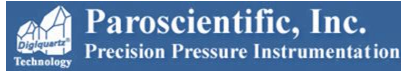


ETLG Ltd

Special points of interest:



Honeywell Pressure

Honeywell's range of precision pressure products consists of MEMS, piezoresistive pressure sensors and precision pressure transducers. They offer outstanding performance and reliability for a variety of applications, with over 400 unique models to choose from and a large selection of pressure ranges, you are sure to find the right sensor for your requirements.

The PPT, Precision Pressure Transducer, offers extraordinary value with high accuracy over a temperature range of -40°C to +85°C. Supplied in a compact and rugged package.



The PPT2, "next generation" PPT, offers superior performance over the PPT with higher accuracy, increased sampling rate and improved RF susceptibility while maintaining excellent long-term repeatability and stability.



Available in the standard temperature range of -40°C to +85°C or in an extended range of -55°C to +110°C, the PPT2 is supplied

in a smaller package, with the option to attach an adapter plate for legacy projects to meet the form and fit of the original PPT.

Both units are available in a wide range of configurations, in absolute, gauge and differential pressure measurements up to 500psi, with digital and analog outputs. The PPT and PPT2 are currently used in a



wide range of applications including flight test, secondary air data, engine testing and meteorology.

The Integrated Pressure Transducer (IPT) provides high accuracy pressure data in an industry standard SPI digital format. The IPT is small and lightweight and can be easily integrated by the user into a



wide variety of applications, including air data computers, altimeters, cabin air pressure, engine test systems, flight test systems, meteorology, flow and pressure calibrators, instrumentation and analytical equipment. The IPT can measure absolute pressure up to 50PSI, differential and gauge pressure up to 20PSI over the temperature range -40°C to -85°C. Accuracy is $\pm 0.04\%$ FS max for absolute pressure and $\pm 0.10\%$ FS max for gauge and differential pressure with long term stability of 0.025%FS max per year.

The Integrated Pressure Sensor (IPS) is the sensor only part of the IPT providing a high level millivolt output. It can be easily mounted on to circuit boards and with the application of signal conditioning electronics and digital correction, the IPS offers highly accurate and stable pressure readings over a wide temperature range, and is suitable for the same applications as the IPT.



Precision Barometer/Altimeter (HPA/HPB) Honeywell's Barometer provides accurate and reliable barometric measurements in real world conditions. Mi-

croprocessor-based signal compensation eliminates the need to insulate or temperature-regulate the barometer. The HPB has a pressure range of 500 to 1200hPa (7.3 to 17.4psia) with an accuracy of ± 0.4 hPa max, over a temperature range of -40°C to +85°C, suitable for a wide range of applications including AWOS weather systems, remote meteorological systems, ocean data buoys and environmental data logging. The HPA is designed for altimeter applications with a pressure range of 0 to 17.6psia and an accuracy of 0.03%FS max, over the temperature range -40°C to +85°C.



The aerospace specific LG1237 Smart Pressure Transducer is a lightweight and rugged sensor designed to provide extremely precise and stable measurements up to 1000psia. Incorporating high speed digital processing and compensation algorithms the LG1237 offers outstanding performance over temperature and excellent long term stability. With Maximum Accuracy of $\pm 0.05\%$ FS from -55°C to +125°C, it is perfect for a wide range of applications including Jet engines (FADEC), flight testing and engine test cells.

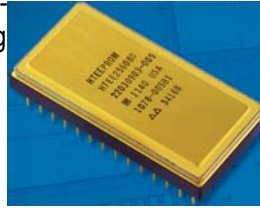



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Honeywell High Temperature

Honeywell's 256kb Non-Volatile **High Temperature Electrically Erasable Programme Read Only Memory (HTEEPROM)** utilises the same proven Silicon-On-Insulator (SOI) technology that supports the rest of their high temperature range, providing high reliability and performance for continuous use for

5 years at 225°C. Designed for a range of different applications including engine controls, downhole, nuclear and other extreme environments. An



autonomous memory refresh capability is provided to extend data retention at high temperatures. The memory contains integrated Error Coding Correction (ECC) consisting of 56 ECC bits per page (64 bytes).

Honeywell Thermal Switches

Honeywell **Thermal Switches** provide exceptionally high reliability and consistent high quality thermal products even in the most unusual or demanding environments. Qualified to numer-



ous commercial, aerospace, military and NASA specifications and available in a variety of package configurations, each weighing less than 0.22lbs (100g) with temperature ranges from -84°C to +371°C, the thermal switches are designed for integration into a variety of applications including space, commercial

aviation, military, transportation and commercial/industrial and de-icing of helicopters. A special range of high reliability switches for train applications include fan temperature controllers and high current thermal management switches.

Honeywell Accelerometers

The range of **Q-Flex Force Rebalance Servo Accelerometers** provide long-term stability with high performance and reliability; accuracy of <1200mg and MTBF of 600,000 hours. The **QA550**, **QA650**, **QA700** and **QA750** offer tactical grade performance, while the **QA1400**, **QA1500**, **QA2000** and **QA3000**, the

highest performing accelerometer, provide inertial grade performance. These are designed for a wide range of applications including flight test, wind tunnel testing, IMUs and navigation systems.

Energy Q-Flex Accelerometers; QAT160, QAT185 and Mini-Q are designed and built to tolerate the demanding environments associated with Measurement-While-Drilling (MWD) and wireline applications while providing precision accuracy.



Honeywell Magnetics

The **HMR3601 μ POINT® Three Axis Digital Compass** has been reclassified, no longer falls under ITAR regulations and is now listed under ECCN 7A994. Gyro stabilised to reduce magnetic disturbance effects and incorporating 3 magneto-resistive sensors, 2 MEMS accel-



erometers and a MEMS yaw rate gyro, the **HMR3601 (μ point®)** provides compass heading along with pitch and roll angles. With Azimuth accuracy of 0.5° typ with 0.15° resolution and a tilt range of $\pm 80^\circ$ with an accuracy of <0.5°.

Honeywell's NEW high temperature single or dual axis navigational grade magnetic sensor for linear, low-field magnetic sensing for directional drilling azimuth

offers; high sensitivity, low noise floor and low hysteresis over the temperature range of -55°C to +225°C in a 10mm square package (1 axis)/14mm square package (2 axis). Capable of sensing magnetic field strength and direction down to 29 nT, it is the perfect solution in directional drilling applications.

Honeywell Gyroscopes

Honeywell is a world leader in both ring laser and MEMS inertial & tactical grade gyro technology, with rate integrated and ring laser gyros designed for high performance, high reliability and long life us-

age. Honeywell present an unmatched range of both ring laser gyros and MEMS based IMUs, and in a venture with Rock-



well Collins, offers a family of gun-hard, deeply integrated INSGPS and anti-jam capable MEMS guidance and navigation units.

SYSTRON DONNER INERTIAL Quartz MEMS Sensors

Systron Donner's range of **Quartz MEMS, gyroscopes, IMUs and INS** work on a wide range of projects including military, industrial and aerospace



applications to offer guidance and navigation, bias stabilisation down to <1°/hr and pointing in some of the

toughest environments. Precision integration of their advanced quartz micro-machined solid-



state sensors with discrete electronics and specialised GPS, digital signal processing (DSP), user-programmability

and user-friendly interfaces create a cadre of designs that offer system miniaturisation, low power consumption and

light-weight benefits that exceed virtually every system requirement for reliable, repeatable performance.

SILICON DESIGNS INC
SDI Accelerometers

The Silicon Designs 1521 (analog) and 1410 (digital) are low cost surface mount integrated silicon MEMS accelerometers designed for harsh environments and are capable of limited exposure to 175°C. They are form fit and function upgrades to the 1221, 1210 and 1010 models offering significantly improved bias and stability. Models 1221, 1210 and 1010 have been discontinued. There are small quantities of some models remaining in stock, however, this is dependent on model number and availability, once these are gone no more units will be available.



The Model 1510 series is a lower cost family of analog surface mount (LCC) silicon MEMS capacitive accelerometers designed for OEM vibration measurements, offering excellent long-term stability across a variety of aerospace, automotive, energy, industrial, oil and gas, and tests and measurement applications. Available in standard measurement ranges from ±5g to ±100g, available in ±4V differential or 0.5 to 4.5V single ended outputs. Units are RoHS compliant and operate over a temperature range of



-40°C to +85°C.

Accelerometer modules are available in single and tri-axial versions with an integrated cable or with a connector and detachable cable in a variety of lengths up to 15cm. The single axis modules are available in a standard size or compact package. The Model 3330G Tri-axial Data Acquisition unit is compatible with all Silicon Designs 8-32 VDC powered accelerometers with no additional power supply required.



Paroscientific, Inc.
Precision Pressure Instrumentation

Paroscientific's Digiquartz® depth and pressure sensors offer accurate measurements of up to 0.008% FS over ranges up to 40,000psi or 7000m. These sensors are suitable for a wide range of metrology, oceanography,



aerospace, energy exploration and pressure standard applications. With Paroscientific's patented Nano-resolution technology, the Digiquartz sensors have



been used to develop disaster warning systems as they offer improved stability to separate earthquake vibrations and other oceanic noises from tsunami waveforms.

Jewell Instruments Tilt Sensors and Accelerometers

Jewell's new range of low cost force-balanced inclinometers, known as the Emerald series are designed with higher accuracy than comparably-priced MEMS sensors and are supplied in a small rectangular package to allow it to be installed in areas with space constraints. Able to withstand up to 500G shock and with single or dual power output and available with custom ranges and bandwidths, the Emerald series is suitable for a variety of industrial and railway applications including wheel alignment, construction equipment, antenna positioning, crossrail management and tilt safety systems among others.



Force balanced (servo) technology inclinometers are extremely sensitive, rugged transducers capable of measuring changes of angle down to 50 nanoradians (0.1 arcsec) with high resolution from ±1° to ±90° full range. The force balanced linear and angular accelerometers are fully self contained and are able to measure changes in acceleration as small as 1mg with hysteresis less than 0.0005% FRO from ±0.01g to ±20g full ranges. These products are designed for a wide range of applications including wind tunnels, antenna and platform stabilisation, automotive and structural monitoring of dams, bridges and buildings. These products are not ITAR restricted.



Jewell's ranges of electrolytic tiltmeters and inclinometers are high performance, rugged, fluid filled, tilt transducers designed to measure angle and deflection using an absolute gravity reference. Able to measure changes in angle as small as 5 nanoradians (0.01 arcsec) the sensors are suitable for a variety of applications including geotechnical/structural, platform levelling, volcanology, aerospace, astronomy and, synchrotron and particle beam research. Signal conditioning electronics are used to produce stable output signals over a wide range of input voltages ensuring accurate measurements.



Computer Conversions is a technically advanced electronics company engaged in the design and manufacture of synchro converters, amplifiers, displays and encoders, brushless resolver packages and related multi-channel I/O computer bus interface cards for the military



and industrial market. Standard low cost units to satisfy almost any synchro/resolver or shaft interfacing requirement are available either off the shelf, or with very short lead times. Computer bus formats available (COTS products) are VME, PCI Bus, CPCI and PC104 built to commercial or military specifications. Computer Conversions has proven conformance to the Quality Assurance requirements of various US naval, aircraft,

missile and nuclear programs. Their quality control system conforms to MILI45208 and source inspection is available on request.



ETLG Hire and Calibration Services

ETLG Hire – ETLG hire has been providing rental equipment for many years and can offer the full range of Digi-quartz depth sensors with a depth capability in the range of 20m to 4000m. ETLG engineers have a wide range of experience in supplying customers with hire equipment and always ensure that all sensors are fully maintained and calibrated prior to shipment to customers. Also available from the hire pool of equipment are many other sensors for measurement and tilt and other physical

parameters, provided from the range of equipment supplied by ETLG. If you have a sensor hire requirement, please call us to discuss your application.

ETLG Calibration - All purchased Digi-quartz sensors should be returned to ETLG on a regular basis, preferably annually, but with a maximum of two years between sensor review and zero point calibration. ETLG can provide a wide range of calibration services for Digi-quartz sensors with either single or multi

point calibration. All Digi-quartz sensors have traceability to UK NPL and US NISST standards

Loan/Hire Prior to Purchase - Many sensors that we supply may be provided on a short term loan/hire basis, the cost of which may be deducted from a subsequent purchase of the same or equivalent type of sensor. Terms and Conditions apply. Please call us for a quotation.



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