

Handheld engine monitor

Caterpillar's Pocket Tec enables operators to access real-time engine data using a **Palm** handheld orga-



nizer. The software is easy to install, and the plug-in adapter allows direct communication with an engine's electronic controls. Information can be saved and downloaded to a computer for more efficient asset management. Cat has identified three primary markets for the tool. Pocket Tec for industrial applications provides technicians, site managers, and equipment owners an affordable means to manage their equipment more effectively. Pocket Tec for heavy-duty vehicles provides data useful for tracking all electronically controlled engines and managing the maintenance of the entire fleet. Pocket Tec for marine provides owners an affordable means to manage engines more effectively.

For more information, circle 145

Pedal control

Mico's line of electronic pedal controls was designed for long life in harsh on- and off-highway applications. The control uses two noncontacting Hall-effect sensors to offer improved durability without the failure modes of potentiometers. Each sensor features independent circuits for failsafe systems, and the electronic assembly is potted to the pedal base to minimize environmental effects while limiting tampering to the unit. Engineered for applications requiring an electronic



signal proportional to the pedal travel, typical uses include throttle and accelerator pedals. The pedal is ergonomically designed to improve operator comfort and productivity; control options include pulse width modulation or analog output.

For more information, circle 146

Waterproof connectors

Radiall offers a new product range for severe off-highway applications where connectors are submitted to humidity, dust, etc., with the FAKRA II in-line waterproof connectors, the



USCAR in-line waterproof connectors, and the rotatable FAKRA II/USCAR waterproof connectors. These new connectors feature the same performance and mechanical characteristics as existing Radiall non-waterproof connectors. Their protection meets the IP67 or IP68 rating standards. The stamped center contact is compatible with waterproof FAKRA II and USCAR in-line connectors.

For more information, circle 147

IP 67 closure caps

The minifast B and C size closure caps from **Turck** are designed to provide an IP67 seal on unused



junction box ports or cordset plugs. The closure caps, available in male or female, are used in places where ports need to be "capped off" for environmental protection. The closure caps are available in nickel-plated brass or stainless steel, with

or without a nylon-coated stainless-steel lanyard. The lanyards provide eyelets for receptacle applications and loops for cordset applications, and prevent unwanted debris collection.

For more information, circle 148

Gauge lines

Siemens VDO Automotive's gauge lines for off-highway equipment include VDO Severe Duty,



Vision, and Cockpit International. All of the instruments incorporate air core technology and/or stepper motor movements. VDO Severe Duty gauges are designed to perform in extreme environments—featuring corrosion-resistant materials, silver contact connectors, and special seals with dual lenses. VDO Vision Series instruments incorporate white graphics on black dials with illuminated red pointers, and use Trioptic illumination for ease of visibility. VDO Cockpit International instruments provide economy and worldwide application.

For more information, circle 149

Updated actuators

Two new color brochures from **Burr Engineering & Development** feature the latest specifications for the company's HD-Series and A-Series electric linear actuators. The HD-Series acme screw actuators are designed to handle moving loads up to 2500 lb (1130 kg) and static loads to 5000 lb (2270 kg) in applications that range from agricultural, construction, and other off-highway equipment, as well as ad-



justable seat mechanisms, air-control and venting equipment, and lift tables. Standard stroke lengths range from 4 to 48 in (100 to 1220 mm), with three available gear ratios of 17:1, 25:1, and 55:1. The A-Series actuators are for more demanding applications, with dynamic load capacities to 3000 lb (1360 kg) and static loads to 5000 lb (2270 kg). Designed with either round 2.25 in (57 mm) or square 2.5 in (64 mm) tubing, the A-Series features gear ratios of 34:1 or 110:1 with standard strokes of 4 to 18 in (100 to 457 mm). All Burr actuators feature die-cast aluminum powerheads and zinc-plated inner and outer tubes.

For more information, circle 150

PCB enclosure

A transparent printed circuit board (PCB) enclosure from **LADD Industries** eliminates the need to drill holes for LEDs or digital readouts, allows for complete viewing of the circuit board, and enables data transmissions. The small transparent enclosure features an integrated mounting flange. The 90° PCB-mounted DTM series headers come in 12- or 24-pin versions and feature #20 contacts rated for 7.5 A each.



For more information, circle 151

Surveying system

SmartStation from **Leica Geosystems** integrates GPS and total station functionality into a single compact package with common software, database, storage medium, and user interface. All operating procedures for GPS and terrestrial surveying are performed via the total station keyboard and display. All data are stored in the same database on a CompactFlash card. The integrated package eliminates the need for cables, additional batteries, or extra data loggers.



For more information, circle 152

Lead-free fuses

Littelfuse's 2AG, 3AG, 3AB, and 5 x 20 mm form factor fuses comply with electronic industry manufacturing standards for lead-free circuit board content, including IEC 60068-2-20 as well as the EIA-IS-722 (low-voltage supplemental fuse



qualification specification), **CSA**, and **UL** approvals. The fuses are designed to withstand the higher temperatures associated with lead-free wave soldering and offer the same performance specifications as the firm's conventional fuses.

For more information, circle 153

Pressure transducer

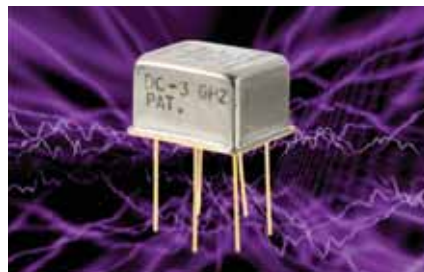
The Ashcroft G2 pressure transducer from **Dresser Instruments** unites a polysilicon thin-film pressure sensor with a circuit featuring an application-specific integrated circuit to provide accuracy rated at 1% total error band. The device offers 0/30 to 0/20,000 psi (0/207 kPa to 0/138 MPa) and features a choice of outputs, electrical terminations, and process connections.



For more information, circle 154

Ultraminiature attenuator relays

Series A150 ultraminiature attenuator relays from **Teledyne Relays** are designed to attenuate RF signals in 50-ohm systems over a frequency range from dc to 3 GHz.



The relays' low profile and small grid spacing make them suitable when packaging density is critical. The devices also eliminate the need for additional external resistors.

For more information, circle 155

Power connectors

NEPTUNE connectors from **Amphenol Industrial Operations** provide safe and dependable power interconnects in por-

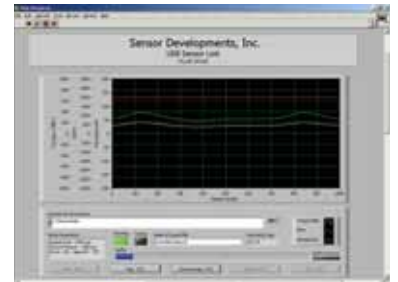


table equipment including oil exploration, modular power generation, and modular manufacturing plants. The line encompasses plugs and receptacles from 30 to 400 A at 600 V, featuring the RADSOK contact system, which allows for more amperage and voltage through a smaller connector. Lightweight, rugged aluminum hardware is machined from high-tensile-strength bar stock and finished with a hard coating to 40 points on the **Rockwell C** scale. Conductors are readily terminated to easily accessible pressure wire terminals.

For more information, circle 156

Sensor link interface

Sensor Developments' USB Sensor Link interface helps engineers create their own dynamometer test stand. Users can moni-



tor power, torque, and speed with basic interface software, or create unique interfaces to control various processes with the eight digital I/O ports. The link can operate any strain-gauge-based torque sensor and encoder system and convert it to USB-compatible signals.

For more information, circle 157

Tilt sensor

The single-axis linear output electrolytic tilt sensor from **Fredericks** features a ± 30 arc minimum angle range, less than 0.05-arc second resolution, and less than 0.5-arc second null repeatability. Long-term stabil-



ity over its angle and temperature range is a distinctive characteristic of this sensor. The sensor's hermetic glass-to-metal construction and platinum electrodes guarantee a long operating life and stable operating characteristics. Applications include laser instruments and transits, PS capability, geophysical monitoring, and machine tool leveling.

For more information, circle 158

Delay-on-make timer

The ST1D Series delay-on-make timers from **Amperite** are featured in a hockey-puck-style package. The units contain solid-state complementary metal oxide semiconductor digital circuitry and adjustable switching device via a 10-position DIP switch encoded in binary format. Although 3-A continuous load current is standard, a 10-A load current rating is also available. Two timing ranges are offered: 0.2 to 102.3 s in increments of 0.1 s, and 1 to 1023 s in 1-s increments, both with timing accuracy of $\pm 5\%$ plus $\frac{1}{2}$ increment, and a 2% timing repeatability. The device is available in 12, 24, 48, 110, and 120 V ac or dc.



For more information, circle 159

Junction boxes

Turck's new four- and eight-port pentafast junction boxes provide multiple I/O points for increased flexibility. The junction boxes' small footprint offers installation flexibility to small OEMs that need a compact junction box, or robotic applications that require small, light-weight junction boxes. The small footprint also permits existing applications to be retrofit to allow individual cable runs. The junction boxes are offered with power and signal LEDs. The nylon-encapsulated junction boxes provide IP67 protection and meet **UL, CSA, and NEMA 1, 3, 4, and 6P** standards. Their operating current is 1 A per port and 3 A total with one power pair, with an operating voltage of 10- to 30-V dc.



For more information, circle 160

High-wattage resistor assembly

The PWHW power resistor assembly from **TT electronics' IRC Wire & Film Technologies** Division consists of a high-wattage power wirewound resistor encapsulated in a flameproof housing with an inorganic fill material—giving the assembly a high thermal mass. The device also features an optional in-line circuit protection device designed to prevent motor damage. Initially developed as a voltage-dropping resistor for daylight running lamps and cooling fan motor speed controls, the resistors have been field-proven in harsh underhood environments. At the heart of the resistor is a 115-W device that can be used to provide a dual-speed system for single motor drives in industrial applications.



For more information, circle 161

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Solenoid control module

The Equalizer from **Trombetta Motion Technologies** incorporates a solenoid, control module, and wire harness in one unit. No external switches or other assisting devices are required. Fine-wire winding and fragile interconnect wiring are eliminated. The control module is located under the end cap and connector shell, opposite the plunger. The Equalizer uses a single coil winding and achieves a 50% reduction in continuous operating power, thus draining



less energy from the power source. The system eliminates variations typically caused by voltage and temperature fluctua-

tions. Pulse-width modulation is used to control coil power by changing the duty cycle in response to changing voltage and temperature conditions.

For more information, circle 162

Instrument clusters

Siemens VDO Automotive produces instrument clusters that offer significant cost savings over traditional, individual instrument installations, at times even in small-quantity runs and short development



lead times. Compared to traditional gauges, the clusters offer quicker assembly, reduced parts inventories, and increased reliability. The designs can process data protocols from any engine protocol, and can be customized to display a range of operating metrics and equipment status indicators. Any combination of analog, digital, or screen displays is possible.

For more information, circle 163

Tubular heaters

A tubular aluminum substrate resistive technology from **TT electronics' IRC** Wirewound & Film Technologies Division delivers tightly controlled "instant on"



heat with greater than 95% efficiency, and can serve as a voltage-drop source for daylight running lamps and fan speed controls. Designated the Anotherm Series, the devices consist of rugged thick-film resistive elements deposited on tubular anodized aluminum substrate material that can be tailored for automotive heating applications. The low thermal mass of the aluminum substrate provides "instant on" and "instant off" capabilities, and use of multiple zones of resistive circuitry enables precise temperature control.

For more information, circle 164

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VRS sensors

Plastic-molded variable reluctance sensing (VRS) magnetic sensors from **Honeywell Sensing and Control** are suited for high-volume OEM applications. The 2015/2025/2030/2040 Series Molded VRS Sensors come in three termination styles: leaded, pin, and crimp. Output ranges from 7 V to 17.5 V peak-to-peak minimum. Coil resistance is either 54 or 130 ohm maximum and inductance is either 9 or 11 mH. The self-powered sensors provide speed, timing, or synchronization data to a display in the form of a pulse train. Common applications include engine rpm measurement; motor rpm measurement; speed measurement of pumps, blowers, mixers, exhaust, and ventilating fans; flow measurement on turbine meters; vehicle wheel-slip measurement; and mph measurement on agricultural equipment.



For more information, circle 165

Ruggedized tablet PC

The G-Force 850 PC from **JLT Mobile Computers** features a photograph-quality, 8.4-in high bright display with 400 nits of backlighting for daylight applications. The portable unit has a mass of 3.5 lb (1.6 kg) yet operates for five hours (full operation) or eight hours (power-saving operation) on a single battery charge. Military battery upgrades are available. The batteries are hot-swappable for changes during operation. The PC includes **Microsoft Windows XP** operating system, resistive eight-wire touch screen, and 800-MHz CPU.



For more information, circle 166

Emission sensors

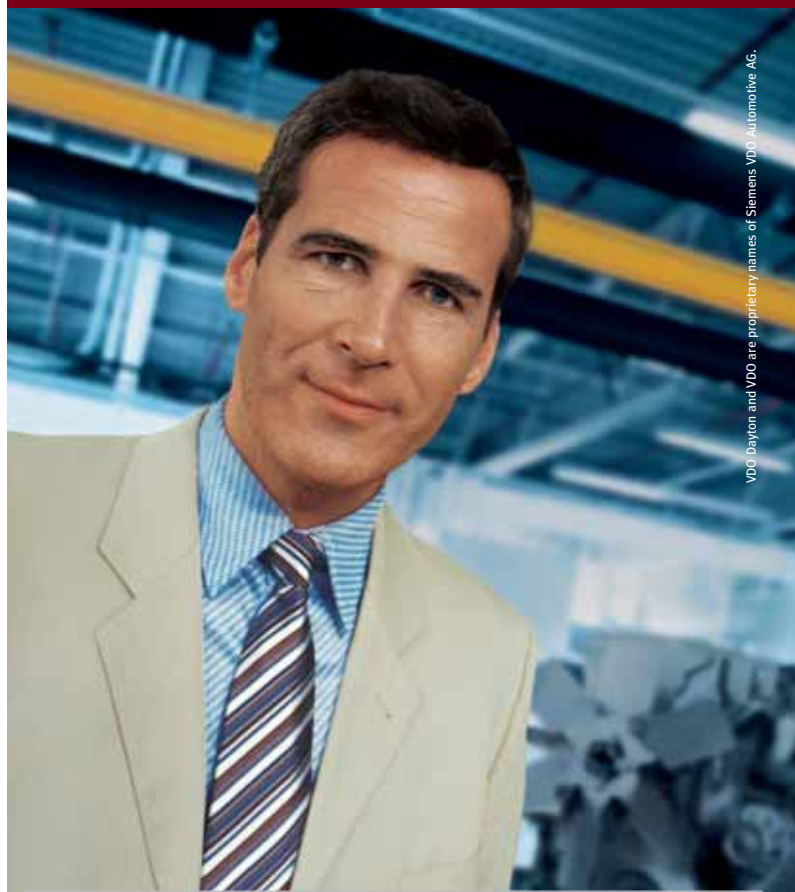
Kavlico's emissions sensors for on- and off-highway trucks and vehicles are resistant to exhaust gases, soot, and acids. The compact designs are offered in pressure ranges of 1 in H₂O to 25,000 psi (0.0025 bar to 172 MPa), absolute and differential. Sensors include differential pressure for particulate filter monitoring, urea sensors, charge air, EGR, and exhaust pressure.



For more information, circle 167

Industrial monitors

A family of rugged, low-profile monitors from **CyberResearch** comes in screen sizes from 17 to 24 in, with brushed stainless steel or black colors. Optional AR-Bonding glass treatment prevents reflections, giving the CyRAQ line high clarity, even under bright lights. The flush-mount series features an ultra-thin stainless-steel front bezel which, when panel-mounted, is 0.3 in (7.6 mm) thick. These monitors also feature a rugged NEMA 4X waterproof, corrosion-resistant, stainless-steel chassis with either



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success

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Circle 229



front or rear controls. They are suited for use in washdown and other severe environments.

For more information, circle 168

Mobile electronic development

BODAS is **Bosch Rexroth's** Hydraulics technology group's latest mobile electronic system. The software system features building block architecture. The programming interface is based on standard IEC 61131-3 and is comparable to



industrial control systems that use a programmable logic controller. The development and interface tools enable reliable system installation and simplify setup. In addition, software application packages with specific Rexroth application knowledge are designed according to this building block system. Customers can select and configure turnkey coordinated application software modules depending on the requirements of their system. Individual and precisely tailored software concepts are also possible.

For more information, circle 169

Machine guidance

The MC 200 Digger from **Leica Geosystems** permits the machine operator to dig rapidly, accurately, and on-grade from inside the cab—minimizing the need for workers in the trench.

A ruggedized LCD display panel in the cab indicates the exact bucket position in real



time relative to the desired finished grade. A rotating laser, in combination with the laser catcher as reference, provides a constant grade regardless of the excavator's height. In addition, a "Learn & Dig" feature assists the operator to set up multiple profiles within the cab, providing increased flexibility.

For more information, circle 170

Motion controller communications

PROFIBUS-DP communications has been added to **Delta Computer Systems' RMC70 Series Motion Controllers** for one- and two-axis applications. The initial releases, RMC75P-MA1 and RMC75P-MA2, complement the RMC100 PROFIBUS multi-axis motion controllers and interface to absolute position transducers—magnetostrictive displacement transducers and synchronous serial interface. PROFIBUS is a high-speed RS-485



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serial link (up to 12 Mbaud). The RMC70 acts as a PROFIBUS-DP slave, and is controlled by a PROFIBUS-DP master, such as a Siemens PLC.

For more information, circle 171

Finish grading control

Topcon's Millimeter GPS for 3-D machine-control applications expands capabilities of machine-control systems to building pads, roads with near flat slopes, athletic fields, and other areas where vertical tolerances are less than one-tenth of a foot. The product enhances the vertical precision of GPS-guided systems via LazerZone



technology, which incorporates the PZL-1 zone-beam laser transmitter to speed a 2000-ft (600-m) area with a 33-ft (10-m) high wall of laser light. The PZS-MC sensing unit is mounted on the machine's vibration pole, replacing the GPS antenna.

For more information, circle 172

Automated positioning systems

Dashboard-mount positioning systems from JLT Mobile Computers use GPS technology to position dozer blades or other heavy equipment tools anywhere on a job site within thousandths of an inch of their intended location. The units with-



stand heavy dust, constant vibration, and ambient temperatures ranging from -30 to +120°F (-34 to +49°C). They feature rugged mouse or optional touchscreen interface, sunlight-viewable display, and various processor choices.

For more information, circle 173

Magnetostrictive sensor

The Temposonics C-Series linear-position sensor from MTS Systems' Sensors Division fits completely inside a 36 x 23 mm (1.4 x 0.91 in) cylindrical package. The sensor's reduced size is achieved using ASICs (application-specific integrated circuits). Its modular architecture is built upon a base Core sensor to which additional application-specific features can be added as dictated by the application. When more robust environmental protection is re-

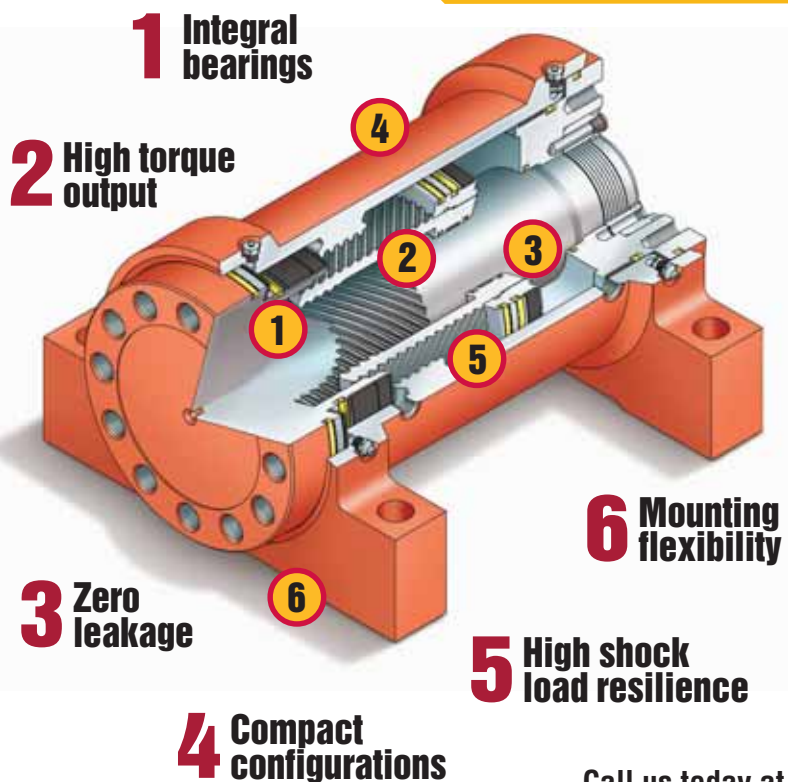
quired, standardized IP67 rated packaging can be used to house the Core sensor. It has a 0-5 V dc or pulse-width-modulated output and can be powered with a standard 5-V power supply.

For more information, circle 174



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Vehicle electrical center

Designed for driving high currents, the mVEC multiplexed vehicle electrical center from **Vansco** and **Cooper Bussmann** features up to 30 A/channel, to a maximum of 200 A. As a networked controller and power distribution module, the device alerts the operator to any system deficiency by sending information on the status of relays and fuses via the databus to any networked display or telltale module. It can address vehicle multiplexing through a J1939/CAN interface, as well as other industry-standard protocols. Applications include construction, agriculture, heavy trucking, transit bus and coach, recreational vehicle, marine, and specialty vehicles.

For more information, circle 175



Crane load

Maestro load moment indicator (LMI) from the **Hirschmann Electronics Group** consists of a central unit, console, and accessories that modernize old PAT LMIs cur-



rently installed on boom trucks and hydraulic cranes. Retrofitting takes about half a day and includes replacement of the central unit with a compact unit, loading the original data and load chart information into the central unit, and sensor alignment. Recalibration is not required. The original length and angle sensor, A2B switch, and electrical wiring can be used.

For more information, circle 176

Liquid-level switches

Whitman Controls manufactures a line of liquid-level switches that includes side- and vertical-mount models. Electromechanical devices that open or close an electrical circuit in response to a change in the level of the liquid, the switches operate with a float containing a



permanent magnet riding on the liquid's surface. The motion of the float is guided by a stem containing a reed switch actuated by the magnet in the float. The switches are produced in brass, stainless steel, and plastic. High-performance and combination temperature/liquid level models are also available.

For more information, circle 177

Electrical conduit

Liquatite flexible electrical conduit from **Electri-Flex** was designed for extreme temperature applications. The jacketed conduits withstand excessive hot or cold and offer the strength of a metal core. Applications include machinery and industrial and outdoor equipment subjected to



the elements. Type AT features a permanent virtual circuit jacket that remains flexible at low temperatures and offers a rating from -55 to +105°C (-67 to +221°F). Type ATLA has the same temperature range as the AT and offers a flexible inner core composed of a spiral wound strip of heavy gauge, hot-dipped galvanized steel for machine tool wiring and cold climates. Type ATX uses a halogen-free thermoplastic rubber jacket unaffected by temperature changes and remains flexible at -60 to +150°C (-76 to +302°F).

For more information, circle 178

Actuator feedback

Absolute Position Feedback (APF) technology from **TOL-O-MATIC** is featured on a fully integrated linear actuator sensor and eliminates the need for homing routines. The APF-equipped actuators provide analog feedback to the controller or power line carrier to determine actual load position and feature analog-to-digital conversion capabilities. Work point variances can be accommodated throughout the cycle, eliminating stoppage for manual setups.



Feedback is provided once power is applied, causing immediate resumption from shutdowns, resets, and power losses. Benefits include high life expectancy, high speed, and high linearity and repeatability. The APF option is fully integrated within the actuator body and can be ordered in incremental stroke lengths from 2 to 156 in (50 to 4000 mm).

For more information, circle 179

Zero-speed sensors

Honeywell MHS Series Hall-effect sensor offers zero speed-sensing capability and precise switch point measurement in a package that supports a variety of sensing elements and application needs, including direction sensing and diagnostics capabil-



ity. The sensor features modular construction that allows a choice of probe lengths, connector types, and multiple connector orientations. It offers two- or three-wire digital current sinking output and a gear speed measuring range of 0 to 12 KHz (depending on target). The two-wire version can detect faults in the power supply line by monitoring sensor output levels. They are suited for measuring speed in transmissions and engines as well as engine timing, ABS and wheel speed, camshaft, and speed and direction applications.

For more information, circle 180

Electrohydraulic control

The **Bosch Rexroth** RC2-2, RC4-4, and RC6-9 control units provide programmable control of up to six proportional solenoids and nine additional switching functions for simple open- or closed-loop control of hydrostatic drive transmissions or valve control on mobile machinery. The Series 20 RC units meet protective requirements with regard to ambient temperature



ranges from -40 to +158°F (-40 to +70°C), tightness to IP69, shock and vibration resistance up to 15 *g*, and electromagnetic compatibility of 100 V/m as an integral part of the overall system requirements to meet IEC 61508 functional safety guidelines for machine builders. The units feature a 16-bit microcontroller, and location of all inputs and outputs on a single circuit board.

For more information, circle 181

GPS for excavators

Topcon's 3Dxi indicate control system for excavators, which features the GX-60 display and MC-A1 antennas, enables contractors to achieve significant increases in excavation productivity. The display's low-profile design occupies minimal cab



space. Operating features include Ethernet and Bluetooth capabilities to aid communication with other site management systems. Real-time movement of bucket, stick, boom, and entire machine is displayed—providing instant visual recognition of the bucket's relation to planned grade. Plan, profile, and section views can be selected singly or in combination. The operator can see the machine's exact position in relation to the site, enabling precise positioning over utility centerlines.

For more information, circle 182

Joystick controller

J.R. Merritt's ultra-compact CS3 joystick controller includes a Hall-effect sensor for a noncontact proportional signal. This versatile controller—available in one-, two-, and three-axis models—is de-



signed for smooth, non-biasing handle action and supports a variety of deadman functions. The components of the heavy-duty device resist corrosion, and its durable housing and center pivot design allow it to withstand abuse and perform reliably in mining applications where limited space is a factor.

For more information, circle 183

Crane scale

The MSI-9260 motion-compensated crane scale from **Measurement Systems** is a complete weighing system that installs between the crane boom and magnet. With battery power and RF communications, the system requires no wires to install. It includes the



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MSI-3750CS digital weight indicator for the crane cab. In addition to displaying the lifted weight, the system can also total a series of lifts to provide vehicle or blend weight.

For more information, circle 184

Back-up alarm

The bbs-tek back-up alarm from **Brigade Electronics** uses broadband technology to emit a non-strident sound that is fully directional and equally effective at 5 db(A) lower than conventional beepers.



Localizing the direction of sound, dissipating it much faster than traditional alarms, and emitting a distinctive signal, the alarm enables people in the surrounding area to pinpoint exactly which vehicle is reversing. The system works in applications from 107 dB(A) down to 77 dB(A).

For more information, circle 185

Camshaft sensing

A Hall-effect sensor assembly from **TT electronics' OPTeK Technology** provides powertrain engineers with a noncontact means of detecting the position of a rotating shaft. The device incorporates Hallogic



technology, which combines a Hall-effect sensor element, linear amplifier, and a Schmitt trigger on a single silicon chip to provide reliable, noncontact sensing for rotary shafts or gear tooth position applications. The sensor features "true power on" position sensing independent of temperature for rotary shafts in drivetrain applications. Other applications include camshaft and crankshaft position sensing, and drivetrain and transmission speed sensing.

For more information, circle 186

Durable joystick

Designed for demanding applications including material handling, agricultural, and construction equipment, the AJ4 joystick from **ITT Industries, Cannon** offers a life cycle of more than 6 million actuations. Featuring flexibility, mechanical strength, and an improved environmental protection level, the aluminum-fabricated joystick can accommodate various standard or custom grips. With a mass of 860 g (30 oz), the AJ4 joysticks are sealed IP67 above gate with potted electronics and offer an operating voltage of 9 to 16 V dc with output options of 0.5- to 4.5-V dc, 500 Hz for pulse-width modulation. Operating temperature range is -40 to +85°C (-40 to +185°F) and maximum torque is 25 N·m (18.4 lb·ft).



For more information, circle 187

Rugged connectors

Cinch Connectors offers the SHS line of sealed headers and wire harness connectors for electronic control units in the commercial vehicle market, particularly construction, mining, agricultural, industrial, on-highway, and recreational applications. The line is based on 1.5-mm (0.06-in) blade technology and includes 18, 30, 48, and 60 I/O connectors. Other features include push-to-seat terminal technology, tangless terminal, and secondary locking as well as optional inductive filtering and various keying/color configurations in 18 and 30 positions. Jackscrew connector mating and integral protected wire seals offer environmental resistance.



For more information, circle 188

Circuit breaker

Waytek offers mid-range circuit breakers for use in marine, agricultural, construction, recreation vehicle, chassis, and specialized equipment applications. Available with 10 to 50 A ratings, the breakers are available in a panel-mount design as either automatic



reset or switchable with a manual trip feature to allow opening of the circuit path without disconnection from the power source. The single-pole, thermal-type breakers are rated up to 30-V dc maximum, and 10-32 stud terminals and nuts are included.

For more information, circle 189

Marine breaker

The Series 187 marine-rated circuit breaker (MRCB), from **Bussmann Automotive Products**, a division of **Cooper Industries**, is suitable for use in marine, agricultural,



construction, and specialty-vehicle industry applications. The MRCB is a Type 3 manual-reset style circuit breaker with a switching function. An accessible yellow lever on the cover identifies the on-off switching and allows the MRCB to be used as the main circuit breaker in dc electrical systems. Other features include ignition protection, main breaker protection interrupt rating, 5/16-18 electrical termination studs, and a mounting hole clearance designed to allow use of 5 mm (0.2 in) or 10-32 screws. Available in ratings from 25 to 150 A, the MRCB is offered in panel- and surface-mount models.

For more information, circle 190

Torque sensors

Series 4200 rotary transformer torque sensors from **PCB Piezotronics** use noncontact rotary transformers to send excitation voltage to, and receive measurement sig-



nals from, rotating strain gage sensors. Product applications include torque studies on pumps, electric motors, engine dynamometers, transmissions, and gearboxes. The maintenance-free transformer design eliminates the need to replace worn brushes and offers a capacity from 11 to 11,300 N·m (8 to 8300 lb·ft) at speeds up to 10,000 rpm. The temperature-compen-

sated units feature 2 mV/V output sensitivity and an integral shunt calibration network and are available with an optional foot-mounted housing.

For more information, circle 191

Digital controllers

Two six-digit, dual-channel controllers from **Macro Sensors** are suitable for applications involving linear variable differential



transformer (LVDT) based displacement transducers or variable-reluctance half-bridge gaging probes. The DMC-A2 AC-LVDT and DMC-D2 DC-LVDT dual-channel controllers perform arithmetic calculations between two channels or execute differential measurements to gage products for quality control and product sorting. Features include internal signal conditioning to provide proper voltage for operating LVDTs, four independently programmable set points with eight selectable functions, a scrolling display that prompts users to input information during specific stages, and a scalable analog output for use with data loggers and computers.

For more information, circle 192

Display control

TTC Vision from **TTControl** is a display control unit that supports both CAN and TTP bus solutions. It is designed for use in



harsh environments and at extreme operating temperatures of -40 to +70°C (-40 to +158°F). The injection-molded aluminum housing protects against electromagnetic disturbance and mechanical stress. Additional communication interfaces are offered for RS-232, RS-485, and LIN. The system provides both a low-voltage differential signaling interface and a PAL/NTSC interface, and thus is suited for the control of various display types.

For more information, circle 193

Multi-lingual display

FWMurphy's PowerView is a multifunction tool that enables equipment operators to view many different parameters and service codes, with the ability to display more than 30 standard **SAE J1939** parameters broadcast by engine and transmission ECUs. Introduced initially in October 2003,



the latest version of the PowerView software includes three new languages, offering users a choice of English, French, Spanish, or German without PC or software downloads required. All fault codes are translated appropriately along with real-time information. Murphy has also implemented MODBUS support for the PowerView, allowing the translation of existing ECU protocols into the traditional MODBUS protocol for users not yet used to J1939. It also allows users to integrate their J1939 information into a PC or PLC (programmable logic controller) device.

For more information, circle 194

Rugged pedals

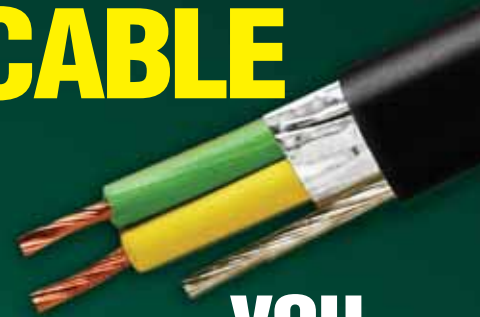
Single and double foot pedals from **ITT Industries** feature a rugged design and contactless sensing system suitable for use in harsh environments, including heavy-duty industrial vehicles and machinery. Both the FP (single)



and DFP (double) series have a life of more than five million cycles and were designed to incorporate both standard and custom-designed pedal levers. Both series are also protected to IP67 and meet EMI specifications of more than 100 V/m. The pedals are configurable in standard or slave versions and are offered with a controller that can be arranged to act as the master device. Output characteristics, operating force, and level deflection angle are customized to suit specific requirements.

For more information, circle 195

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