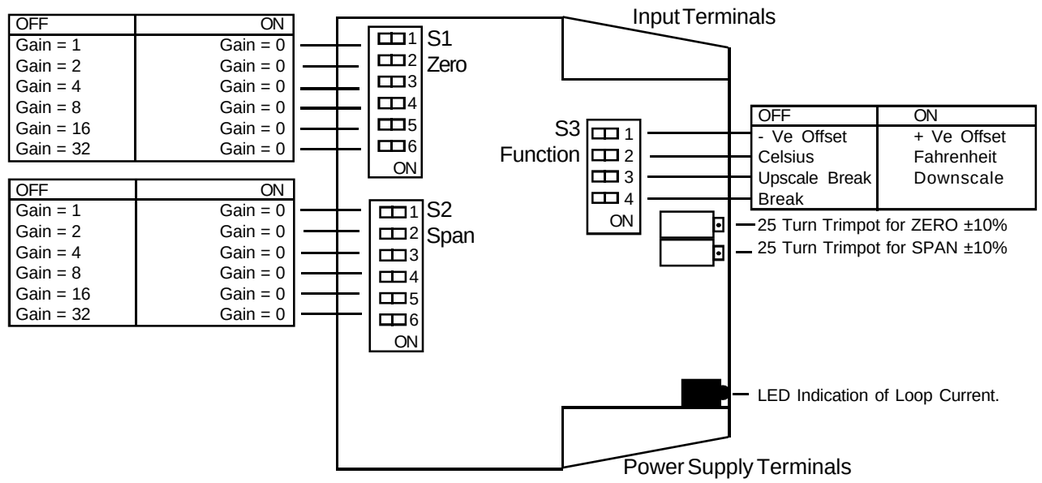
Examples of Input Connection.



Terminations.

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

Plan View of TX802RTD Adjustments.



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.

deg C Span Gain = $\frac{1200}{\text{deg C High - deg C Low}}$

deg C Zero Gain = $\frac{\text{deg C Low}}{5}$

deg F Spain Gain = $\frac{2400}{\text{deg F High - deg F Low}}$

deg F Zero Gain = $\frac{\text{deg F Low}}{10}$

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

If Zero Gain is 1/ +ve Put S3-1 OFF (Positive Offset)
2/ -ve Put S3-1 ON (Negative Offset)

Note: Enter the Zero or Span gain value into the appropriate Zero or Span DIP switch.

So 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. Dip switches are accessed by seperating the two halves of the enclosure

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 Span trimpot.

Input Range C (Put S5-2 OFF)	Input Range F (Put S5-2 ON)	S1-Zero						S2-Span						S3-Function			
		1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4
0~20C	0~40F	1	1	1	1	1	1	1	1	0	0	0	0	X	SET TO '0' FOR CELCIUS. SET TO '1' FOR FAHRENHEIT.	Set to '0' for UPSCALE Sensor Break. Set to '1' for DOWNSCALE Sensor Break.	Set to '1' for UPSCALE Sensor Break. Set to '0' for DOWNSCALE Sensor Break.
0~25C	0~50F	1	1	1	1	1	1	1	1	1	1	0	0	X			
0~30C	0~60F	1	1	1	1	1	1	1	1	1	0	1	0	X			
0~40C	0~80F	1	1	1	1	1	1	1	0	0	0	0	1	X			
0~50C	0~100F	1	1	1	1	1	1	1	1	1	0	0	1	X			
0~60C	0~120F	1	1	1	1	1	1	1	1	0	1	0	1	X			
0~70C*	0~140F*	1	1	1	1	1	1	0	1	1	1	0	1	X			
0~75C	0~150F	1	1	1	1	1	1	1	1	1	1	0	1	X			
0~80C	0~160F	1	1	1	1	1	1	0	0	0	0	1	1	X			
0~90C*	0~180F*	1	1	1	1	1	1	0	1	0	0	1	1	X			
0~100C	0~200F	1	1	1	1	1	1	1	1	0	0	1	1	X			
0~110C	0~220F	1	1	1	1	1	1	0	0	1	0	1	1	X			
0~120C	0~240F	1	1	1	1	1	1	1	0	1	0	1	1	X			
0~125C*	0~250F*	1	1	1	1	1	1	1	0	1	0	1	1	X			
0~150C	0~300F	1	1	1	1	1	1	1	1	1	0	1	1	X			
0~200C	0~400F	1	1	1	1	1	1	1	0	0	1	1	1	X			
0~250C*	0~500F*	1	1	1	1	1	1	0	1	0	1	1	1	X			
0~300C	0~600F	1	1	1	1	1	1	1	1	0	1	1	1	X			
0~400C	0~800F	1	1	1	1	1	1	0	0	1	1	1	1	X			
0~600C	0~1200F	1	1	1	1	1	1	1	0	1	1	1	1	X			
-10~10C	-20~20F	1	0	1	1	1	1	1	1	0	0	0	0	1			
-10~20C	-20~40F	1	0	1	1	1	1	1	1	1	0	1	0	1			
-10~40C	-20~80F	1	0	1	1	1	1	1	1	1	0	0	1	1			
-20~20C	-40~40F	1	1	0	1	1	1	1	0	0	0	0	1	1			
-20~30C	-40~60F	1	1	0	1	1	1	1	1	1	0	0	1	1			
-25~25C	-50~50F	0	1	0	1	1	1	1	1	1	0	0	1	1			
-25~50C	-50~100F	0	1	0	1	1	1	1	1	1	1	0	1	1			
-30~20C	-60~40F	1	0	0	1	1	1	1	1	1	0	0	1	1			
-50~50C	-100~100F	1	0	1	0	1	1	1	1	0	0	1	1	1			
-50~100C	-100~200F	1	0	1	0	1	1	1	1	1	0	1	1	1			
-50~150C	-100~300F	1	0	1	0	1	1	1	0	0	1	1	1	1			
-100~100C	-200~200F	1	1	0	1	0	1	1	0	0	1	1	1	1			
-100~200C	-200~400F	1	1	0	1	0	1	1	1	0	1	1	1	1			
-200~200C	-400~400F	1	1	1	0	1	0	0	0	1	1	1	1	1			
-200~400C	-400~800F	1	1	1	0	1	0	1	0	1	1	1	1	1			
20~40C	40~80F	1	1	0	1	1	1	1	1	0	0	0	0	0			
50~100C	100~200F	1	0	1	0	1	1	1	1	1	0	0	1	0			
50~150C	100~300F	1	0	1	0	1	1	1	1	0	0	1	1	0			
100~200C	200~400F	1	1	0	1	0	1	1	1	0	0	1	1	0			
100~500C	200~1000F	1	1	0	1	0	1	0	0	1	1	1	1	0			