How To Select a Load Cell

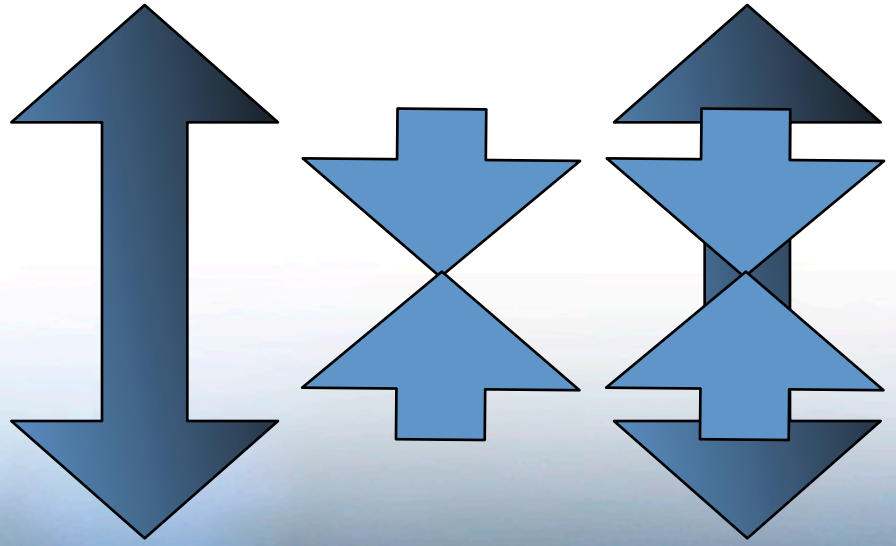
Manufacturer of Pressure, Load/Force/Torque, Displacement, & Temperature Sensors

716.250.1900

Stellar Technology STI

Performance Considerations

- **Determine the Maximum Load, Weight, or Force that you intend to measure.**
- **Determine the Loading Conditions of the application.**
  - Tension
  - Compression
  - Tension and Compression
  - Multi-Axis



Performance Considerations

- **Identify the Engineering Units you require:**
  - Pounds Force
  - Tons
  - Grams
  - Kilograms
  - Newtons
  - Kilonewtons

…or even

- **Customer Specified**

Performance Considerations

- **Accuracy**
  - **Static Accuracy:**

    The combined affects of Linearity, Hysteresis, and Repeatability.

    Expressed as ±% of full scale output.
  - **Thermal Accuracy:**

    How temperature affects the output.

    Expressed as ±% of full scale output/°F or /°C.
  - **Total Accuracy:**

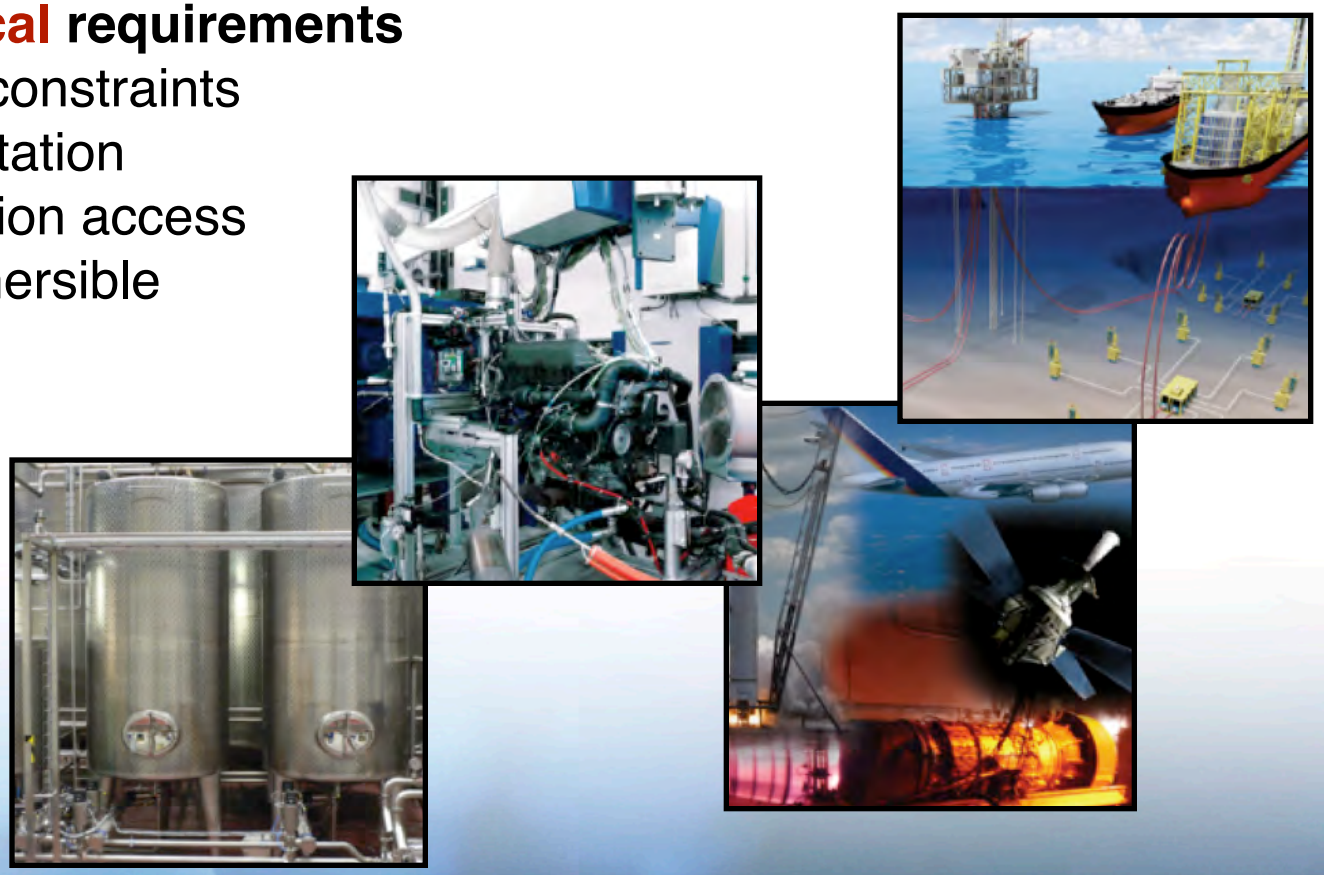
    Static accuracy + Thermal accuracy.

Performance Considerations

- **Take into account the Loading Conditions the sensor will encounter.**
  - **Overloading conditions:**
    Will the load ever exceed the maximum load? By how much?
  - **Static overload capacity:**
    Are there any safety factors to take into account?
  - **Dynamic loading:**
    Dynamic loads can far exceed the anticipated static loads.
  - **Fatigue loading:**
    High cycle rates
  - **Off-axis loading:**
    Side loads

Mechanical Considerations

- **Physical requirements**
  - Size constraints
  - Orientation
  - Location access
  - Submersible



Mechanical Considerations

- **Configuration**
  - Rod End
  - Pancake
  - Load Pin
  - Miniature
  - Beam Style
  - Thru-Hole / Donut
  - Canister
  - Load Washer

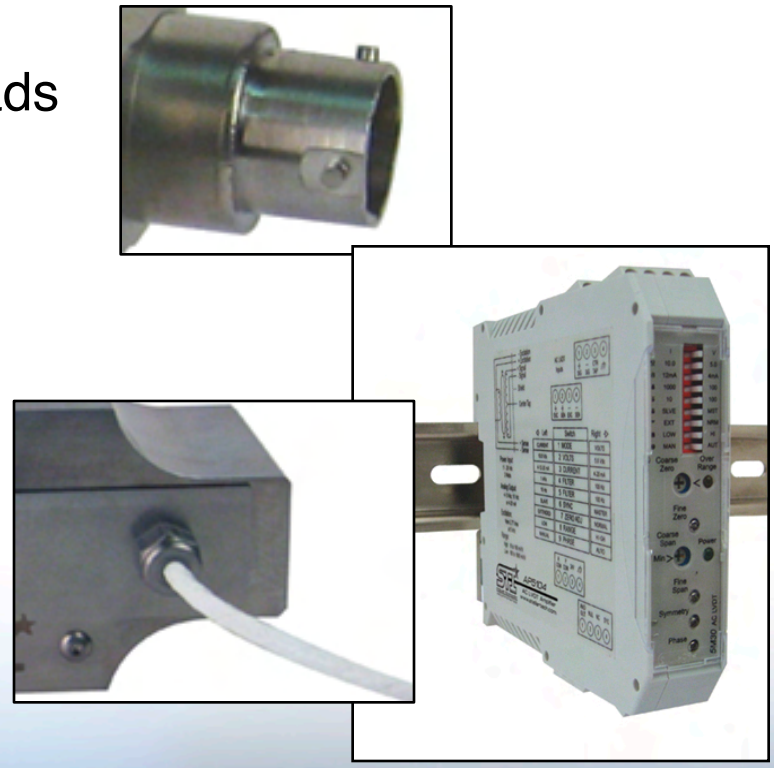
- **Loading**
  - Threaded
  - Clevis Pin
  - Tongue Shackle
  - Load Button
  - Special Configuration

Electrical Considerations

- **Electrical Output from the sensor**
  - **Analog:**
    - mV/V
    - 0-5 Vdc, 0-10 Vdc
    - Bipolar voltage
    - Isolated or non-isolated voltage
    - 4-20mA current
  - **Digital:**
    - RS485 (MODbus)
    - RS232
    - CANbus, J1939, CANopen
  - **Combination:**
    - Analog and digital

Electrical Considerations

- **Electrical Termination**
  - Connector, integral cable, flying leads
  - Need for mating connectors and cable assemblies
  - Connector/cable orientation
  - Wiring codes and Pin-outs
- **External zero and span Potentiometers**
- **DIN Rail mount or In-Line Signal Conditioning**



Environmental Considerations

- **Operating temperature range**
- **Compensated temperature range**
- **EMI/RFI conditions**
- **IP or NEMA rating required?**
- **Hazardous Environment**
  - Intrinsically Safe
  - Explosion proof
- **Indoor or outdoor use.**
  - Exposure to the elements
  - Dust, dirt
  - Temperature extremes
  - Animals, critters, rodents, etc.
- **Submersible**
  - Fresh water / Salt water
  - Depth
  - Case Pressure

Special Requirements

- **Calibration requirements**
  - Standard 5-point calibration
  - Special calibration with added points
  - AFTM E-74
  - ISO 17025
- **Special Approvals/Certifications**
- **Testing or Cleaning**
- **Special Labeling requirements**
- **Frequency Response**
- **Shock and Vibration resistance**
- **Serviceability**
  - How accessible must the unit be?
  - How often will it be serviced?

Delivery

- **What is the required Lead Time?**
  Lead time is impacted by a variety of factors including, but not limited to:
  - Design and engineering
  - Special components
  - Special processes
  - Qualification testing
  - Method of shipment

In Conclusion

PERFORMANCE CONSIDERATIONS

- Maximum load
- Engineering units
- Accuracy
- Load conditions

MECHANICAL CONSIDERATIONS

- Physical constraints
- Load connection
- Configuration

ELECTRICAL CONSIDERATIONS

- Output
- Connections
- Signal conditioning

ENVIRONMENTAL CONSIDERATIONS

- Temperature
- Indoor/outdoor
- Hazardous locations

SPECIAL REQUIREMENTS

- Calibration
- Approvals
- Shock & vibration

Call today, 716.250.1900 - for additional information on Load / Force / Torque Sensors from Stellar Technology

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Thank You

This Has Been an STI Production

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