

Sensing and Control Products



SOLUTIONS FOR YOUR SENSING AND
CONTROL APPLICATIONS

Product Portfolio

Honeywell



For innovation that matches your imagination, there's only Honeywell Sensing and Control.

With more than 50,000 products ranging from snap-action, limit, toggle, and pressure switches to position, speed, pressure, and airflow sensors, Honeywell Sensing and Control (S&C) has one of the broadest sensing and switching portfolios available.

Honeywell sensor, switch, and control components are tailored to exact specifications for stronger performance, longer productivity, and increased safety. Enhanced accuracy and durability are built into every part, improving output and endurance. For our customers, this can reduce expenditures and operational costs. Our global footprint and channels help to competitively price such components for your chosen application and provide immediate technical support.

Our expertise in aerospace and defense, transportation, medical, and industrial industries means we offer products and solutions for a wide range of applications. But, an impressive product line is only one part. We possess unique engineering expertise and value-added capabilities.

While Honeywell's switch and sensor solutions are suitable for a wide array of basic and complex applications, our custom-engineered solutions offer enhanced precision, repeatability, and ruggedness. We offer domain knowledge and technology resources, along with a close working relationship, to develop and deliver cost-effective, individually tailored solutions. Whether clean-slate development or simple modifications to an existing design are needed, our expertly engineered solutions help to meet the most stringent requirements with world class product designs, technology integration, and customer-specific manufacturing.

With a 75-year legacy in the switch and sensor business, Honeywell S&C has earned a reputation for reliability and excellence. Our strong product designs, Six Sigma Plus manufacturing environment, and robust testing facilities help provide quality out of the box, as well as enhanced, sustainable performance down the line.

Global service, sourcing, and manufacturing. Industry-leading engineers. Value-added assemblies and solutions. Construction to required specifications. A one-stop, full-service, globally competitive supplier... Honeywell Sensing and Control.

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Pressure Sensors - Board Mount: TruStability®

PRODUCT OVERVIEW

Honeywell's TruStability Board Mount Pressure Sensors consist of the following Series:



- HSC Series: Compensated, amplified, ultra-low and low pressure
- SSC Series: Compensated, amplified, ultra-low and low pressure
- TSC Series: Compensated, unamplified, low pressure
- NSC Series: Uncompensated, unamplified, ultra-low and low pressure

Piezoresistive silicon pressure sensors offering ratiometric analog or digital output for reading pressure over the specified full scale pressure span and temperature range. Measure pressure ranges from ± 1.6 mbar to 10 mbar, ± 160 Pa to ± 1 MPa, and ± 0.5 inH₂O to 150 psi. Multiple packaging, mounting, signal, and customized calibration capabilities. With the single side wet media option, can use one port of the sensor with condensing humidity or directly with non-corrosive liquid media.

POTENTIAL APPLICATIONS

Airflow monitors, anesthesia machines, barometry, blood analysis machines, chemical analyzers, flow calibrators, gas chromatography, gas flow instrumentation, HVAC, life sciences, medical monitors, oxygen concentrators, pneumatic controls, respiratory machines, sleep apnea monitoring, therapy equipment, and ventilation.

FEATURES

- Industry-leading long-term stability, reliability, flexibility, and Total Error Band
- Fully temperature compensated and amplified using ASIC (HSC, SSC); compensated, unamplified (TSC); or uncompensated, unamplified (NSC)
- Miniature packages with DIP, SIP, and SMT mounting options
- Wide choice of package styles and ports
- Analog Vdc or digital output (I²C or SPI compatible) (HSC, SSC); analog mV output (TSC, NSC)
- RoHS and WEEE approvals

Pressure Sensors - Board Mount

PRODUCT OVERVIEW

In addition to its TruStability® pressure sensors, Honeywell offers many other board mount pressure sensing devices including 24PC, 26PC, ASDX, NBP and TBP Series. Proven sensing technology that uses a specialized piezoresistive micromachined sensing element. Pressure ranges from 5 inH₂O to 250 psi.



POTENTIAL APPLICATIONS

Air compressors, airflow monitors, automotive diagnostics, barometers, battery-powered equipment, blood analysis machines, chemical analyzers, dental equipment, dialysis equipment, environmental controls, flow calibrators, gas chromatography, gas flow instrumentation, HVAC, industrial instrumentation and machinery, medical monitors, oxygen concentrators, pneumatic controls, sleep apnea monitoring, therapy equipment, and ventilation.

FEATURES

- Miniature packages
- Analog or digital output (I²C or SPI compatible)
- Wide choice of pressure ranges, styles, terminations, and ports
- Wet/wet differentials and flow-through porting
- Accuracy as high as $\pm 0.25\%$ FSS BFUL
- Gel coating option allows use in applications where condensation can occur (NBP)
- Non-compensated, unamplified versions (24PC)
- Compensated, amplified versions (26PC)
- ASIC-enhanced output (ASDX)
- Digital and analog outputs available
- DIP, SIP, and SMT mounting options

Pressure Sensors - Heavy-Duty

PRODUCT OVERVIEW

Developed for potential use in pressure applications involving measurement of hostile media in harsh environments compatible with 316 stainless steel. This type of steel increases corrosion resistance, improves resistance to pitting from chloride ion solutions, and provides increased strength at high temperatures. The small sensor size allows them to be used on their own in tight packages or as the building block for a complete transducer. The vacuum gage series sensors are specifically designed for potential use in applications that can be exposed to vacuum. Series include 13 mm and 19 mm.



POTENTIAL APPLICATIONS

Agricultural equipment, drilling mud density, hydraulic controls, industrial automation and flow control, industrial controls, irrigation equipment, medical equipment, pressure calibrators, pressure transducers, process control systems, and tank pressure.

FEATURES

- Rugged, isolated stainless steel package
- Small package size
- Reliable semiconductor technology
- Compensated and uncompensated options
- Absolute and gage pressures
- Vacuum compatible, isolated sensors
- Absolute pressure

Pressure Transducers - Heavy-Duty

PRODUCT OVERVIEW

Complete amplified and compensated pressure measurement solutions. With a choice of ports, connectors, outputs, and pressure ranges, these transducers can be configured to meet the needs of the application. Heavy-duty pressure transducers are engineered to be resistant to aggressive media in most harsh environments. Series include MLH, PX2, and SPT.



POTENTIAL APPLICATIONS

Air compressors, data analyzers, depth sensing (tank level, fluid level, underground water level, leak detection, etc.), fluid/gas flow monitoring and metering, food and beverage processing, HVAC/R, hydraulic and pneumatic controls, industrial automation and controls, medical diagnostic equipment (GCMS and LCMS, blood analysis, etc.) medical equipment (anesthesia machines, kidney dialysis machines, ventilators), natural gas vehicles, off-road vehicles, pollution/emission measurement devices, pressure devices (calibrators, gages, transmitters), pressure valves, process control systems, solar energy, sprayers/ industrial lasers, and water purification systems.

FEATURES

- Wide choice of package styles
- Rugged packaging for most harsh environments
- Industry-leading Total Error Band (PX2)
- Designed for configurability
- Custom variations for larger opportunities
- High quality and reliability
- Various pressure ranges
- No internal elastomeric seals allow for excellent media resistance

Magnetic Sensor ICs - Digital

PRODUCT OVERVIEW

Constructed from a thin sheet of conductive material, Honeywell's digital magnetic sensor ICs generate a high or low voltage output in response to a magnetic flux perpendicular to the surface of the sheet. Series begin with SS.



POTENTIAL APPLICATIONS

Appliances, automotive transmission position sensing, building access, brushless dc motors commutation, convertible roof position, counter pickup, cylinder position monitoring, damper or valve position control, disc speed, electric window lift, fan monitoring, fitness equipment, float-based fluid level sensing, flow-rate sensing, hospital beds, HVAC, industrial processes, magnetic encoding, medical equipment, medication bin monitoring, motion detection, motor and fan control, portable drug carts, printer head position sensing, robotics control, speed and RPM sensing, tachometer, and tape rotation.

FEATURES

- Bipolar, bipolar latching, unipolar, and omnipolar magnetics
- Supply voltage as low as 2.2 Vdc, combined with very low average current (1.8 μ A typ. for SL353LT, the lowest in its class) (SL353 Series Micropower Omnipolar)
- Push-pull output does not require external pull-up resistor (SL353 Series Micropower Omnipolar)
- Non-chopper stabilized design available, eliminating noise generated by products using this technique
- Package materials and styles include plastic radial lead, plastic surface mount (SOT-23 and SOT-89)
- High output current and speed capability
- Reverse polarity protection available
- Digital sinking output
- Built-in pull-up resistor option
- Multiple operate/release points available
- Tape and reel packaging available

Magnetic Sensor ICs - Linear

PRODUCT OVERVIEW

Constructed from a thin sheet of conductive material, Honeywell linear magnetic sensor ICs generate an analog voltage output proportional to a magnetic flux perpendicular to the surface of the sheet. Quad Hall-elements design minimizes effects of mechanical or thermal stress on output and provides a stable output (SS490/SS491). Catalog listings include SS.



POTENTIAL APPLICATIONS

Current sensing, length measurement, linear or rotary motion detection, liquid-level sensing, magnetic code reading motor control, position sensing, robotics control, rotary encoding, vibration, and weight sensing.

FEATURES

- Linear actuation
- Package materials and styles include ceramic SIP, ceramic with solder bumps, plastic radial lead, plastic surface pack, ammopack styles T2 and T3, and plastic surface mount (SOT-23, SOT-89B, flat TO-92-style)
- Ratiometric sinking or sourcing output
- Standard mounting centers
- Low voltage operation
- Tape and reel available

Magnetic Sensor ICs - Magnetoresistive

PRODUCT OVERVIEW

With a built-in magnetoresistive bridge integrated on silicon and encapsulated in a plastic package, Honeywell's magnetoresistive magnetic sensor ICs feature an integrated circuit that responds to low magnetic fields. Product series include omnipolar 2SS52MT/SS552MT, differential VF401, analog APS00B, and the ultra-sensitive, omnipolar Nanopower.



POTENTIAL APPLICATIONS

Automated assembly/pick-and-place, cylinder position sensing in pneumatic cylinders, high accuracy speed sensing, high resolution angular sensing, lid sensor for laptop computers, position sensing for material-handling equipment, presence/absence detection, and rotary position sensing, handheld computing equipment and scanners, utility meters (water, electric, and gas), and as a reed switch replacement for battery-operated security systems.

FEATURES

- High sensitivity: 7 Gauss typ., 11 Gauss max. or 14 G typ., 20 Gauss max. (Nanopower)
- Low power requirements: 360 nA typ. or 310 nA typ. (Nanopower)
- Omnipolar magnetics (2SS52MT/SS552M)
- Dual bridge (APS00B) provides analog voltage outputs related to the angle of the magnetic flux
- Two-wire, current sourcing, differential output (VF401)
- Low Gauss operation extends sensing distance to one inch or more, depending upon the strength of the magnetic field
- Packages include flat TO-92-style and surface mount (SOT-89B and SOT-23), supplied on tape/reel
- Wide angular measurements up to $\pm 90^\circ$ with a resolution capability of less than 0.05° (APS00B)

SMART Position Sensors

PRODUCT OVERVIEW

One of the most durable, adaptable, and lightweight position sensors available in the industry, enabling highly accurate motion control and improving operation efficiency and safety. Linear, arc, and rotary configurations. Series includes SPS.



POTENTIAL APPLICATIONS

Aircraft actuators/ram doors, boom arm detection, chassis, construction/heavy-duty equipment, cutting and slitting machinery, elevators, hydraulic cylinders, marine motors, material handling, packaging, passenger buses, plastic molding machines, robotically-assisted surgery equipment, solar panels, steering angle, valves, wafer handling equipment, wind turbines, and weapons systems.

FEATURES

- Sensing ranges:
 - 35 mm linear: 0 mm to 35 mm [0 in to 1.38 in]
 - 75 mm linear: 0 mm to 75 mm [0 in to 2.95 in]
 - 225 mm linear: 0 to 225 mm [0 to 8.86 in]
 - Arc: 0° to 100° or 0° to 180°
 - Rotary: 360°
- Accurate: 35 mm measures values down to 0,04 mm [0.0016 in], 75 mm down to 0,05 mm [0.002 in], 225 mm down to 0,14 mm [0.0055 in] (analog) and 0,0035 mm [0.000137 in] (digital); 100° down to 0.06°; 180° down to 0.11°; rotary ± 0.069 %FS
- Non-contacting technology can provide enhanced product life and durability with less downtime
- Combined patented MR sensor and ASIC technology provide enhanced differentiation and performance
- Self diagnostics can reduce equipment downtime
- IP67, IP69K allow use in harsh applications
- Analog or digital output
- CE approval

Speed and Direction Sensors

PRODUCT OVERVIEW

Provides true zero capability, direction sensing, and precise switch point measurement.

Speed sensor diagnostics provide

information on air gap and sensor failure for increased reliability and functionality. A comprehensive line-up of Hall-effect, magnetoresistive, and variable reluctance sensors which provide electrical compatibility to most control systems interfaces.



POTENTIAL APPLICATIONS

Anti-skid control, cam and crankshaft speed and position, compressor speed, computing, dyno testing, engine and motor RPM, factory automation, fan speed, flow metering, gear reducer RPM, gear tooth sensing, high speed counting, industrial process control, machine control, mixers, motor or pump RPM sensing, over/under speed sensing, positioning, pumps, rollers, rotary gear or shaft position detection, routing, spindles, synchronization, tachometers, traction control, transmission speed, and wheel speed detection.

FEATURES

- Non-contacting technology
- High reliability
- Digital sinking, open collector, and square wave output options
- Rotationally insensitive versions available
- Extended life (30 billion operations in keyboard module test programs)

Variable Reluctance Sensors

PRODUCT OVERVIEW

Deliver direct conversion of actuator speed to output frequency. Simple, rugged devices that do not require external voltage source for operation.



POTENTIAL APPLICATIONS

Engine and motor RPM, flow, gear-speed measurement, process measurement, and wheel-slip measurement.

FEATURES

- Non-contacting technology
- High reliability
- VRS Series includes general purpose, hazardous location, high output, high resolution, high temperature, low cost molded, and power output
- Sealed front-end versions available for use where sensor is exposed to fluids, lubricants, or adverse environmental conditions
- Operates over a wide speed range
- Customized versions for unique speed sensing applications available
- Adaptable to a wide variety of configurations

Variable Reluctance Sensors - Digital

PRODUCT OVERVIEW

Senses moving ferrous metal. Output signal of integrated circuit allows for direct use in digital equipment. Eliminates need for interface circuitry, reducing installation and maintenance costs. Constant output amplitude independent of speed.



POTENTIAL APPLICATIONS

Computing, engine and motor RPM sensing, flow metering, high-speed counting, machine control, over/under speed sensing, positioning, pump RPM sensing, tachometry, synchronization, routing, and wheel-speed detection.

FEATURES

- Non-contacting technology
- High reliability
- Enhanced stability due to precisely matched components
- Extremely precise relationship between the physical position of any sensed object and the electrical signal produced
- Provides improved accuracy to timing and positioning applications
- Enhanced sensitivity
- Capable of producing full output of 5 V to 30 V at speeds as low as 3 in/s at gaps of 0.050 in, or 1 in/s at gaps of 0.005 in

Airflow Sensors - Honeywell Zephyr™ ±50 SCCM to ±750 SCCM

PRODUCT OVERVIEW

Provide a digital or analog interface for reading mass flow of air and other non-corrosive gases over the specified full scale flow span and temperature range.

Their thermally isolated heater and temperature sensing elements help these sensors provide a fast response to air or gas flow. Catalog listings start with HAF.



POTENTIAL APPLICATIONS

Anesthesia delivery machines, ventricular assist devices (heart pumps), hospital diagnostics (spectrometry, gas chromatography), nebulizers, oxygen concentrators, patient monitoring systems (respiratory monitoring), sleep apnea machines, spirometers, ventilators, laparoscopy, air-to-fuel ratio, industrial analytical instrumentation (spectrometry, chromatography), fuel cells, gas leak detection, VAV system on HVAC systems, gas meters, and HVAC filters.

FEATURES

- Total Error Band as low as ± 0.25 %FSS
- Fast response time
- Standard flow ranges of ± 50 , ± 100 , ± 200 , ± 400 or ± 750 SCCM
- Full calibration and temperature compensation
- Customizable flow ranges and configurable package styles for specific end-user needs
- Linear output
- High stability reduces errors due to thermal effects and null shift to provide accurate readings over time
- Low pressure drop
- High 12-bit resolution (digital), 0.039 %FS resolution (analog)
- Low 3.3 Vdc operating voltage
- ASIC-based, I²C digital output compatibility
- Insensitivity to mounting orientation and altitude
- Small size

Airflow Sensors - Honeywell Zephyr™ 20 SLPM, 200 SLPM

PRODUCT OVERVIEW

Provide a digital interface for reading mass flow of air and other non-corrosive gases over the specified full scale flow span and temperature range.

Their thermally isolated heater and temperature sensing elements help these sensors provide a fast response to air or gas flow. Catalog listings start with HAF.



POTENTIAL APPLICATIONS

Anesthesia delivery machines, ventilators, ventricular assist devices (heart pumps), patient monitoring systems (respiratory monitoring), spirometers, laparoscopy, industrial analytic instrumentation (spectrometry, chromatography), air-to-fuel ratio, fuel cells, fume hoods, gas leak detection, and gas meters.

FEATURES

- Total Error Band is ± 0.5 %FS or ± 4.0 of reading, whichever is greater
- High accuracy ($\pm 3.5\%$ reading)
- Fast response time
- Flow ranges of 20 SLPM or 200 SLPM
- Full calibration and temperature compensation
- High sensitivity at very low flows
- Linear output
- Customizable flow ranges and configurable package styles for specific end-user needs
- High stability reduces errors due to thermal effects and null shift
- Low pressure drop
- High 12-bit resolution
- 3 Vdc to 10 Vdc source voltage range
- ASIC-based I2C digital output
- Choice of port styles
- Optimized calibration for many gases

Airflow Sensors

PRODUCT OVERVIEW

Contains advanced microstructure technology to provide a sensitive and fast response to flow, amount/direction of air or other gases. Airflow catalog listings start with AWM.



POTENTIAL APPLICATIONS

Analytical instrumentation, anesthesia, chromatography, fuel cells, gas leak detection, gas metering, HVAC, hospital diagnostics, leak detection equipment, medical equipment and instrumentation, nebulizers, oxygen concentrators, oxygen delivery systems, plant monitoring systems, process control, respirators, sleep apnea equipment, spirometers, vent hoods, and ventilators.

FEATURES

- High sensitivity, capable of sensing flows as low as 0.1 SCCM
- Fast response time
- Analog or digital
- Bi-directional sensing capability
- Low pressure drop (1 in H₂O or less typ.)
- True flow measurement
- Low power consumption
- Ability to sense different gases
- Amplified or unamplified analog or digital output
- Easy mounting to circuit boards
- Cost effective

Force Sensors

PRODUCT OVERVIEW

Operate on the principle that the resistance of silicon implanted piezoresistors will increase when the resistors flex under any applied force. The plunger concentrates force to the silicon sensing element with the amount of resistance changing in proportion to the amount of force applied. Product series include FSS, FS01/FS03, FSG, and 1865.



POTENTIAL APPLICATIONS

Ambulatory noninvasive pump pressure, anesthesia monitors, blood pressure equipment, drug delivery systems, enteral pumps, infusion pumps, kidney dialysis machines, load and compression sensing, non-corrosive non-pressurized media-level sensors, occlusion detection, syringe pumps, variable tension control, and wire bonding equipment.

FEATURES

- Precision force sensing ranges:
 - FSS, FSS-SMT, FSG: 5 N, 10 N, 15 N, 20 N
 - FS01/FS03: 1.5 lb, 3.0 lb (6,67 N, 13,3 N)
 - 1865: 5 psi, 10 psi, 15 psi, 25 psi, 30 psi (30,87 N, 7,75 N, 11,62 N, 19,38 N, 23,32 N)*
- High sensitivity
- Extremely low deflection, 30 microns full scale (FSS, FSG)
- Multiple signal conditioning available:
 - FSS, FSS-SMT, FSG – Unamplified mV output
 - FS01/FS03 – Amplified, compensated 4 V output
 - 1865 – Compensated unamplified mV output
- Application expertise
- Proven technology

*Newton conversion of 1865 Pressure is an approximation

Current Sensors - Digital/Inductive

PRODUCT OVERVIEW

Provides digital output that changes from Vcc to 0.4 V when sensed current exceeds operation point. Not damaged by overcurrent in the sensed conductor. Listings start with CSD.



POTENTIAL APPLICATIONS

Battery management systems, current feedback control systems, ground fault detectors, overcurrent protection, power supplies, robotics, UPS and telecommunication power supplies, variable speed drives, watt meters, and welding power supplies.

FEATURES

- Open collector output
- Output voltage isolation from input
- Minimum energy dissipation
- Maximum current limited only by conductor size
- Provides logic-level output that changes from Vcc to 0.4 V when sensed current exceeds the operate point
- Not damaged by overcurrent in sensed conductor
- RoHS compliant

Current Sensors - Closed Loop

PRODUCT OVERVIEW

Uses feedback control to provide output proportional to measured current. Engineered with enhanced accuracy and linearity to deliver fast response.

Output relatively immune to electrical noise. Series start with CSN.



POTENTIAL APPLICATIONS

Battery management systems, consumer tools, current feedback control systems, ground fault detectors, HVAC, overcurrent protection, power supplies, robotics, UPS and telecommunication power supplies, variable speed drives, wattmeters, and welding power supplies.

FEATURES

- Current sensing up to 1275 A
- ac, dc, and impulse currents
- In-line and thru-hole design
- Rapid response and reduced overshoot
- High overload capability
- High level of electrical isolation between primary and secondary circuits
- Wide operating temperature from -40 °C to 85 °C [-40 °F to 185 °F]
- Pinout styles include unipolar, offset, center, spade terminals, Molex, 5-pin
- CE, UL approvals; RoHS compliant

Current Sensors - Open Loop

PRODUCT OVERVIEW

Provide output proportional to measured current without using feedback control. Often preferred in battery-powered circuits due to low powering power requirements. Series start with CSC and CSL.



POTENTIAL APPLICATIONS

Battery management systems, current feedback control systems, ground fault detectors, overcurrent protection, robotics, UPS and telecommunication power supplies, variable speed drives, wattmeters, and welding power supplies.

FEATURES

- Current sensing to ± 900 A
- ac, dc, and impulse currents
- Low power consumption
- Compact size
- High level of electrical isolation between primary and secondary circuits
- Large primary aperture
- Mounting methods include Molex connectors, Gallant connectors, and PCB
- CE, UL approvals; RoHS compliant

Liquid Level Sensors

PRODUCT OVERVIEW

Incorporates the principle of total optical reflection to create a fast, accurate, reliable, and cost-effective solid state sensor



with no moving parts. Used for detection of liquid level or leaks, and are designed to switch digital I/Os, LEDs, coil relays, buzzers, and incandescent lamp indicators. Designed for harsh industrial environments with extremes in temperature, pressure, vibration, and shock. Series include LLE and LLN.

POTENTIAL APPLICATIONS

Aerospace, compressors, food and beverage, HVAC, home appliances, industrial compressors, machine tools, medical, military, transportation, and vending machines.

FEATURES

- Solid-state reliability, no moving parts
- Sinking output
- Fast response
- Very large choice of sensing material
- Polysulphone sensor dome on LLN Series is often suitable for hygiene applications
- Operating pressure from 5 bar to 25 bar

First-Level Emitters

PRODUCT OVERVIEW

Metal packaged emitters may be used in commercial/industrial applications with a glass lens that provides superior optics. Also used in commercial/industrial applications, plastic-packaged emitters are specified when a consistent infrared light source is required. Series begin with SE, SEP, and SME.



POTENTIAL APPLICATIONS

Automated transaction, data storage systems, drop sensors, liquid-level sensing, metering systems, motion control systems, non-invasive medical equipment, printers and copiers, and scanning.

FEATURES

- Compact packages: leaded case coaxial, miniature pill, TO-46 flat window, TO-46 dome lensed, T-1 plastic, side-emitting plastic, tight beam side looker, and surface-mount ceramic
- Non-contact sensing when long, reliable, non-contact operation is required in highly repetitive applications, where zero mechanical force is desirable, and limit/proximity detection
- Extended sensing distance with no complicated mechanical design needed to accommodate increased distance
- Wide variety of standard products with custom solutions to meet specific customer needs
- Mechanically and spectrally matched to Honeywell photodiodes, phototransistors, photodarlingtons, and Schmitt triggers
- Metal and ceramic packages may be used in high-pulsed current applications to gain greater sensing distance with lower total power dissipation in device
- GaAlAs emitters exhibit typically 70 % greater power output than GaAs devices at the same forward current to provide for enhanced LED lifetime as well as reduced current consumption for power-sensitive battery or portable applications
- Through-hole and surface-mount configurations

First-Level Detectors

PRODUCT OVERVIEW

Encoder detectors are monolithic ICs consisting of two adjacent diodes, amplifiers, and Schmitt trigger output stages. Photodarlington detectors provide non-linear, high gain analog output. Optoschmitt detectors consist of a photodiode, amplifier, voltage regulator, Schmitt trigger, and a NPN output transistor with a variety of output options.



POTENTIAL APPLICATIONS

Copiers, counting, limit sensing, motion sensing, movement detection, position encoding, presence sensing, printers, and robotics.

ENCODER FEATURES

- Side-looking plastic package (encoder)
- TTL/LSTTL/CMOS compatible
- Inverting logic option
- Resolution to 0,229 mm [0.009 in]
- Sensitivity vs. temperature compensation
- No additional signal processing circuitry required

PHOTODARLINGTON FEATURES

- Compact packages: leaded case coaxial, miniature pill, TO-46 flat window, TO-46 dome lensed, T-1 plastic, and side-detecting plastic
- Acceptance angles range from 12° to 90° for applications requiring a wide or narrow field of view
- Wide sensitivity and temperature ranges
- 0.5 mA light current minimum
- Through-hole mounting configuration

OPTOSCHMITT FEATURES

- Compact packages include TO-46 dome lensed and side-detecting plastic
- Acceptance angles from 6° to 55° for applications requiring a wide or narrow field of view
- Enhanced noise immunity output
- TTL/LSTTL/CMOS compatible, requiring little to no additional signal processing

Second-Level Reflective Sensors

PRODUCT OVERVIEW

Reflective sensors are often used when unable to locate an emitter and detector on opposing sides of an object, object is not opaque, or object presence/position detection is required. Series begin with HOA or HLC.



POTENTIAL APPLICATIONS

Counting, limit sensing, motion sensing, movement detection, position encoding, and presence sensing.

FEATURES

- Miniature, pc, or chassis mount
- Choice of phototransistor or photodarlington output
- Low profile to allow for miniaturization or higher density sensor mounting
- Available as unfocused for sensing diffused surfaces or focused for maximum response
- Plastic-molded components to help provide a cost-effective sensing solution
- Provide precision optics and wider operating temperature
- Certain listings designed for short-distance detection (HLC1395)
- Ambient light and dust protective filter (HOA1405)
- Wide operating temperature range

Second-Level Transmissive Sensors

PRODUCT OVERVIEW

Transmissive encoders contain an IR LED facing a dual output encoder in a plastic-molded housing. May be used with an interrupter strip or disk (code wheel). Optoschmitt sensors are an infrared emitter facing an Optoschmitt detector. Detector switching takes place whenever an opaque object passes through the slot between the emitter and detector. In transmissive sensors, through a field of view, an infrared emitter and a photosensor are mounted facing each other. When an opaque object passes through the slot, the interruption of the infrared path is detected.



POTENTIAL APPLICATIONS

Copiers, counting, limit sensing, motion sensing, movement detection, position encoding, presence sensing, printers, robotics, and similar applications.

TRANSMISSIVE ENCODER FEATURES

- Dual channel IC and infrared emitter encased in a black thermoplastic housing
- Direct TTL interface
- Inverting logic option
- Resolution as low as 0,229 mm [0.009 in]
- Internal temperature compensation

OPTOSCHMITT SENSOR FEATURES

- Direct TTL interface requiring little or no additional signal processing helping to reduce system cost
- Buffer or inverting logic available for enhanced design flexibility
- Choice of detector aperture, mounting tab configurations, and housing material

TRANSMISSIVE SENSOR FEATURES

- Various mounting tab configurations including PCB
- Choice of phototransistor, photodarlington, or Optoschmitt output for design flexibility
- Wide operating temperature range
- Metal-can packaged or plastic-molded components

Linear Force Measurement Assemblies

PRODUCT OVERVIEW

Measure the forces applied by the pilot or co-pilot to the elevator, aileron, and rudder flight control systems. Sensor output is used both by auto-pilot and flight data recorder.



Mechanism in each sensor allows the device to continue to function as a control linkage in the unlikely event of sensor failure.

POTENTIAL APPLICATIONS

Aerospace and military applications including active sidestick force sensing, actuator force and autopilot feedback, rudder, aileron, and elevator input force, and weight measurement.

FEATURES

- Strain gage-based sensors
- Multiple sensing technologies
- No moving parts
- ac or dc excitation versions available
- Various measurement ranges available
- Integral signal conditioning electronics
- Flexibility in output format
- Potential for lower-cost assemblies
- Smaller cross-sectional area
- Enhanced reliability: typical MTBF data between 120,000 hours and 200,000 hours

Force/Torque Sensor Assemblies

PRODUCT OVERVIEW

Range of force/torque sensing and force-feedback products designed specifically for the most demanding aerospace and military applications and customers. Specialize in working with customers to create and deliver not only a sensor, but a bolt-on solution for nearly any force/torque measurement need.



POTENTIAL APPLICATIONS

Aerospace and military applications, including actuator feedback, fuel valve position, landing gear, and pilot input controls.

FEATURES

- 0.25 %FS accuracy (higher tolerance available)
- Integral signal conditioning
- Environmental protection
- Redundant channels
- Higher level assemblies
- Range of technologies
- Custom design

Non-contact Hall-effect Rotary Position Sensors

PRODUCT OVERVIEW

Output voltage or current varies in response to changes in a magnetic field using a magnetically biased Hall-effect integrated circuit (IC) to sense rotary movement of the actuator shaft. The rotation of the shaft changes the IC's position to the magnets, and then detects the change in flux density. The output of the IC is converted to a linear output. Series include RTY, RPN, and HRS100.



POTENTIAL APPLICATIONS

Foot pedal position, gimbal position and control, inboard lever control, manipulator arm position, seat and mirror position, steering position, suspension system position, throttle/speed position and control, and tilt position.

FEATURES

- Solid-state, Hall-effect technology
- Up to 360 degrees of travel
- Plastic or metal housings
- Lever option (RTY Series) may reduce the number of mechanical linkages required for the application

Potentiometers - Cermet and Wirewound

PRODUCT OVERVIEW

Compact and rugged thick film devices, these potentiometers are stable over a range of operating temperatures. Provides high power dissipation and improved resistance temperature coefficient.



POTENTIAL APPLICATIONS

Audio, heating, joysticks, lighting, manual controls, marine controls, medical, telecom control systems, and welding.

FEATURES

- Retains position memory when power is off
- Wirewound or cermet elements
- Rotary, push-pull, and momentary options
- Proven, well-established technology
- Wide range of shafts, bushings, terminal styles, resistance values, tapers, and tolerances
- Special detents available
- Customizable packaging and electrical output
- RA30 meets MIL-R-19 standards

Potentiometers - Conductive Plastic

PRODUCT OVERVIEW

Compact and rugged thick film devices are available in a wide range of resistance values. Uses precision technology developed for military applications.



POTENTIAL APPLICATIONS

Audio, crane, electric vehicles, forklifts, fuel level sensing, heating, instrumentation, joysticks, lighting, manual equipment, marine controls and equipment, medical, missile fin feedback position, off-road vehicles, panel dials, pedal position, personal mobility, scissor lifts, throttle level sensing, valve position feedback, volume controls, and welding.

FEATURES

- Retains position memory when power is off
- Conductive plastic element
- Wide range of shafts, bushings, terminal styles, resistance values, tapers, and tolerances
- Special detents and custom electronic travels available
- Proven, well-established technology
- Customizable packaging and electrical output
- RV4 and RV6 meet MIL-PRF-94 standards

Potentiometers - Linear

PRODUCT OVERVIEW

Potentiometer sensors for linear, rotary position, and displacement measurement with extended life PTFE bearings and precious metal multi-finder contact wipers.

Utilizes technology Honeywell originally

developed for military applications and then adjusted for industrial segments. Proprietary conductive plastic delivers extensive temperature range and infinite resolution, and provides precision position measurement.



POTENTIAL APPLICATIONS

Animated characters, cranes, drill presses, fluid flow meters, front end loaders, gauging, hospital beds, in-tank level sensing, injection molding machines, linear actuators, marine steering systems, meat packing, medical equipment, off-road vehicles, packaging and processing equipment, printing presses, robotic motion control, scales, seismology, semiconductor process equipment, and woodworking guides.

FEATURES

- Shaftless, waterproof linear version (AQLT/AQMLT)
- Plunger-driven linear version (LFII, SLF, LT, MLT)
- Rodless, space-saving side actuator (DR)
- Infinite resolution
- Absolute position measurement on power up
- Reliable response to movement or target location
- Can withstand harsh environments and hazardous chemicals
- Works when immersed in oils
- Long life, 1 billion dither operations
- NEMA approval for water resistance

Rotary Position Encoders

PRODUCT OVERVIEW

Available in both mechanical and optical versions. Best suited for applications requiring panel mounted, manually operated rotary sensing. Series are 510 and 600.



POTENTIAL APPLICATIONS

Motion sensing and control, motor control, flow control, robotics, computer peripherals, welding equipment, portable diagnostic equipment (EKG, ultrasound), home health care respiratory equipment, surgical equipment, precision joysticks, irrigation controls, audio/visual equipment, EKG and defibrillation machines.

FEATURES

- Absolute and incremental versions
- Contacting and non-contacting versions
- Mechanical (510 Series) and optical (600 Series)
- 510 Series outputs a two-bit gray code for relative reference applications and a four-bit gray code for absolute electrical reference applications
- 600 Series outputs two square waves: Channel A leads Channel B by 90° electrically in a counterclockwise direction at a rate of 128 pulses per channel per revolution.

Robust IHM Series Proximity Sensors

PRODUCT OVERVIEW

Designed to meet the increased EMI, lightning, and vibration requirements of today's modern aircraft, Honeywell's IHM Series proximity sensors utilize enhanced traditional eddy current technology to provide Integral Health Monitoring (IHM) capability. The IHM effectively provides real-time indication of the health of the sensor through the use of a 3-state output*. Proven ability to meet the extreme vibration, thermal shock, and lightning requirements of modern composite structures and aircraft engines.



**available as a special option*

POTENTIAL APPLICATIONS

Aircraft system monitoring including thrust reverser, nacelle, flight control actuation, landing gear, doors, slides, and valves. Other discrete position monitoring where environmental ruggedness is required.

FEATURES

- Extremely robust to resist vibration and thermal shock
- Fully qualified to DO-160
- Fully hermetic; robust to handle environmental exposure
- Health monitoring provides fault indication that is distinct from both target-near and target-far output state
- Package and interface options to match many industry standards and competitive products, allowing simple upgrade to the IHM Series' benefits of higher vibration, EMI, and lightning robustness
- Several connector and mounting options

Proximity Sensors

PRODUCT OVERVIEW

Designed to meet demanding temperature, vibration, shock, and EMI/EMP interference specifications. Feature enhanced reliability (over 5 million units and 25 million flight hours for Models 340FW and 370FW Series).



Proximity sensors listings are from the following series: 5FW-400FW, ZS, 922/932.

POTENTIAL APPLICATIONS

Aircraft door monitoring and landing gear, door and hatch open/closed monitoring, door and utility systems, engine/thrust reverser systems, environmental control systems, flight control surfaces, gun turret position control, high lift systems, hydraulic systems, offshore underwater equipment, power generation systems, submarine control systems, submersible vehicles, underwater pipeline controls, and valves.

FEATURES

- No touch operation
- High frequency switching
- High reliability (MTBF > 500 k hours)
- Designed to meet the requirements of US and European AOM industry, particularly MIL standards, RTCA/DO 160, DEF
- Built-in test (BITE) available
- High level of sealing and EMC/EMI/RFI performance
- Custom designed solutions possible

Position Sensor Assemblies

PRODUCT OVERVIEW

Range of position measurement products designed specifically for the most demanding aerospace and military applications. Honeywell specializes in working with customers to create and deliver not only a sensor, but a full solution for nearly any position measurement need.



POTENTIAL APPLICATIONS

Aerospace and military applications including wing-mounted, engine/high temperature, landing gear/nosewheel, and cockpit/internal. May be used for actuator feedback, door position, engine nozzle position, flap skew detection, flight control surface position feedback, fuel valve position, landing gear, lever position, pilot input controls, stabilizer measurement, and valve position sensing.

FEATURES

- Products include integral gearing, environmental protection, redundant channels, and higher-level assemblies
- Sensing technologies include RVDT, potentiometer, and resolver
- Carry MTBF beyond 200,000 hours
- Aluminum or plastic housing options
- As low as 0.25 %FS accuracy
- Rig lock viewing window option (408 Series)
- Alternate excitation voltages, integral gear reduction (449 Series)

Rotary Variable Differential Transformer Position Transmitters

PRODUCT OVERVIEW

Multi-purpose, environmentally sealed, dual redundant device with a self-rigging mechanism. Available with dissimilar frequencies or as a resolver/synchro output to guard against common mode failures.



POTENTIAL APPLICATIONS

Most widely used rotary sensing technology on aircraft, primary, and secondary flight controls.

FEATURES

- 25 % reduced in both weight and volume over comparable devices
- No brush or slip-rings to wear, enhancing reliability
- Simplified repair and maintenance; fewer parts allows for faster maintenance activities
- Supplied standard with fork-style interface, integral rig-lock feature, and flange mount
- Fully engineered product, built to specification by aircraft program
- Enhanced reliability
- Drop-in replacement for competitive sensors

Ultrasonic Sensors

PRODUCT OVERVIEW

Measure time delay between emitted and echo pulses. Available in analog or digital versions for distance or presence/absence sensing. Programmable versions offered. May be used in a variety of rugged presence and absence sensing applications.



POTENTIAL APPLICATIONS

Bottle counting, cranes, crop handling machinery, filling machinery, food and beverage, food processing machinery, loop control, product height measurement, rapid presence/absence detection, raw materials processing, reel diameter measurement, slitter and rewinder machines, tank level measurement, tire manufacturing, and vehicle ground flatness detection.

FEATURES

- Ranges from 0,2 m to 6 m [0.7 ft to 11.5 ft]
- Analog and switching outputs
- Housing styles include plastic M18, M30, square, two pieces square, metal M12, and stainless steel M30
- IP67 sealing available
- Integrated teach-in/auto-tuning sequence eliminates the risk of losing a programming insert
- Termination includes cable, connector, or M12 connector

Humidity Sensors – Honeywell HumidCon™ Digital Humidity/Temperature Sensors

PRODUCT OVERVIEW

Digital output-type relative humidity (RH) and temperature sensors combined in the same package. Available in the following accuracies:



- ±1.7 %RH (HIH9000 Series)
- ±2.0 %RH (HIH8000 Series)
- ±3.0 %RH (HIH7000 Series)
- ±4.0 %RH (HIH6100 Series)
- ±4.5 %RH (HIH6000 Series)

POTENTIAL APPLICATIONS

HVAC/R, air compressors, weather stations, telecom cabinets, industrial incubators/microenvironments, respiratory therapy, medical incubators/microenvironments.

FEATURES

- Industry-leading long-term stability (1.2 % over five years)
- Industry-leading reliability (MTTF 9,312,507 HR)
- Lowest total cost solution
- Combined humidity and temperature sensor
- Energy efficient
- High resolution
- True, temperature-compensated digital I²C or SPI output
- SOIC-8 SMD and SIP 4 Pin housing styles
- Available with or without hydrophobic filter and condensation-resistance
- Tape and reel
- Wide operating temperature ranges
- Optional one or two %RH level alarm outputs
- Multi-function ASIC
- RoHS and WEEE compliant, halogen-free

Humidity Sensors

PRODUCT OVERVIEW

Configured with integrated circuitry to provide on-chip signal conditioning. Laser-trimmed sensors designed to offer stable, low-drift performance and enhanced accuracy with calibration. Absorption-based sensors provide both temperature and %RH. Humidity catalog listings start with HIH or HCH.



POTENTIAL APPLICATIONS

Air compressors, battery-powered systems, drying, enthalpy sensors, environmental test chambers, HVAC/R, humidistats, leak detection, medical incubators, meteorology, microenvironments, printers/OEM assemblies, office automation, plotters, recorders/dataloggers, refrigeration, respiratory therapy, telecommunication cabinets, VAV, and weather stations.

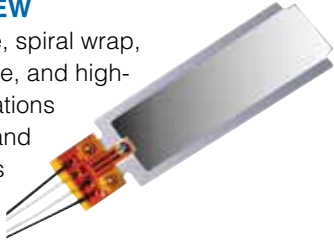
FEATURES

- On-board signal conditioning
- Analog voltage, resistance, and capacitance value outputs available
- Covered or uncovered, filtered or unfiltered, integrated circuit options
- ± 3 %RH accuracy
- Interchangeability
- Low current draw
- Thermoset sensing polymer
- Chemical resistivity
- Survival under saturation
- TO-5, SIP, surface-mount packages
- RFQ responses to custom thermal product typically within one week or less
- Requests for samples typically ship immediately from stock

Flexible Heater Assemblies

PRODUCT OVERVIEW

Flat, molded-to-shape, spiral wrap, transparent, composite, and high-temperature configurations with single, multiple, and variable watt densities to customize heat output to unique applications. Flexible resistive heaters include wire wound and etched foil. Wide variety of installations. On-board thermal control components can be added, such as integral thermistor, thermostat, RTD, or thermocouple controls.



POTENTIAL APPLICATIONS

Appliances, autoclaves, blood analyzers, chromatography, dialysis equipment, drain pipe heater, food service equipment, infusion pumps, LCD displays, outdoor cameras, potable water, sleep apnea equipment, valves, and ventilators.

FEATURES

- Single source for both heat and control
- Custom designs for total system solutions
- Integrated controls for the highest system accuracy and reliability
- ITO transparent heaters offer higher light transmission than other technologies
- Up to 260 °C [500 °F] temperature output available
- Agency approvals available on specific materials
- RFQ responses to custom thermal products typically within one week or less
- Requests for samples typically ship within five business days of material availability

Packaged Temperature Probes

PRODUCT OVERVIEW

Compact and lightweight. Operate with enhanced sensitivity, reliability, and stability under diverse conditions of shock, vibration, humidity, and corrosion.



POTENTIAL APPLICATIONS

Aerospace, copier diffuser rollers, duct temperature sensing, engine exhaust gas recirculation systems, engine management systems, fluid or air temperature sensing within the HVAC or engine environment, HVAC compressors, industrial, industrial ovens and ranges, refrigeration compressor equipment, transportation, and water heaters/boilers.

FEATURES

- Vibration and shock resistant
- On-board signal conditioning circuitry available
- Allows for monitoring of harsh gaseous and liquid environments
- Wide range of operating temperatures
- Provides a system solution instead of just a component
- NTC thermistor output available (500 Series)
- Enhanced accuracy, response time, and stability
- Wide selection of housing, resistance, and termination options
- RFQ responses to custom thermal products typically within one week or less
- Requests for samples typically ship within 17-20 working days

Thermostats - Precision

PRODUCT OVERVIEW

Bi-metallic, snap-action, SPST thermostats. Hermetic/non-hermetic devices available.

Enhanced reliability versions meet stringent requirements of military and aerospace industries for dielectric strength, moisture, resistance, vibration, and shock. Available in low profile, logic level, and automatic reset.



POTENTIAL APPLICATIONS

Aerospace, antenna gimbals, battery heater controls, blood analyzers, commercial aircraft, computers, copier machines, de-icing systems, dialysis equipment, environmental controls, food service and carts, industrial controls, infotech, medical electronics, power supplies, satellite thruster rockets, shuttle avionics, telecommunications, and test equipment.

FEATURES

- Tight tolerances (± 3 °F)
- High reliability and military (QPL) versions
- Excellent resistance to shock and vibration
- Up to 8 A electrical loads
- UL and CSA approvals
- Wide variety of mounting and termination options
- Custom designs available
- Pre-set and tamper proof
- 100 % tested at factory
- RFQ responses to custom thermal products typically within one week or less
- Requests for samples typically ship within 17-20 working days

Thermostats - Commercial

PRODUCT OVERVIEW

Half-inch snap-action, bi-metallic, SPST non-hermetic thermostats. Automatic or manual-reset options. Phenolic or ceramic housings. Wide variety of mounting brackets and terminals.



POTENTIAL APPLICATIONS

Copy machines, fax machines, fire alarms, fireplaces, gas-fired heaters, glue guns, heat/smoke detectors, heater controls, humidifiers, HVAC, laser printers, power supplies, refrigeration, and steamers.

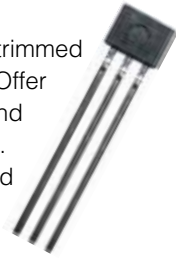
FEATURES

- Operating temperature range up to 260 °C [500 °F]
- Wide variety of mounting and termination options
- Custom designs available
- Pre-set and tamper proof
- Up to 15 A electrical loads
- Gold contacts available
- UL, CSA, and other international agency approvals
- RFQ responses to custom thermal products typically within one week or less
- Requests for samples typically ship within 17 to 20 working days

Discrete and Packaged RTD Sensors

PRODUCT OVERVIEW

Platinum-based thin film RTDs, laser trimmed for accuracy and interchangeability. Offer stable, fast, linear inputs. Accurate and interchangeable without recalibration. Plastic and ceramic, miniaturized, and surface-mount housings (including printed circuit board termination). Series include HEL, 700, HRTS, and TD.



POTENTIAL APPLICATIONS

Electronic assembly thermal management, HVAC equipment, motor overload and semiconductor protection, process control, and temperature compensation.

FEATURES

- Linear resistance vs. temperature
- Interchangeable
- Enhanced stability
- Wide temperature range
- Teflon or fiberglass lead wires
- Provides 8 Ohm/°C sensitivity with inherently near linear output (TD)
- Fully assembled and ready to use without need for fragile splices to leads (HRTS/HEL-700)
- Surface mount in industry standard 0805 and 1206 packages (700)
- SIP package with solderable leads for strong connections to wires or printed circuit boards (HEL-775/776/777)

Discrete Thermistors

PRODUCT OVERVIEW

Change resistance with change in temperature. This change can occur in the surrounding temperature or by passing a current through the thermistor to self-heat. Available in a wide range of resistance values. Variety of packages and styles from leaded devices to surface-mount versions.



POTENTIAL APPLICATIONS

Aerospace, gas chromatography, instrumentation test equipment, integrated circuits, measurement and control applications, medical assemblies, military, pc boards, semiconductor devices, telecommunications, temperature control and indication, and thermal conductivity gas analysis instruments.

FEATURES

- Extremely fast thermal response
- Lower cost alternative to other resistive technologies
- Tolerances as low as $\pm 1\%$
- Can be used both as a temperature monitor and control
- Board-mountable designs occupy minimal space and can be inserted using pick and place
- Extremely stable over life
- RFQ responses to custom thermal products typically within one week or less
- Requests for samples typically ship either immediately from stock or are built to order, depending on the product ordered

Limitless™

Wireless Limit Switches

PRODUCT OVERVIEW

Combines the best of Honeywell's limit switches with the latest commercial state-of-the-art wireless technology. Can be used for position sensing and presence/absence detection for an endless number of applications. Especially beneficial for remote monitoring where wiring or wire maintenance is not physically possible or economically feasible. Product series includes the WLS and WGLA switches.



POTENTIAL APPLICATIONS

Construction/ag machines, conveyors, crane boom/jib/skew position, door position, grain diverters or flaps, hose attachment verification, lifts, material handling, movable machinery, presses, remote or temporary equipment, specialty machines, and valve position.

FEATURES

- Radio (license-free and global): WPAN 802.15.4, 2.4 GHz, point-to-point
- FCC 15.247, Industry Canada RSS 210, ETSI, CE mark, ACMA, C-Tick mark, COFETEL, IDA, ANATEL, SRRRC, KCC, WPC approvals
- EMI resistance protects against external interference
- In excess of 305 m [1000 ft] line-of-sight communication
- EN50041 metal enclosure
- IP67; NEMA 1, 4, 12, 13 (WGLA Series)
- IP67/IP68; NEMA 1,3, 4, 6, 6P, 12,13 (WLS Series)
- Unique all-metal drive train and twin shaft seals (WLS Series)
- Full complement of operating heads and levers
- -40 °C to 185 °C [-40 °F to 185 °F] operating temp
- Standard replaceable battery with ultra-low power consumption
- Direct or remote mount antenna options

Limitless™

Wireless Non-Contact Switches

PRODUCT OVERVIEW

Provides non-contact presence/absence detection of a variety of different magnet styles and magnetic actuators installed on the end-users' product, machine, or equipment. Features an industrial grade reed switch that can be oriented within the switch's plastic head, i.e., either top- or side-sensing. Especially beneficial for remote monitoring where wiring or wire maintenance is not physically possible or economically feasible. Product series include WLS.



POTENTIAL APPLICATIONS

Machine tools, packaging machinery, lifts, ag/construction equipment, and industrial machines.

FEATURES

- Radio (license-free and global): WPAN 802.15.4, 2.4 GHz, point-to-point
- FCC 15, IC, ACMA, ETSI, COFETEL, WPC & IDA
- In excess of 305 m [1000 ft] line-of-sight communication
- IP67; NEMA 1, 4, 12, 13
- Zinc head and body are phosphate treated and epoxy finished
- Standard replaceable battery with ultra-low power consumption
- Direct or remote mount antenna options

Limitless™ Single Switch Adapters

PRODUCT OVERVIEW

Converts almost any electromechanical switch with low-energy contacts (i.e., gold) into a wireless switch. A user-supplied electromechanical switch is simply wired to the WLS Series Single Switch Adapter via the internal or external connections to then become a wireless-enabled switch for use with the Limitless™ WPMM or WDRR Series of monitors/receivers. The Limitless™ Single Switch Adapter can be used in a variety of industrial wireless limit switch applications such as reed, contact, pressure, door actuator, etc.



POTENTIAL APPLICATIONS

Agricultural equipment, construction equipment, door actuation (up/down) switch, industrial machines, lifts, machine tools, packaging machinery, wireless warehouse operations, wireless electromechanical switch applications (i.e., pressure switch, reed switch, basic switch and/or limit switch).

FEATURES

- Radio (license-free and global): WPAN 802.15.4, 2.4 GHz, point-to-point
- FCC 15, IC, ACMA, ETSI, COFETEL, WPC & IDA
- Up to 305 m [1000 ft] line-of-sight communication range when used with a Limitless™ WPMM Series wireless monitor or WDRR Series receiver module (sold separately)
- IP67; NEMA 1, 4, 12, 13
- 4-pin M12 micro-change receptacle, cable grip with internal connector wiring options
- Internal battery power
- Body phosphate treated and epoxy finished with a 30 % glass-filled PBT plastic head
- Direct or remote mount antenna options

Limitless™ Wireless Operator Interfaces

PRODUCT OVERVIEW

Enables operator indication (i.e. push button) from remote locations where wiring is too costly or not possible. The WOI Series provides flexibility for users to choose and install their desired operator type; i.e. 22 mm rotary switch, 22 mm key switch, etc. Able to reconfigure multiple WOI inputs which easily allows for adding, subtracting, or relocating of Limitless™ WOI switches.



POTENTIAL APPLICATIONS

Agricultural equipment, CNC action, conveyors, door/gate action, lifts, material handling, motor drives, movable machinery, presses, pumps, quality control buttons, specialty machines, stop/start machinery, stop/start production, valve action.

FEATURES

- In excess of 305 m [1000 ft] line-of-sight communication
- Aluminum enclosure
- IP65 sealing
- 22 mm flush, 29 mm mushroom, and 40 mm mushroom (push-pull) round pushbutton operators available
- User chosen/installed operator type is allowable
- Momentary and maintained contact options
- Radio (license-free and global): WPAN 802.15.4, 2.4 GHz, point-to-point
- FCC 15.247, Industry Canada RSS 210, ETSI, CE mark, ACMA, C-Tick mark approvals

Limitless™ Wireless Monitors and Receivers

PRODUCT OVERVIEW

Wireless panel-mount monitors provide a visual, audio, and NPN-type output based on a signal received from a Limitless™ input. Offer quick indication of an actuator position



change on a paired Limitless™ switch. DIN-rail receivers accommodate up to 14 Limitless™ digital inputs for applications that need more than one-input/one-receiver configuration. Provides a separate visual and selectable NPN- or PNP-type output. Product series includes the WPMM and WDRR.

POTENTIAL APPLICATIONS

Construction/ag machines, conveyors, crane boom/jib/skew position, door position, grain diverters or flaps, hose attachment verification, lifts, material handling, movable machinery, presses, remote or temporary equipment, specialty machines, and valve position.

FEATURES

- Radio (license-free and global): WPAN 802.15.4, 2.4 GHz, point-to-point
- FCC 15.247; IC RSS 210, ETSI, CE mark; ACMA, C-TICK; COFETEL; IDA; ANATEL; WPC; SRRC; KCC approvals
- EMI resistance protects against external interference
- In excess of 305 m [1000 ft] line-of-sight communication
- Field pairing function
- Diagnostic functions include lost RF and low battery indication
- Panel-mount enclosure (snap-in or screw mount) (WPMM)
- DIN-rail or screw mount (WDRR)
- Direct or remote-mount antenna

MICRO SWITCH™

Heavy-Duty Limit Switches

PRODUCT OVERVIEW

Offer a rugged, die-cast body with multiple mounting and actuator options. Low- and high- temperature construction and factory sealed, pre-wired versions available. Includes boss-and-socket head design for secure head-to-body retention, unique all-metal drive train for consistent operating characteristics even at high temperature, and self-lifting pressure plate terminals to save wiring time. Type 316 stainless steel housing available.



POTENTIAL APPLICATIONS

Automotive machine tools, caustic waste handling, conveyors, food and beverage machinery, machine tools, material handling, packaging, presses, power generating plants, pulp and paper, welding, and shipboards/dock side.

FEATURES

- Rugged housing with electrostatic epoxy finish
- Sealed to NEMA 1, 3, 4, 4X, 6, 6P, 12, 13; IP65/66/67
- Fully potted versions exceed NEMA 6P washdown
- Side rotary styles may be field modified for CW and/or CCW operation
- Operating heads can be rotated 90°

MICRO SWITCH™

Medium-Duty Limit Switches

PRODUCT OVERVIEW

Featuring a small metal package size. Medium-duty product series includes the 14CE/914CE, LS, BZE6/V6, and SL1.

POTENTIAL APPLICATIONS

Agricultural equipment, automotive factory floor, conveyors, cranes, earth moving, electronic assembly equipment, lift trucks, machine tools, material handling, packaging, printing, platform lifts, processing equipment, robotics, surface transportation, and textiles.



FEATURES

- Rugged housing, miniature size
- Variety of operating characteristics, heads, actuators, styles, and terminations
- Direct-acting contacts available
- Pre-leaded or various quick connect terminations
- Mode of operation is field adjustable
- Standard and low-temperature versions
- Gold contacts available

MICRO SWITCH™

Global Limit Switches

PRODUCT OVERVIEW

Designed to meet the requirements of the International Electrotechnical Commission (IEC) for worldwide acceptance. Rugged electromechanical switches to detect the position of equipment by physical contact with the switch actuator. Product series includes the GLA, GLC, GLD, GLE, 91MCE, and SZL-VL.



POTENTIAL APPLICATIONS

Aerial/platform lifts, agricultural equipment, construction, cranes, dock locks/levelers, forklifts, electronics assembly, elevators, escalators, food and beverage, gaming, industrial doors, injection molding machines, lifts, machine tooling, moving stairs, packaging, plastic molding equipment, PLC interface, rail, and wind turbines.

FEATURES

- Broad range of actuators and electrical terminations
- Global approvals, support, and sourcing
- IP66/67 sealing, NEMA 1, 3, 4, 12, 13
- Metal and plastic housings
- EN50041 and EN50047 mounting patterns
- Direct-acting NC contacts (GLS)
- Analog output option (GLS)
- Side and bottom exit connection options (91MCE)
- Gold-plated silver contacts (SZL-VL)

MICRO SWITCH™

Hazardous Area Switches

PRODUCT OVERVIEW

Electromechanical switches designed specifically to extinguish flame paths in potentially explosive environments. Major products: EX, 14CE100, CX, GXE, LSX, BX, and GSX. Smaller sizes, lower cost options, analog output available. LSX, BX, EX weather-sealed for indoor or outdoor use, as low as -40 °C [-40 °F]. CLSX cable-pull version available.



POTENTIAL APPLICATIONS

Chemical and food processing, control valves and actuators, conveyor lines, grain conveyors, grain handling, mining equipment, oil and gas equipment, oil and gas refineries, paint facilities, petro-chemical plants and refineries, pipeline flow control and accessories, pulp and paper coating, power generating, waste and material handling.

FEATURES

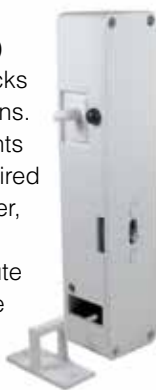
- Built for use in hazardous-rated areas
- Heavy-duty enclosures will withstand pressure of internal explosion
- Weather-proof, water-tight, and dust-tight
- Selection of actuators and circuitry options
- Indoor and outdoor versions
- UL, CSA, ATEX, IEC Ex, and INMETRO certified products available
- Small packages available
- Variety of sealing options for specific needs
- Silver and gold contacts available

Relialign™

Door Interlock Switches

PRODUCT OVERVIEW

Electromechanical residential (RDI) and commercial (CDI) door interlocks designed for swing door applications. Holds the door in place and prevents it from being opened when not desired (e.g. the elevator/lift car, dumbwaiter, etc. is not present at the door). A number of design features contribute to increase safety, reduce nuisance stoppages and call-backs, and contribute to simplified wiring and installation.



POTENTIAL APPLICATIONS

In the USA: residential swing door applications, specifically dumbwaiters, lifts for the mobility impaired, and swing-door elevators

In Canada: residential swing door applications, specifically elevators and dumbwaiters

FEATURES

- RDI: Compliant to ASME A17.1, cULus, and CAN/CSA B44
- CDI: Compliance with ASME A17.1, ASME A18.1, cULus, and CAN/CSA B44
- Manual override for easy actuation without user hazard
- Two separate mechanical actions to indicate door closure
- Rugged metal housings
- Metal key
- Internal solenoid control (optional)
- No open or exposed contacts
- Series or parallel wiring option for the door closed and door locked switches
- 6-pin terminal strip or Cat 5 connection options
- Configurable product platform

MICRO SWITCH™

Premium and Standard V Series Basic Switches

PRODUCT OVERVIEW

Often used for simple or precision on/off, end-of-limit, presence/absence, pressure, temperature, and manual operator interface applications. UL, cUL, ENEC, CQC approvals.



POTENTIAL APPLICATIONS

Appliances, business equipment/computers, gaming, industrial controls, manually operated devices, office equipment, test instruments, timing devices, valves, vending machines, and water heaters.

FEATURES

- Worldwide package size acceptance
- Current ratings from 0.1 A to 26 A
- Choice of actuation, termination, and operating characteristics
- Broad range of electrical loads and operating forces
- Wide temperature range
- Products with extended mechanical and electrical life
- Custom engineered solutions available

MICRO SWITCH™

Premium and Standard Miniature & Subminiature Basics

PRODUCT OVERVIEW

Designed for high precision, presence/absence detection, where physical contact with an object is permissible and in simple on-and-off actions. Compact, highly reliable, and rugged snap-action switches. Premium switches include SM and SX Series. Standard switches include ZD, ZM, ZV, ZW, and ZX Series.



POTENTIAL APPLICATIONS

Aerospace, appliances, business equipment/ computers, communication equipment, electrical parking brakes, HVAC, indicator lights, instrumentation, lock modules, manually operated devices, medical/ dental equipment, office equipment, subassemblies for convertible roofs, timing devices, valves, vending machines, and wiring harnesses for automotive/ trucks/boats.

FEATURES

- Broad range of ratings, operating actions, and terminations
- Wide choice of actuators and operating characteristics
- Electrical versatility including up to 25 A
- Lower cost vs. solid state
- Package sizes as small as 0.26 in
- Silver, gold, gold-plated silver, silver tin-indium oxide contacts
- MIL-PRF-8805 qualified listings available
- Low energy or power-duty electrical range options

MICRO SWITCH™

Premium Large Basic Switches

PRODUCT OVERVIEW

Worldwide standard large snap-action switch. Often ideal for high cost-of-failure applications. Low operating force and differential travel.

Current ratings from 10 A to 25 A. Designed to withstand 100K operations at full load or 10M for mechanical life. Series includes the BZ/BA/BM/BE, DT, MT, 3MN, 6AS, AC, and DM.



POTENTIAL APPLICATIONS

Generators, dc motors, HVAC, industrial equipment, irrigation systems, machine tools, manually operated devices, medical/dental equipment, office equipment, presses, semi-truck trailers, timing devices, and valves.

FEATURES

- Broad range of ratings, operating actions, and terminations
- Wide choice of actuators and operating characteristics
- Electrical versatility including up to 25 A
- Low operating force and travel
- Momentary or maintained actions
- High temperature versions (204 °C [400 °F])
- 6AS/8AS Series feature two switches joined and actuated by a common lever
- Variety of accessories complement large basic switches including auxiliary actuators, die-cast zinc and plastic enclosures, adjustable mounting brackets, and conversion mounting brackets

MICRO SWITCH™

Watertight Miniature Switches

PRODUCT OVERVIEW

Basic switches designed for harsh-duty, wash down areas. Rugged yet precise, provides machine control for turning circuits on and off. Can be used in a wide range of challenging environments. Often chosen due to their small size and sealing options when there is a need to sense presence or absence in a compact package. Accurate repeatability and extended life. Series includes the ZD, ZW, and V15W Series.



POTENTIAL APPLICATIONS

Appliances, automotive, chair lifts, communication equipment, computers, electric tools, electro-mechanical timers, foot pedal controls, HVAC wall controls, instrumentation, lock modules for tail-gate/trunk, mechanical cam assemblies (timers), medical and hospital beds, office equipment, sub-assemblies for convertible roofs, tank and hood latch detection, truck/boat wire harnesses, valves, and vending machines.

FEATURES

- Degree of protection: IP67 (except terminal parts) to operate under difficult environmental conditions
- Broad range of electrical loads
- Straight, roller, simulated roller, and special actuators
- Special terminations available upon request
- Wide temperature range
- Pre-leaded wires for easy installation
- Global approvals (UL, cUL, ENEC, CQC)

MICRO SWITCH™

Sealed Switches

PRODUCT OVERVIEW

Precision switches enclosed within a corrosion-resistant aluminum housing that seals the switch contacts from contamination. Excel in applications requiring compactness, lightweight, accurate repeatability, and extended life. Series includes the SE/XE, HM, and HS.



POTENTIAL APPLICATIONS

Adverse gas or vapor environments, aircraft, cement mills, desert vehicles, earth moving machinery, helicopters, industrial environments, oil drilling installations, marine environments, ordnance, refrigeration units, spacecraft, stationary undersea equipment, submarines, and valve controls.

FEATURES

- Rugged stainless steel housings
- Qualified to MIL-PRF-8805
- Power load switching capability up to 7 A (SE/XE) or 25 A at 28 Vdc (HS)
- Several auxiliary actuators and choice of terminations
- High temperature construction
- Reduced sensitivity to changes in altitude or pressure (HM, HS)
- Housings as small as 0.25 in

Aerospace-Grade Pressure Switch

PRODUCT OVERVIEW

Highly customizable pressure switch for demanding military and aerospace applications. Meets military and DO-160 standards. Analog outputs to indicate gas or liquid pressure.



POTENTIAL APPLICATIONS

Aerospace systems: engines, fuel pressure, and hydraulic systems, military ground vehicles, military maritime systems, and ordnance and munitions release systems.

FEATURES

- High current or logic-level load options
- Configurable with multiple pressure fittings and electrical connectors
- Optional 90° wire harness exit
- Easily configurable to different pressure set points and differentials
- MIL-PFR-8805 rated switch mechanism
- Industry's broadest pressure range: 35 psi to 5000 psi
- Lightweight, compact
- Vertically integrated production for faster lead-times
- Strong support with MICRO SWITCH™ expertise

Integrated Value-Added Assemblies

PRODUCT OVERVIEW

Combining sensing elements, gearing, and other custom functions into an environmentally sealed housing designed to last the life of the aircraft without servicing.



Integrated assemblies help solve challenging packaging and functional problems within precision aerospace requirements. Design and production of sensor assemblies in concert with customer that optimize engineering time, cost, and performance.

POTENTIAL APPLICATIONS

Aerospace and military.

FEATURES

- Sixty years experience in mil-aero applications
- Optimize customer engineering time
- Reduce customer development risk
- Reduce integration and assembly costs
- Broad portfolio and deep technical expertise in precise, reliable sensors
- Customers of integrated assemblies include all major aircraft OEMs, US, and foreign government agencies
- Integrated supply chain, global footprint

Passive Pilot Controls

PRODUCT OVERVIEW

Fully packaged, qualified pilot control equipment for both aircraft and military ground vehicles. Retrofit and upgrade applications.



POTENTIAL APPLICATIONS

Aerospace and military applications including equipment for use in active inceptors (joystick/sidestick/centerstick), flap control, passive inceptors (joystick/sidestick/centerstick), rudder/brake pedal assemblies, speedbrake, and spoiler control.

FEATURES

- Synchro, capacitive, or analog dc voltage inputs
- Lighting options
- 400 Hz frequency
- ± 0.7 %FS accuracy (higher tolerance available)

Y-Guides

PRODUCT OVERVIEW

Provides lateral guidance of unit load devices in the entrance area of the aft lower hold.



POTENTIAL APPLICATIONS

Cargo loading systems for aircraft.

FEATURES

- Front rail assembly fitted with six off rollers; strut support is bar driven by an electric motor
- Product life: 40,000 cargo load cycles (life of the aircraft)
- Two configuration options
- Rugged and reliable
- Built to exacting tolerances

MICRO SWITCH™

Safety Limit Switches

PRODUCT OVERVIEW

Electromechanical limit switches designed to be readily accessible for emergency stop applications.

Reliability

and safety in

compact, cost-effective switches. Series includes the 24CE/924CE, GSS, and GSX.



POTENTIAL APPLICATIONS

Cams, construction machinery and equipment, doors, machine tools, material handling equipment, packaging machinery, sliding doors, and textile machinery.

FEATURES

- Range of actuation methods for detecting conditions in guarding and machine status applications
- EN50041 and EN50047 mounting and characteristics (GSS)
- IEC electrical standard for global applications
- Positive opening operation of normally closed contacts (conforming to IEC/EN60947-5-1-3) (GSS)
- Snap-action contacts with positive break in an explosion-proof housing (GSX)
- Pre-wired with choice of cable lengths and side or bottom exit cable (24CE/924CE)
- Complies with ATEX, IEC Ex, UL/CSA, INMETRO (GSX)
- Zinc and glass-filled polyester housing options (GSC/D/E hinge mount)
- Full range of actuator heads and lever options (GSS)

MICRO SWITCH™ Key-Operated Safety Switches

PRODUCT OVERVIEW

Designed for use on machinery where key removal brings the machine to an immediate safe condition. Miniature switches for smaller openings. Reduced installation time and cost. Series includes the GK, GKE, GKM, GKN, and GKR/L.



POTENTIAL APPLICATIONS

Harsh environments, hinged or sliding guard doors/screens, machine tools machinery, metalworking machines, plastic molding machines, protective covers and enclosures, robotics assembly cells, and special purpose machinery.

FEATURES

- Positive opening contacts
- Designed for global acceptance
- Various sizes and configurations available
- Multiple key entries, actuator styles, housings, and contacts
- Daisy-chain capability (GKME)
- Standard mounting per EN50041 (GK)
- Small footprint (GKE)
- Large wiring cavity and four-entry head (GKN)
- Solenoid power-to-lock or power-to-unlock (GKR/L, GSS)

MICRO SWITCH™ Cable-Pull Safety Switches

PRODUCT OVERVIEW

Designed to provide emergency stop protection for exposed conveyor lines.

Cost-effective means of providing an emergency stop signal compared to multiple emergency stop push buttons. Internal mechanism latches on both slackened cable (push) and pulled cable. Capability enhances productivity by eliminating nuisance stops due to variations in temperature, stretch of cable over time, and other application variables. Product series includes the 1CPS (single cable pull), 2CPS (double cable pull).



POTENTIAL APPLICATIONS

Conveyor systems having a high amount of vibration, experience wide temperature swings, or where easy through wiring or highly visible trip status is required. Perimeter guarding where hosedown conditions are present.

FEATURES

- 1CPS single head for single span; 2CPS dual head for dual span
- Direct opening of normally closed contacts if emergency occurs
- Typical cable span of 76 m [250 ft] on 1CPS and 152 m [500 ft] on 2CPS
- Gold-plated contacts available
- Extremely rugged design for harsh environments and/or applications
- Easy wiring, installation, and setup

Non-Contact Safety Switches

PRODUCT OVERVIEW

Magnetically operated, non-contact safety switches designed for use in many machine-guarding applications. Tamper-proof, standalone safety switches that can often be used to switch relays, contacts, or safety relays directly.



POTENTIAL APPLICATIONS

Can forming and filling (aluminum, steel, and plastic), pick-and-place packaging and assembly equipment, plastic molding equipment, printing machinery, semicon equipment, textile machinery, and woodworking machinery.

FEATURES

- Tamper-proof electronic switching
- 7 mm to 10 mm [0.28 in to 0.40 in] operating distance
- ABS and stainless steel housing options
- Guard status indication (FFS)
- Options of one or two safety contacts
- Tested to over one-million operations
- Simple mounting (M18/30 thread mounting or frame-mountable versions)
- ac and dc versions
- Easy daisy-chain configurations
- DIN rail mounting capability

MICRO SWITCH™

Sealed and Standard Toggle Switches

PRODUCT OVERVIEW

Hermetic and environmentally sealed toggle switches offer enhanced reliability with MICRO SWITCH™ technology.

Honeywell drives in a center pin for ultimate stabilization. Series includes the AT, TS, TW, ET, NT, and TL switches.



POTENTIAL APPLICATIONS

Aerial lifts, agricultural equipment, construction equipment, factory floor control units, industrial machinery and equipment, machine tool equipment, material handling equipment, medical instrumentation, military and commercial aviation, process controls, scissor lifts, test instruments, and truck-mounted telehandlers/cranes.

FEATURES

- 2- or 3-position, momentary and maintained action
- 1-, 2-, or 4-pole circuitry
- MIL-PRF-8805, MIL-S-5594, MIL-DTL-3950, and MIL-DTL-83731 qualified listings available
- Lever lock and lit options
- Featuring a large selection of circuitries, contacts, bushings, lever designs, and electrical terminations
- Available with IWTS (Integrated Wire Termination System), wired, plug-in connection method (TL, TW)
- High impact strength case material
- Toggle-actuated hermetic switches available

MICRO SWITCH™

Lit and Unlit Pushbutton Switches

PRODUCT OVERVIEW

Lit or unlit. Designed to enhance manual operation with a flexible and attractive interface. Snap-in surface products are easy to apply, operate, and maintain. Switch units are potted in corrosion-resistant metal enclosures. Series includes the PB, AML, and MML.



POTENTIAL APPLICATIONS

Control boards and panels found in computer mainframes and peripherals, flight decks, industrial machinery, instrumentation, medical instrumentation, process control, and test equipment.

FEATURES

- Compact size
- Up to four poles
- Momentary and alternate action switches
- Flexible leaf actuator for lower operating force and shorter button travel
- MIL-PRF-8805 and MIL-STD-1080D qualified listings available
- Choice of terminations, button colors, and electrical data

MICRO SWITCH™ Sealed and Standard Rocker Switches

PRODUCT OVERVIEW

Unprecedented line-up of full-size, miniature, and subminiature rocker switches. 1- or 2-pole switches in single-throw and double-throw maintained and momentary circuits. Series includes the AML and MML.



POTENTIAL APPLICATIONS

Agricultural equipment, appliances, business machines, coffee makers, construction equipment, hand-held vacuums, heavy-duty machinery, marine equipment, office lighting, popcorn machines, portable heaters, power supplies, recreational vehicles, test equipment, telecom, and washing machines.

FEATURES

- Designed to fit industry-standard mounting holes
- LED and neon lamp color options
- Choice of actuator colors, panel seals, lamp circuits
- Customized appearance with choice of colors and legends
- Wide electrical capability from electronic duty to power duty switches
- Available with or without diode protection for LEDs and lamp circuit independent of switch circuit

Key and Rotary Switches

PRODUCT OVERVIEW

Environmentally sealed. O-rings help keep dirt and moisture out of contact chamber and prolong switch life. Two-, three-, and four-position switches.

Honeywell can provide up to 300 unique key codes and match an existing key cut. Integral connector and screw terminal versions.



POTENTIAL APPLICATIONS

Aerial/scissor/boom lifts, agricultural equipment, all-terrain vehicles, construction equipment, forklifts, golf carts, marine equipment, material handlers, skid loaders, snowmobiles, and tractors.

FEATURES

- Environmentally sealed with two o-rings
- Integral Packard, Sumitomo integral connector, or screw terminal connections
- Sliding precious metal contacts
- Key cover to protect against elements
- Optional custom-molded key cover with customer logo
- Key is removable in multiple positions
- Weep holes in key housing allow for drainage
- Screw terminal type switches
- Designed to withstand severe temperature extremes and chemical splashes
- UL certified

Push-Pull Switches

PRODUCT OVERVIEW

Robust.

Environmentally sealed. Activates or disrupts a particular equipment function.

Sliding

contact switch

incorporating two circuits with multiple combinations.

Available with five different circuitry options.



POTENTIAL APPLICATIONS

Boom lifts, compressors, fork lifts, generators, lawn and garden, loaders/backhoes, machine tools, material handlers, scissor lifts, skid steer, telehandlers, and tractors.

FEATURES

- Environmentally sealed with two o-rings
- Positive disconnect suitable for e-stop
- Compact design
- Momentary push version available
- Sliding precious metal contacts
- Multiple circuitry options
- Screw terminal connections
- Environmental sealing of terminal options available
- Button available in a variety of colors
- Excellent vibration and shock resistance
- Emergency stop switch is UL and CE certified

Handlebar Controls

PRODUCT OVERVIEW

For applications requiring electrical/electromechanical control with multi-functions: throttle controls, indicator lights, and multi-function switches. Can be used in severe applications and be sealed or unsealed.



POTENTIAL APPLICATIONS

Agriculture, all-terrain vehicles, construction, electric vehicles, forestry, lawn and garden, material handling equipment, military vehicles, and motorcycles.

FEATURES

- Configurable platform 1080HD controls
- Scalable functionality with minimal tooling
- Utilizes sliding contacts with a variety of button engagements
- Ergonomically sensitive in design
- Environmentally protected
- Configured to customer specification
- Switches can be sealed or unsealed
- Standard circuitry and components
- Designed for speed and directional control
- Night visibility/lighted components capabilities
- Indicator light panels available

Shifters and Turn Signals

PRODUCT OVERVIEW

Crafted for enhanced off-highway application performance, precision, direction, and speed control. Sealed and built to withstand rugged conditions and harsh environments. Can be configured as transmission controls for forward/neutral/reverse and gear selection. Offer head lamp, wiper, and horn controls.



POTENTIAL APPLICATIONS

Agricultural equipment, construction equipment, ground support, material handling equipment, off-highway and military vehicles, and recreational vehicles.

FEATURES

- Rugged design
- IP67 rated
- Environmentally sealed with two o-rings
- Sliding precious metal contacts
- Configurable design
- Integrated connector or wiring harness
- Firm/twist handle grip
- Auto-cancel turn signals
- Variety of button options
- Mounting clamp option available
- Mounting on 38 mm, 45 mm, or 55 mm columns

Pressure and Vacuum Switches

PRODUCT OVERVIEW

Sense a change in pressure or vacuum, opening or closing an electrical circuit when designated point is reached. Featuring set points from 0.5 psi to 4500 psi. Switches from 1.1 in to 22 in Hg also available.

Enhanced repeatability of set points and wide media capability. Uses a diaphragm or quad seal and piston to receive actuating media. Series includes the HP, HE, LP, LE, 1000, 5000, and V.



POTENTIAL APPLICATIONS

ABS brakes, air brakes, brakes, cruise control, dental air, embalming equipment, engine shut-down, engine transmission, fuel pressure, generators/compressors, hydraulics, oxygen concentrators, parking brake, pool/spa water pressure power steering, pre-lube, and transmission.

FEATURES

- **High Pressure:** Factory set 150 psi to 4500 psi [10,34 bar to 310,26 bar] (HP Series, HE Series)
- **Low Pressure:** Factory set or field adjustable 3.5 psi to 150 psi [0,24 bar to 10,34 bar] (LP Series, LE Series)
- Life cycle rating up to 2 million (HP, LP Series)
- Flexibility to modify switches to meet customer requirements
- Excellent repeatability of set points at temperature extremes
- Wide media capability
- Low cost/high value electromechanical design
- Robust design for severe environmental conditions
- Broad set point range
- Banjo bolt fitting (Series 1000)

Hour Meters

PRODUCT OVERVIEW

Records and tracks total elapsed time of equipment usage. Parts are in-process tested for functionality and timing accuracy before shipping. Series include LM, 20000, 28100, 82000, and 85000.



POTENTIAL APPLICATIONS

Agricultural equipment, cleaning equipment, construction equipment, control panels, diagnostic equipment, generators, lawn and garden tractors, lifts, material handling, mining, office equipment, on- and off-highway, oxygen concentrators, panel assemblies, sport/utility vehicles, and recreational vehicles.

FEATURES

- Accuracy to $\pm 0.02\%$
- Various mounting configurations
- Precision built relay driving odometer (dc meters)
- Excellent vibration and shock resistance
- Several sealing options
- UL, CSA certified
- Alternator load dump: 150 V (Quartz +)
- Running indicator
- 1/100 hour precision optional (Quartz +)
- LCD display
- ac meters have CE mark

Pressure Transducers – Model FP2000 Series

PRODUCT OVERVIEW

One of our most popular products. Silicon-based pressure and differential pressure transducers originally designed for rugged automotive engine testing, now widely used in various types of test and measurement applications. Highly configurable; most popular configurations available for quick shipment in two weeks or less. Choose from two accuracies, four outputs, five electrical terminations, and 24 pressure ranges.



POTENTIAL APPLICATIONS

Power train testing – dyno labs test stands (engine, transmission, jet engine, hydraulic systems), ground support engine testing, industrial hydraulic controls, and paint spray gun pressure.

FEATURES

- Highly configurable (> 10,000 combinations)
- 0.10 % and 0.25 % accuracies available
- mV/V, 0 Vdc to 5 Vdc, 0 Vdc to 10 Vdc, 4 mA to 20 mA
- Gage, absolute, barometric, vacuum
- Differential (wet/wet, wet/dry)
- Intrinsically safe option available
- Quick delivery from stock
- Custom options available

View the complete Honeywell T&M portfolio online:
<http://measurementsensors.honeywell.com>

Or call: **800-848-6564** or **+1 614-850-5000**

Pressure Transducers – Digital Pressure Sensor with CANopen®

PRODUCT OVERVIEW

Rugged, stainless steel, all-welded devices are designed to work with a variety of media, and are built to provide consistent performance in harsh environments. Selection of pressure types, accuracy levels, pressure ranges, pressure connections and electrical terminations allow customers to configure the devices to meet specific application needs.

CANopen® protocol simplifies installation and sensor tracking along with mitigating data corruption.



POTENTIAL APPLICATIONS

Aerospace (non-ITAR) test and research labs, automotive test benches, construction equipment, factory automation/industrial equipment, general industrial process control, medical equipment systems (i.e., X-ray collimator, MRI scanning, etc.), rail equipment testing.

FEATURES

- Accuracy options ≤ 30 psi, ± 0.25 %FS or >30 psi, ± 0.1 %FS or ± 0.25 %FS
- Wide pressure range from 10 psi to 10K psi or 1 bar to 700 bar or 70 kPa to 70000 kPa
- Configured with a variety of features and options
- All-welded, 300 series stainless steel and Hastelloy® design allow for use in harsh environments
- CANbus output with CANopen protocol
- ± 2 %FS Total Error Band
- Two connector options: 5-pin M12 and 6-pin Bendix
- Mechanical shock: 100 G/11 ms

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Pressure Transducers – Models TJE and Super TJE

PRODUCT OVERVIEW

Foil-based strain gage technology enables the Models TJE (0.1 % accuracy) and Super TJE (0.05 % accuracy) to withstand pressure that would destroy silicon-based or micro-machined pressure sensors. All-welded stainless steel construction, designed for rugged industrial applications that require high accuracy, enhanced reliability, and measurement stability. Highly configurable, intrinsically safe option available.



POTENTIAL APPLICATIONS

Engine and transmission test stands, fluid flow/flow measurements, fluid pump pressure, fuel line pressure, fuel/air ratio, brake assembly test, air bag system fill pressure, pressure brake testing, long term testing. Hydraulic sensor: brake pedal forces, ABS pressures, tire mold pressure control. Differential pressure models: flow measurement, depth sensing, pressure equalization, liquid level, leak detection.

FEATURES

- 0.10 % (TJE) and 0.05 % (STJE) accuracies
- Ranges: 0.5 psid to 30 psid, 1 psig/psia to 60000 psig/psia (TJE), 0.5 psid to 30 psid (TJE Differential); 10 psig to 7500 psig (Super TJE)
- mV/V, 4 mA to 20 mA, 0 Vdc to 5 Vdc, or 0 Vdc to 10 Vdc output
- Gage, absolute, vacuum
- Differential (wet/wet)
- Intrinsically safe option available (select models)
- CE approved
- Custom options available

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Or call: **800-848-6564** or **+1 614-850-5000**

Wing Union Pressure Transducers

PRODUCT OVERVIEW

Wing Unions (also known as Hammer Unions), provide highly accurate and reliable data to help detect small changes in drilling pressure, enabling quick operator adjustments to media flow or drilling process. All-welded, one-piece, hermetically sealed stainless steel design with Inconel® X-750 wetted parts for durability with abrasive or corrosive media. Used for measuring pressures of 5,000 to 20,000 psi (15,000 psi most popular). Available for use with either Weco® 1502 or 2202 fittings. Models available with higher accuracy ($\pm 0.1\%$ BFSL) or wider aperture for use with more viscous media.



POTENTIAL APPLICATIONS

Oil and gas drilling, mud pumps/mud logging, fracturing and cementing, acidizing, well head measurement, standpipe, and stimulation.

FEATURES

- $\pm 0.1\%$ high accuracy BFSL; or $\pm 0.2\%$ standard accuracy models available
- Standard or wide aperture pressure ports available for more viscous media
- Multiple electrical connectors supported
- High accuracy shunt calibration for quick in-situ sensor output validation in field (one wire and two wire options available)
- Optional protective cage provides extra electrical connection protection and increased durability
- RFI/EMI protected
- Intrinsically safe: CFMUS/ATEX/IEC Ex certification
- CE approved

View the complete Honeywell T&M portfolio online:

<http://measurementsensors.honeywell.com>

Or call: **800-848-6564** or **+1 614-850-5000**

Differential Pressure Transducers – Model KZ Low

PRODUCT OVERVIEW

Offers both accuracy and protection for critical low range differential pressure measurements. Ranges from 0.5 psid to 30 psid with 0.25% accuracy. All welded stainless steel construction with no seals to fail, eliminating internal “O” ring leaks and material compatibility. Robust overpressure capacities (1500 psi standard to 5000 psi available) with safe overload of either side, up to the maximum rating.



POTENTIAL APPLICATIONS

Flow measurement, depth sensing, pressure equalization, liquid level, leak detection. Automotive engine testing – fluid flow (engine intake airflow, engine coolant flow testing), dry airflow (engine block oil port testing), pressure decay (damaged or missing gaskets, o-rings, emission valve issues, other leaks); precise fluid level measurement; test and calibration, pharmaceutical and medical monitoring.

FEATURES

- 0.25 % full scale accuracy
- 0.5 psid to 30 psid
- mV/V (standard), 4 mA to 20 mA, 0 Vdc to 5 Vdc, or 0 Vdc to 10 Vdc output
- All-welded stainless steel design
- Custom options available
- CE approved

View the complete Honeywell T&M portfolio online:

<http://measurementsensors.honeywell.com>

Or call: **800-848-6564** or **+1 614-850-5000**

Pressure Transducers – Miniature / Subminiature

PRODUCT OVERVIEW

Lightweight, extremely rugged stainless steel miniature and subminiature sized pressure and differential pressure sensors. Compact, low profile design, with thin flush diaphragm, and heavy sidewalls to easily fit into very small or tight spaces. Pressure ranges from 100 psi to 20000 psi; or 10 psig to 3000 psig with 1 % accuracy (differential pressure ranges of 5 psid to 2000 psid with 0.3 % accuracy).



POTENTIAL APPLICATIONS

Metering/dispensing – robotic sealing, power paint systems, epoxy/sand coating, container projection/coating systems, fluids; oil and gas downhole tools – MWD, LWD, underbalanced drilling, AUV/ROV subsea; automotive/transportation or aerospace – test stands, brake assembly test, air bag, transmission fluid, or other fill pressure systems.

FEATURES

- Small size to fit tight spaces
- Lightweight stainless steel construction
- Low profile or flush mount design (Model S, G, F)
- Wet/wet differential pressure (Model P-30-P)
- High frequency
- Pressures up to 20,000 psi
- Custom options available

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Load Cells – Low Profile / Fatigue Rated

PRODUCT OVERVIEW

Compact, low profile, pancake style precision load cells, constructed either of stainless or carbon steel. Stainless steel models provide rugged high performance over many millions of cycles of testing or occasional overload conditions with no effect on load cell performance for applications such as high volume manufacturing operation or fatigue testing. The cost-effective general purpose carbon steel models feature exceptional structural capability to withstand extraneous loads, such as torque, bending movements, and side loads combined with a high degree of accuracy and are useful for a variety of general purpose applications.



POTENTIAL APPLICATIONS

Aerospace structural testing, automotive component testing, calibration reference, manufacturing assembly testing, materials or product fatigue testing, spring or shock absorber testing, electro hydraulic shaker systems, high accuracy dynamometer applications, extruding processes, press applications, oil and gas exploration and production, and tank/hopper weight.

FEATURES

- Accuracy from 0.1 % up to 0.02 % (enhanced)
- Load ranges from 5 lb to 500000 lb
- Tension and compression
- Fatigue life: greater than 100 million cycles
- Low sensitivity to extraneous loads
- mV/V output
- Intrinsically safe, fatigue rated (stainless steel), or fatigue resistant (carbon steel) options available
- Custom options available

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Load Cells – Miniature / Subminiature Model 31 / Model 13

PRODUCT OVERVIEW

Designed to fit into test stands or other systems with very limited space and tight clearances. Model 31 is Honeywell's highest accuracy, rugged miniature load cell; measures load forces from 50 grams to up to 10000 lbs or 0.5 N up to 50 kN.

Model 13 measures load ranges from 150 g to 1000 lb. Both feature rugged stainless steel construction for long-term stability and reliability under demanding operating conditions. Model 31 can be completely welded for underwater applications.



POTENTIAL APPLICATIONS

Model 31: aerospace (flight and pilot control, landing gear, systems and doors, airframe and engine testing, military space); precision process and control (pharmaceutical, semiconductor/electronics), medical equipment testing/control, robotics, etc. Model 13: press applications, weighing, sensing for applied loads, and automation process control.

FEATURES

- Rugged, stainless steel welded construction
- Designed to eliminate/reduce to a minimum off-axis loading effects (Model 31)
- High accuracies: 0.15 % to 0.2 %FS (Model 31) or 0.7 % (Model 13)
- Ranges: 50 g to 500 g (Model 31) or 150 g to 1000 lb (Model 13)
- Tension/compression (Model 31) or compression only (Model 13)
- mV/V output
- Custom options available

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Torque Transducers – Rotary Torque Models 1600 / 1800

PRODUCT OVERVIEW

Honeywell's non-contact rotary transformer torque sensors are ideal for test installations running long-term durability testing. The non-contact nature of the signal transfer virtually eliminates the need for maintenance. High overload protection with high signal output (sensitivity) helps prevent potential sensor damage. Carrier frequency excitation provides increased signal/noise immunity.



POTENTIAL APPLICATIONS

Automated assembly process monitoring (where “torque to turn” values are used in determining proper fit of assembled rotating parts), dynamometer applications (testing of internal combustion engines, transmissions, and automotive differentials), motor test / manufacturing (monitoring start up, running, and stall torque levels during development and qualification), pump/gear box/compressor/drive-line testing, conveyors/belt drive monitoring, test stands (automotive engine testing, etc.), development of fractional horsepower electric motors, quality assurance, and general T&M applications.

FEATURES

- Models with capacity ranges 50 in-oz [0,35 Nm] to 1000 in-oz [7 Nm] or 50 in-lb [5 Nm] up to 100000 in-lb [11300 Nm]
- 0.1 % non-linearity and hysteresis; 0.05 % for enhanced accuracy models
- Extended speed range (Model 1800 series up to 27000 RPM)
- Minimal maintenance due to bearings only contact
- Custom options available

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Torque Transducers – Digital Telemetry Torque TMS 9250

PRODUCT OVERVIEW

Provides non-contact torque measurement through digital telemetry on rotating parts. Fully digital, wireless design enables higher integrity of the torque data capture through higher resolution, higher sensitivity, faster response, and no mechanical interferences. Fast and easy software-based setup, with scalable “on the fly” output and parameter adjustments. No slip rings or bearings to wear out. Flexible, customizable design allows unit to fit into a variety of test stands and applications.



POTENTIAL APPLICATIONS

Powertrain: engine, engine diagnostics, cold engine, transmission, driveshaft and rear axle differential, dynamometer, brake, wheel hub, drive wheels, continuous track, heavy equipment, oil and water pump testing, jet engine/turbine testing, wind power gear box and torsion blade testing, propeller testing, turn up/turn down gear box testing, industrial motor/generator testing, and auxiliary component efficiency testing.

FEATURES

- Digital telemetry, non-contact
- 0.5 % full scale, total system accuracy
- High torsional stiffness / low rotating inertia
- Multiple, field selectable, analog outputs
- Shunt calibration standard / remote shunt calibration option available
- Full software set-up
- Zero and span adjustments through TMS software, no potentiometers or dip switches needed
- FCC, CE certified, meeting all EMC emission and susceptibility requirements
- DIN, SAE, integral-coupling, shaft-to-shaft, custom options available

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Torque / Temperature Sensors – Analog WDC Wireless Telemetry

PRODUCT OVERVIEW

Used to measure torque, temperature, acceleration, and other parameters in very large motors (350 HP and above) and other rotating equipment.

Utilizes RF (radio frequency) technology to wirelessly transmit information for testing, continuous feedback, or control monitoring. Programmable alarm can be set so system can be shut down or scheduled for maintenance.



POTENTIAL APPLICATIONS

Automotive (test stands, motor / transmission dynamometers, brake testing, friction testing), marine (propulsion plant health monitoring, fuel rate calculations, cp prop protection, turbine control, sea trials), jet engines (strain, temperature, vibration, small spaces), turbines (diesel, gas, steam), and industrial (rotary kilns, motor temperature monitoring brake testing).

FEATURES

- Measures torque, strain, torsional vibration, temperature, horsepower, acceleration, RPM, thrust, bending, displacement, etc.
- Includes: transmitter, receiver, power supply (inductive or battery), module support ring (collar) and antennas (rotating, stationary)
- Frequency response from dc to 1 kHz
- Typical RF operating frequencies up to 16 MHz
- RF modulation types include FSK and PWM
- In-line torque sensors and clamp-on torsionmeter options
- Useful in harsh or rugged environments, high vibration areas, or tight spaces
- Highly customizable

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Displacement Transducers (LVDTs)

PRODUCT OVERVIEW

Designed to meet the requirements common to most single and multiple-point industrial and/or scientific laboratories. Models available with free-guided, unguided, captive spring return, and captive guided armatures in either ac/ac or dc/dc. Miniature sizes, submersible, and subsea options also available.



POTENTIAL APPLICATIONS

Bearing insertion, building movement, dimensional verification, earthquake monitoring, factory automation parts positioning, force/displacement, hydraulic engineering, inspection fixtures, marine, mining, offshore oil and gas drilling, quality assurance, and turbine blade position.

FEATURES

- ac/ac or dc/dc
- Captive guided or unguided versions
- All welded stainless steel construction
- $\pm 0,25$ mm [± 0.01 in] up to ± 470 mm [± 18.5 in] stroke
- Temperature ranges: -50° C [-58° F] up to 125° C [257° F]
- Miniature, submersible, and subsea options
- Custom options available

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Accelerometers

PRODUCT OVERVIEW

General purpose piezoelectric and piezoresistive accelerometers suitable for use in a variety of general purpose industrial and laboratory testing and monitoring applications. Available in screw-mount, bolt-mount, and stud-mount configurations. Hermetic construction for dependable performance in harsh environments.



POTENTIAL APPLICATIONS

Fatigue testing, vibration monitoring, predictive maintenance, modal analysis, “shake and bake” testing, shock and impact testing, bridge/building movement, seismic studies, and laboratory testing.

FEATURES

- Constant current or voltage
- All welded, non-magnetic stainless steel or anodized aluminum
- Multiple mounting configurations including: screw, stud, bolt, or low profile
- Usable frequency ranges from 0 Hz up to 10 kHz
- Outputs include IEPE and mV/G
- Miniature and subminiature sizes available
- Intrinsically safe and/or submersible options available
- Highly configurable, custom options also available

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Or call: **800-848-6564** or **+1 614-850-5000**

Instruments, Amplifiers, and Digital Gauges

PRODUCT OVERVIEW

Wide variety of display and conditioning instrumentation – single-channel, multi-channel, handheld, and portable units. Broad range of in-



line amplifiers for use with Honeywell and other manufacturer's transducers and transmitters. Complete range of rugged digital gauges for load and pressure calibration and force measurement.

POTENTIAL APPLICATIONS

Display and conditioning units, in-line amplification, diagnostics and calibration, load and pressure measurements and display.

FEATURES

- Single and multi-channel units – portables and handhelds
- Digital pressure gauges
- In-line amplifiers
- Power supplies
- Transducer simulation
- Analog and micro-processor based
- Custom configurations available

View the complete Honeywell T&M portfolio online:

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NOTES

Sensing and Control Sales and Service

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

Phone and Fax:

Honeywell Customer Service - Americas

US East: 815-235-6652

US Central: 815-235-5591

US West: 815-235-5445

International: 815-266-3381

<http://acsnet.honeywell.com/sites/CustomerService/default.aspx>

E-mail: info.sc@honeywell.com

Honeywell Customer Service - Europe

+44 (0)1698 481481

crc.sensingcontroleurope@honeywell.com

Honeywell Customer Service - AP

Shanghai: Tel: (86 21) 2219 6888; Fax: (86 21) 6237 2493

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Tokyo: Tel: (81 3) 6730 7208; Fax: (81 3) 6730 7230

Taiwan: Tel: (886 2) 2245 1000; Fax: (886 2) 2245 3241

Singapore: Tel: (65) 6355 2828; Fax: (65) 6445 3033

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Fax: 614-850-1111

Email: info.tm@honeywell.com

Or visit us online at:

measurementsensors.honeywell.com

Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

Find out more

To learn more about Honeywell's sensing and control products, call **+1-815-235-6847**, email inquiries to **info.sc@honeywell.com**, or visit **sensing.honeywell.com**

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The Honeywell logo, consisting of the word "Honeywell" in a bold, red, sans-serif font.

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