

Hybrid controller

Motorola, Inc.'s 56F8300 hybrid controller series integrates signal processing, fast Flash memory, and clock speed into a 16-bit package, allowing industrial designers to use the devices in applications previously considered the domain of 32-bit microcontrollers. The series executes code from a third-



generation Flash at up to 60 million instructions/s without using acceleration technology, and improved I/O capability provides additional design flexibility. The 56F8300 was created to withstand harsh environmental conditions such as extreme temperatures, heavy debris, and abrasive movements such as vibration and shock. Extended temperature capabilities enable the first six devices in the series to operate at a range of -40 to +125°C (-40 to +257°F).

For more information, circle 170

Piezoresistive accelerometer

Endevco's Model 7270AM6 series of piezoresistive accelerometers feature mechanical filters for shock measurements and provide protection from high-frequency inputs by mitigating the frequency content of a shock pulse. The mechanical isolater is composed of



an aluminum housing with a cushioning layer of elastomer filter on either side of the accelerometer, making the response the same to both negative and positive accelerations. A mechanical filter features a damped output with a linear phase shift. It is available in full-scale ranges of 6000, 20,000, and 60,000 *g*; is usable over the frequency range from dc to 10 kHz; and offers a temperature range of -30 to +150°F (-34 to +66°C).

For more information, circle 171

Controller with HMI

The Allen-Bradley Pico GFX-70 from **Rockwell Automation** is a versatile, small-footprint controller with a multifunction human-machine interface (HMI). It has an integrated graphic display so engineers can program both



control and HMI functionality with one software package (or with on-display buttons), simplifying installation and reducing the cost and time associated with building a control system. Three parts comprise the unit: the HMI, a processor/power supply, and I/O modules (digital or analog).

For more information, circle 172

Low-power receiver

The LF ASK 125 kHz ultra-low-power receiver IC ATA5282 from **Atmel Corp.** features three input channels for 3-D antennae. This remote control receiver IC has a digital 8-bit RSSI output for improved location precision. It is



designed for passive entry go (PEG) systems in automotive and access control applications. By adding up to three antenna coils, a microcontroller, an RF transmitter or transceiver, and a battery, hands-free key fobs for PEG systems can be designed. A PEG system recognizes a card by comparing the magnetic field strengths of the various trigger systems if the card is inside or outside the car. If the card is not recognized to be within the car, the motor will not start. This feature helps to prevent unintended car start.

For more information, circle 173

Antifuse-based FPGAs

Antifuse-based SX-A and MX field-programmable gate arrays from **Actel Corp.** operate at ambient temperatures from -40 to +125°C (-40 to +257°F) and junction temperatures up to 150°C (302°F). They are optimized for in-cab control and interconnect functions for a range of telemetric applications such as navigation, speech recognition, control/comfort systems, passenger monitors, and head-up displays. The SX-A devices feature up to 72,000 typical gates, or 36,000 application-specific integrated circuit gates, and deliver system performance of up to 250 MHz. At 5 V, the MX devices exhibit low power consumption.

For more information, circle 174

Engine control instruments

The CANcockpit system from **Siemens VDO** processes not only the digital signals from two CAN bus inputs, but also the analog data provided by classic sensors. The master instrument controls up to 16 further display instruments. It can be



reconfigured should additional functionality be required. In cases such as where the rpm is too high or oil pressure too low, the system can be programmed to trigger a warning signal or directly display warnings transmitted from the CAN bus.

For more information, circle 175

Electrical connections

Sonicrimp technology from **Methode Electronics, Inc.** creates electrical connections without the use of solder, lead, or high temperatures. It can join similar or dissimilar materials to create gas-tight and moisture-resistant electrical connections. The system mass-terminates solid or stranded wire, cable, flex circuitry, conductive inks, carbon fibers, headers, or connectors directly to a PC board or a



substrate. The process uses a polymer cap-and-cradle system in which high pressure is applied to the connection and sonic energy is used to complete the electrical connection. The compressive load applied to each trace is precisely controlled via ultrasonic technology.

For more information, circle 176

Speed and position sensor

CAESAR DataSystems' QIC-Speed sensor uses global positioning satellite (GPS) technology to communicate the driving performance data of automobiles, trucks, and off-highway equipment. The device provides speed and position



monitoring and measurement in both on- and off-road vehicle testing. It calculates speed and direction continuously at a 20-Hz rate by monitoring the Doppler shift of the received GPS signals as the vehicle is in motion. Speed is measured with an accuracy of 0.1 km/h (0.06 mph) and distance to within 0.25 cm (0.1 in).

For more information, circle 177

Proximity sensors

Cherry Electrical Products' MP1014 Series Hall-effect magnetic proximity sensors provide solid-state sensing in a 3.3-mm (0.13-in) high package for space-limited applications. The sensors' low cost



and long life also are suitable for applications such as flow sensing, cylinder position sensing, and door interlock sensing. They provide a three-wire sinking output and operate with standard supply voltages of 4.75 to 24 V dc and offer reverse-battery protection to 115 V dc.

For more information, circle 178

Low-g accelerometer

Endevco's Model 7290A Microtron accelerometer is suited for applications requiring measurement of whole-body



motion immediately after being subjected to a shock motion. It provides high performance and reliability in the presence of severe vibration. The accelerometer features hyperflex coaxial cable assemblies, which offer break strength and resistance to a variety of chemicals, solvents, and liquids. It operates from 9.5 to 18.0 V dc. Anisotropically etched silicon microsensors feature gas damping and internal overrange stops to control frequency response and withstand high shock and acceleration loads.

For more information, circle 179

Specialty machine controller

STW Technic has added to its ESX family of programmable controllers with the release of the compact ESX-Micro, which allows users to realize "H-Bridge" functionality to control motor functions.



Via RS-232 and CANBus interfaces, bridge and gateway functionality are possible. With corresponding firmware, the ESX-Micro can also be used as analog or digital slave modules for CANopen or Level 2 communications. Cast-aluminum housings with an IP65 rating (with a IP67 option) offer a high degree of safety in terms of EMC and extreme outdoor environments.

For more information, circle 180

Engine panels

FWMurphy offers a new line of Electric Gage Shutdown Panels that are fully compatible with Deutz 1011/2011, 912/913, and 914 engines. The plug-and-go panels accommodate all the wiring and mounting requirements for the engines, which feature pre-installed electric-switched senders. The panels



include a pre-wired external harness with all connections and terminals, mating connectors to match Deutz wiring, pre-assembled rubber isolation mounts, and all hardware for bolt-on/plug-in installation. They also include an oil pressure gauge, engine temperature gauge, voltmeter, tachometer/hour meter, key switch, and engine preheat with indicator lamp. They also feature the Murphy 760A Time Delayed Magnetic Switch designed for simple starting and reliable engine shutdown protection.

For more information, circle 181

Cube accelerometer

The cube-shaped 8763A500 triaxial accelerometer from Kistler Instrument features three 5-40 threaded holes for flexible stud mounting on a test object. In addition, three threaded holes provide



reliable mounting for calibration of each orthogonal axis. Simultaneous shock and vibration measurements are permitted in three mutually perpendicular axes. The accelerometer uses shear element technology to provide high immunity to base strain and thermal transients. A miniature four-pin ceramic insulated connector provides long-term stability over the operating temperature range. Hermetic insulation is provided by welded titanium construction. The accelerometer has a mass of 3.3 g (0.1 oz) and a measuring range of $\pm 500 g$.

For more information, circle 182

Engine control

Axiomatic's digital engine-control module interfaces between an engine manufacturer's electronic-control unit and a hydraulic valve. The module is used for applications such as hydraulic fan drives and hydraulic controls. The device



will accept a pulse-width-modulated signal with variable duty cycle from an engine control module, and it provides one dc current output of up to 2 A. Features include user-configurable superimposed dither and ramp time, reverse polarity protection, RS-232 interface to PC or laptop, and operation from -40 to $+85^{\circ}\text{C}$ (-40 to $+185^{\circ}\text{F}$).

For more information, circle 183

In-circuit emulator

NEC Electronics America, Inc.'s IECube ICE (in-circuit emulator) supports its 32-bit V850 and 8-bit 78K0 microcontroller series. The unit delivers real-time debugging capabilities and a small form factor for easier handling. USB 2.0 interface capability enables the ICE to be connected to a host computer while improving the maintenance and support system. The package includes emulator control software, Flash electrically



erasable programmable read-only memory writer, and power supply unit.

For more information, circle 184

Thermal substrates

TT Electronics' IRC Advanced Film Division's Anotherm PC boards are made of anodized aluminum substrate material with thermal conductivity and address the problem of heat dissipation in direct-mounted LEDs. They allow



design engineers to mount LEDs and other components directly to them, eliminating the need for attached heatsinks and mounting hardware. Solderable thick-film conductors can be screen-printed directly to the substrates to connect surface-mount packaged components and wire-bonded die. In addition to LED applications, the substrates are being designed into power electronics circuits, motor controls, and power amplifiers. They feature an insulation system consisting of a thin layer of anodized aluminum oxide that is chemically grown on the aluminum core, producing a dielectric layer ± 0.0014 in (0.35 mm) thick.

For more information, circle 185

Diaphragm seal

The **Ashcroft** Type 310 mini diaphragm seal is designed for use in small spaces and protects transducers, mini switches, and 3.5 in (89 mm) or smaller pressure gauges from corrosive media, plugging, or freeze-up. The seal is available with male- and



female-threaded NPT process connections in sizes from 0.125 to 1 NPT. Pressure ratings are 2500 psi (172 bar), and coding remains unchanged with the exception of the connection designation. All-welded construction prevents process media from leaking. The seal may be ordered in 316L stainless steel, Hastelloy C, Tantalum, and Monel wetted parts.

For more information, circle 286

Fast idle controls

ETM60 series electronic throttle controls from **InPower** LLC are used for applications requiring regulation of engine speed, including power takeoffs, high alternator demands, inverters, air



compressor systems, hydraulics, and other truck-mounted equipment. Features include three preset rpm controls, variable rpm control, battery charge-protect, and safety interlocks. Applications include rescue vehicles, digger derricks, aerial devices, tail gates, spreaders, and winches.

For more information, circle 187

Pressure/temperature sensor

The model CS100 combined pressure and temperature sensor from **Kavlico** is a ceramic capacitive sensing element paired with a rugged brass housing, stainless steel outer housing, and MIL-C-26482 connector. The sensor can be used for wet or dry applications, may be specified as either gauge or absolute, and is available in several ranges up to 300 psi (21 bar). The sensor



operates on 5 V dc ± 0.25 V, in a temperature range of -40 to +125°C (-40 to +257°F).

For more information, circle 188



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Industrial gauge

The 4.5-in (114-mm) **Ashcroft** digital industrial gauge allows battery replacement without tools. The unit comes apart for battery installation with a twist of the front ring, and the gauge can

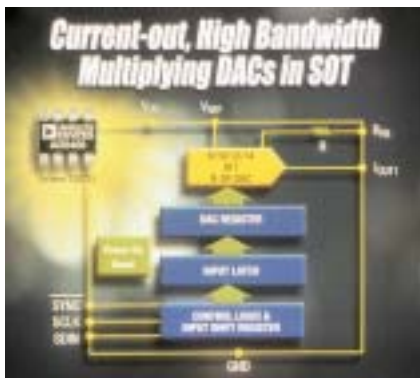


then be hand-tightened to fit securely back in its correct position. The unit comes with a standard thermoplastic case and cam-lock ring, or with an optional aluminum case and threaded ring. The gauge is powered by two C-cell batteries.

For more information, circle 189

Digital-to-analog converter

Analog Devices' AD545x, its smallest current-output digital-to-analog converters, feature up to 14-bit resolution, a small outline transistor packaging, and multiplying bandwidths in excess of 10 MHz. Each part operates from a single 2.5- to 5.5-V power supply, and can handle ± 10 -V signals on the reference input. The three-wire serial port operates at clock rates up to 50 MHz and is compatible with most standard serial



peripheral and digital-signal processor interfaces. High dc applications include setpoint control, bias adjust, automatic test equipment level setting, programmable reference, and gain/attenuation control.

For more information, circle 190

Smart accelerometer

The 8762(X) M10 series accelerometer from **Kistler Instrument Corp.** incorporates TEDS (Transducer Electronic Data Sheet) smart-sensor technology with simultaneous measuring



vibration in three, mutually perpendicular axes. PiezoSmart circuitry permits reading a self-generating data sheet and writing to the internal sensor memory. The series provides conventional analog operation in the low-impedance voltage mode, and measuring ranges include 5, 10, and 50 *g*. The 20-mm (0.8-in) accelerometer features a ceramic shear sensing element and ground-isolated housing.

For more information, circle 191

Solid-state pressure switch

Gem Sensors' PS98 pressure switches feature a polysilicon strain gauge and a custom application-specific integrated circuit to provide thermal-compensated



pressure sensing. The sensing results are used to actuate a solid-state relay or transistor switch. In addition to pressure-sensing electronics that range from 0 to 6000 psi (0 to 400 bar), the series offers a broad selection of pressure connections and several electrical termination options. Operating temperatures range from -40° to $+260^{\circ}$ F (-40° to $+125^{\circ}$ C), and the power requirement is 24 V dc.

For more information, circle 192

GPS receiver

The **Trimble** AgGPS 252 receiver provides a WAAS (wide area augmentation system) / EGNOS (European Geostationary Navigation Overlay Service), OmniSTAR VBS (virtual base station), OmniSTAR HP (high performance), and RTK (real-time kinematic) GPS receiver in a one-piece



antenna design. It features a 12-channel GPS engine, with ionosphere and troposphere models that reduce positional error in any environment. The smart antenna design allows selection of any differential source without making hardware upgrades costly. Operation in RTK mode requires an RTK base station, which transmits real-time positional carrier phase data over a radio data-link to the AgGPS 252 receiver in the field. The receiver then computes its position. For less accurate positioning, the real-time DGPS (differential GPS) mode can be used via WAAS / EGNOS or an OmniSTAR VBS or HP subscription service.

For more information, circle 193

Limit switch

Honeywell Sensing and Control's EVN2000 limit switch is designed for fast wiring in applications that include automated equipment, scissor/platform lifts, packaging machinery, and material handling. The switch has an enclosed housing, no removable external parts, and

uses insulation displacement terminals to reduce installation time by up to 50%, according to the company. It offers snap-action, one-open/one-closed direct-opening operation, with a 4-mm (0.16-in) air gap and a choice of four actuator types.

For more information, circle 194



Vision system

Trimble's SiteVision System, version 5.0, is a machine-guidance and control system for use on dozers, scrapers, motor graders, compactors, and excavators. Precise to 30 mm (0.1 ft), the system uses a GPS receiver installed on the equipment to continually compute the position of GPS antennae on each end of the machine's blade. An onboard computer determines the position of each blade tip and compares these positions to design elevation, computing the cut or fill to grade. This information is displayed on the in-cab screen, and the cut/fill data is

passed to the system's lightbars, which guide the operator up or down for grade and right or left of a defined alignment. Features include cut/fill mapping, coverage mapping, terrain mapping, and enhanced avoidance zones.

For more information, circle 195



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PC card

The FlexCard from Vector Informatik GmbH is a CARDBUS-based PCMCIA (Personal Computer Memory Card International Association) card that is equipped with two FlexRay channels that communicate with the FlexRay bus either



by RS-485 or the FlexRay Physical Layer. The card permits the sending and receiving of FlexRay messages and listening to the FlexRay bus. The card supports FlexRay controller implementation V6.2, and runs on Microsoft Windows 2000 and XP.

For more information, circle 196

Power converter

The C5300 series of 7500 W, 7-in (178-mm), standard 19-in rack dc/dc and ac/ac converters from Schaefer, Inc. are designed for applications such as locomotive controls, communications and charging equipment, military vehicles, telecommunication systems, process-control systems, and power stations for direct-load sourcing. The devices are available in five dc input ranges from 80 to 800 V dc, and three ac input ranges from 160 to 530 V. Units can also be supplied with an external power factor correction module offering additional input ranges. Single output units provide eight ranges from 24 to 400 V dc. All units



have remote sensing, over-voltage protection, and output-current limiting features. Operating temperature is -20 to +75°C (-4 to 167°F), with optional operation down to -40°C (-40°F).

For more information, circle 197

Absolute pressure sensor

Kavlico's OEM P4050 BAP (barometric absolute pressure) sensor is designed to withstand hostile, high-vibration, and broad-temperature-range environments found in small-engine applications for recreational and marine vehicles and equipment. It incorporates a peizo-



resistive sensing element and a programmable application-specific integrated circuit on hybrid circuit for reliable signal conditioning and maximum electronic integration. Operating from -40 to +125°C (-40 to +257°F), the unit measures pressure from 5.8 to 15.95 psi (0.4 to 1.1 bar) absolute. It operates on 5 V dc and provides an amplified, linear 0.5 to 4.5 V-dc output. The sensor is capable of submergence in water due to a hydrophobic filter barrier.

For more information, circle 198

Open-air resistors

The OARS series of precision surface-mount current-sense resistors from TT Electronics' IRC Wirewound and Film Technologies Division features a resistive element with an open-air flow-through design that keeps the resistor's hot spot safely off the PC board. Air can circulate around the element, contributing to cooler operations via increased heat



dissipation. The resistors are rated for 1-W at 85°C (185°F) and 50-V continuous with resistance values from 0.002 to 0.05 ohm. Applications include antilock brake systems, window lift motors, wiper controls, body computers, power steering systems, seatbelt pretensioners, fuel pumps, heated seats, flasher modules, and solenoid controls.

For more information, circle 199

Boat electronics

Raymarine, Inc.'s A-Series product line is intended for boats with limited space yet incorporates the same technology found in its products for large boats. The products in the series include the 3.5-in (89-mm) DS400X, 5-in (127-mm) DS500X, and



6-in (153-mm) DS600X high-definition fish-imaging color digital fishfinders; Ray 48 and Ray 54 (pending FCC approval) fixed-mount VHF radios; Ray101 handheld VHF radio; RC400 portable color GPS chartplotter; and RC435 and RC435i fixed-mount color GPS chartplotter with external antenna and fixed-mount color GPS with internal antenna.

For more information, circle 200

Instrument cluster

An instrument cluster from **Siemens VDO** provides the drivers of excavators, tractors, or forestry machinery with engine-monitoring displays at a glance. It has four analog displays for parameters such as engine speed, tank fill level, and



coolant and engine temperature. A digital display features operating hours and the selected gear, and it offers up to 15 separate control lamps. The equipment is vibration-resistant, and is installed to be water-tight.

For more information, circle 282

Proportional valve actuators

The PVE Series 4 electric, proportional valve actuators from **Sauer-Danfoss** enable multiple functions to be performed simultaneously, delivering the exact oil flow and pressure needed for each motion. They replace the existing Series 2 and 4 actuators. Typical applications



include tractors, backhoe loaders, telehandlers, truck-mounted cranes, and forestry machinery. The modules enable valve assemblies to be built to exact requirements. The redesigned solenoid valve allows faster operation than the previous version. A software potting material provides maximum water and humidity resistance, while enhanced electromagnetic compatibility gives protection from external interference up to 100 V/m.

For more information, circle 283

CAN device profile

CAN in Automation's CANopen device profile for road construction machinery covers machines such as pavers, compactors,

graders, dozers, mills, heaters, and trucks. The onboard computer provides for the type of machine via wireless local-area network communication. This device profile was jointly developed with the **Osyris** (Open System for Road Information Support) consortium and the **European Asphalt Pavement Association**. Devices compliant to this profile require an application master device with CANopen



manager functionality that can support self-configuration of the CANopen network.

For more information, circle 284

Compact dc/dc converters

Schaefer, Inc.'s mechanical accessories allow for mounting compact dc/dc converters of the LFC, HFC, and LEC series on rails. Engineers can choose between a horizontal and vertical variant. The converters in the output power class of up to 160 W are available with input



voltage ranges (up to 1:4) for 12, 12/24, 24, 36, 72, and 110 V and with the standard output voltages. Features include short-circuit, over-temperature, and under-temperature protection; remote on/off; voltage control; and thermal warning. Operating temperatures include -40 to +85°C (-40 to 185°F).

For more information, circle 285

Electronic data sheets

TEDS (Transducer Electronic Data Sheets) from National Instruments extend plug-and-play capabilities to the sensor by simplifying connection and



eliminating manual data entry. The smart TEDS sensor provides a serial digital interface for communicating with an embedded memory device within the transducer. This memory contains the binary TEDS information that identifies and describes the sensor, including manufacturer, sensor model number, serial number, measurement range, sensitivity, and calibration information.

For more information, circle 286

Voltage regulator

The LM9076 from National Semiconductor Corp. is a 150-mA, low-voltage dropout voltage regulator for applications such as keyless entry, security, and lighting systems. The unit is available in 5 V, with other voltage options for multiple applications. Protection features



include thermal shutdown, input transient protection, and a wide operating temperature. The simplified circuit design can withstand harsh environments with wide voltage transients. The LM9076 has a quiescent current of 25 mA, typical for a 0.1-mA load.

For more information, circle 287

All-metal connectors

ITT Industries, Cannon's range of FAKRA RF (radio frequency) connectors feature an all-metal construction, which increases robustness and simplifies installation. The single-piece die-cast connectors are available in



one-, two-, and three-way versions for high density. They are color-coded in accordance with the FAKRA standard: Code A is black for DAB (digital audio broadcasting); Code B, natural (DAB with power); Code C, blue for GPS; and Code D, violet (cell phone).

For more information, circle 288

CAN component

The CL407 controller area network (CAN) component from HED enhances the response of off-highway machine functions to commands from operator control devices. It is an interface between joystick control and components such as



machine valves and solenoids. The device is typically configured as a "slave" module in a CAN system, although as a stand-alone module or single-board controller there are an additional four digital inputs available. Features include an input/output count, with 4 A available on the outputs, and a 60-mA, 5-V dc regulated-supply for providing power to external input devices.

For more information, circle 289

Hydrostatic gauge

The G/LL46 open hydrostatic gauge from e-Components International, Inc. continuously displays the liquid level of a tank. It is supplied in a range of depths up to 10 ft (3 m), and is adjustable for precise



calibration. The tank level is measured with either polyurethane or a stainless steel capillary tube. It features no moving parts, no electrical connections, and can be used for fuel and storage tanks.

For more information, circle 290

CL-410 control module

The CL-410 module from HED enables forestry/logging equipment, agricultural machinery, forklifts, excavation, and other smaller vehicles to offer safety interlocks and load shedding. The unit, which resides in the software, provides load control. A safety interlock feature



prevents damage from activity such as a boom swinging too far. The device also provides proportional control to the machine's hydraulics, controls the starter and fuel solenoids, and manages the interface to the ignition key. SmartFETS provide diagnostic feedback. The device uses no relays or fuses, making it suitable for tight spaces. The module has eight total inputs, including one frequency or digital input for load control functions and seven analog or digital inputs.

For more information, circle 307

Multiple lingual display

FWMurphy's PowerView system products support Spanish, French, and German within the interface, along with the default English language setting. The feature displays standard engine operating parameters and menu fault codes in any of the supported languages, which can be selected as an additional menu option. The system is a multifunction tool that enables equipment operators to view different engine or transmission parameters and service codes via display and analog gauges. The display-viewing operating temp-



erature range is -40 to +167°F (-40 to +75°C), and features environmental sealing to ± 5 psi (0.34 bar).

For more information, circle 308

Dry photoresist

DuPont Electronic Technologies' WB series dry photoresist is an alternative for wafer bumping. The thick, dry photoresist spans over 100 μm (3900 μin) and is applied in one step, with no solvents or drying required, resulting in fewer overall process



steps, and exact thickness uniformity from edge to edge of the wafer, according to the company. A range of photoresist thicknesses and formulations are available for use in lead-free, photostencil, and standard electroplating applications.

For more information, circle 309

Seven-pole connector

Cole Hersee Co.'s seven-pole connector is designed with a heavy-duty, die-cast metal construction, and is composed of a seven-pole plug-and-socket with the ground terminal reversed. It acts as a supplementary link to work in



conjunction with the standard connector between a truck and trailer to handle the extra circuits involved in systems such as trailer antilock braking systems; trailer temperature, load, and monitoring; onboard weighing equipment; rear vision and blind spot correction; and satellite trailer tracking.

For more information, circle 310

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Circle 235

Wireless information director

AVIDWireless' AVIDirector is a Java-based intelligent wireless information director that is able to gather, process, and format information and transmit it over the appropriate wireless network. It is built to function in -40 to +85°C (-40 to +185°F) with no ventilation, and features 10 g vibration and 40 g shock



specifications. It is ruggedized for performance in hostile environments such as field data collecting and vehicle data monitoring. It can be customized to connect with multiple types of equipment, machines, or devices. Features include 160 MIPS Java processor, open architecture for ease of handling custom applications, four configurable AVIDIO ports, and an internal GPS option.

For more information, circle 311

Intellectual property core

The Core1553BRM intellectual property core from Actel Corp. is designed for use with Actel's field-programmable gate arrays in the military and industrial markets. Designers can select an integrated, individual, or dual-function bus controller, remote terminal, or monitor terminal solution. The core speeds time-to-market, eliminates nonrecurring engineering costs, and reduces high system costs when compared with custom application-specific integrated circuits. It can interface to standard transceivers and legacy systems, enabling engineers to replace existing components and reuse current software.

For more information, circle 312

Power electronics material

ACME Electronics Corp.'s line of manganese-zinc ferrite materials includes the P51 material offered in a selection of core shapes for high-frequency power electronics applications. The P51 soft ferrite material was developed to meet the rising performance requirements of dc



dc converters with operating frequency requirements up to 1 MHz. The material exhibits initial permeability of 1500 ($\pm 25\%$) at 10 kHz, and flux density is 490 mT at 25°C (77°F) to 400 mT at 100°C (212°F). Applications include switch mode power supplies, dc-dc converters, and high-frequency transformers.

For more information, circle 313

Coaxial connector

Seven field-replaceable SMA (Subminiature A) subminiature coaxial connectors from San-tron, Inc. are designed to accept semi-rigid and flexible cables ranging from 0.85 to 0.250 in (2.16 to 6.35 mm). They employ a



screw-type coupling mechanism and have precision-buffed dielectric interfaces which yield consistently low VSWR values. The 50- Ω units perform to 26.5 GHz, and are mounted onto a glass bead and designed per the Mil-348 interface. They come in gold-plated brass and 303 stainless steel, and in two-hole and four-hole configurations.

For more information, circle 314

Pressure transmitter

The D-2X-9 CANopen pressure transmitter from WIKA Alexander Wiegand GmbH features digital technology, high shock and vibration resistance, and electromagnetic compatibility characteristics. An optional



integrated Y-connector makes data and power-supply connections possible without looping into external components. Customer-specific adjustments of measuring values are enabled by an individually programmable filter.

For more information, circle 315

Lead-free cables

Madison Cable lead- and heavy-metal-free cables from Tyco Electronics feature proprietary polymer compounds for both primary and jacket insulations, allowing them to be made in both flexible and standard versions. The polymer technology

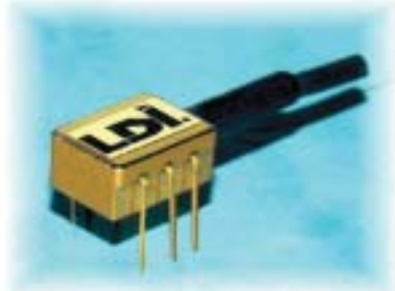


does not use polybrominated biphenyls, polybrominated diphenyl ether, cadmium, mercury, or hexavalent chromium to achieve stability, flexibility, gloss, hardness, or color attributes. Products in the line include small computer-system interface, Fibre Channel, Infiniband, video, multi-conductor, multi-pair, coax, parallel pair, planar, and single-conductor designs.

For more information, circle 316

Mini-DIL package

Laser Diode Inc.'s small-footprint, pigtailed mini-DIL (dual-inline) option for its emitter products is available for F-P (Fabry-Perot) laser and ELED (edge-emitting light-emitting diode) devices as well as the single-element pulsed-laser devices. A QCW (quasi continuous wave) version can be used for ordnance initiation. Fiber types range from single-mode to



100- μm multi-mode with a maximum cladding diameter of 140 μm . The package features laser-welded fiber alignment and hermetic metalized fiber technology for long-term reliability. The pins are arranged on a 2.54-mm (0.10-in) lead spacing and 7.62-mm (0.30-in) center lines in DIL configuration. Leads may also be specified in a straight wing profile. The system provides low inductance, which is suitable for fast-pulse applications.

For more information, circle 317

Rotary sensor

The RS80 position sensor from **Power Components of Midwest, Inc.** is used in throttle position, steering feedback, and suspension height adjustment applications. Sensor electronics are environmentally sealed with a two-part



epoxy potting and are isolated from rotating parts. The sensor uses Hall-effect technology, and features analog or pulse-width-modulated output, a programmable rotational range, and complete circuit protection.

For more information, circle 318

Tire-pressure monitoring

The **Doran PressurePro** tire-pressure-monitoring system continuously



monitors pressure of up to 34 vehicle tires and displays them in a digital readout in the vehicle cab, allowing the driver to monitor leaks and schedule repairs or replacements without breakdowns or downtime. Audible and visual alerts notify the driver of low-pressure conditions.

For more information, circle 319

HARD COAT

(MOTHER NATURE'S VERSION)

Of course, if Mother Nature hardened her eggshells like we harden aluminum, you'd need a diamond cutter to make your morning omelet. Hard coat anodizing gives aluminum the hardness of steel along with a superior resistance to the life-shortening effects of abrasion, corrosion, moisture, heat and cold. Combine all this with its excellent electrical and thermal insulating properties and high lubricity, and you've got the best and most cost-effective way to protect your parts. What's more, it's an environmentally safe process.

Huge or tiny parts, high or low volume - our fully automated 75-foot hard coat line can handle it all with greater accuracy and reliability to provide you with high quality parts that will give you the edge on Mother Nature. For a FREE hard coat sample on your aluminum parts, call Fort Wayne Anodizing today!

You make the parts. We make them last.

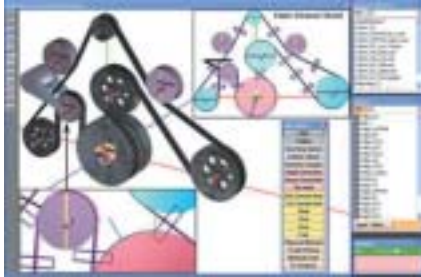


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Multi-chip switch

The MC33984 eXtreme Switch from **Motorola, Inc.**'s Semiconductor Products Sector combines dual intelligent switches into a single package to deliver significant power savings and reduced heat generation. The chip can independently control and diagnose two loads while



providing self- and system-protection. The device is an alternative to mechanical or existing solid-state relays, fuses, and field-effect transistors, and is designed for systems requiring multiple drivers to switch high-dc current loads.

For more information, circle 320

Limit switches

Honeywell Sensing and Control's EVN, SZL-VL, GLD, and GLC series limit switches meet requirements in applications including scissor and aerial lifts, packaging machinery, and agricultural equipment. The EVN 2000



features insulation displacement termination wiring, integral cord grip, and the HARAX connection system. The SZL-VL contains a rugged metal base, plastic cover, and gold-plated silver contacts, which allow the unit to be applied in both logic-level and power-duty loads. The GLD and GLC series are rugged devices that are suited for indoor or outdoor applications.

For more information, circle 321

Magnetic rotary encoder

Austriamicrosystems' AS5040 is claimed to be the world's smallest 10-bit multiple-output magnetic rotary encoder integrated circuit. A system-on-chip, which integrates field-sensing Hall-effect elements, analog front-end, and digital signal processing, the device has

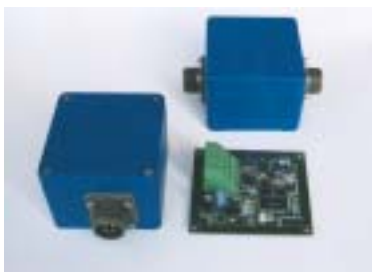


applications including steering wheel and gas pedal position sensing, headlight control, power-seat-position indicators, transmission box encoders, brushless dc motor commutation, and motion control. It operates in a contactless system with a small magnet that is placed either above or below the device. The device can detect 1024 positions in a 360° magnet turn. It provides absolute, incremental, and pulse-width-modulated digital output signals simultaneously.

For more information, circle 322

Bucket position system

A bucket position system from **Axiomatic** provides a continuous assessment of actual bucket position compared to job-site design. The operator can maintain an accurate digging slope and view in real time the horizontal bucket position as well as vertical position relative to the original reference elevation at the site. The system includes an operator display, main boom sensor, stick boom sensor, bucket sensor, and excavator pitch/roll sensor that is mounted to the excavator's body. All components are wired over a CANopen



network. Applications include excavators, attachments, graders, bulldozers, and wheel loaders. In another configuration, it is also suitable for pavers, asphalt milling, sleeper-layer, and tamping machines.

For more information, circle 323

Joystick machine control

Sauer-Danfoss's expanded line of joysticks provides a range of interchangeable base and grip options. The line includes choices



from mini-rollers and mini-rockers for light-duty machines and chest packs to standard, heavy-duty, and custom-designed base and grip solutions for more demanding applications. The joysticks are PLUS 1 compliant for ease of integration.

For more information, circle 324

Laser control

Caterpillar Trimble Control Technologies LLC's GCS400 laser-based machine-control system simultaneously controls lift and tilt of a dozer blade. The



user can select from two elevation control modes. The independent mode allows the operator to control the lift and tilt functions independently. Linked mode ties lift and tilt together, allowing the operator to maintain the blade parallel to the laser beam. With this feature, the system treats the two masts as one, setting them at the same elevation and allowing the operator to adjust grade via one switch.

For more information, circle 325