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

TX802DCSERIES
2 WIRE TRANSMITTER
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, EXCEPT THAT 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.

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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.
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 TX802TC2 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 cable.
3. For 2 wire current loops Austral Standard Cables B5102ES is recommended.
4. It is recommended that you do not ground current loops and use power supplies with ungrounded outputs.
5. Lightning arresters should be used when there is a danger from this source.
6. Refer to diagrams for connection information.

**THERMOCOUPLES.**
1. Avoid locating the thermocouple where it will be in a direct flame.
2. Never insert a porcelain or refractory tube suddenly in a hot area. Pre-heat gradually while installing.
3. Locate it where the average temperature will be measured. It should be representative of the mass. If necessary use several thermocouples to obtain the average temperature.
4. Immerse the thermocouple far enough so that the measuring junction 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 junction causes an error in reading.
5. If the thermocouple is mounted horizontally and the temperature is above the softening point of the tube, a support should be provided to prevent the tube sagging. Otherwise install the tube vertically.
6. Keep the junction head and cold junction in the approximation of the ambient temperature. Especially in the Noble Metal Class.

**EXTENSION WIRE.**
1. Use the correct thermocouple extension or compensation cable. i.e. Thermocouple type, insulation type, correct colour coding.
2. If possible install extension or compensation cable in a grounded conduit by themselves. Never run electrical wires in the same conduit.
3. All wires that must be spliced should be soldered, or a proper thermocouple termination block used.
4. Lightning arrestors should be used where there is a danger from this source.

**COMMISSIONING**
1. Once all the above conditions have been carried out and the wiring checked apply power to the TX802DC2 loop and allow five minutes for it to stabilize.
2. Due to the limits of error in a standard thermocouple probe, and standard extension wire and compensating wire, an error can occur. For example in a type K thermocouple installation an error of 2.2°C or 0.75% FSO (whichever is greater) can occur. To check the variable being measured use a calibration standard thermocouple at the same immersion depth.

**MAINTENANCE**
1. Check thermocouples in place with a calibration thermocouple at the same immersion depth.
2. Do it regularly - at least once a month.
3. Replace defective protection tubes - even if they look good they may not be air or gas tight.
4. Check out extension cable circuits.

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**Features.**
- Field Programmable Bi-Polar Input Ranges.
- Isolated Input to Output 2.0kV.
- High Accuracy.
- 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)

**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.
**TX802DC Specifications.**

- **Input Voltage:** 10mVdc to 150Vdc and Bipolar, (LPI-D-P is Field Programmable.)
- **Minimum Input Resistance:** 200Ω.
- **Maximum Over-range:** 170Vdc Continuous.
- **Current:** 200mA to 50mA and Bipolar, (LPI-D-P is Field Programmable.)
- **Input Resistance:** 25Ω.
- **Maximum Overrange:** 70mA and Continuous.

**Output**

- **mA:** 2 Wire 4-20mA (Loop Powered).
- **mV:** 40-200mV = 4-20mV. (Indicative Test Signal Only.)
- **Power Supply:** 8-40Vdc.
- **Supply Voltage Sensitivity:** <0.005% FS/0.
- **Output Load Resistance:** 800Ω @ 24Vdc, (500V/2 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, (2.0kHz Vac RMS Limit.)
- **R.F. Immunity:** <1% Effect FSO Typical.
- **Isolation Voltage:** 2.0kV/1AC/DC Input to Output for 60sec.
- **Response Time:** 200μsec Typical. (10 to 90% 50μsec Typical.)
- **Operating Temperature:** 0-70°C.
- **Storage Temperature:** -20-80°C.
- **Operating Humidity:** 90%RH Max. Non-Condensng.
- **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.**

**Plan View of TX802DC Adjustments.**

**TX802DC Input Programming.**

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

**Span Gain =**

- 24

**Zero Gain =**

- 10 x Pre Gain x Signal Low.

- If Zero is:
  - 1: Positive, put S3-4 OFF.
  - 2: Negative, put S3-4 ON.

**Notes:**

- (a) Enter ranges with their exponential value.
  - Eg. Enter 20mA as 2 x 10^2.
- (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.
- (d) If your GAIN.ZERO exceeds 63, then your input range will need to be factory calibrated.

**TX802DC Input Range Programming Table.**

**Notes:**

- 1: Switch status 1 = ON, 0 = OFF, X = DON'T CARE.
- 2: Input ranges with ** beside them reverse the polarity of the input connections.
- 3: Input ranges with * beside them require more adjustment with the Zero and Span trimpots.

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**TX802DC ONLY**

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**Gain Value**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>4</th>
<th>8</th>
<th>16</th>
<th>32</th>
<th>64</th>
</tr>
</thead>
</table>

**DIP Switch No.**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
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</table>

**Effective Input Range**

<table>
<thead>
<tr>
<th>(in Signal High - Signal Low)</th>
<th>S3=1</th>
<th>S3=2</th>
<th>S3=3</th>
<th>PREGAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>10mV &lt;= Range &lt;= 20mV</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>200</td>
</tr>
<tr>
<td>20mV &lt;= Range &lt;= 200mV</td>
<td>01</td>
<td>01</td>
<td>00</td>
<td>20</td>
</tr>
<tr>
<td>200mV &lt;= Range &lt;= 2V</td>
<td>01</td>
<td>11</td>
<td>00</td>
<td>0.2</td>
</tr>
<tr>
<td>2V &lt;= Range &lt;= 20V</td>
<td>01</td>
<td>11</td>
<td>10</td>
<td>0.02</td>
</tr>
<tr>
<td>20V &lt;= Range &lt;= 150V</td>
<td>11</td>
<td>11</td>
<td>10</td>
<td>0.02</td>
</tr>
<tr>
<td>200mV &lt;= Range &lt;= 800μA</td>
<td>11</td>
<td>11</td>
<td>10</td>
<td>5000</td>
</tr>
<tr>
<td>800μA &lt;= Range &lt;= 8mA</td>
<td>11</td>
<td>11</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>8mA &lt;= Range &lt;= 50mA</td>
<td>11</td>
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