For more than 50 years, under the FW Bell, Sypris and OECD banners, Pacific Scientific has been providing high-reliability, mission critical, electromechanical, and power generation sensor devices for highly demanding industrial, educational, research, defense and aerospace applications.

Pacific Scientific-OECO offers a broad range of system products, components and services, specializing in Power Generation, Power Conversion, Magnetics and Sensors. OECD products are found on commercial and military aircraft, military ground vehicles, Unmanned Aerial Vehicles, down hole drilling equipment, commercial/industrial applications, medical devices, space vehicles and other complex mechanisms where system reliability is paramount.

**FW Bell Current Sensors – Reliable Performance Monitoring**

Pacific Scientific-OECO manufactures a complete line of current sensors under the F. W. Bell brand which allow users to create Closed Loop control systems for monitoring the performance of larger systems and components to assure their proper functioning. These feature-rich devices are prized for their small size, light weight, reliable performance and advanced capabilities that enable precise and cost-effective current measurement in a variety of applications. From our extremely accurate line of magnetoresistive sensors to our Open Loop type current sensor, F. W. Bell produces both standard and custom-designed current sensors to meet customer-specific requirements.

Customers rely on F. W. Bell current sensors to measure the health and performance of a variety of operation-critical functions. For example, our sensors are used for systems control, to monitor power use and output, to sense if batteries are charging or discharging, or to monitor the health of a component as it wears over time.
Closed Loop sensors measure DC and AC currents over a broad range, from a few milliamps to 3,000 amps, while also providing vital electrical isolation. F. W. Bell Current Sensors offer fast response, high linearity and low temperature drift. Additionally, the current output of these Closed Loop sensors is virtually immune to electrical noise. F. W. Bell current sensors are the sensor of choice when highly accurate measurements are essential.

F. W. Bell’s newest current sensor, specifically designed and qualified for space flight, is Hall based and utilizes a Closed Loop construction to provide optimum accuracy for the end user. Performance over wide temperature ranges and light weight were major design considerations in this new device, which was created to meet the demanding environmental and operational requirements of space flight as well as other military and aerospace applications. These applications vary from in-flight power monitoring and feedback to ground-based vehicle system diagnostics. The construction can be PCB mount, aperture, or split design for installation on existing wiring.

F. W. Bell’s Closed Loop current sensor consists of a Hall generator mounted in an air gap of a magnetic core, a coil wound around the core and a current amplifier. The current-carrying conductor, placed through the aperture of the sensor, produces a magnetic field that is proportionate to the current. This field is concentrated by the core and sensed by the Hall generator. The Hall generator is connected to the input of the current amplifier, which drives the coil.

The current through the coil produces an opposing field to that provided by the current through the aperture. Thus, the flux in the core is constantly driven to zero. The output is a current proportional the aperture current, multiplied by the number of turns on the coil. A sensor with a 1000-turn coil provides an output of 1mA per ampere. The current output is converted to a voltage by connecting a resistor to the output of the sensor and ground, and can be scaled by selecting the resistor value.

This results in a high-reliability current sensor capable of optimum performance in extreme environments and conditions.

**Hall Effect Devices – Contactless Sensing**

F.W. Bell’s Hall Effect sensors can be found in a variety of systems and devices, from the International Space Station to a simple electronic compass.

Hall Effect sensors provide electrical output in the presence of and proportional to a magnetic field -- the stronger the magnetic field, the greater the output of the Hall Effect device.
These sensors are popular in industrial applications where contactless sensing of moving mechanical components is required, such as sensing rotors of brushless motors. Hall Effect devices may stand alone or serve as an element inside a current sensor, translating the induced field created by the current being measured to an output, allowing users to monitor magnetic solenoids, motor and rotor positions, and to create their own custom current sensors.

**High Reliability Applications**

Hall Effect sensors are a semi-conductor that produces a linear voltage output in relation to magnetic field intensity when a constant current is applied. Impervious to the environmental conditions that easily affect the electromechanical type sensors that they replace, Hall Effect sensors are ideally suited to space flight and other high-reliability applications, including aviation, transportation, medical, automotive, instrumentation, research, alternative energy, and industrial fields.

Available in monolithic crystal or thin film format, F. W. Bell’s Indium Arsenide Hall devices are fully acceptance-tested and lot-qualified for space. Thin film Indium Arsenide Hall Effect sensors are especially sought after for their small size and high reliability. Designed to withstand the rigors of space flight, these Indium Arsenide devices are built to tolerate radiation and perform well in extreme temperatures. F. W. Bell’s Hall Effect sensors typically are used in spacecraft solenoid monitoring, housekeeping, or rotation sensing.

**About Pacific Scientific-OECO**

OECO solutions are designed and manufactured for highly demanding applications where mission-critical performance depends on system availability, reliability, safety, and quality. In addition to space and military qualified devices, Pacific Scientific-OECO offers instrument-quality, high linearity sensors for a variety of commercial, industrial and research applications.

**Customizable Solutions**

“Commercial-off-the-shelf” does not have to mean “one size fits all”. Pacific Scientific-OECO’s expertise in designing precision components for high-reliability applications facilitates and supports customization at any level, allowing customers to modify commercial sensor designs to meet mission needs.

Our core competencies include materials specification and selection, engineering design, custom manufacturing, unique encapsulation techniques, extreme environmental testing (including shock, vibration, and humidity), final test and qualification, and other
essential supplier capabilities. Offering a complete range of services that extend from concept designs to full rate production, OECO delivers innovative solutions that drive customer success.

AS9100/ISO 9001:2000 Certified

Pacific Scientific-OECO is committed to quality in all that it does, as evidenced in quality certifications and approvals from ANSI/ASQC, NASA, FAA, European Aviation Safety Agency, Boeing and other agencies and organizations. Pacific Scientific-OECO is also an FAA145 Repair Station.

NASA Soldering

J-STD certified, Pacific Scientific-OECO provides hand-soldering for surface mount and through hole components, and employs SMT reflow equipment for soldering the company’s own designed and built CCAs. Its 8739 NASA certification, allows Pacific Scientific-OECO to conduct soldering and inspection for the Space community in house, speeding customers’ time to market while minimizing the potential for handling or shipping errors. Pacific Scientific-OECO is truly a complete “concept through delivery” provider.