microSOLUTIONS NOV 2009

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Microchip Technology's MPLAB® ICD 2 Recycle Program

Send us your MPLAB ICD 2 and receive a 25% discount towards the purchase of a new MPLAB ICD 3 In-Circuit Debugger (DV164035), MPLAB REAL ICE™ In-Circuit Emulator (DV244005) or PICkit™ 3 Debug Express (DV164131).

Click the image above to view the MPLAB ICD 2 Recycle Program Video. To view Microchip's YouTube channel, click **HERE**.

The process is simple.

1. Complete the on-line form **HERE**.
2. Send us your old MPLAB ICD 2. Only send the puck. You can keep the rest.
3. You receive a discount code for 25% off the purchase of a new MPLAB ICD 3 In-Circuit Debugger, MPLAB REAL ICE In-Circuit Emulator or PICkit 3 Debug Express.
4. Place your order on **microchipDIRECT** or through one of our **distribution partners**.
5. You receive your new development tool.
6. We'll recycle or donate your old MPLAB ICD 2 for training.

For more information on the MPLAB ICD 2 Recycle Program, visit: **http://www.microchip.com/ICD2recycle**

Selecting an MCU with Integrated Analog to Digital Conversion

Article written by Dave Richkas, Product Marketing Manager, Microchip Technology Inc.

We live in an analog world. Analog-to-Digital Converters (ADCs) help us convert the analog world into something that can be analyzed with digital silicon very efficiently. There are many microcontrollers (MCUs) in the market with integrated ADCs. These MCUs save on board space, reduce cost and improve time to market. If you know what to look for, choosing an MCU with an integrated ADC with the performance you need can be straight forward.

First, you need to understand the difference between the ADC resolution stated in bits and the Effective Number of Bits (ENOB). All ADCs are impacted by input signal-to-noise ratio. Most manufacturers provide the SINAD (Signal-to-Noise and Distortion) specification for their ADC block in decibels (dB); the higher the better. SINAD is basically a good indicator of the ADCs overall dynamic performance. ENOB can be derived using this formula (all values are expressed in dB):

$$ENOB = \frac{(SINAD - 1.76)}{6.02}$$

The sampling rate of the ADC is also important and must be considered to ensure the desired informational components of the input signal are obtained (The Nyquist-Shannon sampling theorem tells us that the input signal frequency components of interest should be less than half of the sampling rate of your ADC). For example a 1.1 Msps ADC can be used to sample a maximum frequency signal of 550 KHz and a 4 MSPS ADC can be used to sample a maximum frequency of 2 MHz.

You may need to monitor multiple signals in the design. Some signals may require simultaneous measurements. Selection of an MCU with multiple analog channels will ease the effort and minimize additional circuitry. Microchip offers MCUs with up to 32 analog input channels. Up to 4 channels may be simultaneously sampled and converted. Simultaneous sampling and conversion is useful in a broad range of applications that have multiple signals containing unique time/relational information. For example, simultaneous sampling and conversion is useful for capturing multiple phase currents on a 3-phase motor at the same instant.

Acquisition of multiple signals can be accomplished by choosing an MCU with an ADC feature called Autoscan. MCUs with this feature incorporate a basic state machine controller for sequencing, collecting and storing data on user selected analog channels. Coupling this with Direct Memory Access (DMA) enables storage of data in on-chip RAM without CPU intervention. This frees up the CPU from servicing every ADC read and improves overall MCU performance efficiency.

Several devices in Microchip's 16-bit product lineup offer 10- and 12-bit ADCs with these features. The **dsPIC33FJ128MC804** is available in a small 8 x 8 mm 44-pin QFN package, provides industry leading SINAD of 69.5 dB typ., 9 input channels (four of which can be simultaneously sampled), and 9 channel Autoscan with DMA. With a 40 MIPS core and DSP functionality, that's perfect for many general purpose applications needing audio and speech processing or advanced signal analysis, the dsPIC® DSC is capable of handling ADC post acquisition processing requirements. To find out more about Microchip's 16 bit product families visit: **www.microchip.com/16bit**

For more information, visit http://www.microchip.com/16bit

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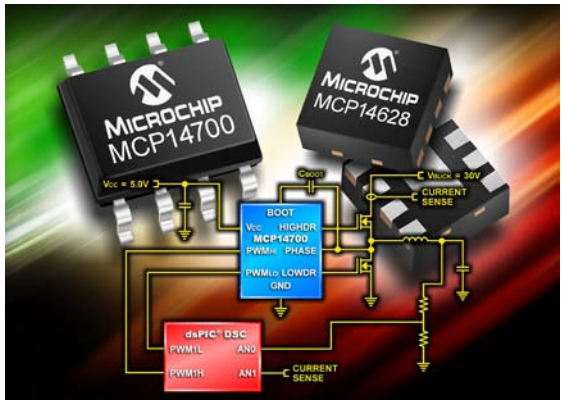
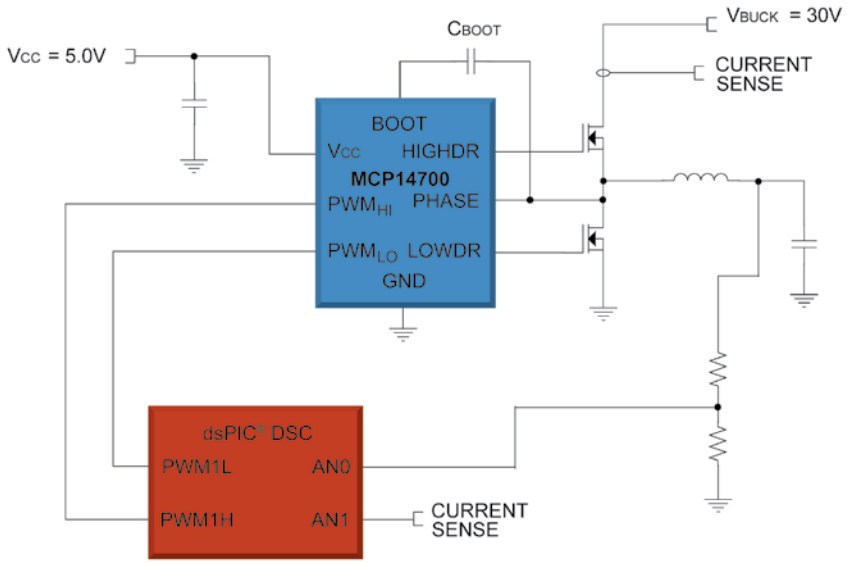
Synchronous Buck MOSFET Drivers



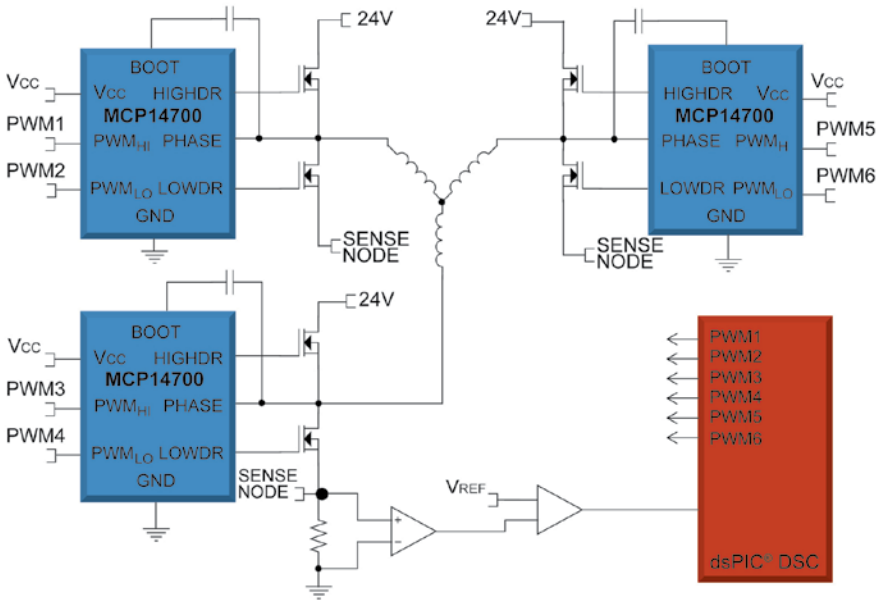
MOSFET Drivers Provide Maximum Efficiency; are Available in Small SOIC and 3 mm x 3 mm DFN Packages

The **MCP14628** and **MCP14700** Synchronous Buck MOSFET Drivers complement market trends toward "green" products by providing maximum efficiency in small packages. With both available in small 8-pin SOIC and 3 mm x 3 mm DFN packages, the new devices drive two N-Channel MOSFETs arranged in a non-isolated, Synchronous Buck converter topology. They feature excellent latch-up immunity, enabling extremely robust applications in the consumer and computing markets, such as digital power conversion, DC-to-DC power supplies, three-phase BLDC motor control and telecom equipment.

MCP14700 Digital DC-to-DC Converter Application Circuit



MCP14700 3-Phase BLDC Motor Application Circuit



The MCP14628 MOSFET driver includes an enhanced light-load efficiency mode that conserves energy when the power supply is not in full use. The dual-input MCP14700 driver is ideally suited for controllers that utilize 3.0V TTL/CMOS logic, and can control the high and low sides independently, which optimizes the timing between the two sides and further maximizes efficiency. Additionally, the MCP14700 driver's timing can be adjusted to a wide range of external MOSFETs, giving designers more flexibility to use different types of MOSFETs in their applications.

The MCP14628 and MCP14700 MOSFET drivers are available in 8-pin SOIC and 3 mm x 3 mm DFN packages, for $1.17 and $1.33 each respectively, in 10,000-unit quantities.

For more information, visit http://www.microchip.com/wwwproducts/Devices.aspx?dDocName=en544281

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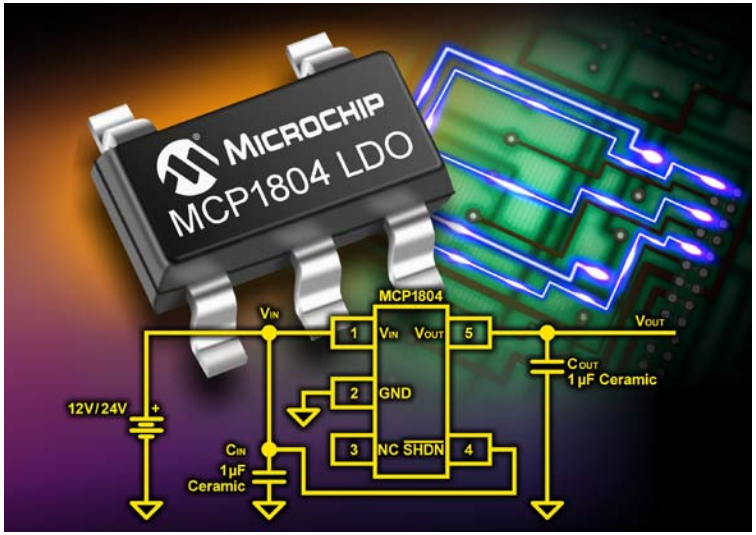
LDOs With Wide Input and Output Voltage Ranges Unveiled



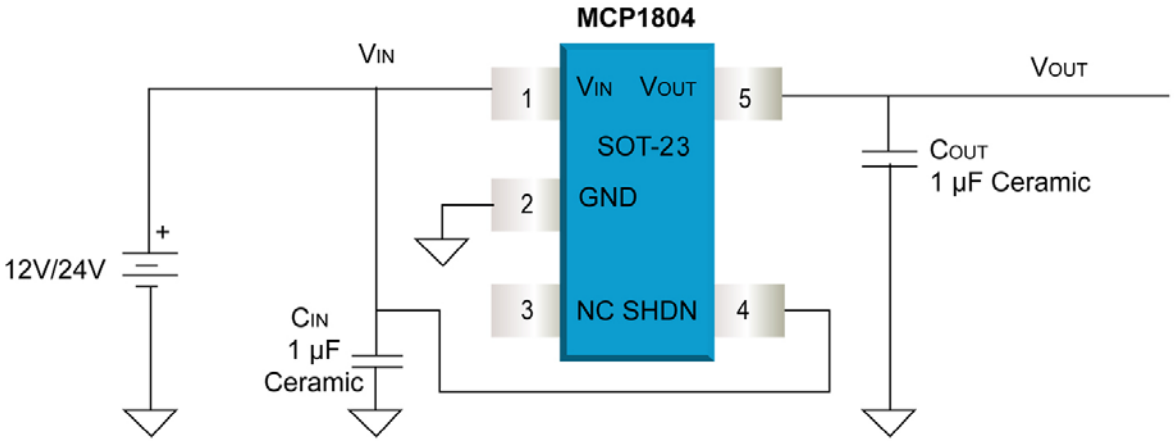
28V Input LDOs Deliver 150 mA Current; Support Output Voltages From 1.8–18V

The **MCP1804** Low Dropout Regulators (LDOs) delivers up to 150 mA of output current and support output voltages from 1.8 – 18V. The LDOs' input and output are stable, with 0.1 mF of input and output capacitance, and operate on a typical quiescent current of 50 mA. A shutdown function allows the output to be disabled, dropping the quiescent current to only 0.01 mF. The LDOs are available in space-saving SOT-23, and thermally capable SOT-89 and SOT-223 packages, and are well-suited for applications in the industrial and consumer markets, such as security systems, wireless communication systems, cordless phones and home appliances.

Designers must often drop the voltage from existing high-voltage rails, such as 12V and 24V rails, to power subsystem circuitry. The **MCP1804** LDOs' 28V input and wide output voltage range provide designers with a flexible means of doing this. Additionally, because the LDOs only require 0.1 mF of input and output capacitance, smaller and lower-cost ceramic capacitors can be used. The small and thermally capable package options make the LDOs ideal for space-constrained and high-power designs.

The MCP1804 LDOs are available in 3-pin SOT-89 and SOT-223 packages, as well as a 5-pin SOT-89 package, for $0.50 each in 10,000-unit quantities. They are also available in a 5-pin SOT-23 package for $0.48 each in 10,000-unit quantities.

MCP1804 LDO Typical Application Circuit



For more information, visit http://www.microchip.com/wwwproducts/Devices.aspx?dDocName=en543230

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Are you an engineer that develops power conversion products?

Learn how to bring the benefits of digital power conversion to your products including higher performance, lower system cost and accelerated innovation by attending one of our FREE Digital Power Seminars!

The Microchip Digital Power Seminar is a FREE technical training event developed for hardware, software and system engineers who develop power conversion products. Typical digital power applications include AC-to-DC converters, DC-to-DC converters, Uninterruptible Power Supply (UPS), renewable power/pure sine wave inverters, battery Chargers, HID lighting, fluorescent lighting and LED lighting.

Location	Date
Boston	12/3/2009
Mission Viejo	12/8/2009

Traditional power conversion designs use analog ICs with fixed functionality to provide regulated power. Digital power integrates a Microcontroller (MCU) or Digital Signal Controller (DSC) for a fully programmable and flexible solution. This seminar provides a focus on full digital control where the digital control replaces the standard analog control loop design and also provides the power management functions. The full digital solution allows you to employ techniques that are not possible with the analog solution, including proprietary digital compensation algorithms and non-linear control techniques.

Learn more about:

- What Digital Power Encompasses
- The Benefits of Digital Power
- Digital Power Applications
- Levels of Integration
- Full Digital Control
- DC to DC converter, AC/DC Power Supply, UPS, Interleaved PFC thru Live Demos
- Microchip Digital Power Solutions

Enter to win a Digital Power Development kit worth over $200!

Register today at: www.microchip.com/DPS

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Gain a competitive edge.

Learn about the latest technologies to enhance your next embedded design.

Are you tasked to do more with less, at lower costs and in less time?

The Embedded Designer's Forums are designed to help you accomplish these goals. Whether it is learning how to develop extremely low-power designs, or enhancing user interfaces with touch sensing and graphic displays, the EDF can give you an edge to quickly differentiate your products in the marketplace.

Join us for the **Embedded Designer's Forum (EDF)**, a worldwide series of technical learning events focused on innovative technologies that will help designers stay ahead in today's competitive environment. The forums will run from October 2009 through February 2010 at 120 locations across North America, Europe, South Africa, Australia, New Zealand, China, Japan, Taiwan, Korea, ASEAN and India. All attendees will receive a substantial discount on select Microchip development tools, as well as a free, hands-on training class at any of Microchip's 37 worldwide **Regional Training Centers**. To register or for more information, please visit **http://www.microchip.com/EDF**.

Showcasing the latest PIC® microcontroller (MCU) technologies, the Embedded Designer's Forums will teach designers how to add more features and functionality to their designs, lower system costs and get to market faster. Each forum will include the following sessions:

- Lower Your System Power with the **World's Lowest Sleep Power MCU**
- Getting the Most Out of the New 32 MHz **PIC16F Enhanced 8-bit Core MCUs**
- Expand Your Application with **PIC32 32-bit** Performance
- Add **LCD** and **Graphics** Displays to Your Products
- Improve Your User Interfaces Using **Touch-Sense Technology**
- Integrate **USB** Connectivity Into Your Embedded Design

EDF attendees will see demos of Microchip's easy-to-use development tools and free software libraries. Discounted tools include the MPLAB Starter Kits for PIC18 8-bit, PIC24F 16-bit and PIC32 32-bit MCUs; the F1 Evaluation Platform for Enhanced 8-bit PIC MCUs; the **mTouch™** Capacitive Touch Evaluation Kit; and the PICkit™ 3 Debug Express.

To learn more, please visit http://www.microchip.com/EDF

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New dsPIC33F PMSM & BLDC Sensorless Motor Control Application Notes

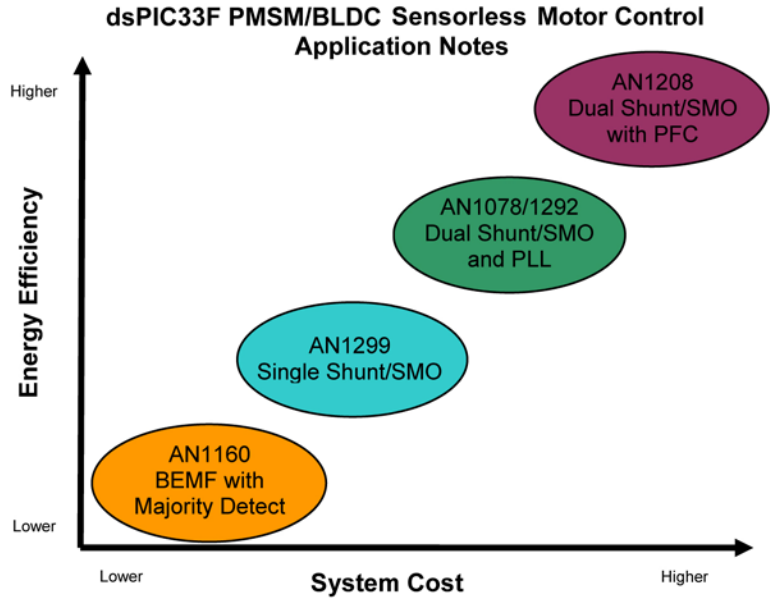
Motors are often a ubiquitous resource, running in the background to perform their tasks out of site, out of mind. However, motors consume a significant percentage of the available electrical energy. It is natural that the trend in motor control is to increase their efficiency while simultaneously reducing their operating cost and carbon footprint.

In order to accomplish this, the motor control system developer must often choose between a lower initial system cost on a less efficient motor and control technique, and a more energy efficient motor and control system with a higher initial cost. For example, choosing an AC Induction Motor (ACIM) for a house blower fan and running it open-loop would undoubtedly provide the lowest system cost. Choosing a Permanent Magnet Synchronous Motor (PMSM) and using a better control method instead would cost more initially, but would result in lower operating costs due to the higher energy efficiency of the system.

Microchip is a leading supplier of motor controllers. For simple on/off or open-loop control, a PIC16F or PIC18F MCU can often be used. However, to obtain top efficiency the dsPIC® family of motor controllers is the preferred choice. The high-speed operation and digital signal processing capabilities of the CPU combined with advanced motor control PWM outputs, A/Ds, comparators, motor shaft encoder interfaces and input captures make them ideal for this task.

The **dsPICDEM™ MCLV Development Board** and **dsPICDEM™ MCHV Development Board** — two new low-cost **dsPIC33F** motor control hardware development tools, were recently introduced by Microchip. Five new or updated application notes intended specifically for PMSM or BLDC motor control have been recently released to run on these two hardware tools. These application notes come with full dsPIC33F source code, allowing the user to quickly create a running motor control system using the MCLV or MCHV and their motor. With these five application notes, Microchip supports all the common "sensorless" control methods for PMSM and BLDC motors.

Motor control system cost is affected by the number and type of sensors used for rotor position feedback and if components are added for Power Factor Correction (PFC). The energy efficiency is primarily affected by the control method and to a lesser degree by the number of sensors. The trade-off between the energy efficiency of each control technique and the system cost is shown in the figure below.



AN1160 - Sensorless BLDC Control with Back-EMF Filtering Using a Majority Function uses a simpler control technique called six-step or trapezoidal control. The rotor position is determined by examining feedback voltage signals from the three motor phases called BEMF. A majority detection technique is used to improve operation.

AN1078 - Sensorless Field Oriented Control of PMSM Motors using dsPIC30F or dsPIC33F Digital Signal Controllers and **AN1292 - Sensorless Field Oriented Control (FOC) for a Permanent Magnet Synchronous Motor (PMSM) Using a PLL Estimator and Field Weakening (FW)** provide optimal efficiency using the FOC sensorless algorithm, however AN1078 estimates the rotor position based on a Sliding Mode Observer (SMO) technique while AN1292 uses a Phased Locked Loop (PLL) technique. The PLL is more stable at lower speeds while the SMO adapts easier to different motors. By utilizing dual shunt resistor feedback circuits, the control operation efficiency is improved at a slightly higher system cost.

AN1208 - Integrated Power Factor Correction (PFC) and Sensorless Field Oriented Control (FOC) System also provides optimal efficiency by using the FOC algorithm with dual shunt circuits. In addition, Power Factor Correction (PFC) is included to keep the motor bus current and voltage waveforms in phase. This "corrects" for the effect of the motor's inductive load, reducing the amount of power required from the electrical grid. In many countries, government regulations require that applications above a certain power size include this feature. Adding PFC significantly increases control system cost.

Recently, these sensorless motor control application notes were updated with several new features. A voltage ripple compensation control loop was added for smoother speed operation. Field weakening control was added to allow the motor to run at a much higher speed. Adaptive filters were added to make it easier to tune the control to each specific motor. These new features help our customers improve the operation of their motor control applications.

For more information or to download any of these new and updated motor control application notes, please visit the dsPIC motor control website at **http://www.microchip.com/dscmotor**.

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MICROCHIP AUTHORIZED DESIGN PARTNER

TEK Industries

TEK Industries, located in Vernon, Connecticut, is a full service electronic contract manufacturer. TEK designs, develops and manufacturers custom electronic products serving a broad range of Military, Medical, RF, Industrial, Telecom and Commercial applications.

Research and Design Engineers provide services including consulting, hardware, software (networked, stand-along and embedded), PCB and system designs.

TEK specializes in services such as automated and hand assemblies, subcontract services, prototypes, turnkey systems, mechanical and cable assemblies. Value added services such as functional testing is performed on all assemblies; parametric and customized Bed of Nails testing is available.

Certifications include: ISO 9001:2000, J-STD-001D Class III, IPC PCB design, IPC-2221A – PCB design, IPC-2222 – Rigid PCB design, IPC-D-325A – PCB design documentation, RoHS Compliant Assemblies, Lead Free Surface Mount Reflow, Lead Free Wave, Lead Free Hand Soldering, Cage Code: 3BR20, Microchip Master Consultant.

All products are domestically manufactured and are backed by TEK warranties and guarantees.

For more information contact:
TEK Industries, Inc.
48 Hockanum Blvd.
Vernon, CT 06066
Phone: 860-870-0001
Fax: 860-870-0001
sales@tekind.com

http://www.tekind.com

TEK Utilizes Microchip's PIC® MCUs in Best Selling Products

TEK Industries utilizes the latest technology, keeping the company among New England's industry leaders, and has acquired international certifications and partnerships with companies such as Microchip to continually enhance its ability to provide the highest-quality manufacturing processes and service for its valued customers.

To date, those same products that put TEK on the map are still being used by companies worldwide for various applications. TEKs utilization of Microchip's PIC MCUs has ensured the success of TEK's best most popular, the TEK Mousemat and the TEK Flashpen.

TEK's Flashpen is handheld, rugged, microprocessor based data collection device housed in cylindrical metal tubing that is compact and small enough to fit into your pocket. The TEK FTP2000™ DCD is designed to read information/data/temperature stored in an iButton™ touch Memory device. The iButton™ is a dime-size stainless steel case which houses a silicon memory chip with an unalterable, unique serial number for positive verification with a touch from the TEK Flashpen 2000™ DCD. The TEK Flashpen 2000™ DCD time and date stamps information read from and to the iButton™ to give you the who, what, when, where and status information essential to the accuracy and timeliness of your data collection needs.

The MOUSEMAT is a custom-designed RFID reader/writer capable of reading and writing to the industry standard 13.56 MHz tags including: Philips, Texas Instruments, Infineon, ISO 15693 and Microchip. Applications for the MOUSEMAT include order entry, computer security and inventory control. Custom printing is available. The Mousemat is 9.25" x 7.75" and weighs 13 oz. It is made of foam rubber with plastic as an insert. The Mousemat's power and download connections are through USB. The carrier frequencies are 13.56 MHz and 915 MHz and its RF power is 200 mw. The read distance of the Mousemat is 2 to 6 inches depending on tag size.

TEK Industries has demonstrated over the past two decades that small businesses can make big differences in the world of technology. Since its birth in 1984, TEK has paved its way into the industry by designing and developing custom electronic products for a broad range of diverse and specialized applications. Their mission has remained the same though thought the years: "To consistently provide superior service, products and technical support for each and every customer as well as every project."

Electronics Manufacturing was the first of the TEK subsidiaries founded by Mark F. Matheny in 1984 with 6 employees. The company initially provided assembly work for outside companies. In 1985, Matheny designed and developed a pay phone amplification module for the Southern New England Telephone Company to aid the hearing impaired. It was patented in 1988 and TEK sold this module throughout North America. The amplifier module, known as the "TEK Loud Button," was the beginning of TEK's communications product line. By 1989, the rapid success of the amplifier and employee growth prompted the incorporation of TEK Communication Services. Further development of the company made way for the next line of products, TEK Data Technologies in 1994 as well as the TEK Touch System or a portable data collection system. TEK was awarded a contract for this product with the United States Postal Service and the product was sold around the globe. TEK also successfully developed a biometrics electronic digital imaging identification system for welfare benefit distribution in Connecticut and went on to become federally licensed by the United States Bureau of ATF, to import and manufacture destructive devices. By 1995, TEK had grown to over ten million dollars in revenue and received the State of Connecticut Governor's Award for Exporting.

In recent years, TEK Industries has shown no signs of slowing down and continues to be diverse in contract and lead-free manufacturing as well as in-house engineering. TEK's RFID Readers and Writers are used in multiple markets. Over (500) products are manufactured at TEK for OEM, consumer, medical and defense companies. TEK has recently paired up with partner Companion Controls; together the two companies are working on new products using technologies such as Power Over Ethernet (POE) and Real Time Location Systems or RTLS.

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Looking to Enhance Your Embedded Control Designs?

In tough economic times, companies often look for ways to trim expenses as a means to cope with a downturn in sales. One of the areas often targeted for cutbacks is employee training. There is not only the direct cost of the training to contend with, but also travel expenses and time an employee spends away from the job. During this challenging business climate, however, competitive pressures and technology changes don't stop and it is training that can help a company be better positioned to take advantage of the potential upswing.

Microchip, with its global network of Regional Training Centers (RTCs) and third-party training partners, is here to help companies stay competitive with cost-effective, local training. To help companies deal with issues of travel expense and time, classes are given not only in Microchip's facilities, but are also taken on the road. Customized customer premise sessions can be scheduled offering the most convenience. Time away can be managed more efficiently with the flexibility of half or full day class sessions.

To be effective in teaching, instruction must take into account the needs and expertise level of the attendee. Microchip's Regional Training Center classes are developed to provide a coordinated flow enabling engineers to implement a solution to their product development needs. Instruction is developed and presented in product, technology and implementation classes that are grouped into application based curriculum.

Each curriculum flow enables the individual to engage with the training at a level that meets his or her current knowledge and needs. The intent is to provide training that is relevant to each attendee while eliminating the frustration often associated with attending classes that present too much known information or assume a level of knowledge beyond what the attendee currently possesses.

Product/tool classes provide knowledge on how Microchip's products and development tools operate. This knowledge provides the foundation upon which all application instruction is based. Attendance at one of these classes can provide significant value through the reduction in time associated with instruction manuals and data sheet review or trial and error attempts to learn individually. Market forces constantly press companies to add functionality and features to their products often outside their areas of core competence. As a result, engineers must continually broaden their knowledge base. Microchip's technology classes are intended to help engineers gain an understanding of a new field.

Implementation classes combine elements of product and technology instruction to teach engineers how to design a real world application. Classes at this level provide how-to instruction rather than what or why instruction.

Microchip is currently offering classes in the following curriculum: DSP, Ethernet, Human Interface, Motor Control, Power Management, Signal Chain, System Design and USB. Future curriculum is expected to include CAN/LIN, IrDA® , Lighting and RF.

With a worldwide network of Regional Training Centers (RTCs) and certified third-party trainers, Microchip makes it easy to enhance your technical skills, with locations in nearly every metropolitan area across the world!
For those organizations who desire to have a number of employees attend a course at the same time, Microchip can customize any curriculum to meet your specific needs. Our instructors arrive at your location with all presentation materials and equipment, making it easy for your whole team to benefit from a specific course topic in one setting. In addition to the instruction, most Regional Training Center classes offer the opportunity to purchase a set of the development tools used in the class at a discounted price.

If the class you are interested in is not scheduled in your area, you can sign up to receive an alert when a session is scheduled.

For information on scheduling custom in-house training, contact your local RTC directly. Contact information is available on the Microchip RTC web site.

MICROCHIP
Regional Training Centers

For a complete list of classes and locations, visit www.microchip.com/RTC

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MICROCHIP AUTHORIZED DESIGN PARTNER

SPECTRUM

Spectrum Design Solutions, Inc., a subsidiary of Digi International, offers custom design and integration services including proven expertise with Microchip's family of RF products. Spectrum has extensive experience in system level wireless design incorporating radios at the transistor level, to chip level and module level integration. Additionally, Spectrum can do full custom antenna design or off-the-shelf antenna integration. Spectrum is an *Honest Purveyor of Technology* and will ensure the total cost of ownership for our customers is balanced between the engineering cost and the final cost of the customers' product in production.

Spectrum Design Solutions was originally formed as a collaboration of industry experts in the areas of wireless design, with enabling technologies that include microcontrollers, FPGA, DSP, PCB and software design. Today, Spectrum employs more than 50 engineers with a wide breadth of communications experience from a variety of industries. Spectrum is built upon the idea that the best services must come from the best engineers and by making design services as easy for our customers as possible.

Spectrum's vision is to help our customers get their design to market quickly with reliable cutting-edge technology. We support our customers from requirements definition through all the steps of a design and through the certification process to pre-production and then hand the design back to the customer to manage manufacturing. Spectrum will even help customers develop functional test systems for their wireless products in manufacturing.

For more information contact:
Spectrum Design Solutions
110 N 5th Street, Floor 3
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Phone: 612-435-0789, Fax 612-435-0736
Mike Fette, VP Business Development
Direct 612-435-0796
mike.fette@spectrumdsi.com

http://www.spectrumdsi.com

Spectrum Design Solutions Takes a Portable Alarm System From a Complicated Design to a Simplified Reliable Manufacturing-ready Solution.

Spectrum Design Solutions is an engineering design services company with extensive expertise in M2M (machine-to-machine) applications. We combine a wealth of professional experience with a complete set of testing tools to pre-scan the customer's products before bringing them to the certification labs, maximizing the potential of certification on the first pass and allowing efficient trouble-shooting of design issues as they arise. Spectrum's testing services, facilities and tools include cellular certification pre-scan (PTCRB and carrier level certifications), TIS/TRP pre-scan, multi-radio co-existence testing, spectral analysis, insertion loss, and impedance measurement. Equipment includes anechoic chamber, RF screen room and isolation chambers, cellular call boxes, RF network analyzer, spectrum analyzers up to 26.5 GHz, high speed oscilloscopes, RF signal generators with GPS simulation capability, conducted GPS test system for efficient software development and custom low noise amplifiers, filters and test antennas.

Spectrum was approached by tattletale™ SYSTEMS to add additional features and make necessary improvements to increase the manufacturability, reduce cost, enhance performance, and add to the reliability of their portable alarm. Spectrum utilized the Microchip Explorer 16 Development Board (DM240001) for PIC24FJ256 and was able to accelerate the design by utilizing the Zero G 802.11 Development Kit (AC164136) along with the Graphics PICtail Plus Daughter Board (AC164127-3) reference designs and software available from Microchip. These tools provided the TCP/IP stack and display drivers to support the external controller, drivers for the Zero G Wi-Fi module, 2D hardware acceleration, SD card interface and JPEG decompression engine. In addition Spectrum worked with Microchip on application development, display and graphical library integration and Microchip analog products. The tattletale™ requirements were met by simplifying the design and the number of boards being used to make it a much lower cost and easier to manufacture solution. Spectrum's experienced engineers were able to resolve the radio problems and keep the GSM noise out of the speakers while continuing to use the existing industrial design with a few modifications to incorporate an intuitive color touch-screen interface display. In addition this product is now designed to be manufactured to support multiple cellular module manufacturers using GSM or CDMA. With an improved antenna design, entirely new application software and other improvements this product is now ready for certification and pre-production.

The tattletale™ Portable Alarm Base Unit functions as a completely self-contained alarm. The heavy duty shell contains a PIR motion sensor, a cellular radio, an alarm panel, a siren/strobe and a backup battery. Even if the power is out and the phone line is cut, the tattletale™ will still send the alarm. This new version of the customer's product adds Wi-Fi and an intuitive color touch-screen interface. The system controls up to 99 sensors in multiple zones so it can be used with any combination of their unique indoor and rugged outdoor sensors to protect anything, anytime, anywhere.

Spectrum employs highly specialized engineers with extensive experience in wireless and wired communication technologies allowing us to address virtually any embedded communication development need. We can get your design to market quickly with reliable, cutting-edge technology.

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Microchip Around Town – Get the latest updates by clicking HERE!

Motor, Drive & Automation Systems 2010

Advancements in Motion Control and Power Electronic Technology

January 28-29 • Orlando, Fla.

Join Patrick Heath, Marketing Manager and Daniel Torres, Application Engineer for Microchip Technology's High-Performance Microcontroller Division as they present...

An Exploration of Ultra-Low Cost Motor Drive Design

Thursday, January 28, 2009 at 1:30 pm

This paper will explore design trade-offs associated with creating ultra-low-cost motor drives, without compromising control techniques, energy efficiency or safety. Three drive designs will be presented. The first is a simple stepper-motor drive for under $50. The second is a standard low-voltage sensorless drive for under $75. The third is a complex isolated high-voltage drive for under $100. The actual Bill of Material (BOM) costs, control techniques, energy efficiency and safety features of the three designs will be compared. Additionally, a package consisting of the BOM, schematics, Gerber files and firmware for all three designs will be available to attendees.

Microchip Technology's Debraj Deb, Applications Engineer, High-Performance Microcontroller Division, will present...

Regenerative Braking of BLDC Motors

Friday, January 29, 2009 at 11:10 am

Regenerative braking is a motor-braking technique that converts kinetic energy from a motor into an electrical output that charges the system's batteries. There are two major advantages associated with regenerative braking. First, it increases the efficiency of the electrical system. Secondly, the life of mechanical brakes increases, as the majority of braking is done through regenerative braking. Depending upon the application, using regenerative brakes can recover 30% to 50% of the system's energy, which is otherwise lost as heat in brake pads. This paper will present a hardware and software implementation of a regenerative braking system for a BLDC motor, and verify its effectiveness through test data.

Register online, today at: http://www.e-driveonline.com/Conf-10/motors_conf10_reg.php

Microchip Technology's Mike Ballard, Home Appliance Solutions Group Manager will participate in a panel:

"Smart Grid: A Dumb Idea?"

Tuesday, February 23, 2010 at 5:00 pm

There's lots of talk about the "smart grid" and how it will save energy and money. Whose money? Should the local utility company have the ability to shut off your air conditioner or stop your clothes dryer when it wants? Should they be allowed to raise their rates with no warning, just when you need electricity the most? And who will write the standards? There are very few original IEEE standards that have had much success. Come help us explore what's right and wrong about this concept.

Register online, today at:
http://www.apec-conf.org/content/view/262/211/

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Microchip Technology will present 3 papers...

Develop Applications Using dsPIC® Digital Signal Controllers: A Step-By-Step Approach

Getting started with application development on dsPIC® Digital Signal Controllers (DSCs) is made easy with Microchip Technology's hardware and software development tools. This presentation will take a step-by-step approach to help engineers and engineering managers understand how development cycles can be optimized using these tools. The presentation will provide a basic introduction to the different tools available from Microchip, focusing on simple steps to set up the tools and begin development. The presentation will walk through the step-by-step development of applications, including power-conversion, motor-control, speech and audio applications, using advanced development boards/tools.

Noise-Compression Techniques Using Delta-Sigma Analog-to-Digital Converters in Embedded-Control Applications

This presentation will demonstrate methods for reducing noise in sensor applications using the latest Delta-Sigma Analog-to-Digital Converters (ADCs). Design examples will be presented that show how to design sensor-interface circuits for reduced noise in temperature, pressure, motion and weigh-scale measurement applications.

Attendees will learn about:

- Interface-circuit requirements between the ADC and the sensor
- Techniques for reducing noise in real-world environments
- Noise-compression methods using Delta-Sigma ADC technology

PIC® Microcontrollers for eXtreme Low-Power Applications

Low power consumption has always been a major concern in embedded applications. Designers are constantly striving to meet aggressive new goals for "green" applications and battery-powered portable devices. Microchip's new PIC® microcontrollers with nanoWatt XLP technology address this concern by providing microcontrollers that are designed to consume minimal power in the most common embedded applications. This presentation will introduce nanoWatt XLP technology, using an example application to demonstrate the benefits of extreme low power microcontrollers. Technical details of some of the PIC XLP low-power modes will be discussed, including how to utilize the new Deep-Sleep mode for current consumption as low as 20 nA.

Register online, today at: http://www.jasa.or.jp/et/english/index.html

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INTERNATIONAL AUTOMOTIVE ELECTRONICS CONGRESS

Accelerate your success in automotive electronics

November 17-18, 2009 > PARIS Pullman Paris Rive Gauche

Microchip Technology's Principal FAE (France) Olof Goransson will present Technical Staff Engineer Keith Curtis' paper...

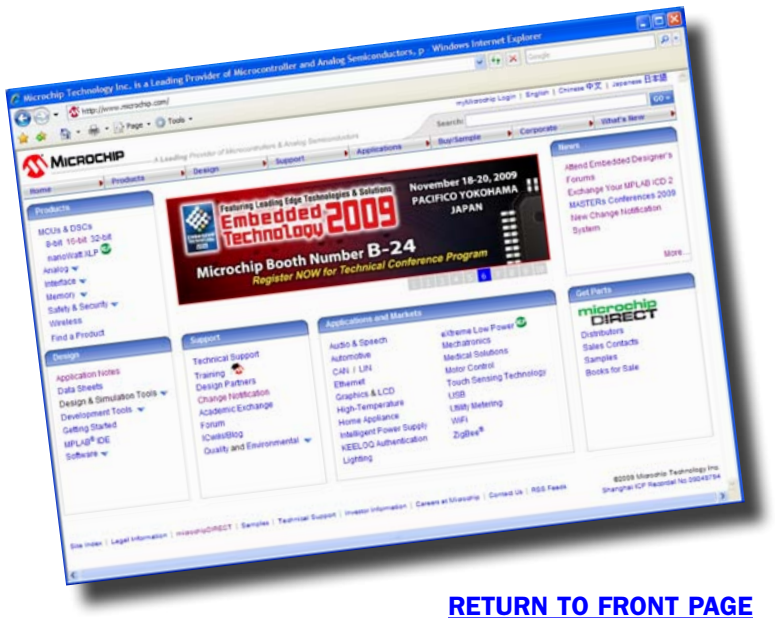
Applying the Right Touch-Sensing Technology in Automotive Applications

This presentation will examine both inductive and capacitive touch-sensing technology from operations and reliability points of view, providing a general understanding of the technologies used in capacitive and inductive touch, as well as good and not-so-good design examples. The limitations of both technologies will be discussed, in light of the various environments both inside and outside the passenger cabin of today's automobiles.

Register online today at: http://www.automotive-electronics-congress.com/register/

To view the complete list of tradeshows and events, please visit:

http://www.microchip.com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=2004



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WHAT'S *New* IN MICROCHIP LITERATURE?

Visit our **Technical Documentation** page on www.microchip.com to view the documents.

Doc. Type	Doc. Title	DS No.
Application Note	AN1095, Emulating Data EEPROM for PIC18/PIC24 MCUs and dsPIC DSCs	01095C
	AN1252, PIC16F636 Interfacing the MRF49XA Transceiver to PIC MCUs	01252A
	AN1298, Capacitive Touch Using Only an ADC	01298A
Data Sheet	24AA024/025 Data Sheet	21201M
	24AA024/025 Data Sheet	21210N
	24AA16/LC16B Data Sheet	21703J
	24AA014/LC014 Data Sheet	21809F
	25AA040A Data Sheet	21827F
	11AA010 UNI/O Data Sheet	22067F
	24LC16B Extended (M) Data Sheet	22213A
	PIC18F2455/2550/4455/4550 Data Sheet	39632E
	PIC18F2X1X/4X1X Data Sheet	39636D
	PIC24FJ128GA010 Data Sheet	39747E
	PIC18F2682/2685/4682/4685 Data Sheet	39761C
	PIC18F97J60 Family Data Sheet	39762E
	PIC18F87J50 Family Data Sheet	39775C
	PIC18F87J11 Family Data Sheet	39778D
	PIC18F2458/2553/4458/4553 Data Sheet	39887C
	PIC18F8723 Family Data Sheet	39894B
	PIC18F6393/6493/8393/8493 Data Sheet	39896B
	PIC18F46J50 Family Data Sheet	39931C
	PIC18F46J11 Family Data Sheet	39932C
	PIC24FJ64GB004 Family Data Sheet	39940C
	PIC24FJ64GA104 Family Data Sheet	39951B
	PIC16F627A/628A/648A Data Sheet	40044G
	PIC12F629/675 Data Sheet	41190F
	PIC18F23K20 Data Sheet	41303F
	PIC16F72X Data Sheet	41341E
	PIC18F1XK22 Data Sheet	41365C
	dsPIC33FJ32GP202/204 and dsPIC33FJ16GP304 Data Sheet	70290D

Doc. Type	Doc. Title	DS No.
Erata	PIC12F629/675 Errata	80125H
	PIC18F24K20 0xA-0x11 Errata	80366G
	PIC24F16KA102 Family Silicon/Data Sheet Errata	80473D
	PIC24HJ256GPX06A/X08A/X10A Family Silicon Errata and Data Sheet	80482A
	dsPIC33FJ256GPX06A/X08A/X10A Family Silicon Errata and Data Sheet	80483A
	dsPIC33FJ256MCX06A/X08A/X10A Family Silicon Errata and Data Sheet	80484A
	PIC16LF1826/1827 Errata	80485A
	PIC24FJ64GA104 Silicon/Data Sheet Errata	80486A
	PIC24FJ64GB004 Silicon/Data Sheet Errata	80487A
	PIC18F85J90 Family Rev. A6 Silicon Errata	80488A
	PIC16LF1933 Errata	80490A
Technical Brief	Interrupt-on-Change Operation for Mid-Range MCUs	93061A
User's Guide	mTouch Capacitive Evaluation Kit User's Guide	41385B
	PIC16LF1937 Eval. Platform User's Guide	41401A
	Transition Socket Specification	51194R
	MRF24J40MA/MB PICtail/PICtail Plus Daughter Board User's Guide	51867A
	XLP 16-Bit Development Kit User's Guide	51873A
Product Brief	PIC16F720/721 Product Brief	41402A
Programming Specification	PIC24FJ64GA1/GB0 Families Flash Programming Specification	39934B
	PIC12F609/12F6015/12F617/16F610/16F616 and PIC12HV609/12HV615/16HV610/16HV616 Programming Specification	41396A
FRM Chapter	PIC24F Family Reference Manual, Section 39 Power-Saving Features with Deep Sleep	39727B
Misc	dsPIC33FJ128GP804 and PIC24HJ128GP504 PIM Information Sheet for Graphics Applications	51876A

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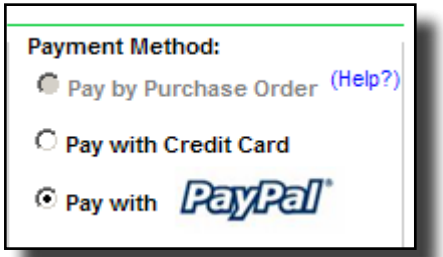
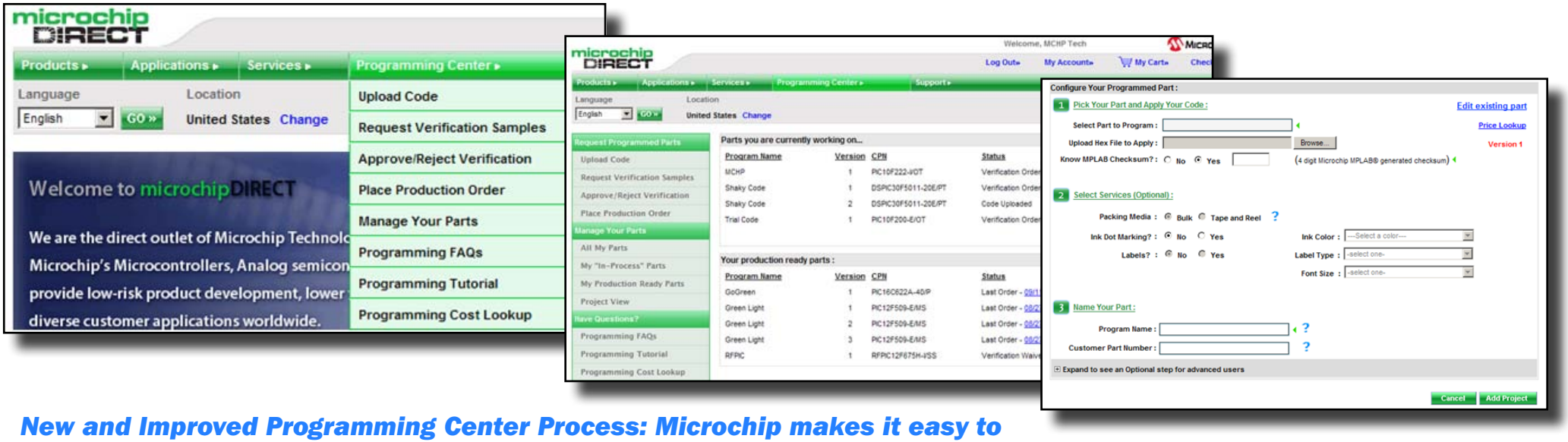
What's New @ microchip DIRECT

Four New Languages added... See the Language pull-down menu on www.microchipdirect.com

PayPal® payment option made available upon checkout to US customers! Additional countries coming soon!





New and Improved Programming Center Process: Microchip makes it easy to load and order pre-programmed parts! See a video demonstration here!

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