iLoad TR Analog™ Integrated Load Cell

The iLoad TR Analog Series integrates signal conditioning electronics into the load cell, eliminating the need to attach any external equipment to generate a usable 0-5V signal. In addition, this family is designed for applications requiring reduced sensitivity to off-center loading. These load cells offer greater ruggedness and improved cable strain relief for more demanding applications.

**Overview**

Loadstar’s iLoad TR Analog Series load cell, based on new break-through technology, provides several unique benefits that make it usable across a wide range of applications. The iLoad TR Analog load cell has signal conditioning electronics built into the sensor, and does not need specialized external equipment for output measurement. The sensor is small, rugged, and provides high reliability as well as space-saving benefits to manufacturers. It mounts easily using commonly available hardware.

Loadstar’s breakthrough comes from its use of capacitive technology for load sensing. Unlike conventional resistive load cells based on either strain gauges or piezo-resistive techniques, Loadstar’s patented technology harnesses changes in capacitance to measure loads quickly and accurately.

The sensor accepts a 5V DC input signal and outputs an analog 0.5V – 4.5V DC signal proportional to the applied load. The full scale output range is 4000 mV — two hundred times that of traditional strain-gauge-based load cells. This signal can easily be measured using commonly available digital multi-meters or with programmable logic controllers (PLC).

**Highlights**

**Capacitive Load Cell Technology**
- Simplifies load measurements
- Standard 5V DC input
- Standard 0.5V – 4.5V DC output
- Large 4000 mV typical change for full load

**Integrated Load Cell Electronics**
- No external signal conditioner
- Large signal to noise ratio
- Saves space & reduces clutter

**Rugged & Reliable**
- Aluminum construction
- Mechanically robust design
- Weather-resistant packaging

**Easy Attachments**
- Convenient, robust mounting on top and bottom of sensor
- Self balancing multiple point support on base
- Optional Tension Adapters available

**Multiple Load Cell Capacities**
- iLoad TR Analog 10 lb.
- iLoad TR Analog 50 lb.

**Load Sensing Made Easy!**

- **Precise**
  Accuracies from 0.25% to 0.15% of full scale.

- **Rugged**
  Aluminum construction. Environmentally protected.

- **Integrated Electronics**
  No need for signal conditioning or amplification.

- **Easy Mounting**
  Threaded mounting holes for easy attachment using standard fixtures.

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iLoad TR Analog Integrated Load Cell

**Dimensions**

![Dimensions Diagram]

**Load Cell Specifications**

<table>
<thead>
<tr>
<th>Category</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td></td>
</tr>
<tr>
<td>Linearity</td>
<td>±0.15 % full scale</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>±0.15 % full scale</td>
</tr>
<tr>
<td>Non-repeatability</td>
<td>±0.15 % full scale</td>
</tr>
<tr>
<td>Off Center Loading</td>
<td>±1% or better @ 0.625 in. from center</td>
</tr>
<tr>
<td>Response Time</td>
<td>10 milliseconds</td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
</tr>
<tr>
<td>Safe Overload</td>
<td>to 150% of capacity (200% - 500% available)</td>
</tr>
<tr>
<td>Deflection</td>
<td>0.003-in at capacity typical</td>
</tr>
<tr>
<td>Sensor Size</td>
<td>3 OD, 1.2 thick top-to-bottom</td>
</tr>
<tr>
<td><strong>Electrical</strong></td>
<td></td>
</tr>
<tr>
<td>Input Power</td>
<td>Regulated 5V at 60 mA</td>
</tr>
<tr>
<td>Voltage Output</td>
<td>~0.5V to 4.5V DC</td>
</tr>
<tr>
<td>Connections</td>
<td>Integrated 6 ft. cable with half inch striped wire for terminal attachment or 5 pin male USB connector</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
</tr>
<tr>
<td>Creep, in 20 min</td>
<td>±0.03 %</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>10°C to 40°C, non-condensing</td>
</tr>
<tr>
<td>Temperature Effect on Output</td>
<td>±0.02 % full scale/°C</td>
</tr>
</tbody>
</table>

**Suggested Mounting**

**Connector Option**

- Pin Out
  1. 5V DC
  2. DATA -
  3. DATA +
  4. No Wiring
  5. Ground

**Pigtail Option**

- Red - 5V DC
- Black - Ground
- Green - Data +
- White - Data -

The load cell is circular with a raised mounting surface at the top of the sensor. The flat bottom surface has multiple stepped areas with tapped mounting holes. Mount the load cells on a flat surface and apply loads perpendicular to the sensor body. Avoid side loads and twisting loads.

**Loadstar Sensors, Inc.**

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