

# Interface

FORCE MEASUREMENT SOLUTIONS™

## Interface Sensor Selection Guide



### Introduction

The **Interface Sensor Selection Guide** provides a structured five-phase framework to help identify the ideal measurement device for your specific technical needs. This simplified checklist walks you through the phases, presented as a series of topics and questions, to help you choose the right sensor technologies to meet your requirements.

The process begins with sensor **characterization**, in which users define essential physical properties such as measurement type, force capacity, and accuracy requirements. The guide then moves into **mechanical integration**, ensuring the hardware fits the physical space and mounting constraints of the intended environment.

Significant attention is given to the **interconnect and instrumentation** phases, which focus on establishing reliable signal transmission through proper cabling, wireless options, and data output protocols. Finally, the guide emphasizes long-term performance through **calibration standards** and maintenance validation to ensure data integrity. By following this comprehensive checklist, users can navigate the complexities of sensor synchronization to achieve a highly reliable and accurate measurement system.

Interface offers tens of thousands of load cells, instrumentation devices, wireless components, accessories, and complete systems. If you have any questions about the selection process or need additional help, please reach out to our experienced application engineers at any time.



## Five Phases for Selecting a Sensor

Interface's Sensor Selection Guide is a quick reference to help you choose the right device for your specific project or program. With thousands of products in our catalog, it is important to ensure your measurement system is optimized for accuracy and reliability. Use this simplified checklist as a final technical review before finalizing your selection.

### Phase 1 - Sensor Characterization

- Select Form Factor Design:** For force measurement, is this a standard LowProfile pancake model or a miniature load cell? If you need a torque transducer, is it a static or dynamic style? Does the application require a specific design, such as a Load Pin, Load Shackle, Load Washer, Load Button, or a Column type?
- Define Rated Capacity:** Does the sensor's capacity cover your peak loads while maintaining the necessary resolution for lower-end measurements?
- Verify Safe Overload:** Have you reviewed the data sheet for the Safe Overload percentage to protect against unexpected dynamic spikes? Will you need overload protection or fatigue-rated sensors for high-cycle tests?
- Confirm Accuracy Grade:** Does the Static Error Band (non-linearity, hysteresis, and repeatability) meet your test requirements?
- Validate Environmental Ratings:** Does the application require a specific IP rating for moisture resistance, or does it require compensation for hazardous environments?

## Phase 2 - Mechanical and Physical Fit

- Check Outline Drawings and 3D CAD Files:** Will the sensor fit within your physical envelope? Check the height, diameter, and clearance for connectors.
  - Mounting Hardware:** Does your project require mounting? Will you require a base, mounting plates, or secure into an existing rig or framework?
  - Match Thread & Bolt Patterns:** Have you verified the thread size (male/female) and bolt circle patterns against your existing mounting hardware?
  - Assess Mounting Rigidity:** For high-accuracy sensors like the LowProfile® series, is your mounting surface flat and rigid enough to prevent off-axis loading errors? Do you need couplings when choosing a torque transducer?
  - Safety and Accessibility:** Does this fit your plan for ease of installation, serviceability, and ingress protection in the mounting area?
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## Phase 3 - The Interconnect

- Connection Type:** How are you connecting, wirelessly or via a cable? If wirelessly, are you connecting via a Wireless Telemetry System or Bluetooth®? If by cable, how are you connecting the sensor to the instrumentation?
- Select Cable Length:** Have you accounted for the distance between the sensor and the instrument? When considering cable length, are you accounting for noise or signal loss?
- Choose Wiring Configuration:** What is the wiring requirement, 6-wire vs. 4-wire? Are you using a 6-wire cable for long runs to utilize remote sensing and eliminate voltage drop errors?
- Match Connector Types:** Does the cable assembly part number match the specific connector (e.g., PT06A or 44-Pin D-Sub) listed on the sensor's data sheet?
- Identify Shielding Needs:** Is the cable shielded to protect the signal from EMI/RFI interference in your facility?
- Environmental Protection:** What exposure to moisture, dust seals, and abrasion resistance needs to be considered for the project?



## Phase 4 - Instrumentation and Output

- Select Data Destination:** Where are you sending the output data? Are you connecting to a local display (Indicator), a control system (Signal Conditioner), a data acquisition system, or a computer (USB/PC Interface)? How are you connecting, wirelessly or via a cable?
- Match Signal Types:** If you use a raw mV/V sensor, does your instrument provide the necessary excitation voltage?
- Verify Analog/Digital Requirements:** If connected to a PLC, have you confirmed the required output (e.g., 4-20mA, 0-5V, or 0-10V)? Do you need a data acquisition system or an indicator?
- Communication Protocol:** Do you have specific communication protocols to adhere to in your environment or for broader connectivity to other devices, such as EtherCAT, Profibus, Ethernet/IP, IO-Link, or others?
- Software Compatibility:** If you use a USB module, have you downloaded the Interface Toolkit or BlueDAQ software for data logging?
- Data Management:** Where are you storing the data? What formats, timestamping, synchronization with other sensors, and storage policy influence instrumentation?
- Cybersecurity:** Do you have to consider access controls, encryption, and secure data transfer for connected setups?

## Phase 5 – Calibration, Validation, and Maintenance

- System-Level Calibration:** Will the sensor and instrument be calibrated together (a system calibration) to ensure the highest out-of-the-box accuracy?
- Calibration Interval and Standards:** Is the applicability of ISO/IEC 17025 a key consideration? Will you use your own lab calibration or send it to a service provider, such as Interface?
- Scaling Factors:** If you plan to do your own system calibration, use the Calibration Certificate to input the specific sensitivity (mV/V) into your instrumentation.
- Validation Plan:** Is the sensor part of a test bench set-up, used in the field, or integrated? How will you validate accuracy in repeated use?
- Documentation and Traceability:** Where will you store datasheets, calibration certificates, tolerances, and configuration records? Will you require TEDS for interchangeable uses? How are you keeping alignment with your audit and standards?

## Ready to Select Your Test & Measurement Equipment?

Interface understands that projects are unique, and there are hundreds of variables not detailed in this simplified checklist, such as whether you are using multi-axis coefficient matrices or embedding a custom sensor into a specific product design.

The Interface Selection Guide is a tool to help you navigate high-level questions and considerations, whether for a single sensor or a complete system.

With more than 35,000 products, we understand that subtleties in designs and capacities may require more investigation. We are here to help. Our experience is that by working with our Application Engineers and Global Network of Representatives and Distributors, you have greater success when selecting a sensor. [Contact us for support.](#)



Interface also provides a series of [product selection guides](#) specific to sensor types and devices, including our [Load Cell Selection Guide](#), [Mini Selection Guide](#), [Multi-Axis Selection Guide](#), [Wireless Selection Guide](#), and [Instrumentation Selection Guide](#), among others.