

boards & solutions + ECE

Combined Print Magazine for the European Embedded Market

November 07/10

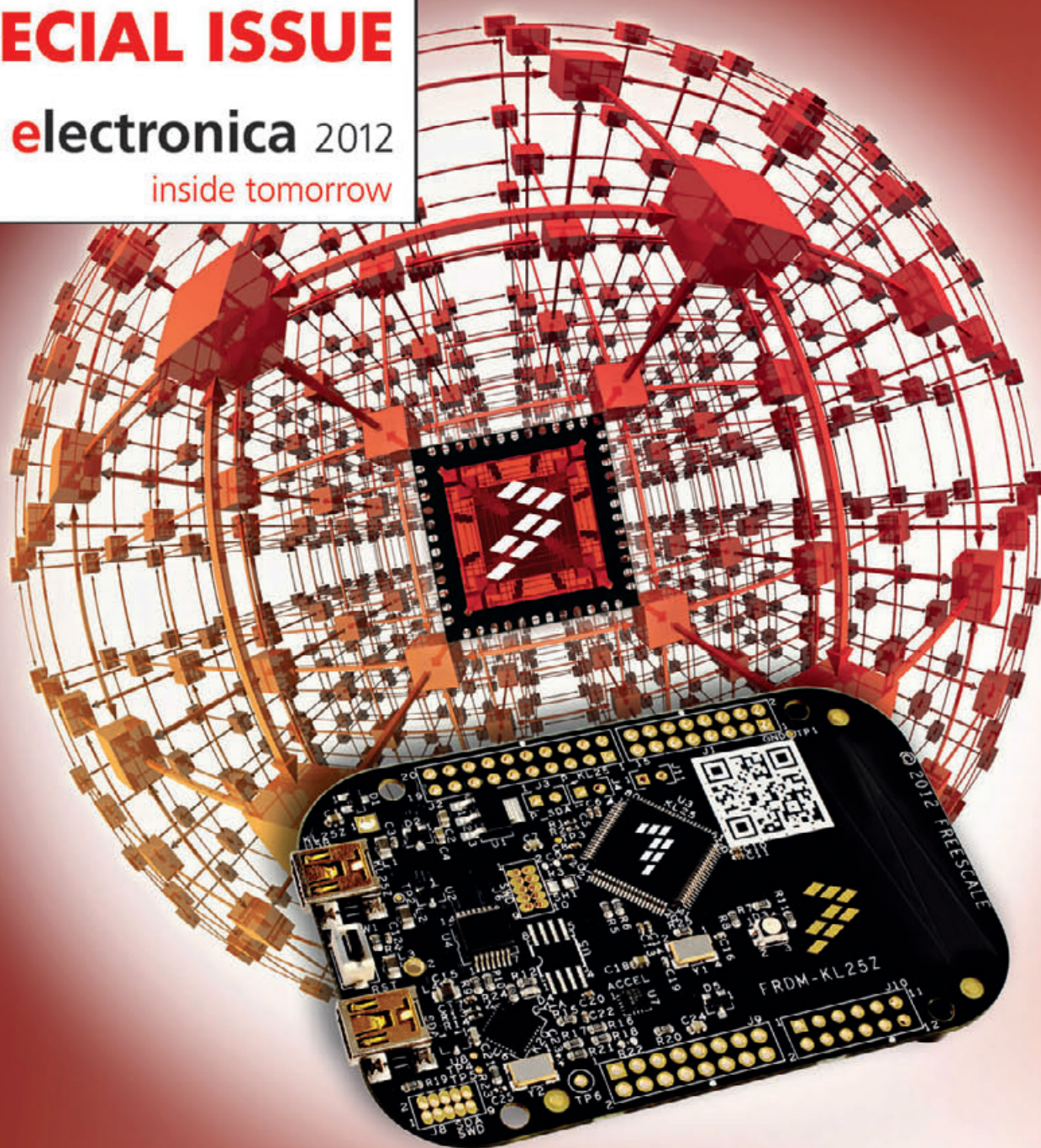
Cover Story:

Kinetis L Series MCUs and the energy efficiency revolution

SPECIAL ISSUE



eelectronica 2012
inside tomorrow



 **freescale**[™]



Drive home in a 2013 Ford Shelby Mustang!



**FREE
SHIPPING**
ON ORDERS OVER €65!



FIND CONTACT AND ORDERING
INFORMATION FOR YOUR REGION AT

DIGIKEY.COM/EUROPE



2.4 MILLION PARTS ONLINE | 600+ INDUSTRY-LEADING SUPPLIERS | NEW PRODUCTS ADDED DAILY

*A shipping charge of €18.00 (£12.00) will be billed on all orders of less than €65.00 (£50.00). All orders are shipped via UPS for delivery within 1-3 days (dependent on final destination). No handling fees. All prices are in euro and British pound sterling. If excessive weight or unique circumstances require deviation from this charge, customers will be contacted prior to shipping order. Digi-Key is an authorized distributor for all supplier partners. New product added daily. © 2012 Digi-Key Corporation, 701 Brooks Ave. South, Thief River Falls, MN 56701, USA

Dear Readers,



Every two years in November the electronics community meets at the fairgrounds of Neue Messe München to visit *electronica* - the worlds most importance electronics exhibition. This year from November 13 – 16, the electronics industry will present the entire range of hardware and software in the sector for embedded platforms - from industrial PCs and industrial control units to software-debugging solutions and entire development tools for microcontrollers. Detailed information about the embedded forum you ll find starting at **page 17**.

In addition, the first embedded platforms conference will be held on November 14 and 15. Besides how to select the best embedded modules, the conference will answer fundamental questions about choosing components and system design. Together with the exhibition and the forum, the conference rounds out the three-pillar concept for the embedded sector. At the embedded platforms conference system architects and developers will find out all there is to know about selecting the right embedded modules, i.e. the processor platform, the operating system, the drivers and the networking technology, at the new embedded platforms conference. On November 14 and 15, semiconductor and tool manufacturers such as Atmel, Farnell, Freescale, Fujitsu, Infineon, Texas Instruments, TQ Systems and Toshiba will inform participants about the use of multicore, multiprocessing, DSP (digital signal processing), USBs (universal serial bus), Ethernet, motor control, safety, low-power, migration, freeware and open source at the Press Center East. The overview of the conference program starts in this issue at **page 32**.

At this year's *electronica*, Freescale will do more than present its large portfolio of ARM processors. The company will also introduce the first microcontroller to be based on the ARM Cortex-M0+, which is currently the most energy-efficient processor on the market. Other highlights include the latest solutions in the sectors for energy supply and management, metrology and building management. More information about this topic is included in our cover story stating at page 8. That ultra low power is a general topic in the embedded industry proves the article form TI starting at page 14, introducing the first ULP MCUs based on the "Wolverine" technology

If you are interested in information about future trends in the embedded sector I recommend you to read our trend session starting at page 25. In this part experts explain their opinion about what s going on in the embedded industry relating to microcontrollers, software, design tools and embedded computers.

As you can see there is a lot going on at *electronica 2012* for designers involved in the development of embedded systems. I would like to invite you to visit our booth at ***electronica 2012 in Hall A6 booth 463***. I m looking forward to see you there.

Yours sincerely
 Wolfgang Patelay
 (Editor)



Semiconductors

Your Ideas. Our Low Cost, Power Solutions. It's got time.

Lattice semiconductors are small at first sight, but MSC wants to show you what power they have and what possibilities they open up.

MSC and Lattice are helping you to create the world's most innovative products. FPGA and programmable power management solutions from Lattice are low cost and low power, so you can build the product you need within the time and budget you want. Our FAE's are 100% committed to getting your ideas off the ground quickly, easily and affordably. Because after all, your ideas inspired the Lattice products in the first place. So keep innovating. We're ready.

ECP3: Lowest Power SERDES capable FPGAs

MACHXO2: Do-It-All PLD

ICE40: Custom mobile devices

Platform Manager:
 Transforms board management design

Feel free to contact us.

MSC – Distributor of 



MSC Vertriebs GmbH
 Tel. +49 7249 910-512 · proglog-lattice@msc-ge.com

www.msc-ge.com

Viewpoint 3

Highlights

- electronica 2012: new impetus for embedded-system design 6
- Kinetis L Series MCUs and the energy efficiency revolution 8
- “Wolverine” based MSP430 microcontrollers slash power consumption in half 14

Embedded Forum Programme 17-24

Trends

- Software developers define the trends in microcontrollers 25
- 32-bit cores are NOT the solution to all 26
- The new challenges of multi-core 26
- Trends for MCUs lead to better support tools and middleware 28
- More analog integration 28
- The Continued Evolution of JTAG Test Solutions 30

embedded platforms conference 32-34

Trends

- Reaping the benefits of energy harvesting 35
- Renewable energy changes the role of distributors 36
- Intelligence for the Grid 36
- Distributors play a key role in promoting electro-mobility 38
- Moving towards standards and services 39
- Serial data transmission is major trend in rugged embedded systems 40
- Customer orientation is crucial 41
- Continuous growth for COMs 42
- How much out-of-the-box is needed? 42
- Multi-platform COM standards 43

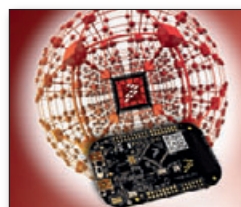
previews & product news 44

electronica 2012: new impetus for embedded-system design Page 6



While generally invisible to the user - although extremely important when it comes to the monitoring, control and regulation of electronics applications - embedded systems have become indispensable in the electronics industry. electronica from November 13 – 16 will demonstrate how important this sector is to the industry by giving it its own exhibition sector, along with the embedded Forum and the new embedded platforms conference. You can look forward to four days full of momentum for technologies of the future!

Kinetis L Series MCUs and the energy efficiency revolution Page 8



This article introduces the Kinetis L series MCUs which achieves total reduction of the area under the energy curve through a combination of the new, leaner 32-bit ARM Cortex-M0+ processor, ultra-low power modes for multiple use cases, watt-saving architectural techniques and a range of autonomous, power-smart peripherals

“Wolverine” based MSP430 microcontrollers slash power consumption in half Page 14

In computing today, you can observe a trend away from mere performance maximization towards optimization around the user interface. In ultra-low power (ULP) design, it's all about the power budget.

Embedded Forum at electronica in Hall A6 Page 17



During electronica, the Embedded Forum in hall A6 provides 30-minutes presentations about technical trends, products, applications and more. The Embedded Forum is free for all electronica visitors!

The new challenges of multi-core Page 26

Multi-core architectures are now common in classic microprocessors, but the era of microcontrollers with multiple cores is only just beginning. The motivation also to deploy multi-core architectures in microcontrollers is the increasing demand of performance of deeply embedded applications.

The Continued Evolution of JTAG Test Solutions Page 30

Board test technology over the past five years is witnessing what could be the most dramatic changes since the introduction of boundary-scan (a.k.a. JTAG IEEE Std. 1149.1) in 1990. While the traditional standard, 1149.1, revolutionized the way PCBs have been tested and programmed, new advancements in circuit design and ICs have initiated developments and updates to both the IEEE 1149.x standards and associated proprietary test techniques.



Cover Photo
Freescale



SAFE
RELIABLE
SECURE

TRUSTED SOFTWARE FOR EMBEDDED DEVICES

For 30 years the world's leading companies have trusted **Green Hills Software's** secure and reliable high performance software for safety and security critical applications.

From avionics and automotive, through telecoms and medical, to industrial and smart energy, Green Hills Software has been delivering proven and secure underpinning technology.

To find out how the world's most secure and reliable operating systems and development software can take the risk out of your next project, visit www.ghs.com/s4e



Green Hills
SOFTWARE

Copyright © 2012 Green Hills Software. Green Hills Software and the Green Hills logo are registered trademarks of Green Hills Software. All other product names are trademarks of their respective holders.



electronica 2012: new impetus for embedded-system design

By **Nicole Schmitt**, Exhibition Group Director electronica, Messe München

While generally invisible to the user - although extremely important when it comes to the monitoring, control and regulation of electronics applications - embedded systems have become indispensable in the electronics industry. electronica from November 13 – 16 will demonstrate how important this sector is to the industry by giving it its own exhibition sector, along with the embedded Forum and the new embedded platforms conference. You can look forward to four days full of momentum for technologies of the future!



■ At electronica Embedded sector several domestic and international companies will have their embedded products on display – from development tools, hardware and periphery systems, DDI and other network-technology components to memories, storage periphery and finished system solutions. Exhibitors include Kontron, MathWorks, OSADL, pls Programmierbare Logik & Systeme and TQ-Systems, among others.

When developing an electronic product – whether a smart phone or an industrial control system – selecting the right embedded modules plays a key role. The processor platform, operating system, drives and networking technology: ensuring that these components interact correctly and suit the application in question is essential. electronica has taken this challenge for developers and embedded-system engineers into account by establishing the new embedded platforms conference. Semiconductor and tool manufacturers as well as service-providers will present concrete solutions and services for developing embedded platforms – from embedded design and multicore to Ethernet and low power.

The embedded sector will be rounded out by the embedded Forum in Hall A6. This year the forum will revolve around topics such as smart metering, embedded computing, industrial control and communication, electronic lighting,

energy management and efficiency. Among other things, presentations will deal with smart-grid security solutions and microcontrollers for intelligent LED lighting. For a list of all presentations, please refer to our event database at www.electronica.de/event-database.

One highlight awaits you on the first day of the fair. At the CEO Round Table, the CEOs of four leading semiconductor manufacturers will discuss what solutions can be used to secure the supply of energy in the future. The speakers at the electronica Forum event titled “Semiconductor Solutions for Smart Grid Challenges” are Carlo Bozotti from STMicroelectronics, Rick Clemmer from NXP Semiconductors, Gregg A. Lowe from Freescale Semiconductor and Dr Reinhard Ploss from Infineon Technologies.

As always, the electronica automotive conference invites participants to two days of lectures that start the day before the fair. It will examine the latest technologies and market developments that pertain to “The Car in the Web”, “Energy Efficient Mobility”, “Safe Driving” and “Design to Cost”. The first day of the conference addresses leading executives at automobile manufacturers, supply companies and electronics companies. The program of events includes presentations including a report by Dr. Thomas Ginsberg, Director Product Engineering at TE Connectivity, about “Connectivity for

Vehicle Data Highways”. Other presentations deal with increased networking between automobiles and the internet, the LTE wireless communication standard, and topics such as power electronics, engines and charging units for electric automobiles. The second day of the conference focuses on technologies that address technical management in automobile manufacturing, supply and electronics companies. Main topics include electromobility, power electronics, safety and the Internet in the automobile. There will then be a panel discussion on “Concepts of Mobility”.

The Wireless Congress will allow industry experts to examine the technical aspects of current and future wireless technologies and give participants insights into applications, security aspects, standards and market opportunities. Topics include wireless technologies in cars, new Bluetooth applications, power supplies and energy harvesting, and there will be keynote addresses by IHS iSuppli, Bluetooth SIG and Zig-Bee Alliance.

The PCB & Components Market Place is a new attraction at electronica that gives representatives of the PCB industry a place to meet. A forum and a networking area will promote an intense exchange of ideas and information about PCBs, other circuit carriers and EMS. The range of topics covered at the other forums (electronica, automotive and exhibitor Forums) is extremely diverse and allows visitors to gather information about current and future issues that pertain to the various application sectors. Planned topics include “Medical electronics”, “Trends in microsystem technology”, “Efficient dynamics in mobility” and “Innovative lighting concepts for the automotive sector”.

On the final day of the fair, Student Day invites potential entry-level employees to gather information about career opportunities and enjoy a networking lunch with sponsors.

I look forward to your visit and wish you an informative and successful electronica!

6U CompactPCI® Blade with 3rd Generation Intel® Core™ i7 Processor



For Transportation, Communication,
Network Security Applications

Power your applications  with ADLINK

cPCI-6520

- Low power 22nm 3rd Generation Intel® Core™ i7 processor with ECC
- Dual channel DDR3 ECC memory, one channel soldered and one channel SO-CDIMM
- Supports three independent displays: DisplayPort, DVI, VGA, HDMI
- USB 3.0 and PCI-Express Gen3 support
- Remote management and TPM support

cPCI-6930

6U CompactPCI Blade with Eight-Core
32nm Intel® Xeon® Processor E5

- Eight-Core Intel® Xeon® E5 processor 1.8GHz and 20MB LLC
- Up to 48GB DDR3 ECC/REG memory by RDIMMs
- Two USB 3.0, four GbE ports on front panel
- Optional SAS 6 Gb/s port for 2.5" drive onboard
- Onboard SATA SSD and optional CF, CFast socket



cPCI-6210

6U CompactPCI® Quad-Core 2nd Generation
Intel® Core™ i7 Processor Host/Peripheral Blade

- Quad-core Intel® Core™ i7-2710QE processor 2.1GHz
- DisplayPort, DVI and VGA graphics interfaces
- SATA 6 Gb/s and CFast storage interfaces
- PCI Express x8 XMC slot in 8HP version
- Remote management support



Tel: +49 621 43214-0
Fax: +49 621 43214-30
Email: emea@adlinktech.com

www.adlinktech.eu

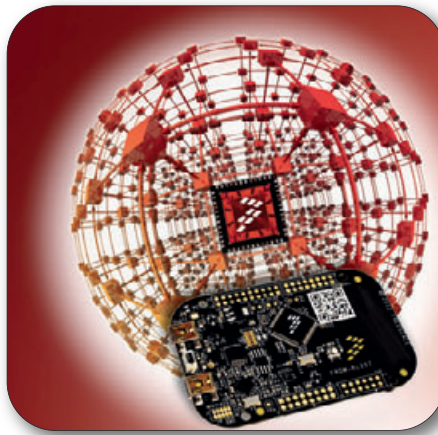
Scan QR code to learn more >>>



Kinetis L Series MCUs and the energy efficiency revolution

By Eduardo Montañez, Freescale

This article introduces the Kinetis L series MCUs which achieves total reduction of the area under the energy curve through a combination of the new, leaner 32-bit ARM Cortex-M0+ processor, ultra-low power modes for multiple use cases, watt-saving architectural techniques and a range of autonomous, power-smart peripherals.



“Once we accept our limits, we go beyond them”. The spirit of Albert Einstein is very much alive nowadays in the entry-level MCU market. While traditional 8- and 16-bit MCUs have performed admirably for many years, the expectations of end-product users continue to outpace the capabilities of such devices and hence new approaches are required. Of course, as with any mass migration, change must be managed carefully if hearts and minds are to be won over. Freescale has done the math and its new 32-bit Kinetis L series MCUs promise an exciting, yet familiar, destination for those bold enough to move. Foremost among the many attractive qualities of this MCU family is an array of low power capabilities that positions it at the heart of the new energy efficiency landscape and offers new possibilities for power-sensitive designs.

When challenged to increase the battery life of their next-generation products, it's easy for developers to fall into the trap of selecting the MCU that offers the most impressive power numbers. However, this doesn't tell the whole story, because to truly maximize battery life they need to look beyond the data sheet to understand the power consumption profile across all aspects of their application. Kinetis L series MCUs redefine energy efficiency from the inside out by focusing on energy savings incurred across all phases of the application: initialization, control and compute. This total reduction

of the area under the energy curve is achieved through a combination of the new, leaner 32-bit ARM Cortex-M0+ processor, ultra-low power modes for multiple use cases, watt-saving architectural techniques and a range of autonomous, power-smart peripherals. Compared with competitive entry-level MCUs, this represents a step-change in capability.

A good rule of thumb for reducing power consumption in your end product is to do more with less. This is easier said than done unless you are equipped with the ARM Cortex-M0+ processor, the most energy-efficient 32-bit processor on the market. Freescale was a lead partner in its development and the first supplier to productize it in a mass market MCU family. Its superior throughput/mW, facilitated by a new 2-stage pipeline and other architectural tweaks, brings significant gains during the initialization and compute phases, where it enables the MCU to reduce time spent in higher power modes and extend time spent in sleep states. Relative to its predecessor, the ARM Cortex-M0, the ARM Cortex-M0+ processor uses 30 percent less power while delivering 9 percent more performance. This equates to a 56 percent increase in energy efficiency (i.e. more work done per unit of energy consumed). Against 8- and 16-bit processors, the results are even more dramatic. And the benefits don't stop at the core. The ARM Cortex-M0+ processor adds

a single-cycle I/O port that delivers 50 percent faster I/O bit banging and software protocol emulation, common processing tasks for entry-level MCUs. Furthermore, the ARM Cortex-M0+ is software engineer-friendly with an on-chip micro trace buffer (MTB) that stores program execution change of flow information in user-allocated system RAM. This can then be used by the debugger to reconstruct a complete execution flow.

Traditional MCUs consist of three power modes - run, sleep and deep sleep - however this philosophy of one size fits all is not optimal in embedded products where there are differing power profiles. Kinetis L series MCUs tackle this problem by expanding the three traditional power modes to 10 flexible modes that support numerous application use cases. In each mode the MCU offers unrestricted functionality across the full operating range of 1.71 to 3.6V.

For applications requiring maximum performance, the up to 48MHz run mode offers a power-to-performance ratio starting from 85µA/MHz. Those with less demanding processing requirements and a stronger emphasis on battery life can use the reduced frequency very-low-power run (VLPR) mode, which starts from 47µA/MHz. Run-mode power optimization extends even further with the new compute operation (CPO) clocking option.

THEY SAY:

"ANALOG
INTEGRATION
CAN'T BE DONE."

TRANSLATION:

"UM...WELL,
THAT SOUNDS
LIKE A LOT
OF WORK."

IT'S TIME TO BRING ANALOG *TOGETHER*.
www.maximintegrated.com

 **maxim
integrated™**

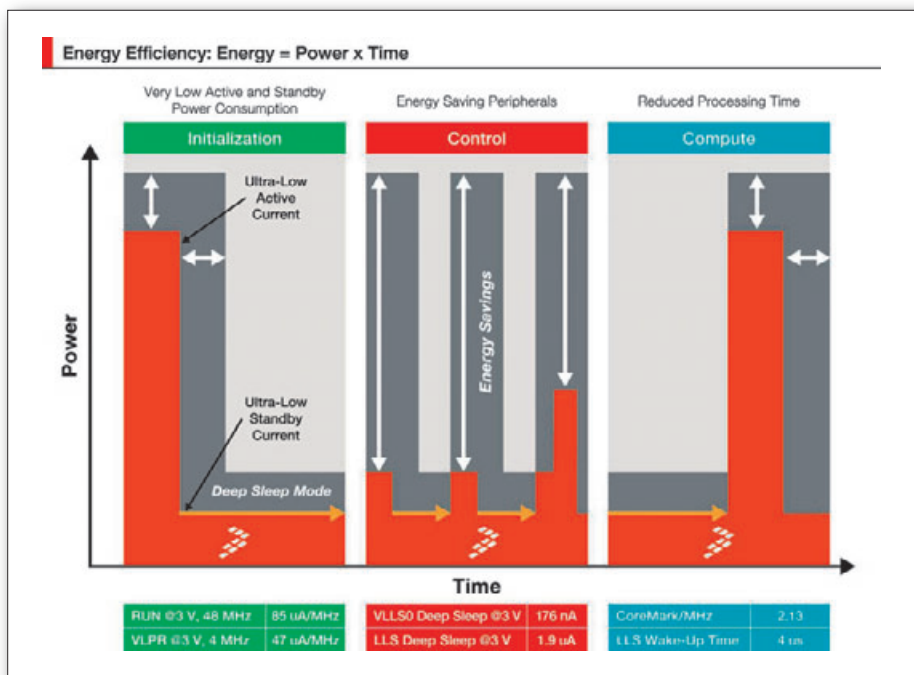


Figure 1. Kinetis L series MCUs focus on energy savings incurred across all phases of the application: initialization, control and compute.

Breakthrough Power Efficiency			
	Kinetis Power Modes	Recovery Time	KL25 Measured IDD @ 3 V and 25 C
Leading Dynamic Power	RUN	—	85 uA/MHz*
Innovative low-power process technology (C90TFS)	VLPR	—	47 uA/MHz**
Low power platform design	WAIT	—	3.7 mA @ 48 MHz
Next-generation ARM® Cortex™-M0+ core	VLPW	—	135 uA @ 4 MHz
Asynchronous DMA Wake-Up (ADMA)	STOP	4 us	345 uA
Energy-saving peripherals are operational with ADMA feature that can wake-up DMA to perform transfer and return to current mode when complete	VLPS	4 us	4.4 uA
Low-Leakage Wake-Up Unit	LLS	4 us	1.9 uA
Enables complete shut-down of core logic, including AWIC, further reducing leakage currents in all low-power modes	VLLS3	42 us	1.4 uA
Supports eight external input pins and eight internal modules as wake-up sources, extends the low-power wake-up capability of some internal peripherals to all power modes	VLLS1	93 us	700 nA
Wake-up inputs are activated in LLS or VLLS modes	VLLS0	95 us	176 nA / 381 nA

* Compute operation enabled: 4.1 mA @ 48 MHz core/24 MHz bus
** Compute operation enabled: 188 uA @ 4 MHz core/1 MHz bus

Table 1. Kinetis L series MCUs expand the three traditional power modes to 10 flexible modes that support numerous application use cases.

This is suitable in use cases where only the processor, flash and SRAM read interfaces are active (i.e. during a compute-only phase). Each run mode also has an equivalent sleep mode in the form of wait and very-low-power wait (VLPW) during which the processor is inactive.

For the most extreme battery-powered applications there are several deep sleep options. These differ in terms of their wake-up sources, level of RAM retention and peripheral functionality supported. The most fully functional

of these are the stop and very-low-power stop (VLPS) modes in which all I/O pins and several peripherals can act as wake-up sources or function with an alternate clock source. Of these, stop mode maintains the low-voltage detect (LVD) circuitry and an active PLL.

At the very low end, the low leakage mode currents range from 1.9µA down to 176nA with up to eight I/O pins and the real-time clock, low-power timer, analog comparator and capacitive touch sensor interface all available as wake-up

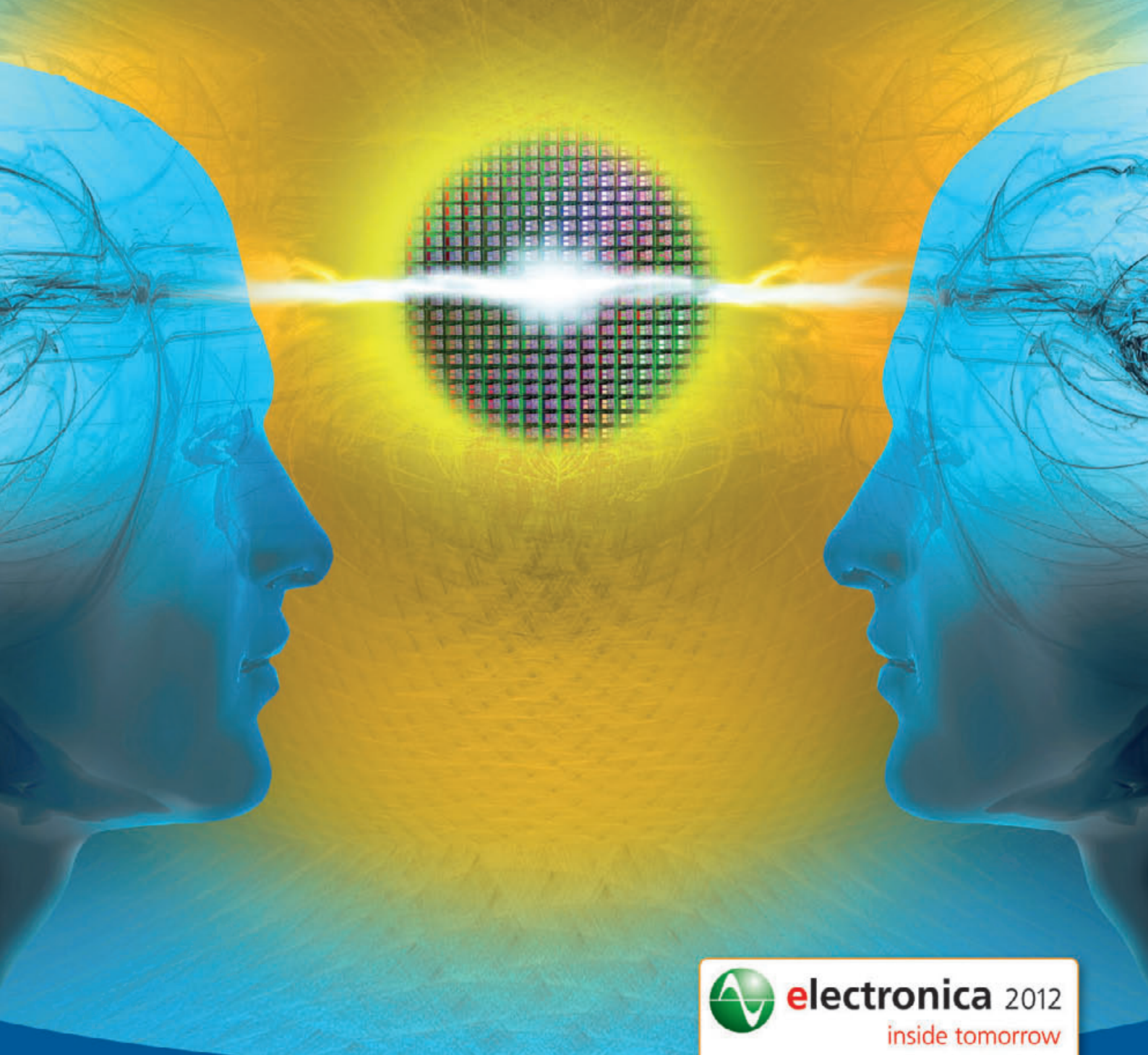
sources. The low leakage stop (LLS) mode is the sweet spot of the deep sleep modes with full logic/memory retention and a 4µs wake-up time. Finally, the very-low leakage stop (VLLSx) modes retain wake-up logic while shutting off RAM power (VLLS1/0 only). These have slightly longer wake-up times and are more suitable for applications where wake-up occurs infrequently.

A key strategy for maximizing battery life in embedded systems is to implement more low-power intelligence within the peripherals and allow them to operate autonomously in deep sleep modes with an alternate clock source. Kinetis L series MCUs take full advantage of this new trend. Consider the following application use cases that can be implemented while the rest of the embedded system remains asleep:

- Energy-saving peripheral Application use case
- ADC
- Periodically sample an analog sensor, perform compare functions and hardware averaging
- UART
- Continuously transmit and receive data to/from a radio IC or other MCU
- Timer/PWM
- Dynamically control a motor or detect external pulses
- Real-time clock
- Perform time keeping and recognize alarm events
- Touch sensor interface
- Detect touch from user interaction with capacitive buttons, sliders, etc
- Segment LCD
- Display user information to segment displays with alternate screens and blinking mode.

Kinetis L series MCUs include an asynchronous DMA (ADMA) wake-up feature that allows certain peripherals to request a DMA transfer in stop and VLPS modes. The ADMA module will execute a data transfer between the peripheral and memory without having to return to run modes or request processor intervention. This allows continuous operation of the peripheral in a deep sleep state where data can be passed to/from data arrays in SRAM until enough has been collected for processing. Achieving this in a conventional MCU would require the MCU to operate in higher power modes with the processor and other system clocks fully enabled.

The architecture of the Kinetis L series adds several low-power features that can be taken for granted in other MCUs. To help streamline the initialization phase of the application there is a bit manipulation engine (BME) which improves cycle time and code size by an average of 40 percent when performing bit-oriented math operations on peripherals. The BME encodes



electronica 2012
inside tomorrow

Visit us from November 13-16
in Hall A5, Booth 575!

EBVchips

Semiconductors Developed with and for Our Customers!

We already provide our customers with highly specific support in markets where intensive consultation is required, such as general lighting, automotive, consumer, renewable energies, FPGAs, medical technology and RF & wireless. Now we are going one step further and raising our services to the next level with a new and revolutionary service.

Under the name EBVchips, we are now defining our own semiconductor products, which we are developing with and for our customers!

These products will be manufactured by our suppliers, fulfilling special requirements of customers not covered by products already available. This makes EBV the first semiconductor specialist in the world to offer such a service. With EBVchips, we offer our customers competitive advantages, as they will now receive exactly the products and technologies they require for their individual applications.

For further information, please contact your EBV partner on site or visit us online at www.ebv.com/chips.

Distribution is today.
Tomorrow is EBV!
www.ebv.com

EBV  **chips**



EBVElektronik
| An Avnet Company |

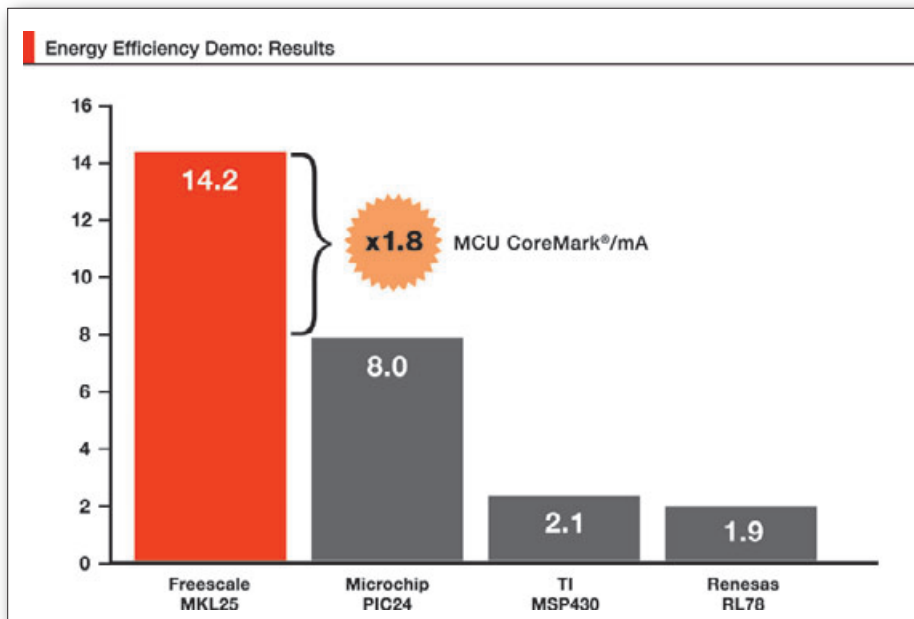


Figure 2. The Kinetis L series combination of superior processing power with excellent low-power operation shone through with a measured figure of 14.2 CoreMark*/mA.

functions like OR, AND, XOR, bit field insert and bit field extract. In contrast, a traditional 32-bit processor would require several instructions to execute the equivalent read-modify-write operation. To reduce power spikes during the boot sequence or deep sleep wake-up, a low-power boot option is included. This is particularly useful in systems where battery chemistry limits the allowable peak current (e.g. those that

use lithium-ion batteries). Safe-stating conditions can also be achieved easily by zero leakage I/O and peripheral clock gating configurations that avoid excess leakage current.

Kinetis L series MCUs are meeting the low power challenges of embedded products nowadays and setting new standards for energy efficiency across all phases of the embedded application

profile. At the Freescale Technology Forum in June 2012, the L series went head-to-head in an energy efficiency benchmark challenge with three respected 16-bit low-power MCUs from well-known competitors. Each MCU was powered by an identical charging circuit and optimized for low-power operation to ensure consistent test conditions. MCUs performed a repetitive cycle of 40 EEMBC CoreMark iterations followed by a five second deep sleep period, continuing until the last MCU remained active. The Kinetis L series combination of superior processing power with excellent low-power operation shone through with a measured figure of 14.2 CoreMark*/mA, significantly greater than its closest rival.

New entry-level Freescale-MCU thinking is being applied beyond the silicon, which, incidentally, is now production qualified. The aptly named Freescale Freedom Development Platform is another beneficiary and at just €10 it is also attractive to entry-level design budgets. This no-fuss, highly capable development kit comes with a free code size limited IDE and RTOS bundle from Freescale, including a GUI-based code generation tool that cuts days from development cycles. Broad third-party support from the ARM ecosystem is also on hand if needed. The Kinetis L series is challenging expectations for energy efficiency in the entry-level MCU arena, and in doing so offers new possibilities for embedded systems that utilize them. ■

Freescale MKL25

Part number: PKL25Z128VLK4

* CoreMark 1.0: 102.17/ Green Hills MULTI 6.1.4 - Compiler 2012.5 - bsp generic -Ospeed -OI -OB -Olink - Onounrollbig -Omax -no_commons - delete -cpu=cortexm0/ Code in internal FLASH, Data in internal RAM/ Processor operating frequency = 48MHz, operating voltage = 3.3V

Microchip PIC24

Part number: PIC24FJ128GA310

* CoreMark 1.0: 29.41/ MPLAB IDE v8.31 -g -Wall -O3 -funroll-loops/ Code in internal FLASH, Data in internal RAM/ Processor operating frequency = 32MHz, operating voltage = 3.3V

TI MSP430

Part number: MSP430F5529

* CoreMark 1.0: 16.23/ Code Composer Studio 5.1.1 -O3--opt_for_speed=5/ Code in internal FLASH, Data in internal RAM/ Processor operating frequency = 25MHz, operating voltage = 3.3V

Renesas RL78

Part number: R5F101MGAF4

* CoreMark 1.0 : 11.04/ IAR for Renesas RL78 1.20.1 --core rl78_1 --code_model near --data_model near --no_unroll --no_inline --no_tbaa --no_crosscall --no_scheduling -D NDEBUB -I/ Code in internal FLASH, Data in internal RAM/ Processor operating frequency = 32MHz, operating voltage = 3.3V

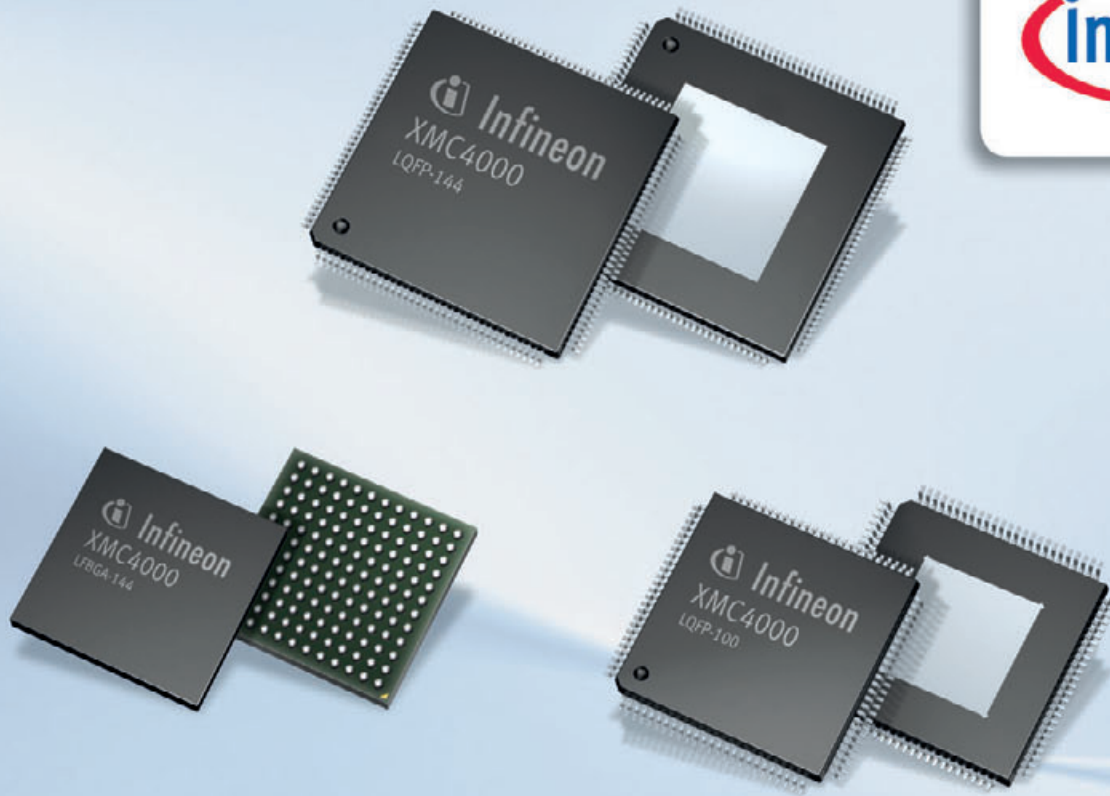


FREE SUBSCRIPTION to the ECE Magazine
Information and Know-how for Embedded Engineers

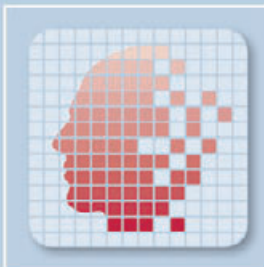
Technical Articles and Product News about:

- Hardware and Software
- Tools
- Technologies

www.embedded-know-how.com/ece-magazine



XMC4000 – Tackle Your Industrial Design Challenges



DAVE™ 3
Free Code Generation Tool



Hexagon Development Kit

The XMC4000 family marks a cornerstone in microcontroller design for real-time critical systems. It is the result of Infineon's world-leading microcontroller know-how now coupled with all the benefits of the ARM® Cortex™-M4. Featuring Infineon's powerful peripheral set, configurable to specific application requirements, XMC4000 is the ultimate choice for today's industrial control solutions. It is designed to tackle the imminent challenges of improving energy efficiency, supporting advanced communication protocols and reducing time-to-market. Striving for energy efficiency, it greatly benefits from Infineon's well-known set of configurable peripherals, fast embedded Flash technology, high quality standards, long product life times and the ability to provide high temperature ranges of up to 125°C, backed by Infineon's background as a leading supplier in automotive.

Development tools complement the product family and provide comprehensive support. In addition to Infineon's free DAVE™ 3 development environment, a full range of tools is available including compilers, debuggers, software analysis and Flash programming tools, an extensive range of software solutions and consulting services by reputable providers.

www.infineon.com/xmc4000



One microcontroller platform.
Countless solutions. XMC.

“Wolverine” based MSP430 microcontrollers slash power consumption in half

By Stefan Rank, Texas Instruments

In computing today, you can observe a trend away from mere performance maximization towards optimization around the user interface. In ultra-low power (ULP) design, it's all about the power budget.



■ “Specify the battery or power source first, then design the electronics around it”, is the name of the game today in ULP design. With TI’s MSP430FR59xx MCUs, however, you can do the most fancy ULP designs, no matter how low the available energy. MSP430 is a very successful ultra-low power MCU architecture for many years now with an aggregate of roughly 2B units sold into the ultra-low power markets, like heat cost allocators, smoke detectors, industrial sensors, low power consumer electronics and advanced medical devices. With the MSP430FR59xx MCU family, a new age in ULP has begun as lowest stand-by currents are combined with the most energy-efficient memory writes on a single piece of silicon, facilitating ULP application with at least 2x lower power budgets.

The typical ultra-low power application remains in stand-by mode 99% of the time consuming only very little energy. In ULP applications, target consumption levels are usually a few μA in stand-by mode and a few 100 $\mu\text{A}/\text{MHz}$ in active mode. Wake-up time should not be higher than a few μs . Peripheral power consumption should be optimized as much as possible as well, above all for the analog peripherals like the ADC. In MSP430FR5969, a new power management module (PMM) facilitates more flexible implementations of power adjustments. Where in older MSP430 variants clock gating was the main tool to adjust power consumption levels, in “Wolverine” based derivatives there is heavy use

of power gating. There are four power domains for core, RTC, FRAM and JTAG that can be switched on and off essentially removing leakage currents, which become quite harmful especially at high temperatures. Mere “power gating” has been used before, but Texas Instruments have brought in completely new power optimization techniques, like an “Adaptive LDO” for core supply. The adaptive low dropout regulator (LDO) that powers the digital core of the microcontroller (MCU) dynamically responds to changing power requirements. In effect, the MSP430FR5969 automatically detects the current needs of the application and provides the clock and power as required. “Wolverine” ULP innovations enable MCU stand-by currents of 360nA including RTC and active consumption between 60-100 $\mu\text{A}/\text{MHz}$, while enabling ultra-fast wake-up from stand-by modes.

Let’s have a look at MSP430 ULP MCUs based on “Wolverine” technology. First of all, these devices leverage the proven ULP features of the already well-established and entrenched predecessors of the MSP430 MCU family, like MSP430F2xx and MSP430F5xx, such as zero-power brown-out and pin leakage of a few nano-amps. “Wolverine” based ULP MCUs with currently up to 64KB ULP FRAM, only consume 590nAs in LPM3 stand-by with ACLK and low frequency peripherals running and with full RAM retention. The now embedded ferroelectric Random Access Memory (FRAM) makes writing

to memory quick, easy and energy-efficient, while additional improvements to architecture and process technology enable more energy savings throughout the application. The integrated ADC12 can measure very accurately parameters of the outside world, like temperature or pressure, consuming only 75 μA or 50% of the power compared with the closest competitor. The internal Voltage Reference (VRef) only adds 8 μA to the power budget, resulting in a combined ADC12/VRef power consumption of 83 μA . When analyzing the measurements, active power consumption is roughly 80 $\mu\text{A}/\text{MHz}$ beating previous values of 160-200 $\mu\text{A}/\text{MHz}$ by a factor of two and facilitating more advanced algorithms even in ULP applications. “Wolverine” based ULP MCUs with embedded ferroelectric random access memory (FRAM) are revolutionary game changers for applications, such as wireless sensors, where lowest possible power consumption saves battery life and enables energy harvesting based operation for a system’s life.

“Wolverine” builds on the very successful MSP430 ULP DNA with power-optimized peripherals and the superior characteristics of embedded FRAM, that is already known from MSP430’s first FRAM device, the MSP430FR5739. Embedded FRAM facilitates 250 times more energy efficient and 100 times faster writes to memory with an endurance of 100 trillion cycles. At the same time, this universal memory is byte accessible and has access

times practically as fast as SRAM. New MSP430FR5969 MCUs are based on a totally revamped ultra-low-leakage process with at least 10x lower leakage currents and 15% reduced active power consumption. The MSP430FR59xx family offers a lot of new and enhanced peripherals that come in handy in wireless harvesting nodes. The memory protection unit (MPU) allows for a quick and easy three-segment memory protection, the integrated AES256 module facilitates secure transmission of data in hardware and the real-time clock module RTC_B enables ultra-low power time tracking. With the ultra-low power product mindset quickly migrating to an all-en-

compassing ultra-low energy world, the air on the energy efficiency playing field is becoming thinner and thinner. Every nano-amp counts. When it comes to ultra-low power, it is essential to understand that software is just as important as hardware and has to be optimized in the same way. An internal study at Texas Instruments showed that optimizing the average non-optimized ULP code, can save up to 75% of the required energy in a typical ULP application. With ULP Advisor™, designers of ULP applications can even check the code along the lines of well proven ULP rules before compilation. On the hardware side, the selection of the right components and a good layout bring you

a long way. In addition, a new energy tracking technology will enable to physically measure improvements in energy efficiency along the code optimization road. MSP430 ultra-low power MCUs based on “Wolverine” technology bring an entirely new hardware and software solution to designers of ULP systems that will revolutionize the way ultra-low power applications will be designed in the future. ■

More information on “Wolverine” technology platform is available in Texas Instruments’ whitepaper “Ultra-low-power pioneers: TI slashes total MCU power by 50 percent with new “Wolverine” MCU platform”: www.ti.com/frame

electronica NEWS

Microsemi introduces next-generation SmartFusion2 SoC FPGA

Microsemi has unveiled its new SmartFusion2 system-on-chip FPGA family. Microsemi’s next-generation SmartFusion2 SoC FPGAs are designed to address fundamental requirements for advanced security, high reliability and low power in critical industrial, defense, aviation, communications and medical applications. SmartFusion2 integrates inherently reliable flash-based FPGA fabric, a 166 MHz ARM Cortex-M3 processor, advanced security processing accelerators, DSP blocks, SRAM, eNVM and industry-required high-performance communication interfaces all on a single chip. SmartFusion2 provides the most advanced design and data security capabilities starting with a robust root-of-trust device with secure key storage capability using the SoC FPGA industry’s only physically unclonable function key enrollment and regeneration capability. SmartFusion2 is also the only SoC FPGA protected from differential power analysis attacks using technology from the Cryptographic Research Incorporated portfolio.

[News ID 16287](#)

Kontron: digital signage kit helps streamline development of intelligent signage systems

Kontron announces the availability of the next-generation Digital Signage Evaluation Kit-12. The DSEK-12 offers a pre-validated system that features technologies from Kontron, Intel and Microsoft. The kit uses the modular OPS-compliant Kontron media player KOPS800 based on 3rd generation Intel Core processors, which will also be available as a standalone media player in early Q4 2012.

[News ID 16135](#)







The Holtek Flash MCU range of devices encompass an extensive range of peripheral functions making them suitable for use in a diverse application area such as health care products, instrumentation products, household appliances, industrial control, consumer products, automotive peripheral products to name but a few. With one range types also including Holtek’s unique TinyPower™ technology, the ability is provided to meet the demands of today’s environmentally conscious products.

- HT68Fxx Internal Multi-function Timer Modules. Internal oscillators with four frequency selections. Multi-function I/O pins with re-mapping function. 4 LCD SCOM outputs for direct driving of LCD panels. Multiple Communication Interfaces.
- HT66Fxx Includes all the HT68Fxx functions with an additional 12-bit ADC and internal reference voltage source.
- HT67Fxx Includes all the HT66Fxx functions but also uses Holtek’s TinyPower ultra low power technology and also includes an internal R-type/C-type LCD driver. Also includes dual SPI or I²C interfaces which can be used simultaneously as well as internal Data EEPROM.

STD Flash MCU HT66/67/68Fxx Series

- Wide Operating Voltage Range: 2.2V~5.5V
- Multiple Low-power Operating Modes
- Fast Wake-up Function
- Industrial Specifications: -40°C ~ +85°C
- Multiple External Communication Interfaces
- Internal Accurate High/Low Speed Oscillators
- High Noise Immunity and Excellent ESD protection



Touch Flash MCU	STD Flash MCU	STD 8051 Flash MCU	USB STD Flash MCU	32bit MCU	Enhanced OTP MCU
TinyPower™ MCU	Power Management	UART MCU	Phone MCU	EEPROM	WLED Backlight

HOLTEK SEMICONDUCTOR INC.

4F-2, No.3-2 BLD H. Yuan-Ou St., NanKang Software Park, Taipei, 11503, Taiwan R.O.C.
Tel: +886-2-26557070 Fax: +886-2-26557383
www.holtek.com.tw/english/contact/contact.htm

● **JTAG: soft-and hardware developments on show**

JTAG Technologies, provider of JTAG/boundary-scan products for electronic test and debug, will showcase amongst other new products the latest soft-and hardware developments:

The JT 2149/DAF I/O module for digital and analogue measurement is the first unit of its type to offer both digital and analogue test access to PCBs via JTAG Technologies' widely-used QuadPod signal conditioning interface. The JT 2149/DAF module has been designed to slot into JTAG Technologies' regular QuadPod transceiver system as used by the renowned DataBlaster series of boundary-scan/JTAG controller hardware. When connected to a circuit board via edge connector or test fixture/jig test pins the module enhances standard digital boundary-scan tests by enabling a series of analogue and frequency measurements to be made.

Capabilities of the JT 2149/DAF module include 16 dual-purpose digital pins capable of digital I/O stimulus and response at voltages of 1.0 to 3.6V plus frequency measurements of up to 128MHz on any pin. 12 additional analogue measurement channels can capture values from 0 to 33V with better than 10mV resolution. One further channel is available as a clock generator, programmable up to 64MHz.

The latest extension to the high-performance boundary-scan IEEE Std. 1149.1 controllers will also be a highlight at the show. Known as the DataBlaster JT 37x7/PXIe the new unit offers support for the increasingly popular PXIe/Compact PCI-express slot format that now features in some of the latest Automatic Test Equipment based on the PXI(e) standards. JTAG has developed the new boundary-scan controller to satisfy the growing requirements for high-speed In-System Programming of flash memories, serial memories and CPLDs as well as complex digital circuit testing. The new DataBlaster JT 37x7/PXIe offers users sustained test clock speeds of up to 40MHz by use of JTAG Technologies' proprietary ETT system and features an on-board flash image buffer memory.

JTAG Technologies is also using the electronica event to present Autobuzz, a tool that learns a connectivity signature of all boundary-scan parts within a design from only the BSDL models of those parts. Autobuzz expands the „seek and discover“ mode of BuzzPlus and automatically gathers circuit data of a known good board and then performs a full connectivity compare against the faulty circuit. Autobuzz is a useful tool for repair and rework technicians, especially when design data is missing or incomplete.

[News ID 16115](#)

● **Swissbit: storage solutions for all Industrial applications at electronica**

Swissbit will be presenting its industrial DRAM and flash storage solutions in all common technologies and formats at electronica. One of the highlights will be its brand new X-500 Series Industrial SATA II SSD with up to 512 GB. The 2.5" storage solution combines a data rate of up to 260MB/sec on SATA II and an impressive 15.000 IOPS with 4k random accesses and special features such as TRIM, the ATA security protocol, a temperature sensor and the in-field update. Additionally, the S.M.A.R.T. protocol with lifetime monitoring and a BCH-ECC ensures absolute reliability with the power fail protected X-500 series.

The Swissbit portfolio includes DRAM modules manufactured using the Chip-On-Board) and SMT methods supporting DRAM, SDRAM, DDR, DDR2 and DDR3 technologies. Its industrial flash product line includes SSDs with SATA and PATA interfaces, mSATA, SLIM SATA, CFast, CompactFlash, SD & MICRO SD memory cards, MMC and USB flash products. All Swissbit storage solutions fulfill the requirements of industrial and embedded applications in harsh environments: the highest level of reliability and robustness, long service life, extended temperature range, all common industrial interfaces and long-term availability including a fixed bill of material. The selection of materials and the module architecture are designed in line with the high demands, and firmware mechanisms, and algorithms such as intelligent wear leveling, bad block management, power fail protection & recovery, ECC, and a clever read disturb management features are also available. Thanks to design-in support and many status monitoring applications, Swissbit supports test engineers during the qualification and approval of new components.

[News ID 16122](#)

● **embedded platforms conference at electronica**

At the embedded platforms conference, which being held in conjunction with electronica in Munich from November 14 – 15, manufacturers and service-providers will present concrete solutions and services for developing embedded platforms. The conference will cover a wide range of topics, from embedded design and multicore to Ethernet and low power.

The variety of the two-day conference is reflected by the group of sponsors that each accompany a lecture session: Atmel, Farnell, Freescale, Fujitsu, Infineon, SGET, Texas Instruments, TQ Systems and Toshiba as well as their distribution, tool and solutions partners will present current and future models for developing embedded platforms. In addition, independent service providers such as the Open

Source Automation Development Lab and MicroConsult will give participants a look at the latest industry trends. For example, the program of events includes lectures on the use of multicore as well as multiprocessing, DSP, USB, Ethernet, motor control, safety, low power, migration, freeware and Open Source. Participants will also get useful information about the capabilities of and differences between modern controller and standards as well as tracing, debugging and analysis solutions.

Twelve lecture series will give developers and system architects a chance to take new ideas home with them, compare various suppliers and get a comprehensive look at the latest solution approaches. Participants are also invited to make new contacts at a networking event on the first evening. The complete schedule is available online and in the electronica event database. Effective immediately, participants can register online.

[News ID 16265](#)

● **Rutronik: development kit for XMC4000 family from Infineon**

Infineon presents the Hexagon Development Kit which is a versatile new tool for the XMC4000 family. At the heart of this four-board development platform is the CPU board with the new XMC4500 microcontroller. Satellite cards allow the expansion of the kit functionality to suit specific applications. The application kit is available at distributor Rutronik as of now.

[News ID 16150](#)

● **AAEON: rugged fanless touch panel computers**

AAEON has released two new rugged panel computers: AHP-2122 and AHP-2153. The AHP wide-temperature series comes in three sizes – 12.1", 15" and 17", and the 12.1" and 15" Rugged Panel Computers have been launched first. Due to the various support on panel size options, OEM and ODMs have a variety of size options to select from. Moreover, the current AHP-2122 and AHP-2153 support panel, wall, desktop and VESA 100 for optimal display mounts.

[News ID 16158](#)

● **Microchip expands USB portfolio with fifteen new 8-bit PIC MCUs**

Microchip announces the expansion of its certified Full-Speed USB 2.0 Device PIC microcontroller portfolio with three new Enhanced Midrange 8-bit families comprising 15 scalable MCUs ranging from 14 to 100 pins with up to 128 KB of Flash. All feature internal clock sources with the 0.25% clock accuracy necessary for USB communication, which eliminates the need for an external crystal.

[News ID 16162](#)



electronica 2012

inside tomorrow

Embedded Forum at electronica in Hall A6

Programme Overview

Tuesday, Nov 13th

Session 1: Microcontrollers & DSPs

Session 2: Smart Metering

Wednesday, Nov 14th

Session 3: Energy Efficiency

Session 4: Small Form Factor Boards

Session 5: Tools & Software

Thursday, Nov 15th

Session 6: ARM-based Systems

Session 7: Industrial

Session 8: Embedded Computing

Friday, Nov 16th

Session 9: Electronic Lighting

Session 10: Software Development

MSP430™
Ultra-Low Power MCUs

 **TEXAS
INSTRUMENTS**

 **TEXAS
INSTRUMENTS**

visit us in Hall 4, Booth 420.

Conference Programme Embedded Forum

During **electronica**, the **Embedded Forum** in hall A6 provides 30-minutes presentations about technical trends, products, applications and more.

The **Embedded Forum** is free for all **electronica** visitors!

Tuesday, 13th of November

Session 1: **Microcontrollers & DSPs**

13h00 - 13h30 **Enable a Battery-free world with MSP430 and FRAM**

Speaker: Jacob Borgeson, Texas Instruments

This presentation will look at the next stage of energy scavenging thanks to the lowest power MSP430 microcontrollers with the world's lowest power non-volatile memory, FRAM. As a unified memory with write energy 300x lower than conventional Flash, FRAM enables data logging and flexible program structures to suit the unique system requirements of Energy Harvesting sensors.

13h30 - 14h00 **XMC4000: one microcontroller platform - countless solutions**

Speaker: Manfred Choutka, Infineon

The 32-bit XMC4000 family based on an industry standard core the ARM® Cortex(TM) M4 marks a cornerstone in microcontroller design for real-time critical systems. Infineon addresses three high-level trends for microcontrollers in industrial drives, automation and renewable energy efficiency, the need to enhance connectivity between systems and the reduce of software complexity. Software complexity is one of the major problems for embedded systems development especially for small and medium sized companies. To challenge this major issue, Infineon came up with the new DAVE™ 3 free Eclipse based software framework.

14h00 - 14h30 **Facts about low-power and how to select the right MCU**

Speaker: Christian Daniel, Texas Instruments

In the last couple of years, the number of ultra-low-power microcontroller suppliers have steadily increased. Everyone claims key parameters e.g. world leading active current, fastest wake up time,... the reality is that the choice of the right MCU is ambiguous if it is reduced to a single parameter. The selection starts with many questions that need to be answered upfront. E.g. what energy do I have available? What is the required lifetime of the application? What are the environmental conditions (like operating temperature profile)? What operating conditions does the application require and what modules do I need (e.g. ADC)? How often runs a certain task and which lowest power mode can it use between the different tasks? This information's combined with the parameters found in the datasheet will finally help to identify the right MCU.

Session 2: **Smart Metering**

15h00 - 15h30 **Integrated solutions for reliable and cost effective energy metering**

Speaker: Mohit Berry, Infineon

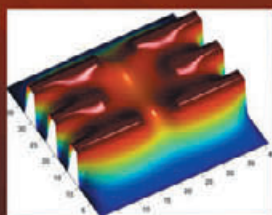
Infineon unveils a new products series which enables reliable and integrated, tamper resistant, yet cost effective energy metering solutions. Cyber security, single and poly phase electrical energy metering, low power flow metering will be discussed during the presentation. Adopting Infineon's solutions customers can implement highly accurate smart meters as well as low cost sub meter and smart home devices such as energy-aware white goods and smart plugs.

More Information:

electronica.embedded-know-how.com

Parlez-vous MATLAB?

Over one million people around the world speak MATLAB. Engineers and scientists in every field from aerospace and semiconductors to biotech, financial services, and earth and ocean sciences use it to express their ideas.
Do you speak MATLAB?



Modeling electric potential in a quantum dot. Contributed by Kim Young-Sang at HYU.

This example available at
www.mathworks.com/lc

MATLAB®

The language of technical computing

15h30 - 16h00 Embedded Security in the Smart Grid

Speaker: Kris Ardis, Maxim Integrated Products

As more and more critical infrastructure is controlled by embedded industrial equipment, it becomes critical that security be a factor in any industrial application. But with a problem as big as "security" to tackle, where to begin? This presentation will take the example of a smart meter, and walk through a threat analysis on the meter. We will identify the potential attackers, and analyze the life cycle of the meter to highlight the threats and the technology that can be implemented to deter those threats. While the examples will focus on a smart meter, the concepts presented in our threat analysis will be highly applicable to the entire industrial segment.

Wednesday, 14th of November

Session 3: Energy Management & Efficiency

10h30 - 11h00 Microcontrollers enabling Greener Society

Speaker: Mohammed Dogar, Renesas

Electronic equipment designs are being driven by customer requirements for increased intelligence, improved portability and higher energy efficiency. Intelligent and low-power microcontrollers are the only way to meet these demands. To make this a reality clever design techniques including architectural and peripheral features are required within an MCU to contribute to overall low-power performance. Because Renesas MCUs are specifically designed to enable smarter and greener solutions, we can achieve these targets easily and efficiently.

11h00 - 11h30 Total power conversion solutions using the latest technologies from Vishay Siliconix


Speaker: David Grey, Vishay Siliconix

Whether you are using power in the form of AC from the grid or DC from a battery there are usually multiple voltage conversion stages that waste valuable energy. At Vishay Siliconix we are continually developing new silicon and packaging technologies aimed at minimizing these losses. In this presentation we will introduce new products including the "E Series" Super Junction High Voltage MOSFET family along with the latest ThunderFET Medium Voltage releases.

11h30 - 12h00 ARM Cortex-M3-based SmartFusion2 SoC FPGAs for power management and high efficiency designs

Speaker: Luca Cattaneo, Microsemi

Microsemi's solutions offering for power management and efficiency has been recently extended with the introduction of the SmartFusion2 device family. SmartFusion2 SoC FPGAs are designed to address fundamental requirements for advanced security, high reliability and low power in critical industrial, defense, aviation, communications and medical applications. SmartFusion2 integrates inherently reliable flash-based FPGA fabric, a 166 MHz ARM Cortex-M3 processor, advanced security processing accelerators, DSP blocks, SRAM, eNVM and industry-required high-performance communication interfaces all on a single chip. An additional industry unique feature "Flash*Freeze" allows further reduction in power consumption from mW down to uW range. High efficiency within the application is achieved by leveraging the embedded micro-processor sub-system Cortex-M3 based, and the design specific flexibility introduced in the FPGA side.



FREE SUBSCRIPTION to the ECE Magazine
Information and Know-how for Embedded Engineers

Technical Articles and Product News about:

- ▣ Hardware and Software
- ▣ Tools
- ▣ Technologies

www.embedded-know-how.com/ece-magazine

Session 4: Small Form Factor Boards

12h30- 13h00 Standardization vs Specials for ARM based modules

Speaker: Wolfgang Heinz-Fischer, TQ-Group

The ARM module market is broadly positioned and complicates the choice for the user as there are many form factors and standards. The presentation provides an overview to find the best fitting module.

13h30 - 14h00 The new ARM Computer-on-Modules Standard

Speaker: Peter Müller, Kontron

ULP-Computer-on-Modules are ARM SoC building blocks that enable unique ultra low power designs with minimal time-to-market and high design security, as the processor module is a standard-based COTS component that can simply be designed-in. ULP-COM modules therefore close the gap between proprietary industrial offerings and the highly integrated, full custom designs of the consumer market. Learn more about the supported processor families and features and discuss the Kontron Computer-on-Modules strategy with us.

14h00 - 14h30 Rugged Small Form Factor solution for industrial control applications

Speaker: Hubert Baierl, Infineon

Infineon Technologies ISOFACE products enable small form factor industrial control solutions through integration of rugged galvanic isolation, valuable diagnostic feedback and solid switching capabilities or flexible inputs. The innovative ISOFACE products permit highly compact printed circuit board (PCB) designs, concurrently shortening time to market and delivering superior Electro Magnetic Interference (EMI) robustness. At the heart of a reference design are an ISOFACE 8-channel high-side driver IC and an ISOFACE 8-channel digital input IC. The PCB is designed to meet the IEC 61131-2 norm applicable for Programmable Logical Controllers (PLC).

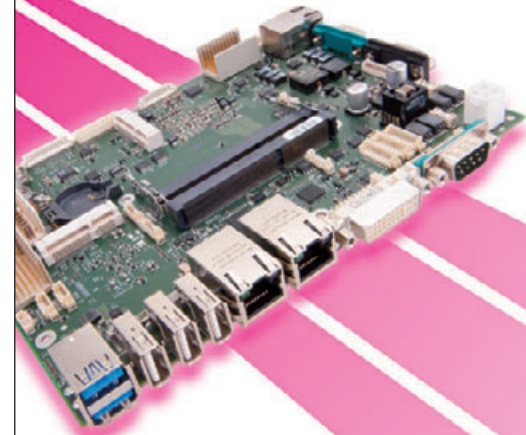
Session 5: Tools & Software

15h00 - 15h30 Analog and Digital combined: Mixed-Signal Design and Verification in Simulink

Speaker: Alexander Schreiber, Mathworks

In this presentation we will demonstrate how MATLAB and Simulink can serve as an integrative platform for the design of mixed-signal systems. Several technical disciplines and areas of expertise are combined in communications systems, e.g. radio technology, digital communication and signal processing algorithms. In order to ensure and verify the overall system performance as early as possible, the characteristics of these domains need to be taken into account in system simulation and through linking the domain-specific development tools together. This can be realized using MATLAB and Simulink.

F85PanelBoard



Intel® Core™ i7-6600UE Processor



Fan less design



USB 3.0 up to 5 Gbit/s

E.E.P.D.

Tomorrow's Technology Today™

Gewerbering 3 · 85258 Weichs - Germany

Telefon +49 8136 2282-0

Telefax +49 8136 2282-109

E-Mail sales@eepd.de

sps ipc drives

Visit us in Hall 8 at Booth 110



electronica

Visit us in Hall A6 at Booth 525

More Information:

electronica.embedded-know-how.com

15h30 - 16h00 Multi-core debugging – basics and hints

Speaker: Heiko Rießland, pls

Debugging and test of software for deeply embedded multi-core SoCs is a demanding task for developers and requires for efficiency powerful tools. Simple stop-and-go debugging does not more help in many scenarios. The presentation gives an overview about state-of-the-art data acquisition and real time analysis of current tools. Especially the integration of on-chip test capabilities with the tool features is one main topic. Further we will have a look at the debugging of interactions between two or more cores.

16h30 - 17h00 Multi-Board System Development

Speaker: Günther Schindler, CEO EasyLogix

Combine electronic design from multiple sources. Trace net between different PCB boards. Cross probe between multiple schematic and boards at the same time. Verify embedded mainboard and satellite boards with all information in one environment.

Thursday, 15th of November

Session 6: ARM-based Embedded Computers & Processors

10h30 - 11h00 Overview of the broad TI ARM-based processors portfolio

Speaker: Arnaud Van-Den-Bossche, Texas Instruments

TI offers a broad portfolio of ARM-based processors, with more than 500 devices available across the ARM Cortex-M series, Cortex-R series and Cortex-A series of cores. TI's innovative ARM solutions leverage the company's system-level expertise to provide class-leading performance and power efficiency, with easy-to-use kits and reference designs speed development cycles. TI solutions are complimented by a comprehensive ecosystem that spans software, tools and operating systems (OS) – from high-level OS to RTOS to no OS.

11h00 - 11h30 ARM-based MultiCore Qseven with single cable PCap touch panel solution

Speaker: Markus Mahl, Data Modul

With the new ARM based multicore solutions, it's possible to drive large TFTs with high resolutions (HD1080). This new technology step enabled Data Modul to introduce the first x86 compatible Qseven module. Together with the new Displayport 1.1 interface, Data Modul created a new standard solution to drive the whole range of available TFTs in combination with the new easyTouch (PCap solution).

11h30 - 12h00 A field report - Android in industrial applications

Speaker: Tim Jaacks, Garz & Fricke

Google's operating system Android has recently become a leader in the mobile phone and tablet market. Bringing a very user-friendly GUI for users and an easy-to-use SDK with a strong API for programmers, it also starts to make its way into industrial embedded systems. Since the Android framework is based on a Linux kernel, it is generally portable to any ARM based platform. This presentation gives a short overview of the architecture and the advantages of Android and the experiences Garz & Fricke made using it in their products.

Session 7: Industrial Control & Communications

12h30- 13h00 Communication infrastructure solutions for Industrial Automation 2020

Speaker: Christoph Hecker, Renesas

Communication is key in Industrial Automation and there will be significant changes in the related infrastructure as we move towards 2020. The trend starts now on the fieldbus level and will continue into the future. Renesas has several readymade solutions available on the fieldbus level, such as Industrial Ethernet Components, as well as on the last meter communication with ASI or IO-Link systems. The clear strategy from Renesas is to support customers in a way that will allow them to concentrate on the application and simply use the communication where applicable.

13h00 - 13h30 **High-side Driver IC with integrated 2.5kV Galvanic isolation for industrial control applications**

Speaker: Hubert Baierl, Infineon

Infineon Technologies 2nd generation ISOFACE 8-channel high-side driver IC ISO2H823V offers integrated 2.5kV galvanic isolation, thus meets the IEC 61131-2 requirements for reinforced isolation. Concurrently, the ISO2H823V sets a new standard for system-level diagnostics. Each of the 8 channels is equipped with 5-fold diagnostic monitoring capabilities: Open Load, Short-to-Vbb, Short-to-GND, Over Current, Over Temperature. With the ever increasing level of complexity and integration in industrial control systems comprehensive diagnostic monitoring is highly valuable in a vast range of industrial applications, both for preventive maintenance as well as to shorten costly un-scheduled down-times.

Session 8: **Embedded Computing**

15h00 - 15h30 **From Model to Code – Fast Implementation with Automatic Code Generation**

Speaker: Dr. Stephan Myschik, Mathworks

Today, more and more technical systems like cars, airplanes and robots are relying on embedded processors and control systems to provide their intended functionality. In the design process of these control systems (e.g. autopilots, driver assistance systems), MATLAB and Simulink are already playing a key role in the industry. With the system design already being performed using models, automatic code generation in the implementation phase is the next logical step. In this presentation we will present the value of automatic code generation and how it helps to speed-up the implementation phase.

15h30 - 16h00 **Will x86 still play a major role within the future industrial markets?**

Speaker: Christian Blersch, E.E.P.D.

The battle between ARM and x86 based systems for industrial applications has just started. Now also new operating systems such as Windows 8 and Android are getting into the game. We will provide an overview about current technologies and provide an outlook where this journey might take us to in the next years. As EEPD is much more than just a board vendor, we provide elaborate solutions and technological expertise to guide you into the future.

16h00 - 16h30 **The right board solutions for different embedded applications**

Speaker: Jan Felder, embedded-logic

(This paper will be presented in German language)

The right choice of embedded boards depends on your requirements in terms of volume, time to market, flexibility and ambient area. In addition you need to consider the new possibilities of the now available ARM-based solutions. This presentation provides an overview about the boards (ETX, COM Express, Q7, PC/104, 3,5" and Nano-ITX), which embedded-logic offers for various applications.



More Information:

electronica.embedded-know-how.com

Friday, 16th of November

Session 9: **Electronic Lighting**

10h00 - 10h30 **Optoelectronic measurement - the right way**

Speaker: Kevin Jensen, MAZeT

The choice of optoelectronic detectors and sensors always depends on the specific application at hand. This presentation demonstrates problems and solutions of application-specific sensor systems based on the JENCOLOR color sensors.

11h00 - 11h30 **Clever microcontrollers for intelligent LED lighting**

Speaker: Steve Norman, Renesas

Considering the role of the microcontroller in the anticipated explosion of the LED Lighting market and the "clever" solutions required in order to deliver the proof of user experience that will underpin that explosion, including high efficiency, intelligence, communications, safety and, of course, reduced cost. This is set against a background of achieving these in the simplest possible manner, and with an eye on embracing some of the new opportunities in LED Lighting just around the corner.

Session 10: **Software Development**

12h00- 12h30 **The RAM revolution: How would you use 2.5MB more RAM in your application?**

Speaker: Robert Kalman, Renesas and Colin Walls, Mentor Graphics

The new family of MCUs from Renesas are revolutionising the way that engineers think about system design. The 2.5MB of embedded SRAM open up a new range of different solutions and possibilities. This session will explore the possible use cases for different applications which can benefit from the addition of 2.5MB of SRAM, and how these different application areas can also benefit from the use of Mentor Graphics solutions such as Nucleus RTOS and Inflexion.

13h00 - 13h30 **DAVE 3 makes embedded software development much faster**

Speaker: Georg Huba, Infineon

Component based software development is widely used to improve development efficiency. Up to now this concept had limits in embedded applications. It was not easy to avoid hardware conflicts when using various software components that require peripheral and I/O resources of the target microcontroller. DAVE™ 3, the free development platform from Infineon overcomes these limitations. This paper provides an overview of component based programming and outlines the innovative concept of DAVE 3. It will prove that embedded software development will be much faster when using DAVE™ 3.

13h30 - 14h00 **API: a helpful tool for the analysis of electromagnetic designs**

Speaker: Dr. Doug Craigen, INTEGRATED Engineering Software

An API enables the user to greatly enhance the power of an application to suit their needs including coupling with other API enabled software. Examples shown in this talk will include insulator design; testing for EMC/EMI issues, and optimizing a magnetic core shape to obtain a desired B field profile.

electronica NEWS

Schroff: effective cooling for industrial applications

Pentair Technical Products has introduced the new V-series of air conditioners to the market under its McLean brand. In Europe the McLean brand, which offers cooling solutions for industrial and telecommunications applications, is marketed through Schroff and its sales partners. The new V-series air conditioners have been developed to provide effective cooling for industrial systems. This series of cabinet wall-mounted devices offers a wide range of five different cooling capacities: 300 W, 600 W, 1200 W, 1500 W and 2000 W.

[News ID 16223](#)

Maxim: smart-meter SoC combines metrology, security and communication

Maxim Integrated Products introduces Zeus, a complete smart-meter system-on-a-chip that offers highly accurate metrology, multiple layers of security, and plenty of processing horsepower for today's advanced communication protocols. Zeus provides meter manufacturers with a platform for development in multiple end markets, supporting a wide range of security and communication requirements.

[News ID 16254](#)

Software developers define the trends in microcontrollers

Dr. Stephan Zizala, Senior Director, Microcontrollers, Industrial and Multimarket, Infineon



■ In early 2012 Infineon introduced XMC4000, its first ARM-based microcontroller family. When we made the decision to use the ARM Cortex M4 processor there were some concerns, of course. Would such a product be commodity, replaceable by any other ARM Cortex M4 based microcontroller? Would there be a price war? By now, we know the answer. Of course one might face price pressure in applications which just need little computing performance, an USB interface, a few ADC channels etc. But XMC4000 is far away from a commodity product. The family is highly optimized for industrial drives, renewable energy and factory automation. And optimized additionally means the reliability, quality, real-time performance needed for such demanding applications that the peripherals are leading edge and can be configured in a way which allows the customer to adapt them to the exact requirements of the target application.

However, applications for a simple, low-end microcontroller and a powerful, highly advanced microcontroller have one thing in common: innovations in applications drive up software complexity. If one just browses through the application trends in the embedded domain – energy efficiency, connectivity, safety, low power etc – all of them require more advanced software. Algorithms to fully utilize the powerful peripherals, to make protocol stacks work together smoothly, to fulfill new safety requirements for factory automation or to transit from sleep mode to active mode. And Moore's law will accelerate the trend towards more and more powerful affordable

microcontrollers. This means even more possibilities for embedded software developers to create innovative software for their target markets. The traditional answers of the semiconductor industry to reduce software complexity have been the use of standard cores, hardware abstraction layers or reference designs with sample code. Using a standard core does not relieve the software developer from considering the peripherals or integrating several software modules to work together. Hardware abstraction layers are helpful as long as the application does not require powerful peripherals. Reference designs with sample code are a good proof of concept, but as soon as the software developer tries to adapt the sample code to the exact application requirements things become tricky. Also combining two more software examples can quickly become tedious.

Infineon suggests a different approach to handle the complexity of industrial applications nowadays: The DAVE integrated development environment (IDE). First pre-defined software components, the so-called DAVE apps, can be configured and combined to high level application model in a graphical user interface. Second DAVE maps the application model to the microcontroller with a leading edge algorithm, making best use of the peripherals, and generates C code. Third the C code can be modified, compiled and debugged within DAVE. Being based on the Eclipse framework the IDE is extendable to third party tools, and the DAVE SDK allows modifying the pre-defined DAVE apps or creating new ones. This innovative concept works, as the microcontroller is prepared for this: XMC4000 is based on a modular architecture with highly configurable peripherals, which can be interconnected via the central connection matrix by software. Due to this structure the IDE can automatically configure the microcontroller to match the high level application model.

By using this more abstract development methodology based on software components, embedded software developers can create applications which are easy to port between XMC4000 family members. They don't have to care about peripheral implementation details, but still can take full advantage of application-optimized peripherals. In future this approach will be further expanded, especially by offerings of third party apps. ■

THREADX

**ALL YOU
NEED
IN AN RTOS**

**Source Code
No Royalties
Small Footprint**

YOUR EXTRAS

Certification Pack™

Fastest RTOS

**Automatic
Event Trace**

**ADDITIONAL
MODULES**

NETX

TCP/IP with IPv4 & IPv6

FILEX

Embedded FAT File System

USBX

Host and Device Stack

PEGX

Embedded Graphics

TRACEX

Real-Time Event Trace

For Information visit

WWW.RTOS.COM

+49 5143-911303

expresslogic

32-bit cores are NOT the solution to all

Lucio Di Jasio, Business Development Europe, Microchip Technology



■ The embedded control market is experiencing a very tumultuous and interesting evolutionary phase. The small CMOS geometries (<200nm) that propelled the mainstream computing industry more than a decade ago into the “Pentium” era have finally reached the price point, but perhaps more importantly the robustness and low power consumption levels, required by embedded control applications. The practical repercussions are significant: more flash memory is available, which has boosted the use of higher-level programming languages, more gates are available to enrich the core of the microcontroller and to increase performance,

making 32-bit, 100 MIPS solutions an increasingly affordable option, and lastly and predictably, the die size reduction has made it possible to fit even larger microcontrollers in the smallest packages (2x2mm DFN and SOT23-6).

Claims are often made that 32-bit cores are the solution to all embedded applications because they offer the utmost in functionality and power. Some have even extended this message to say that standardization around one, and only one, 32-bit architecture will benefit all developers and eventually the end users. Microchip does not agree with this view. We believe that developers and end users will benefit from a greater (not lesser) availability of affordable core choices. We feel engineers should be able to choose the right core for the application. We offer a more holistic perspective, where the embedded control solution is the sum of a number of choices comprising the selection of the right set of peripherals, the right packages, the right mix of memory components (RAM, flash, EEPROM, ...) with the right endurance, retention characteristics, integration of analog features (amplifiers, comparators, voltage references, supervisors ...) to create the perfect microcontroller for the application. This requires not just the availability of a large portfolio of devices, but a true platform where all

the above choices are available as part of a uniform migration path, including: common pin-outs for true pin-to pin compatibility, universal tools that can be used for all -he devices in a portfolio of products, and common software libraries for connectivity, touch and graphics etc. The Microchip approach promotes the idea of core-independent peripherals to support the design process; any C compiler can manage the difference between two cores, but incompatible peripheral and pin-outs can force substantial redesign. This approach also means that peripheral modules can be designed to relieve the core from low level, processor-intensive tasks that are not bound to the choice of an 8-, 16- or 32-bit core.

Microchip use the added flexibility offered by advanced CMOS processes to provide increased internal connectivity, for example by adding configurable logic cells, and integrating more analog functionality to help reduce the power consumption of the solution, the bill of materials and ultimately the total cost of the solution. The PIC microcontroller platform offers a continuum of compatible 8-, 16-and 32-bit products, all within the same MPLAB X development environment umbrella, supported by compatible compilers (XCB, XC16, XC32), simulators, programming and debugging support. ■

The new challenges of multi-core

Heiko Riessland, Head of Product Marketing, PLS Programmierbare Logik & Systeme



■ Multi-core architectures are now common in classic microprocessors, but the era of microcontrollers with multiple cores is only just beginning. The motivation also to deploy multi-core architectures in microcontrollers is the increasing demand of performance of deeply embedded applications. This could theoretically also be fulfilled by increasing the clock rate. However, this leads to higher power uptake combined with problematic heat development on the chip. High clocking frequencies are also difficult to keep under control in many respects. Using several cores, however, permits a performance boost without increasing the clock rate and the increase in

electrical power uptake is much lower than using a higher clock frequency. This sounds good, and it is, but it would be wrong to think that this means all problems are solved with it. Multi-core MCUs confront semiconductor manufacturers, tool suppliers and users with completely new challenges. Whilst classic microprocessors mainly consist of symmetrical multiprocessing on identical cores, multi-core microcontrollers for deeply embedded applications in the automotive or industry sectors are often designed asymmetrically. This means that several microcontroller cores with different performance levels or specializations are integrated into the chip.

The encapsulation of the cores with operating system software is only standard for classic microprocessors. With multi-core microcontrollers, the operating system normally does not help to divide up application tasks on different cores dynamically at run-time. The question, which part of the application is running on which core is currently more often decided during creation time of the application. One of the reasons for this is the often very demanding requirement of deterministic time responses. The ideal solution would be to adapt single-core software for several cores. This is unfortunately rather unrealistic.

A further challenge is testing the applications for correct function and finding errors which occur. With the parallel processing of software, programmers are moving into new dimensions in development and test. Multiple cores can only be started and stopped nearly in sync with the corresponding logic, which is integrated directly on the chip. To make effective use possible for the developer, the deployed debug tools must in turn fully exploit these on-chip components, but they should hide the concrete implementation as far as possible. This is, for example, made possible by the concept of run control groups. Multiple cores of a complex SoC can thus be conveniently debugged using the PLS Universal Debug Engine (UDE) within one user interface. Showing and hiding and also the specific colouring of views support rapid navigation between the individual cores.

New rules also apply for the supreme discipline of debugging - the tracing of multi-core microcontrollers. The created amount of on-chip data is normally much too large to transmit it completely to the debugger with normal interfaces. There are two basic solution approaches to overcome this bottleneck. On the one hand, new interfaces with a drastically higher bandwidth are used and on the other hand, an attempt is made to reduce the quantity of trace data.

The first solution is the use of serial high-speed interfaces such as the Xilinx Aurora protocol with which data rates of several Gigabits per second are currently possible. As regards tools, above all a corresponding trace framework is required alongside the corresponding hardware, which is able to record or store such data. This must not only be able to process large quantities of data from different cores and sources, but also to make visualizations for profiling, code coverage etc.

For the second solution approach, the trace data which accrues is already filtered on the chip. Several chip manufacturers have extended their trace units accordingly with a special trigger and filter logic. Once configured by the debugger,

these extended units permit very precise selection of data which should be recorded. A tool with a superior abstraction method is needed to allow developers to intuitively program the additional trigger logic in their known terminology. One concept which has already proved itself is the schematic configuration of the trigger logic, based on a state machine model such as it is used by the PLS Universal Emulation Configurator (UEC).

There is no doubt that multi-core microcontrollers will establish themselves rapidly due to the continuing constantly increasing performance requirements in sophisticated deeply embedded applications. However, the examples mentioned also show that chip providers, tool manufacturers and users still have a number of challenges to overcome. And these challenges require the concerted and early collaboration of all those involved. ■

ACROMAG EMBEDDED I/O SOLUTIONS

FPGAs Your Way.



Configurable FPGA Solutions on VPX, PMC, XMC, or IP Modules

Only Acromag gives you configurable FPGAs in so many formats with just the features you need for a quick and trouble-free implementation.

- Virtex-5® FPGA for high-performance logic, DSP
- Spartan-6 FPGAs for cost-sensitive projects
- DDR2 SDRAM handles high volumes of data
- Dual-port SRAM optimizes bus DMA transfers
- Extension modules interface analog & digital I/O

NEW!



Virtex-6 FPGA XMC Module with GbE and PCIe x8

Acromag Embedded I/O Board Solutions

 PMC Modules • 20+ models • Analog, digital, serial, FPGA I/O • Carrier cards	 Industry Packs • 30+ models • Analog, digital, serial, FPGA I/O • Carrier cards	 Industrial PCs • Fanless design • Atom® or Geode® CPU versions • -40 to 75°C
---	--	--

Download "FPGA Computing for Speed and Flexibility" at www.acromag.com/fpga

Acromag 
THE LEADER IN INDUSTRIAL I/O
ISO 9001:2000 and AS9100 certified manufacturer

www.acromag.com • solutions@acromag.com • 877-295-7087

All trademarks are the property of their owners.

More Information:

electronica.embedded-know-how.com

Trends for MCUs lead to better support tools and middleware

Steve Gaines, Senior Manager MCU Marketing, Industrial Business Group, Renesas

■ The traditional market requirements, such as the need for higher performance, more integration and less power, will continue to remain as the main drivers shaping the future developments for microcontrollers. However, this results in the applications that use MCUs becoming more complex and challenging, so there is a need to provide both the hardware and software support framework by market segments.

Modern microcontrollers are now well equipped with integrated peripherals, especially those for communication. Integrated IIC, CAN and Ethernet controllers are now de facto standards in any new controller family. This has increased their use in communication applications, but at the same time has put pressure on the level of memory integrated, driving the need for higher levels of data memory. This will mean future devices will have more on-chip RAM and a higher ratio of RAM to ROM, or use flexible memory technologies that will allow the user to achieve larger data storage solutions. The increasing growth of applications aligned to green energy is driving the need to reduce



power. The challenge for microcontroller manufacturers, when developing products for low power applications such as energy harvesting, is to achieve the perfect balance between performance and current consumption. Renesas, as the leading supplier of microcontrollers, has applied significant development expertise to achieving exceptional processing capability whilst dissipating remarkably small

amounts of power, both at low voltage. The main drivers for MCUs will continue to be achieved through utilising leading edge process technology and design. Higher performance, reduced active current, and more integration will come from the use of finer line width technology. At the hardware level, Renesas has already introduced its 40nm generation of microcontrollers for automotive applications and is now ramping up products on this technology for the industrial market, focusing on low power performance and integration. The Renesas 40nm MCUs will support up to 8 Mbytes flash at 120 MHz single-cycle access times and provide up to 512 KBytes of on-chip SRAM.

Thirty-five per cent of embedded engineers consider middleware availability as the deciding factor in choosing a processor, and the availability of software tools is included as a top criterion. Therefore, semiconductor vendors will continue to develop support tools and middleware which create a framework for customers that allows for better hardware abstraction, and allows customers to focus on adding value to their developments. ■

More analog integration

Chris Neil, Senior Vice President, Industrial & Medical Solutions Group, Maxim



■ The trend in analog? – Very clearly, our view at Maxim Integrated is that it is going towards more analogue integration. This is reflected in our new branding and company name – Maxim Integrated. We have the strong belief that higher integration can make the world smarter, safer, more convenient and more energy-efficient. Look at your smartphone - you have a phone, a PDA, a music player, a video camera, a still camera, a computer that runs software and games. If you can put all of these systems into a phone that fits into your pocket, just imagine what you could do with a TV... or medical equipment... or a car. This is what we're thinking about at Maxim. We believe that more integration means more possibilities, for

our customers and for the world around us. Analog has traditionally been divided into four discrete functions – amplifiers, data conversion, interface and power management. Analog integration combines these functions into a single chip, which also includes microcontrollers and small amounts of memory in order to solve system-level problems in a single piece of silicon.

Examples include analog front ends, which combine converters with amplifiers, and power and metering systems-on-a-chip (SoCs) that combine power management, data conversion, and micro processing. Digital has used integration for decades to give customers more functions in a smaller space. Analog has resis-

ted this trend. Our view is that it's time for our industry to change. Analog integration is more difficult for several reasons – for example, products have been developed on different process technologies, or crosstalk and interference problems might occur when combining noisy digital circuits near noise-sensitive analog circuits on one chip. However, Maxim has the process technologies and design expertise talents on board to solve these technical challenges, and this gives us a unique position in the analog market.

We have developed this expertise over time - we started with our famous building blocks; we then grouped those blocks to sell into solutions; and now, where it makes sense, we are integrating those solutions in a single chip in key markets like mobile, financial terminals, smart meters, motor health monitoring, factory automation, and automotive. Our integration efforts include several steps. We partner with our customers to better understand their systems and define our roadmaps; we collaborate and share IP within Maxim to get the best solution for the end application; we have developed internal tools and technology processes with the goal of integration in mind from the onset. Our share of integration products has been increasing 1-2% each quarter over the last 5 years. Today over one-third of our revenue comes from highly integrated products. And the trend continues - all around us, the world is getting smaller and design cycles are accelerating – and system solutions and integration enable both of these trends.

Integration is occurring in all markets – not just mobility. For example - we have just announced Zeus, a new highly integrated complete smart meter SoC combining power measurement, sophisticated security, and several communication functions into a single integrated IC - an important advance in integration and security protection for the smart grid. Smart homes, smarter cars, highly efficient factories - there are countless possibilities. Together with our customers, we open the doors for new possibilities never thought of before. Maxim is the analog integration pioneer; the company who can bring complete solutions to our customers as a technology partner for strategic silicon. ■

electronica NEWS

■ Rutronik: innovative products for future technologies

Under the motto „Meet tomorrow now!“ Rutronik will be demonstrating its innovative electronic components and complete solutions at electronic. Visitors to the stands will be able to select applications from touch-screens and view the matching components with their technical specifications. Operational applications for each market will demonstrate the potential benefits. With the multi-sense system illumination, Rutronik will be exhibiting state-of-the-art presentation techniques. Many Rutronik partners will also be showing their latest product releases, including Rutronik subsidiary Rusol, which will be featuring high-end PV modules, inverters, mounting systems and accessories.

One of the highlights will be the updated online platform Webg@te, which visitors will have the opportunity to try out live. Over a million products across the full spectrum of electronics are available to order at up-to-the-minute, customer-specific prices. A redesign has made Webg@te even more user-friendly, while the smartphone-optimized version also allows mobile access.

[News ID 16152](#)



Industrial Grade Embedded Modules

ATP industrial grade embedded modules provide the most reliable and cost effective memory solutions to customers. ATP products strengthen any mission-critical applications, such as IPC, automation, networking, POS, digital signatures and rugged notebooks.



ATP mSATA module

- Flash type: SLC
- Capacity: 4GB~64GB
- Seq. Read/Write:
Read up to 258MB/s; Write up to 220 MB/s
- Operation Temp.: -40°C to +85°C
- Dimension: : 50.8 × 29.8 × 4mm



ATP SATA DOM (Horizontal/Vertical)

- Flash type: SLC
- Capacity: 2GB~16GB
- Seq. Read/Write:
Read up to 113MB/s; Write up to 81 MB/s
- TBW: up to 640TB
- Operation Temp.: -40°C to +85°C
- Dimension:
35.1 × 30 × 14mm / 35.5 × 33.1 × 7.6mm



ATP eUSB module (2.00mm & 2.54mm)

- Flash type: SLC
- Capacity: 512MB~16GB
- Seq. Read/Write:
Read up to 35MB/s; Write up to 25 MB/s
- TBW: up to 320TB
- Operation Temp.: -40°C to +85°C
- Dimension: 36.9 × 26.6 × 9.7mm



ATP Slim SATA module

- Flash type: SLC
- Capacity: 2GB~32GB
- Seq. Read/Write:
Read up to 112MB/s; Write up to 91 MB/s
- TBW: up to 1280TB
- Operation Temp.: -40°C to +85°C
- Dimension: 54 × 39 × 4mm



Hall A6, Booth 145,
November 13 - 16, 2012

ATP Electronics Europe B.V.

Corkstraat 46, Rotterdam 3047 AC,
The Netherlands

Tel: +31 (0) 88 287 0000

sales-europe@atpinc.com

www.atpinc.com

The Continued Evolution of JTAG Test Solutions

By Peter van den Eijnden – Managing Director JTAG Technologies

Board test technology over the past five years is witnessing what could be the most dramatic changes since the introduction of boundary-scan (a.k.a. JTAG IEEE Std. 1149.1) in 1990. While the traditional standard, 1149.1, revolutionized the way PCBs have been tested and programmed, new advancements in circuit design and ICs have initiated developments and updates to both the IEEE 1149.x standards and associated proprietary test techniques.

Following the progression of the standards

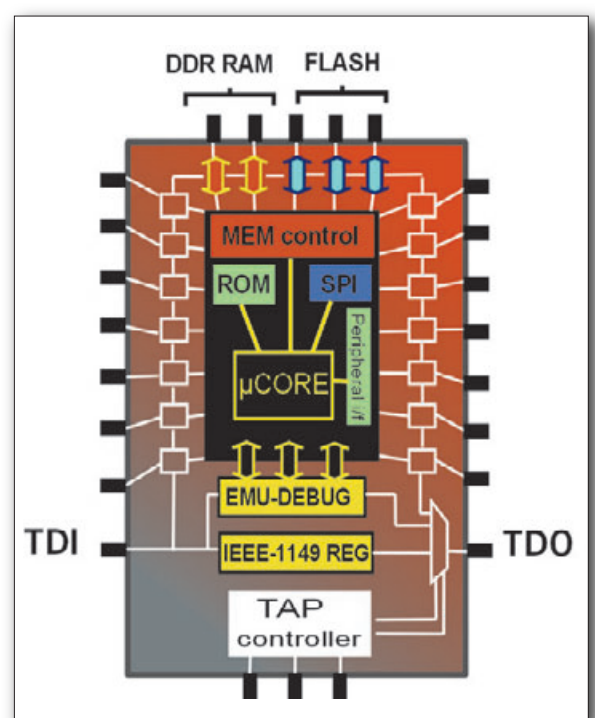
The rise in the use of LVDS-type bus systems, such as PCIe and Rapid I/O, has led to a relatively recent development of a test standard. Since these buses typically use capacitive AC coupling between driver and sensors the low frequency test data rates offered via 1149.1 boundary-scan are no longer tenable. Fortunately this issue was anticipated by the IEEE computer society some years ago which proposed an extension to the 1149.1 standard to address AC-coupled LVDS networks; namely IEEE Std. 1149.6. Parts complying with this standard addendum, dubbed “dot 6”, feature additional circuitry to generate a test pulse, or train of pulses, that can propagate through the coupling (see box). At the receiver pins, edge detectors reform the pulses from the rising and falling edges.

The fact is that IEEE 1149.6 is now a mature standard, having been ratified as long ago as 2003 and is supported by all industry-leading boundary-scan test tools such as JTAG ProVision. However, it is only in recent times that silicon vendors have produced parts that have implemented the ‘dot 6’ features reliably and as such the value of standards may sometimes be overstated when there is an increasing urgency to fulfil pressing test needs.

Proprietary solutions using JTAG

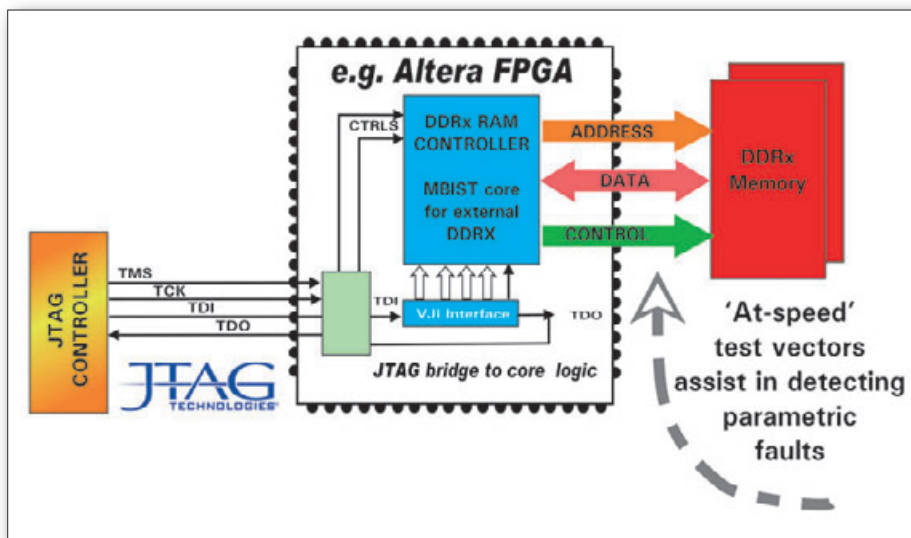
In parallel with the developments in high-performance computing and datacomm products it is also possible to observe another industry trend; namely the increased use of high-performance yet low-cost processors featuring ARM cores (7/9/11 Cortex-M) or PPC cores. Mainstream semiconductor manufacturers such as Atmel, NXP, ST and Freescale have spearheaded their introduction and such parts can be commonly found in growing electronics sectors such as automotive and industrial controls; within applications that would have traditionally employed relatively low-tech 8-bit microcontrollers. One consequence of the introduction of budget micros is that while the parts have a JTAG port to access On-Chip Debug (OCD) functions they are sometimes lacking a full 1149.1 boundary-scan implementation, normally essential to create meaningful production-orientated tests.

Nevertheless, enterprising engineers can now harness the OCD functions of the device cores for test purposes, using easy to set-up control routines that can be embedded within a Python script, for example. What’s more, since the level of automation in using these ‘core command’ tools is relatively low so too is the cost of adoption. Users of JTAGLive’s CoreCommander, for example, can expect to pay \$1200.00 for a set of core control routines that will allow them to develop memory tests, analog value checks (e.g. on PSUs and temperature sensors) and flash memory programming applications.



Leveraging OCD modes in cores - Many new microcontrollers include cores from ARM, Intel or Freescale. In such cases the host device may also feature a full or partial boundary-scan register. Testing via JTAG is possible using pre-defined routines that unlock the debug modes and allow you to perform internal memory writes and reads.

A further example of proprietary (non-standard) ingenuity is the use of FPGA embedded test cores. Some years ago, principal FPGA vendors including Actel, Altera and Xilinx introduced mechanisms to provide engineers with access to gate array logic resources directly via the standard JTAG test access port (TAP). (Prior to that a secondary pseudo TAP had to be defined along with the TAP state machine and in the process using-up valuable pin (I/O) and gate resources unnecessarily)



This in turn gave the test engineering community a free hand to define BIST cores that could be (temporarily) loaded then exercised via the FPGA logic during manufacturing test. Typical of such cores are 'at-speed' memory test features that allow parts such as DDR2/3 memories to be truly functionally tested via JTAG rather than using the standard structural style test that is possible using the relatively slow boundary-scan register. Note: Altera's mechanism, known as VJI (Virtual JTAG Interface), is mentioned in the article "JTAG Provides 'Missing Link' in FPGA-based BIST", in Electronic Product Design, April 2009.

Still waiting...

Finally, readers will often read of impending or 'coming soon' board and device test standards, such as IEEE P1687 (iJTAG), that will fulfil the future of board test. In this case the P stands for Preliminary (or working Party stage) and this particular standard relates only to a proposed system to access and control so-called 'embedded instruments' within ICs for testing logic elements such as embedded or external memories (i.e. MEMBIST). This idea in itself is not new and for many years silicon vendors have often added proprietary embedded test and measurement functionality into their devices to characterize, validate and test their chip designs. However, developing such standards via a committee can be an inexact and drawn-out process; especially when your commitment is one of backwards compatibility with a base standard (such as 1149.1).

What's more, in times of economic hardship, volunteer committee members will seldom get full support and/or resources from their employers to pursue 'extra-curricular' activities. Accordingly, such developments may take many years (six years and counting for P1687) to reach a conclusion and even then with no guarantee of success or wide-scale adoption once they are ratified. Moribund standards such as IEEE 1149.5 abound along with those that never even reach the working party stage. Test engineers choosing a test equipment company to work with over the long-term, should therefore ensure that their supplier has a solid past track record and can keep pace with technology trends both inside and outside the framework of rigid test standards; that more often than not lag the 'bleeding edge' work that is already in practice.



About the Author: Peter van den Eijnden is Co-founder and Director of JTAG Technologies in Eindhoven. Peter graduated in 1981 from the Eindhoven University of Technology in Electrical Engineering / Digital Systems. After graduation, he has worked as a scientist at this university and taught at the New Teacher Training Group several years of research and teaching in the field of microprocessors, circuit theory and design of programmable logic and ASICs. From 1985 to 1993 he was employed by the Philips testing equipment group. He was involved in the development of ASICs and microprocessors emulators and logic analyzers, and he was project manager of the boundary-scan test equipment development and later director of that group. JTAG Technologies was founded by him together with a partner in 1993.

EMBEDDED PLATFORMS CONFERENCE
NOVEMBER 14-15, 2012

Messe München International

embedded platforms
conference program

electronica 2012
inside tomorrow

25th International Trade Fair for Electronic Components, Systems and Applications
Messe München
November 13-16, 2012
www.electronica.de

1st embedded platforms conference
The communications forum for selecting future-proof hardware and software platforms

e

embedded platforms conference 2012—
Program Framework—Day 1, November 14, 2012

Morning Sessions		
	Title	Sponsor
Session 1: Embedded Design, Multicore, Future Challenges		
09:00-09:45	Where Will You Begin Your Next Embedded Design? Start with the CPU, the peripherals or further away from hardware? <i>Jean Labrosse, Micrium</i>	Farnell
09:45-10:30	Migrating to Multicore Example of an ecosystem and outlook on how multicore products will scale in future <i>Jean-Christophe Bodet, Freescale</i>	Farnell
11:00-12:30	Future Challenges —Are next-generation engineers and programmers ready for next-generation design challenges? Panel-led discussion and debate	Farnell
Session 2: XMC4000 Family, DAVE3		
09:00-10:00	The XMC4000 MCU Family Countless solutions for industrial applications in one hardware platform <i>Andreas Jansen, Infineon</i>	Infineon
10:00-10:30	Tools and Software Solutions Wide landscape of free and commercial tools and software solutions for the XCM4000 MCU family <i>Georg Huba, Infineon</i>	Infineon
11:00-11:30	DAVE3: Free Development Platform Technical concept of code generation and resource management for embedded systems with DAVE3 <i>Oreste Bernardi, Infineon</i>	Infineon
11:30-12:30	Life Development Session How to develop a complex embedded software project with DAVE apps in less than 1 hour	Infineon
Session 3: 8, 16 and 32 Bit RISC, CISC, Singlecore, Multicore?		
09:00-12:30	8, 16 and 32 Bit RISC, CISC, Singlecore, Multicore? Overview of cores, peripherals and tools - CPU subsystems - Memory interfaces - Memory management - Clock management - Power management - Interrupt and event handling - Debug support - Communication - Analog-digital peripherals - Industrial control peripherals - Input/output - Tools and RTOS <i>Dieter Volland, MicroConsult</i>	MicroConsult

electronica NEWS

■ Densitron: new bonding facility and TFT & E-paper design solutions

Densitron's E-paper Evaluation Kit and RipDraw Display and Design Solution will be unveiled. These new offerings promise to significantly reduce product development time and cost. Densitron will also introduce its new optical bonding facility and capability to add cover lenses or PCTs to any display using a reworkable process.

The new RipDraw introduction includes the worldwide launch of Densitron's Cloud Computing Web Portal. The portal enhances customers' ability to rapidly prototype world class GUI designs for TFT projects. Not only does the portal include a 7 layer intuitive WYSIWYG Drawing tool, it also comes fully populated with over 8,000 copyrighted royalty-free images for customers to use with the RipDraw TFT product line. This removes the barrier most mid-market customers confront if they lack the art department to fully utilize a TFT display. This coupled with the release of the RipDraw TFT emulator and initial release of the RipDraw 7" WVGA 1024 x 600 GPU assisted TFT display greatly reduces time to market and results in extraordinary cost effective GUI solutions for our customers.

News ID 16177

embedded platforms conference 2012—
Program Framework—Day 2, November 15, 2012

Afternoon Sessions		
	Title	Sponsor
Session 4: Embedded Standardisation		
	The World of Embedded Technologies Standards —Status quo and future ideas for standardization within the embedded technologies ecosystem - Existing SGET standards - How they are developed - How they are created - Status quo - How they are further developed - How you can participate - Implementation examples <i>Engelbert Hörmannsdorfer, SGET Standardization Group for Embedded Technologies e.V. and partners</i>	SGET
13:30–17:00		
Session 5: Motor Control		
	TOSHIBA Product Line-up for Motor Applications —Motor control from logic to power stage and optical isolation <i>Roland Gehrmann, Toshiba</i>	Toshiba
13:30–14:00		
	Introduction of a TOSHIBA Cortex M370-based Motor Control Architecture Implementation of highly intelligent motor drives using field-oriented control <i>Andreas Kohl, Toshiba</i>	Toshiba
14:00–15:00		
	Tools and SW Support IDE, kits, boards, firmware, stacks, RTOS and more <i>Thomas Haase, Toshiba</i>	Toshiba
15:30–16:00		
	Practical Session Live set-up of a brushless DC motor and tool demonstration <i>Andreas Kohl, Toshiba Thomas Haase, Toshiba</i>	Toshiba
16:00–17:00		
Session 6: The ARM Architecture on Its Way to Industry		
	The ARM Architecture on Its Way to industry <i>Frank Walzer, Texas Instruments</i>	OSADL
13:30–14:15		
	How to Select the Best Suitable Processor for a Given Industrial Application Test center for processor selection and how it works <i>Carsten Emde, OSADL</i>	OSADL
14:15–15:00		
	Challenges and Chances of Real-time Linux Status quo and future prospects <i>Thomas Gleixner, linutronix</i>	OSADL
15:30–16:15		
	Current Status of the GNU/Linux SIL2 Certification Project Project background and details <i>Nicholas Mc Guire, Opentech</i>	OSADL
16:15–17:00		
Lunch break: 12:30–13:30		
Coffee break ☕		

Morning Sessions		
	Title	Sponsor
Session 7: Power Architecture Modules, ARM Modules		
	The Power Architecture Module Market - Roadmap - Advantages of a modular design - How to find the right module provider - Market overview: module providers <i>Wolfgang Heinz-Fischer, TQ-Group Frank Roux, Freescale</i>	TQ Systems
☕ 09:00–10:30		
	The ARM Module Market - Processors for embedded modules - Freescale ARM processors - Standardization - Module providers - How to choose the right module provider - Application examples <i>Wolfgang Heinz-Fischer, TQ-Group Jean-Louis Dolmeta, Freescale</i>	TQ Systems
11:00–12:30		
Session 8: Multicore, ARM, Safety		
	Multicore Efficiency How TI enables high-performance computing, maximizing GFLOPS/Watt <i>Jochen Schyma, Texas Instruments</i>	Texas Instruments
09:00–09:45		
	Helping Developers Unleash the Best of ARM to the Industrial Market Which processor will best meet critical design requirements <i>Yves Massé, Texas Instruments</i>	Texas Instruments
☕ 09:45–10:30		
	TI's Microcontroller Solutions for Safety-critical Control Applications Example of a safety project, from start to certification <i>Gerhard Wenderlein, Dr. Kurt Böhlinger, Texas Instruments</i>	Texas Instruments
11:00–12:30		
Session 9: FM3Connect—USB and Ethernet, ECO System for ARM Cortex		
	Embedded USB Solutions—Ready to Use Theory and practice of USB software development for host and device <i>Manuel Schreiner, Fujitsu Semiconductor Europe</i>	Fujitsu
☕ 09:00–10:30		
	FM3Connect—The ECO System for Connectivity Application Development Available components, free development environment and middleware <i>Dirk Fischer, Fujitsu Semiconductor Europe</i>	Fujitsu
11:00–11:45		
	FM3 TwinMAC—Single and Dual Port Ethernet MCUs Ethernet in embedded applications from point-to-point, over gateway up to web servers <i>Christoph Nolte, Fujitsu Semiconductor Europe</i>	Fujitsu
11:45–12:30		

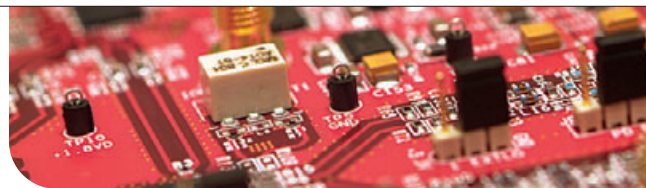
electronica NEWS

☑ „Obsolescence Day“ on November 14 at electronica 2012

Due to the ever decreasing product life cycles in the consumer sector many industrial electronic components are either hard to find or no longer available after one or two years. For manufacturers of durable goods, for example military, aerospace, railway, power plants, automation and medical technology, both product development and cost calculation become more and more a truly high-wire act.

The aim of the non-profit-organisation COG Deutschland, founded 2004, and now with almost 90 members is to provide a manufacturer-independent platform to companies affected by the problem of obsolescence, to share insights and information on procedures and solutions and to promote jointly the development of efficient obsolescence strategies. If you want to get information about the wide range of possibilities for prevention and minimising the risks associated with obsolescence, visit the following COG member companies at the COG Deutschland Obsolescence Day on November 14. at electronica 2012: BMK Group, BuS Elektronik, Cidor Electronic Solution, e2v technologies, HTV, IHS Global, Kamaka Electronic Bauelemente, Municom, RD Alpha Microelectronics, Rochester Electronics, Serma, SILICA, TQ-Systems and Würth Elektronik.

[News ID 16293](#)



Afternoon Sessions

Title **Sponsor**

Session 10: QorIQ, i.MX 6, AMP

Speed up Your Multicore Designs with Embedded Board Solutions

Building blocks for innovation in highly integrated platforms

- QorIQ communications platforms
- Layerscape architecture
- Software-aware networking architecture
- QorIQ Qonverge platform
- DSP integration
- Advanced Multiprocessing (AMP) series
- i.MX 6 series: scalable multicore platform

15:00–15:30

Franck Roux, Freescale
Jean Louis Dolmeta, Freescale

Freescale

Session 11: Low-Power, IP-Reuse, Migration

Managing Project Uncertainties with the Right Development Platform

A design example for building a low-power, real-time application with a Cortex-M4 MCU

- How to avoid the nightmare of project dead end
- Intellectual property reuse across different microcontroller platforms
- Minimizing the challenges of 8 to 32 bit, change of toolchain, introducing RTOS, etc.

15:00–15:30

Joerg Berthold, Atmel

Atmel

Session 12: Debug, Trace and Analysis

Debugging of Complex Microcontrollers

Principles and hints

Heiko Riessland, PLS Programmierbare Logik & Systeme GmbH

13:30–14:15

MicroConsult

Trace-Streaming

New Technology for debugging, performance tuning and quality assurance

Andrea Martin, Lauterbach

14:15–15:00

MicroConsult

Analysis of Code Execution and Data Access in Modern Microcontrollers

Capabilities and limits

Erol Simsek, iSystem

15:30–16:15

MicroConsult

Challenges for Tools, Today and Tomorrow

How to meet the requirements of multicore, power efficient code, safety critical applications, etc.

Martin Gisbert, IAR

16:15–17:00

MicroConsult

Lunch break: 12:30–13:30

Coffee break

Participation fees:

1-day ticket EUR 390 (Early Bird: EUR 330),

Conference ticket (valid on both days) EUR 700 (Early Bird: EUR 600)

Early Bird prices apply to those who register by September 28, 2012!

All tickets entitle the holder to attend electronica 2012 on all four days of the fair.

Sponsored by:



Application at www.electronica.de/embeddedplatforms

Organizer/Information

Messe München GmbH
Messegelände
81823 München, Germany
Tel. +49 89 949-20331
Fax +49 89 949-20339
www.electronica.de
E-mail: info@electronica.de

In cooperation with:



Published by Messe München GmbH, München; embedded platforms Programm E/9.12. Subject to chance without notice. All prices subject to VAT. As of 9/12.

electronica NEWS

Garz & Fricke: HMI series with display sizes between 7" and 10.4"

Garz & Fricke introduces a new member of the HMI series. SANTARO, the name of the series, promises to cover the demand for high performance. The Freescale quad-core ARM module Cortex-A9 i.MX6Q and the Android operating system are particularly noteworthy. Single- and dual-core variants will also be available. In the area of operating systems, the customers can choose between Windows CE 7 and Linux but also the latest Android system will be offered, the Android 4.0.4 Ice Cream Sandwich.

The series comes with display sizes between 7 and 10.4". SANTARO may additionally have the following attributes: resistive or capacitive touch, dual-channel LVDS interface, 4GB eMMC flash, 1GB DDR3 RAM and an optional HDMI port. SANTARO will be presented at the upcoming electronic. Furthermore there will be shown some product differentiations, such as the new mini version VINCELL LT with 4,3" touch display or the new SENSO GLASS series, which combines NESO LT (ARM 9), CUPID (ARM 11) and VINCELL (Cortex- A8) systems with 3 mm cover glass in one group.

[News ID 16322](#)

Reaping the benefits of energy harvesting

Mark Burr-Lonnon, Vice President Europe and Asia, Mouser



■ There are a number of reasons why companies are investing in energy harvesting. Some are looking to reduce the cost associated with powering systems. Depending on the life expectancy of the system, an upfront cost to use energy harvesting may pay off in the long run, even if the energy generated is not substantial. One of the key applications for energy harvesting is wireless sensors. These are already deployed in many areas, specifically for smart meters, but the applications are growing as the technology develops and new ways to use the power are devised. When power is created, using whichever method is chosen, it has to be stored. Storage devices include capacitors for low cost and spike power, supercapacitors for high energy output with a fast recharge time, and batteries for sustained power distribution. A battery like the Cymbet Electronics EnerChip CBC 3150 can store power to be used as the system requires in a thin-film package. This thin-film battery is rated at 50 OhmAh and features integrated battery management.

The method of energy harvesting by photovoltaic panels has been used in a number of applications, the most common and basic of which is the calculator. The Texas Instruments eZ430-RF2500-SHE development tool is based on the ultra-low power MSP430 MCU and in-

cludes a Cymbet solar panel that is optimized for operation from low-intensity fluorescent lighting to power a wireless sensor application. One alternative to photovoltaic panels is to convert RF energy into usable power. This is especially useful when sunlight is not available. This technology has been used for RFID systems, but it is also being explored for other applications. It is a unique way to generate energy enabling the system to be placed anywhere that a 2.4GHz signal can reach. And if you have a wireless network in your home you will realize that this means it can be placed nearly anywhere. For companies looking to implement this type of technology there are development kits available, such as the Powercast Lifetime Power Energy Harvesting Development Kit which includes an RF receiver board powered by the Powercast P2110 Powerharvester receiver, a 915 MHz RF transmitter, and wireless sensor boards which operate without battery power. The energy collected by the kit is stored in a supercapacitor.

With thermoelectric harvesting power is generated when heat is created. While the power generated is typically low, it can be useful to capture the wasted energy from other power methods. The Micropelt TE-Power PROBE Thermoharvesting power source can create up to 4.5V given enough heat, which is sufficient to recharge capacitors or thin-film batteries. With a temperature difference of 75C, this kit can produce up to 10mW of energy, equivalent to 30 AA batteries. The method for generating microelectricity uses the change in a substance as pressure is exerted. For example, piezoelectric power can be created by putting a thin layer of material under a walkway which contracts and expands as people walk on top of it. One novel idea of piezoelectric power was to operate a remote control simply by pressing the buttons to generate the power necessary to send the IR signal. Mouser Energy Harvesting Page and its Product Knowledge Center details the latest in micro-energy harvesting technologies and products. ■

More Information:

electronica.embedded-know-how.com



3 MByte/s
Download

Emulator (J-Link™)

ARM/Cortex™ and Renesas RX

- Fastest JTAG Emulator Available
- Extremely Fast Flash Download
- Intelligence Inside the Emulator for Robust Communication
- Multicore Debugging Support
- Supports All Popular IDEs Including CodeBench, CodeWarrior, Crossworks, emIDE, EWARM, HEW, MDK, TrueStudio and GDB/RDI Compliant Environments



The J-Link Ultra+ and J-Link Pro include a number of software modules to fit your application needs.

J-Flash is a standalone application used with the J-Link to program internal and external flash devices.

J-Link Unlimited Flash Breakpoints permits you to set an unlimited number of breakpoints while debugging in internal and external flash memory.

As the original manufacturer of the J-Link and its OEM derivatives, we are happy to inform you that this software also supports the Analog® mIDAS-Link, Atmel® SAM-ICE, and IAR® J-Link.

Programmer (Flasher)

Stand-Alone Programmer

- Fast Flash Download
- Flexible Interface for Easy Integration into Production Environments

5.07.01 Flasher ARM Ethernet, RS232, and USB interface



Webshop Coupon
Code: **JL120NDICC**
10% discount on J-Link Ultra+ at <http://shop.segger.com>
one coupon per customer
Valid in 2012

Renewable energy changes the role of distributors

James Turner, Global Segment Manager, Alternative Energy, Premier Farnell

■ As we approach electronica, a major theme (and one that has been around for some time now), is that of renewable energy and the role of the electronics industry. This is fast becoming a topic of some debate for distributors, who need to re-evaluate their role and what they offer customers. For a components distributor, it just isn't enough to simply stock a broad range of standard products, nor to be a niche player focused solely on solar or wind-specific components. With the renewables industry improving our ability to maximise energy generation from solar, wind and other sources every day, we need to meet the needs of clients and carry the complete bill of materials. Distributors need to decide just how far along the supply chain they are prepared to go, and be clear on which audiences they are targeting. A solar system integrator and a wind turbine manufacturer, for example, will have very different requirements. Distributors must ask themselves if they want to focus on board level components, or compete with wholesalers by stocking the likes of complete inverters, modules and racking.



Clearly it is also essential to combine this wide product range with an efficient dispatch system. With the cost of downtime increasing as system power rises, there is an ever-greater requirement for swift deliveries. Project times often end up becoming compressed, as the pressure to deliver ROI intensifies in line with ever-tightening feed-in tariffs. And this pressure is evidenced not only in system commissioning, but can be

traced all the way back to the R&D schedule for design engineers. Therefore engineers are looking to distributors to go beyond just the provision of parts to becoming a complete one-stop shop, particularly in the form of further design resources support.

Some segment-specific manufacturers, such as EnOcean and Cymbet, have carved successful niches for themselves through innovative technologies, but the traditional powerhouses such as Texas Instruments, Freescale and STmicroelectronics remain popular with the renewables design audience due to brand familiarity and long standing trust. An assuredness of how components will respond for a given scenario removes risks in an industry for which reliability is critical. As the market matures and consolidates, companies engaged in renewable energy are increasingly adopting a global outlook as they pursue sales. Distributors operate in a service industry and therefore need the agility, scale and reach to effectively partner their clients regardless of where they are based. ■

Intelligence for the Grid

Karl Lehnhoff, Director Vertical Segment Renewable Energies, EMEA, EBV Elektronik



■ Communication is the key for expanding worldwide energy networks; intelligent Smart Grid systems and applications would be impossible without it. Only the bidirectional exchange of information and data, between the energy generator at one end and the energy consumer at the other end of the energy transmission chain, makes the system smart. This intelligence is facilitated by a multitude of electronic components: specific microcontrollers for electricity meters, power line modems, high performance processors with communication interfaces, efficient power supplies, precise analog circuits, or high voltage semiconductors for transmission and conversion of

electric current. The interaction of all these components in the Smart Grid, the worldwide varying standards and communication protocols, the special requirements for dealing with high voltage or incorporating real-time control, all require comprehensive technical expertise. The demands placed on the electronics used in energy networks are also high: the availability of plants – from the generator to the substations through to the meter – must be close to 100 percent. The energy losses from Smart Grid components should be kept as low as possible at the same time. Anything else would make nonsense of the reasons for introducing the intelligent grid – more reliable and efficient

networks and the integration of renewable energies. For this reason, many aspects have to be considered in the development of solutions for the Smart Grid – expertise that one individual can hardly possess. Alongside its extensive semiconductor portfolio, EBV Elektronik, the leading specialist in EMEA semiconductor distribution, also offers consultancy and services in all areas. Its own “Renewable Energies” competence team looks after customers in the market and maintains close links with all Smart Grid players. The EBV experts are therefore always informed about innovative technologies and current international standards. This ensures that they understand the needs

and requirements of the market and anticipate new developments, thus forming the basis for competent support in the development of solutions for the Smart Grid. This support starts at the very outset of a project, as required: EBV advises companies on the choice of the right technology and the most appropriate electronic components, and provides assistance on technical questions which arise during the development or production of new devices.

Beyond technical support, EBV develops proprietary semiconductors that are tailored to the individual needs of the customer. These EBV chips are specified jointly with customers and

produced by EBV semiconductor manufacturers, though distributed exclusively by EBV. This service is of special interest to SMEs that can therefore use their own chips without enormous order quantities. The anticipated boom in the Smart Grid sector calls for a partner who can not only supply large volumes of electronic components quickly and reliably, but also supports customers at the development stage – compressing development times and reducing errors. EBV has its own expertise in the Smart Grid sector and therefore understands customer needs. Hence the company can offer innovative services which extend beyond pure electronics distribution. ■

electronica NEWS

■ ADI: Aaronia and Inova participate in product demonstrations at electronica

Aaronia and Inova Semiconductors will participate in product demonstrations in the Analog Devices booth at electronica 2012. Aaronia will showcase its newest hand-held RF spectrum analyzer with a “treasure hunt” allowing show attendees to use the Spectran V5 spectrum analyzer to find RF devices. Next-generation infotainment and driver assistance systems in vehicles integrated with a smart phone will be demonstrated using Munich-based Inova’s APIX2 (Automotive PIXel Link) technology. APIX2 meets automotive requirements for EMI and cost efficiency while transmitting two uncompressed high-definition video streams, multi-channel audio and 100Mbps/s Ethernet data over a single 4-wire shielded twisted-pair cable. The demonstration features video conferencing and touch surfaces in remote displays via standard Ethernet protocols and the integration of real-time user interfaces and applications using HDMI connectivity to smart phones.

[News ID 16261](#)



MSI Back Up Your Needs In Embedded Solutions


electronica 2012
 inside tomorrow

www.msi.com/ipc
ipc-sales@msi.com



MS-9895

- Intel® Atom™ D2550/N2800/N2600 (Dual Core) Processor
- Single Channel DDR3 1066MHz (Non-ECC)
- Memory up to 4 GB (N2600 Up to 2GB)
- 1 x 204-pin SO-DIMM
- Intel® GMA3650 Graphics (N2600 only Support GMA3600)
- 2 x LVDS (LVDS1/LVDS2)
- 2 Independent Displays Supported
- 2 x Intel 82574L GbE LAN (D2550/N2800 SKU)
- Realtek ALC887 HD Audio CODEC
- 8 x USB 2.0 (4 x Rear, 4 x Internal for D2550/N2800 SKU)



MS-9A45

- Intel® Atom™ D2000 Series Processor
- Dual Channel DDR3 1066MHz (Non-ECC)
- Memory up to 4GB
- 2 x 204-pin SO-DIMMs
- Intel® GMA3650 Graphics
- 2 Independent Displays Supported
- 2 x Intel 82574L GbE LAN

Distributors play a key role in promoting electro-mobility

Andreas Mangler, Director Strategic Marketing & Line Management, Rutronik

■ The shift towards electromobility is proving to be one of the main drivers of new component and technology development. At the same time, it is presenting manufacturers, OEMs and suppliers in the automotive sector with new challenges. Distributors can provide valuable support towards solving the problems that arise. Electric and hybrid vehicles require various different power electronics systems. In addition to the drive unit itself, these include the battery management system in connection with the inverter technology and systems to cope with the very high currents and voltages arising under load and during recuperation. The main thrust in most development programmes is aimed at increasing the efficiency and service life of the entire system, whilst ensuring that the total costs remain as low as possible. In many cases these requirements are mutually exclusive, for instance where higher switching frequencies lead to higher junction temperatures, which in turn can reduce the service lives of the power semiconductors.

Here, components with low switching losses that allow a higher power density and more compact designs, with less stringent demands on the thermo-management system, are of advantage, such as the SiC IGBTs. They have significantly lower parasitic capacitances than conventional silicon-based technologies, resulting in reduced switching losses and heat generation, so that more current can flow over the same area. This more robust material means that higher temperatures can be handled with lower ON resistances, allowing higher switching frequencies with less heat generation.

Rohm is now producing the first truly series-produced SiC IGBTs together with the corresponding diodes. They consist exclusively of SiC power elements and produce 85% less switching losses than a silicon IGBT with a flyback diode. The combination of low heat generation and higher power density increases the service life of the components and therefore also of the system as a whole - a decisive quality factor for



electric vehicles. For engine electronics that need to be replaced after ten years would not be acceptable to end customers. The fly in the ointment is that the market is not yet prepared to pay the higher price for the SiC IGBTs. On top of this, the requirements profiles for the faster driver components and the passive elements as well as the EMC requirements are completely different. Until SiC IGBTs can be produced at prices that the market is willing to pay, it is essential to ensure that the components continue to operate within the safe operating area (SOA), that high temperatures are avoided, and therefore a long service life for the entire electronic component can be guaranteed.

Electromobility also places radically new demands on packaging aspects. Thus for the first time Bosch Semiconductor has developed an IGBT in which the high current contacts can be welded instead of screwed on. As the chip connections are not wire bonded, the IGBT is considerably more resistant to vibration. Also, the reliability is increased because no torque stresses arise from screw connections. The welded connections conduct heat more efficiently via the main connection, providing even more reliability and a longer service life for the system and/or higher switching frequencies. Further, a more compact design compared with screwed module housings is possible. An additional

plus-point: the complete system can be manufactured more efficiently, because the contacts can be applied using industrial processing. The main objective in the development of new energy storage units is to achieve a high degree of packing density with optimal thermo-management and low weight. An interesting alternative to systems involving batteries or fuel cells in isolation is to be found in their combination with double-layer capacitors, e.g. as supplied by Maxwell. These outperform batteries in practically all relevant aspects, the only exception being the energy density. Therefore they are not suitable as stand-alone storage units for drive energy. However, their capabilities in respect of rapid storage and yield of high-power energy make them the ideal complement to batteries in quasi-parallel operation. Here, the battery or a combustion motor supply a constant average quantity of energy during travel, whilst the capacitors deal with high peak demands for supply or storage of energy during acceleration and braking. This means that the battery is subjected to fewer charging cycles, which improves the service life. Also, double-layer capacitors permit the construction of electric or hybrid vehicles with better total efficiency ratings and excellent acceleration.

The examples underline that optimised solutions cannot be achieved by concentrating on one part of the system alone, but only by exact tuning of all components together. That is why it is always necessary to maintain an overview of the entire solution package so as to be able to assess it properly, both from the technical point of view as well as in respect of its cost-effectiveness. In many cases passive and electro-mechanical components prove to be just as important and to have just as great a share in added value as the semiconductors. Distributors who dispose of an exhaustive component portfolio and corresponding know-how in the areas of marketing and technology - as well as occupying a leading position in the automotive market - represent highly sought-after partners in the race towards electromobility. ■

electronica.embedded-know-how.com

Moving towards standards and services

Norbert Hauser,
Executive Vice President Marketing, Kontron



■ While the world of embedded computing is becoming more and more complex, our customers are searching for reliable standards and further services to ease implementation of these complex technologies into their appliances. At the upcoming electronica, I expect many of our visitors will be very interested to see what we have so

far achieved in this context within the ARM sector that differentiates with low power designs and a long-term availability of 10 years plus. With the launch of our first ultra-low power Computer-on-Module based on the ULP-COM form factor specification, which is shortly to become an SGET standard specification, we now have three standards-based product lines.

The module which is based on Nvidia Tegra 3 processor is designed to reduce cost and energy consumption of imaging-centric, low profile applications. It delivers an advanced, rugged and scalable building block for industrial tablet and imaging-centric applications where power consumption has to be extremely low as, for example, in the POS/POI, infotainment, digital signage, security/surveillance, medical and military markets. The combination of the low power NVIDIA Tegra 3 ARM processor and optimized ARM/SoC pin-out of the ULP-COM definition enables designers to build fanless, passively cooled systems that dramatically reduce power consumption and costs of deployed systems.

This launch as well as the launch of our Mini-ITX and Pico-ITX boards with ARM processors, such as Nvidia Tegra 3 and Nvidia Tegra 2, have already created a great awareness, and are being seen as very compelling as they bring standardization to the previously proprietary approach of ARM-based solutions. And this is elementary for our customers. They need a range of interfaces that is aligned to their target applications. And they need roadmaps which ensure that features remain identical and are available for ten years or even longer. The reason being: OEMs require evolutionary platforms with comprehensive OS support from operating system vendors, so that there is no need to carry out any significant changes on the software and hardware when implementing the next hardware generation.

Putting all this in place, however, does not mean that the mission is completed. Without, for example, an evaluation platform, customers are not in a position to work with these modules. And even if they get



Qseven™ AMD® Embedded G-Series APU

High-end Graphics on economic, compact Module

1 MSC Q7-A50M NEW

Single-core and dual-core APU with AMD Radeon™ HD6250 Graphics

- AMD G-T40E dual-core processor 1GHz
-dual-core performance, 2x Full-HD graphics
- AMD G-T40R single-core processor 1GHz
-mid-range computing, 2x Full-HD graphics
- AMD G-T16R single-core processor 615MHz
-low-power, low-cost module, 2x Full-HD graphics

2 MSC Q7-MB-EP4 NEW

Flexible application platform for the Q7-A50M module

- DVI + dual-channel LVDS graphics
-with backlight power + control
- Dual Gigabit Ethernet,
5x USB 2.0 Host, 1x USB 2.0 Client
- SATA port, SD/MMC socket, mSATA socket
-mSATA and mSATA mini supported
- CAN bus, RS-232C interface,
wide power supply range 10...28V



MSC Vertriebs GmbH
Tel. +49 8165 906-122 ■ boards@msc-ge.com
www.msc-ge.com

the evaluation platform, they need software and services to test their appliances on these new target platforms. So in addition, Kontron is offering a pre-validated evaluation platform with its ULP-COM Computer-on-Modules. The reference platform includes all the evaluation resources OEMs require to start development immediately, including the Kontron Computer-on-Module ULP-COM-sAT30, the ULP-COM Evaluation Carrier Board, pre-loaded

Linux OS and a 10.6 inch 1280 x 768 display which are mounted together on a platform for lab bench use. Once the target platform has been tested, we provide our customers with the option to use this evaluation platform as a springboard for their custom designs.

These can be based on the module itself, including optional carrier board design services for full board level design services or on full

custom designs, which are preferable for high volume projects. Of course, Kontron also provides design-in services on system level. Thus, OEM vendors can get full service and support for Nvidia Tegra 3 and 2 implementations – including optional OS images for their applications or software integration of their appliance. So, if you view the whole picture, it's easy to deduce that 'Standards & Services' are the key to fastest and predictable time-to-market. ■

Serial data transmission is major trend in rugged embedded systems

Christian Ganninger, Product Manager for Systems, Pentair Equipment Protection



■ As a manufacturer of electronics packaging solutions, the Schroff brand of Pentair Equipment Protection has long been involved in developing embedded systems for various different standards and application areas. Today we can see a clear way here towards serial data transmission. The new serial bus standards from VITA and PICMG, in particular CompactPCI Serial, MicroTCA and AdvancedTCA, are driving the market forward. In the area of military applications in particular, VMEbus is gradually being replaced by the serial VPX standard. The multi-core processors that have since become established in the market and corresponding chipsets are further accelerating this development.

Today, higher data transmission speeds are not just talked about - they have become the reality. And the hunger for performance, particularly in AdvancedTCA and MicroTCA-based communications systems, continues to advance. This also affects the now higher cooling

capacities, which in the case of AdvancedTCA systems have already reached 450W per slot. While conventional air cooling will still be sufficient for a little more time, solutions with supported air cooling, air/water heat exchangers, etc are on the horizon. Cooling at cabinet or room level (climatized rooms) will then be strongly preferred to cooling at system level on cost grounds.

A further trend we are seeing is the use of rugged systems. In the transport segments – rail, air, ships, etc – and in defense and security, higher demands are generally made for shock and vibration resistance and particularly high or low temperatures. We offer a product portfolio for this that consists generally of off-the-shelf products that can then be upgraded to match the higher demands made on it. The greater the demands, the higher can be the upgrade. Robust accessories such as conduction cooled assemblies (CCAs), Wedge-Loks/Card-Loks and clamshells are also available.

In the military sector, the new serial VPX standard with highly robust systems and corresponding cooling systems (conduction cooled, liquid cooled) are in use. However, for AdvancedTCA, MicroTCA and CompactPCI Serial there are also niches in what is known as the semi-mobile sector. Here, for example, the classic communications technology of MicroTCA is made fit for purpose with the Rugged MicroTCA specifications for particularly harsh environmental conditions and high demands. Currently, VITA is specifying a sub-specification that integrates the AdvancedTCA shelf manager in a slimmed-down and modified form in VPX. Since the new serial specifi-

cations operate on the same widely-available software, as do PCIe, Ethernet, S-ATA and Rapid IO, it has become considerably simpler to exchange the best solutions between the individual specifications. The user who requires one of the software protocols for his application is no longer tied to one standard but can rather freely select which specification is best suited to his particular application. The conditions prevailing in the final location, the possible backplane topologies (star, dual star, full-mesh, daisy chain, etc) and the mechanics used ultimately determine the standard to be used. As regards CompactPCI Serial in particular, we are assuming that this standard will become established in the coming year. A considerable number of backplanes are already now commercially available. New and exciting developments are under way that will drive the market in the coming year.

Another point not to be underestimated is the trend towards individualization. More and more customers do not want a system „off the shelf“ but rather one that has been precisely matched to their demands and individually configured. For this we have developed an internet-based „System Selection Tool“. This is a form of configurator that does not specify any dependencies and allows customers to create their individual system by themselves, based on pre-defined systems or bespoke. For example by backplane type, number of slots, conformal coating, power supply, cooling, mechanical features and much more. If the selected features cannot be realized from a technical point of view, the specialists at Pentair Equipment Protection can work together to find another suitable solution along with the customer. ■

Customer orientation is crucial

Stephan Grüniger,
 Product Manager Enclosures & Components, Elma



■ As a solution provider of electronic packaging systems, Elma orientates itself very much towards the markets of its customers. An overview shows that not only technical challenges are important in this process.

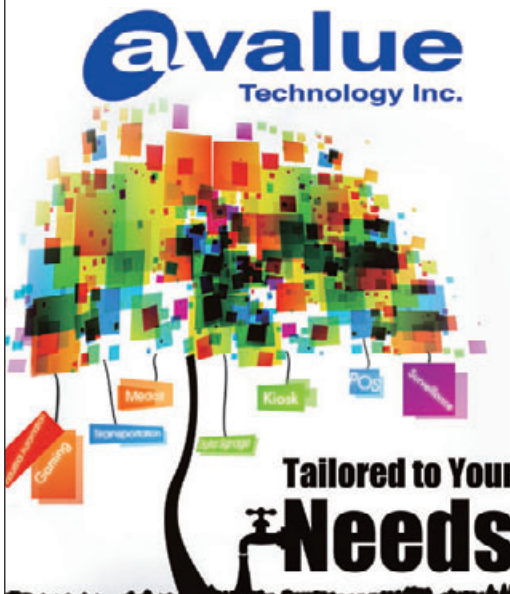
With its enclosure solutions, Elma Electronic serves three essential market segments. A major market is SMEs that manufacture testing and measuring instruments. These companies think about the packaging of their electronics late in the development process and often require customer-specific enclosures. The second segment is 19" racks, a sector that led to the success of the company in the 1990s. However, this division is decreasing; for example, today only a few individual sectors, such as telecommunications or the military, have to process a great number of signals at extremely high speeds using these systems. The third market segment is heavy-duty applications, used, for example, in railways. These devices have to withstand vibrations and shocks and meet strict standards; the electronics have to resist high temperature fluctuations and need protection from salt and fog.

The market for medical devices is growing – if only due to demographic trends. The product manager also expects an increase in building installations: the compilation of data that today is still stored on various computers is becoming more important. Server solutions will be used in the future in order to manage this data centrally. In addition, the concept of the intelligent house is gaining importance. The devices

themselves are becoming smaller in general and prices are also contracting. This translates into greater cost pressure for enclosure manufacturers. However, the number of packaging solutions is growing slightly, since systems are often being decentralized. This in turn results in a decrease in units of individual enclosure types. Previously, one cabinet type could meet the demands of a large market; today customer-specific solutions are in greater demand. While electronics is becoming ever more compact, its efficiency is increasing. This means that the temperature dissipation over the enclosure is becoming more important. Specific solutions are required in areas where the enclosure has to be sealed, for example, against spray.

EMC remains an issue. As the frequencies at which the devices are operating will be even higher in future, the demands on EMC are increasing as well. On the one hand, the device is not supposed to be disruptive; on the other hand, the device itself must not be disrupted. In addition to the technical aspects, design is also playing an important role. In order to succeed in the future, customer orientation is crucial. The trend is moving towards system solutions. This means that we provide a platform on which as many components as possible can be reused. However, it is possible for the customer to assemble and design enclosures individually. For example, a customer-specific design for logos, color labeling or color prints on enclosures is possible. Many manufacturers are working on opening up markets and expanding their services, since many customers have a clear idea of how to define an enclosure and are looking for a specific manufacturer. At Elma, this trend has an impact on production, which has to be set up flexibly in order to produce small batches in a customer-specific and cost-effective way.

But there is another trend, too. In recent years, many of our customers have relocated towards America and Asia. This is why we have factories in Europe, America and Asia, so that we can introduce developments in these markets and produce and deliver on-site. As manufacturer it is also important for us to develop suitable strategies in order to avoid dependencies, since this could lead to supply shortages. ■



Tailored to Your Needs

- Low Power Consumption
- High Performance
- Energy Efficiency

Avalue Embedded Platforms



ECM-QM77 | 3.5" SBC
Intel® Ivy Bridge 3.5" Micro Module with Intel® QM77 Chipset
 ➤ One SODIMM Up to 8GB DDR3 1333/ 1600, 2 CH 18/24-bit LVDS, HDMI, VGA, Audio, 2 GbE, Triple Display, 2 SATA III, 1 Mini PCIe, 4 USB 3.0, 2 USB 2.0, 2 COM, 8-bit DIO



EMX-QM77 | Mini ITX
Intel® Ivy Bridge Mini ITX MB with Intel® QM77 Chipset
 ➤ Two SODIMM Up to 16GB 1333/ 1600, HDMI, 2 CH 18/ 24-bit LVDS, VGA, DVI, Audio, 2 GbE, 1 Mini PCIe, 1 PCIe16, 1 CFast, 2 SATA III, 3 SATA II, 4 USB 3.0, 8 USB 2.0, 3 COM, 8-bit DIO



EMC-CDV | Embedded System
Fanless Intel® Atom™ D2550 Rugged Embedded System
 ➤ Intel® Atom™ D2550 w/ Intel® NM10 Chipset, One SODIMM Up to 4GB DDR3 1066, Rich I/O, 1 VGA, 1 LAN, 1 SIM Slot, 1 Swappable HDD, Audio, 12-bit GPIO, 1 SMBUS, 2 COM, 2 PS/2 for KB & MS, 2 Knockouts Antenna Mounting, 3 USB



EPS-QM77 | Embedded System
Fanless Intel® Ivy Bridge Rugged Embedded System
 ➤ Intel® Core™ i7/ i5/ i3 CPU w/ QM77 Chipset, One SODIMM Up to 8GB DDR3 1333/ 1600, Triple Display, CRT, DP, HDMI, Audio, 2 GbE, 2 SATA III, 2 SATA II, 8 COM, 8 USB, 1 LPT, 2 PCI, 2 Mini PCIe, 1 SIM Card, 8 In/8 Out GPIO



OPM-CDV | Open Frame Module
Fanless Open Pluggable Module Compliant
 ➤ Intel® Cedarview N2800 1.85GHz CPU, Interchangeable Osseven Module and Carrier Board, Onboard 1G DDR3 1066, 1 HDMI, 1 GbE, 1 Line-out, 1 COM, 2 USB, 1 Mini PCIe, Support 2.5" HDD/ SSD



SPC-1207 | Multi-Touch
Full IP-65 Stainless Steel Chassis Fanless Touch Panel PC
 ➤ Intel® Atom™ D2550 w/ Intel® NM10 Chipset, GbE, 1 COM, 3 USB, 1 Membrane Power Button, Wide Voltage +12V ~ +28V Input, ErP Power, Backlight Controlled by PWM/ BIOS/ API, Water Proof Solution, Power-on Timer



BFC-1507 | Multi-Touch
15" Multifunctional Bezel Free Multi-Touch Panel Computer
 ➤ Intel® Atom™ D2550 w/ Intel® NM10 Chipset, GbE, 5.1-CH Audio, 1 HDMI, 1 COM, 2 USB, 1 Power Switch, 1 CF, Optional WiFi and 3G Module, Fanless System & VESA Compliance, Wide Voltage +12V ~ +28V Input, ErP Power, Front Side IP65 Dust and Water Proof



MORE PRODUCT INFORMATION

sales@avalue.com.tw

Tel: (886) 2 8226 2345 FAX: (886) 2 8226 2777

www.avalue.com.tw

Continuous growth for COMs

Wolfgang Heinz-Fischer, Head of Marketing & PR, TQ-Group



■ Modules with ARM technology are the greatest growth area. All leading providers of x86 embedded modules will keep a relevant ARM module in their portfolio, allowing both worlds to merge even on the embedded module provider market. The variety of application options for

ARM processors as a result of the small chip size and low power loss means modules can also be used in mobile devices. Further miniaturization is progressing well.

Standardization in the field of embedded ARM modules is also still being promoted, though it remains unclear as to whether or not one individual standard will be able to establish itself on the market. Proprietary systems will continue to play a major role in this area, as the standardization process involves too many compromises. It will be exciting to see how the providers of x86 processes react to the current ARM successes and launch relevant one-chip solutions with minimal power usage. In terms of operating systems, Linux will continue to play a major role, although Android is becoming increasingly popular in order to also use cell-phone and tablet-PC features in the industry. It remains to be seen how Microsoft Windows 8 establishes itself on the market. However, it is

becoming more and more important for embedded module providers to offer system solutions. Customers expect more extensive support with the design-in, including both hardware and software support. System providers on the software side must thus also provide appropriate BSPs (board support packages) and other drivers, while on the hardware side, the minimum requirement is to be able to offer design support, or better still, an application board. TQ is perfectly equipped for this. As its core business has always been customized solutions, it is thus a matter of course that we develop and manufacture customer-specific main boards or application boards for our own modules. Everything under one roof is the TQ motto. With a full range of ARM modules, from ARM 9 to Cortex-A9, and a complete line of PowerArchitecture modules, TQ offers the widest range of modules in this area. All modules have optimized dimensions, and provide all processor signals on the robust plug system. ■

How much out-of-the-box is needed?

Michael Mitezki, CEO, Phytex



■ Customers are increasingly willing to use commercial System on Modules for their applications. The question that keeps emerging is: which System on Module is the right one for my application? How much out-of-the-box is need-

ed? All ARM-based microprocessor providers have one thing in common: they all use an ARM-licensed processor IP. So, it is difficult for customers to differentiate between the providers.

Therefore the specific, target-market and destination application oriented interface will remain a key differentiator among microprocessors. We can be excited to see a wired variety of modern and powerful ARM derivatives that differ considerably in type and amount of offered interfaces. We have to think whether these ARM-based microprocessors fulfil the customer desire for standard-based solutions. The embedded market already knows universal standards for Computer on Modules, such as COM Express, CoreExpress and Qseven. These standards follow the concept of achieving mechanical and electrical compatibility. They are not well suited for the variety of ARM-based microprocessors for two reasons. Firstly, signals

that ARM microprocessors are not able to deliver. This is due to the fact that these standards are based on x86 processors. ARM does not support SMB, LPC, LID Button, Suspend-To-RAM as well as Wake interfaces. The high number of x86 relevant PCIe lanes that USB interfaces is not supported either. Consequently the equivalent pin-positions are not usable. Secondly, these standards do not support ARM-typical special interfaces, such as multiple camera interfaces, display interfaces, analog I/O, serial inter-chip-communication, hardware-accelerated communication and Industrial Ethernet. Therefore, the existing standards are incompatible with ARM-based Computer on Module applications. We need to develop new solutions; ideally standards that combine customized off-the-shelf solutions with the desired flexibility. Our solution with the new phyFLEX product family is an excellent choice for moving forward with new processors. ■

Multi-platform COM standards

Zeljko Loncaric, Marketing Engineer, congatec



■ In recent years, standardized COMs (Computer-on-Modules) have gained a broad foothold in the embedded world. This is because they allow users to concentrate on their core competencies in development and manufacturing, while buying in the latest processor technology application-ready from elsewhere. What began more than 10 years ago with ETX and x86 architecture has long since evolved into an open multi-platform standard with the introduction of COM Express and Qseven.

As technology development moves on, COM Express is evolving to stay up to date. In the x86 world the dominant COM Express Pin Out Type 2 is losing importance for new designs. Here, COM Express Type 6 has become the market-leading Pin Out type and the first choice for power-hungry x86-based systems. The new Type 6 provides not only maximized support of displays. Going one step further, Type 6 also offers support for up to four USB 3.0 channels and two additional PCIe lanes, so that a PCIe x8 configuration is possible on the carrier board. Overall, it's the right time for this update which helps make COM Express future-proof.

Due to performance and direct support from the chip manufacturers, the momentum DisplayPort is picking up is now even greater, since from 2015 Intel and AMD products will no longer support the VGA display interface. Starting in 2013, LVDS will no longer be supported by Intel and will be omitted from most AMD products. Together with Dell, Lenovo, Samsung and LG Display, Intel and AMD want to radically accelerate the changeover to DisplayPort and HDMI digital display interfaces. DisplayPort will be more popular than

HDMI because of licensing costs. In general, however, the current market trend goes more towards smaller and more mobile systems. Increasingly, industrial systems adapt their graphical user interfaces (GUIs) in line with the specifications of phones and tablet computers from

the consumer world. Despite competition from increasingly small COM Express form factors the Qseven standard has firmly established itself in the x86 world. What speaks for Qseven is a more modern, legacy-free design, along with a new connector concept and fanless cooling



Schroff®
 Design with CONFIDENCE®

Confidence is the key to making a decision. Thanks to the outstanding support of our employees and our high-quality products and solutions, our customers can have complete confidence in us.

And can thereby perfectly bring their own ideas to life.

Visit us at Electronica

Hall A2, booth 243

PENTAIREQUIPMENTPROTECTION.COM

specifically designed for compact and ultra-compact devices. Since Qseven was conceived as an open multi-vendor standard from the beginning, last year the extension of the standard to version 1.2 was the next logical step. While it specifically addresses the needs of the increasingly important ARM architecture, the Qseven standard remains open for x86 and other processor architectures. ARM silicon offerings

have become much more capable, driven by the consumer market. Now they have all the required interfaces like PCI Express, HDMI, Gigabit Ethernet, high resolution graphics, USB and higher performance at low power to fulfill the market needs, for example in medicine, where applications often require passive cooling to prevent irritating noise for patients, or may need a battery device. More software sup-

port and good tools for ARM-based designs will be necessary to be successful. Increasing ARM penetration will also change the mix of operation systems used on Computer-on-Modules. Linux and Android will become more popular. With these updates the new COM standards are the fastest growing industrial board types. In general it becomes more cost-effective to buy a COM at very high volumes. ■

previews & product NEWS

Atlantik: latest semiconductor products, solutions and developing trends

Atlantik Elektronik presents itself during electronica with its motto: We love technology. During this year's anniversary electronica, Atlantik Elektronik comes up with a firework of latest semiconductor products and solutions as well as developing trends in the areas embedded microcontroller, wireless, connectivity, information and system solutions.

Visitors can dive into the world of wireless communications and explore the Embedded RANGER Development Kit for which Atlantik Elektronik received the Innovation Award 2012. This development kit is the basis for the development of GSM/GPRS, Wi-Fi, Bluetooth and ZigBee. Qualified and pre-certified radio modules allow an efficient design and reduce the development time significantly. Atlantik Elektronik focuses their app development activities and develops apps for specific applications. Visitors can get to know the world of apps on a new industrial i.MX53 Cortex-A8 based 1GHz module with Android. Another Atlantik app on the iPhone 4S as well as the Motorola RAZR will demonstrate a robot control via Bluetooth Low Energy.

Furthermore Atlantik Elektronik presents an intelligent home automation solution with integrated remote management and cloud services. All aspects of modern remote maintenance and control systems will be demonstrated. ZigBee-based sensor networks are used for applications that can be managed on mobile devices via a central control computer or via apps. The new industrial i.MX53 Cortex-A8, an iDigi enabled wireless module based on the i.MX53 processor from Freescale can instantly connect to the iDigi cloud. This enables customers a smooth development of wireless multimedia devices.

According to the Atlantik slogan „Innovation by expertise“ Atlantik informs the visitors about the latest TFT displays with capacitive touch technology. In addition, up-to-date black matrix TN LCD displays with high contrasts and extended viewing angle are presented. The

focus of M2M and POS applications are reliability, low power consumption and worldwide interoperability of the transmission technology. Atlantik Elektronik introduces the QUECTEL GSM/GPRS modules with optimal price/performance ratio and offers also the smallest GSM/GPRS quad-band module in the world.

The topic „Strong ARM with industry-leading specifications“ continues to enjoy highest popularity. Atlantik Elektronik presents a large portfolio of ARM Cortex-M0, which now covers 159 derivatives. NuMicro ARM Cortex-M0 MCUs are ideal for the cost-optimized implementation of intelligent industrial control systems. Atlantik Elektronik also presents the high-power 500W LED lighting module X10. The 500W solution allows customized lighting scenarios. For the first time, size and design of light sources are fully configurable with innovative networking solutions based on the RANGER.

[News ID 16316](#)

PLS: UAD2pro now enables strong electrically isolated connections to the target

PLS Programmierbare Logik & Systeme presents its Universal Access Device 2pro (UAD2pro) at electronica. The UAD2pro is an especially high-performance, versatile target access device for on-chip debugging of a wide range of 16 bit and 32 bit microcontrollers. Connection of the debug hardware to the PC is achieved via a USB 2.0 interface.

For all Windows versions, starting from Windows XP including the 64-bit version, easy-to-install device drivers are available by means of plug & play. Connection to the target takes place by means of architecture-specific adapters - available for JTAG, cJTAG, DAP, SWD, OnCE and other manufacturer-specific debug interfaces - via a universal interface. When changing to other microcontroller architectures the user only needs a different adapter and a corresponding license. Updates and downloading of the firmware takes place transparently for the user.

Apart from the universal target interface, the UAD2pro offers a D-sub connector that can optionally be used as serial or CAN interface. Thus, not only various bootstrap loader mechanisms of the respective microcontroller are supported; the UAD2pro can also be used as CAN recorder hardware in parallel to debugging. For debugging microcontroller boards with high-voltage components, as is common for instance with motor or inverter controls, target adapters with an electrical isolation of up to 1,000 V can optionally also be used with the UAD2pro. At the same time, the full transmission bandwidth of 50 MHz serial clock is maintained.

The UAD2pro from PLS, which is offered together with a software license of the UDE, is available for TriCore, Power Architecture (e200), XC2000/XE166, Cortex, ARM and other microcontroller architectures. The UDE also supports multi-core debugging and special emulation devices. Furthermore, a seamless integration in an Eclipse-based development environment is possible by means of an own debugger perspective.

[News ID 16151](#)

Arrow Electronics at electronica 2012

Arrow Electronics announced details of its participation at electronica 2012. As the premier full-service provider, Arrow Electronics will be dedicating its show presence to solutions for vertical technology markets and to its service offerings that cover every stage of the product lifecycle. Arrow will bring dedicated teams of experts to electronica with in-depth experience in the automotive, LED lighting, aerospace/defense, industrial automation, smart energy and power solutions markets.

In addition, leading suppliers of semiconductors, passive and electromechanical components and connectors will team with Arrow to highlight their offerings during the show. Arrow will also present its services portfolio spanning the entire product lifecycle, from design and production through to end-of-life solutions.

[News ID 16276](#)

demmel: intelligent 10.2-inch display on show

demmel products presents the successor of its largest iLCD panel at this year's electronica. The price has been reduced in spite of increased performance. As a result, the new 10.2" iLCD is an excellent alternative to often oversized and over-priced Panel PCs. demmel product's „Next Generation Intelligent LCD“ technology allows the user to store all graphics, animations, fonts, text templates and macros in the flash memory of the iLCD. Graphics and proprietary files can be also stored on an on-board MicroSD card. Overall development time can be drastically reduced by eliminating the pixel-based programming required for conventional LCDs. Color iLCD panels are available with touch screens in a wide range of formats from 2.8" (240 x 320 pixel) up to 10.2" (1024 x 600 pixel).

The integrated iLCD controller offers powerful and easy to learn high-level commands. Formatting text messages with Windows fonts, displaying static and animated graphics, drawing frames and lines and controlling the touch screen can all be done quickly and simply via Ethernet, USB, RS232, I²C or SPI interfaces.

[News ID 16197](#)

CREATIVE CHIPS showcases ASICs and ASSPs

In keeping with good tradition CREATIVE CHIPS exhibits at electronica 2012 its latest solutions for custom-specific ICs (ASICs) and ASSPs. Complex digital ICs as well as circuits for mixed-signal applications with sophisticated analog circuits and integrated sensors are provided in high volumes for the industrial automation industry, consumer electronics, automotive electronics and for medical applications.

[News ID 16114](#)

Emerson: ATCA media processing blade with up to 576 DSP cores

A new AdvancedTCA media processing blade by Emerson Network Power has the highest density of DSP cores of any commercially available blade. With up to 576 DSP cores and running sophisticated media processing software, the new ATCA-8320 will enable communications equipment companies to simplify and accelerate the development and deployment of very high density IP media processing applications. These applications include session border controllers, media gateways and servers, media resource functions, mobile video optimization, video communications and conferencing servers, and interactive voice and video response systems.

[News ID 16156](#)

Rohde & Schwarz: test and measurement equipment at electronica

A highlight at the Rohde & Schwarz booth is the new R&S ESR EMI test receiver. Thanks to its broadband architecture, it performs standard-compliant disturbance measurements up to 6000 times faster than other solutions. Comprehensive diagnostic tools, such as spectrogram display, realtime spectrum analysis and IF analysis, help developers detect and eliminate disturbance. The R&S ESR is impressively easy to use thanks to its intuitive touchscreen.

In addition, Rohde & Schwarz showcases the R&S FSW43 high-end signal and spectrum analyzer with a frequency range from 2 Hz to 43 GHz. The R&S FSW43 is the most powerful microwave analyzer on the market, featuring impressive RF performance and measurement speed with simple touchscreen operation. The analyzer significantly simplifies complex measurement tasks in satellite communications and

radar applications. Its integrated multi-standard radio analyzer function helps development engineers analyze multi-standard signals. The MSRA mode enables users to measure spectrum and modulation parameters of differently modulated signals, including their time references. This feature makes it easy to analyze whether signals are influencing or interfering with each other.

Rohde & Schwarz also presents the new R&S RTO-K5 software option for its R&S RTO high-performance oscilloscope. Developers of microcontrollers, audio components or audio consumer electronics can use this option to trigger on and decode I2S, LJ, RJ and TDM audio signals. The graphical user interface, color coding of protocol details in the waveform diagram and summarized protocol data help developers solve their T&M tasks. The tracking function, which displays the audio signal as a waveform, makes short work of clipping, glitches and other anomalies.

[News ID 16291](#)

ADI: DC-DC switching controller family features current- and voltage-mode configuration options

Analog Devices introduced the ADP1851 wide-input-range, synchronous, step-down DC-to-DC controller with voltage tracking and synchronisation capability. The ADP1851 expands ADI's series of configurable controllers following the recently introduced ADP1853. The versatile ADP1851/53 can be configured to work as a voltage-mode controller with input feed-forward or as a current-mode controller, depending on the application and customer preference.

[News ID 16155](#)




congatec
 the rhythm of embedded computing


electronica 2012
 inside tomorrow
 November 13 - 16
 Booth 306
 Hall A6

the new performance

High performance graphics on Qseven®, COM Express®, XTX™ and ETX®
 Integrated CPU-Modul | low power consumption | value priced

Q S E V E N

COM + Express®

XTX **ETX**

For more information about AMD G-Series:
www.congatec.com | info@congatec.com | fon: +49 (991) 2700-0





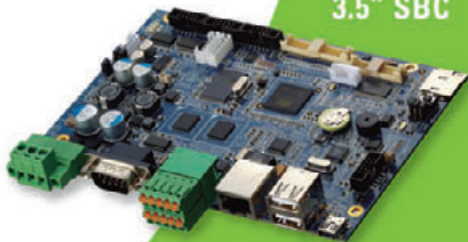


Embed ARM in Automation

ARM9 SoM



3.5" SBC



Box Computer



- Atmel ARM9 SoC
- SoM/SBC/Box Computer/PAC
- Ethernet/Serial/USB/CAN/LCD/DIO
- Compact DIN Rail and wall mount
- Linux 2.6 and WinCE 6.0 support
- Ultra low power and wide temperature

Artila

www.artila.com sales@artila.com

Microchip: 8-bit PIC MCUs combine high integration, low power and automated touch sensing

Microchip announces the expansion of its 8-bit eXtreme low Power Enhanced Midrange Core PIC microcontrollers, with the new PIC16F1512/13 devices. These new 28-pin MCUs offer a combination of advanced digital and analogue peripherals, combined with XLP for the extended battery life required by many applications. These features make the general-purpose PIC16F1512/13 MCUs ideal for a broad range of applications in the appliance, medical, consumer, automotive and many other markets.

[News ID 16201](#)

Advantech: highly secure Micro-ATX Industrial motherboard powered by SUSIAccess

Advantech introduces AIMB-501, a new industrial-grade Micro-ATX motherboard powered by a 3rd generation Intel Core i processor. AIMB-501 is pre-loaded with SUSIAccess Pro 2.0 providing intelligent remote device management and monitoring. With SUSIAccess Pro 2.0 on your device you can remotely switch machines on and off, access the desktop, recover a system and configure protection features. SUSIAccess Pro 2.0 includes McAfee's banking-level security for system protection.

[News ID 16133](#)

Maxim: new products target factory automation and automotive

Maxim Integrated Products introduces five high-integration products for the Factory Automation and Automotive markets that dramatically improve operating efficiencies and reduce costs. These new products will be on display at Maxim's booth at electronica 2012. Maxim also announced it has collaborated with two firms to produce a reference design for a highly integrated telehealth fitness ("Fit") shirt that monitors vital signs, lowers the cost of medical diagnosis, and represents a new era in preventive medical care that could reduce health care costs by up to 10x.

The MAX78638 is a turnkey solution for 3-phase motor energy measurement and diagnostics. Unlike previous bulky and expensive solutions that required moving the equipment from motor to motor, the fully integrated MAX78638 contains a microcontroller, compute engine, an analog-to-digital converter (ADC), and flexible and configurable sensor interfaces that allow for the measurement of current, voltage, speed, vibration, position, and temperature. The high-accuracy ADC enables a less than 0.5% energy calculation error compared to the 5% of a standard microprocessor solution. The MAX31865 is a fully integrated RTD-to-digital converter, a single-chip solution that lowers costs

by up to 50% and solves the common industrial design problem of digitizing a platinum RTD (such as a Pt100 or Pt1000) resistance. It offers simple and accurate measurement of temperature, making it ideal for industrial measurement and process control applications.

The MAX17823 high-voltage battery sensor for mission-critical automotive and industrial lithium-ion battery and fuel cell applications offers a full suite of proprietary integrated ISO-26262 diagnostic features, the MAX17823 maximizes electric and hybrid electric vehicle driving range, while ensuring battery and fuel cell safety and reliability. Maxim also offers the MAX17830, a second-generation, high-voltage battery-management solution.

The MAX9273/MAX9272 (22 bits) and MAX9271/MAX9272 (16 bits) serial-data chipsets transmit over coax cables and lower costs for automotive camera systems by up to 50%. The chipsets reduce power use, process signals faster, and improve electromagnetic emissions compared to standard solutions using Ethernet cables. Maxim's new camera chipsets operate at very high data rates (1.5Gbps), which is critical for today's fast video and megapixel image transmissions. Using coax cables, the chipsets do not need to compress data and thus process images immediately—a crucial requirement for safety applications like sign recognition, collision avoidance, and night vision.

The new "Fit" shirt that enables medical professionals to perform frequent and less costly fitness monitoring that will lead to more effective preventive medical care. The highly integrated shirt measures 3-lead ECG, body temperature, and motion. All diagnostic tools are packaged in a shirt that is comfortable to wear. The new Fit shirt integrates dry ECG sensor technology, complex signal processing technology, a temperature sensor, motion sensor, an ultra-low-power microcontroller, and wireless electronics.

[News ID 16196](#)

Rohde & Schwarz: triggering and decoding audio signals

I2S, LJ, RJ and TDM are serial buses that implement unidirectional point-to-point connections. They carry digital audio data between ICs and are often used to connect analog-to-digital converters and digital-to-analog converters to DSP for audio processing. Developers of microcontrollers, audio components and audio equipment can now use a new software option for the R&S RTO oscilloscope to thoroughly analyze all audio interfaces, and continue to reap the benefits of this high-performance oscilloscope from Rohde & Schwarz.

[News ID 16166](#)

Agilent: 60-GHz remote sampling head oscilloscope module

Agilent introduced a 60-GHz remote sampling head oscilloscope module for engineers who design, validate and manufacture high-speed electrical communications systems and components. The Agilent N1045A 2/4-port electrical remote sampling head module provides the most economical solution for accurately characterizing multilane designs used in today's new and emerging standards such as IEEE 802.3 ba/bj/bm (40Gb/100Gb Ethernet) and Optical Internetworking Forum CEI 3.0.
[News ID 16179](#)

Maxim: energy measurement and diagnostic solution for mission-critical motors

Maxim Integrated Products announces the MAX78638 solution for 3-phase motor energy measurement and diagnostics. Unlike previous bulky and expensive solutions that required moving the equipment from motor to motor, the highly integrated MAX78638 conveniently allows for constant and simultaneous monitoring of multiple pumps and motors.
[News ID 16200](#)

Mouser debuts power supply technology site to charge design development

Mouser Electronics broadcasts its launch of a new Power Supply technology site. The new site contains technical information that refines design engineers' exploration of power supply solutions that best answer their unique design requirements. Additionally, the site highlights the newest power supply solutions from Texas Instruments, TDK-Lambda, GE Energy, Microchip Technology, Murata Power Solutions and STMicroelectronics, to mention a few.
[News ID 16185](#)

Atlantik: enhanced Cortex-M0 microcontroller series by Holtek

Atlantik Elektronik announces the release of the new and advanced additions to Holtek's ARM Cortex-M3 32-bit device range, the HT32F1755/1765/2755 series. These new 32-bit Flash devices, include features such as a high operating speed of up to 72 MHz (90 DMIPS), a single power supply with an operating voltage range of 2.7V ~ 3.6V and an industrial temperature range of -40 ~ +85°C. With Holtek's integrated ISP and IAP functions, users will experience the implementation of software upgrades as an easy and quick process, thus enhancing the efficiency and flexibility of their products.
[News ID 16193](#)

ROHM present latest technologies and products at electronica

ROHM Semiconductor will be exhibiting its latest technologies and products at electronica 2012. Themed "Technology for you – Sense it!

Light it! Power it! The main focus will be on power management, optoelectronics and wireless low energy technology. ROHM's large choice of LED drivers include drivers with dimmers for lower power consumption, compact units with integrated LDO regulator, RGB drivers that reduce the software load, and models with built-in Flash that contribute to set miniaturization. Its new BD18377 LED drivers include programmable constant output, optimized accuracy and diagnostic features. Along with the industry's thinnest high-brightness RGB LEDs delivering optimum color uniformity and mixing, they provide a complete design solution for indicator lights in automotive


cluster solutions. The new compact ML7105 controller for Bluetooth LE enables short range wireless communication with ultra-low-power consumption and low-latency. This allows for smaller form factor devices in many applications such as healthcare, fitness, security and home entertainment industries. Adopting a new structure through improved proprietary design technology ROHM's new 40V power MOSFETs for DC/DC converters enable ultra-low ON resistance with ultra-low gate capacitance for ultra-low loss and unmatched efficiency supporting high speed operation.
[News ID 16204](#)

SANTARO Series

Embedded HMI Systems

Electronica 2012
 Halle A6, Stand 301

Embedded
 Systems



ARM Cortex
 A9 A9
 A9 A9

Android
 4.0.4 ICS


1 GB DDR3
 4 GB Flash

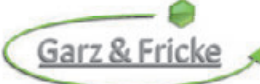
10.4
 7.0

The new performance artist:

- ◆ **One of the first**
 QUAD Core ARM system (available also as single- and dualcore)
- ◆ **Performance on the highest level**
 1 GHz ARM Cortex-A9 CPU (Freescale i.MX6Q)
- ◆ **Huge grown and it grows further**
 7.0 or 10.4" display sizes (more alternatives in planning)
- ◆ **Allrounder**
 Latest ICS version of Android (4.0.4), Windows 7 EC, Linux
- ◆ **Highly capacious**
 4 GB eMMC Flash, 1 GB DDR3 RAM, SD-Card

Get to know me on the upcoming autumn fairs





Garz & Fricke GmbH · Hamburg · Deutschland
 +49 (0) 40 / 791 899 - 30 · info@garz-fricke.com

Reliable
 Quality
 Made in Germany

❖ **DATA MODUL: Qseven compatible quad core ARM module**

DATA MODUL presents its first in-house developed Qseven module the eDM-QMX6. It supports the in September 2012 released Standard Revision 1.2 which is optimized for dedicated ARM-support with the I/O extension UART and CAN. It offers all specified x86 features and more. On the reference-baseboard you can run x86 based Qseven-modules and as well the new ARM based module.

[News ID 16286](#)

❖ **TI: Sitara ARM Cortex-A8 starter kit with LCD touch screen**

Texas Instruments introduced the new Sitara AM335x ARM Cortex-A8 starter kit with a 4.3-inch LCD display supporting rotation and tilt capabilities via the on-board accelerometer that provides an affordable platform for smart appliances, industrial and networking applications and other devices requiring a touch screen interface. The low-cost development platform, based on the Sitara AM3358 ARM Cortex-A8 processor, integrates multiple communication options such as Dual Gigabit Ethernet, Wi-Fi and Bluetooth connectivity for the creation of highly connected devices.

[News ID 16205](#)

❖ **Freescale Kinetis L series microcontrollers now broadly available**

Freescale Semiconductor's Kinetis L series is now broadly available. Kinetis L series 32-bit devices are the first to be featured on the new Freescale Freedom development platform, a small, low-power, cost-effective evaluation and development system for quick application prototyping and demonstration. The first member of the Kinetis L series, the KL25 MCU, and the Freescale Freedom development platform are readily available today through global semiconductor and electronic component distributors and suppliers, including element 14, Digi-Key Corporation and Mouser Electronics.

[News ID 16207](#)

❖ **Axiomtek: entry-level, slim-type network platform with AMD G-series processor**

Axiomtek announces its new fanless, slim-type network appliance platform, the NA-110, built on AMD G-series APU T24L 1.0GHz with A50M chipset. The low-power NA-110 comes in a small package with a height of just 30mm and a weight of 2.2kg, which can easily fit into any confined space and harsh environment. It offers up to 4GB of DDR3 SO-DIMM RAM, one PCI Express Mini Card expansion, four gigabit Ethernet ports, and dual USB 2.0 ports.

[News ID 16300](#)

❖ **MathWorks: release 2012b with major updates to MATLAB and Simulink**

MathWorks introduced release 2012b with major updates to MATLAB and Simulink that significantly improve use and navigation. The new Simulink Editor features tabbed windows, smart signal routing and simulation rewind while the MATLAB Desktop now includes a toolbar that offers quick access to frequently used features and a MATLAB apps gallery. In addition, Release 2012b includes a redesigned help system with improved browsing, searching, filtering, and content organization

[News ID 16147](#)

❖ **NI: single-board RIO GPIC enables new embedded system design approach**

National Instruments announced the NI Single-Board RIO GPIC, which provides a standard RIO architecture for smart, grid-tied power conversion systems with a comprehensive NI LabVIEW system design toolchain that significantly reduces the cost and risk of embedded system design. This product reflects the ongoing investments by NI R&D to revolutionize the design, testing and large-scale deployment of new digital energy conversion systems.

[News ID 16191](#)

❖ **Axiomtek: 3rd gen Intel Core processor Mini ITX motherboard**

Axiomtek is pleased to announce MANO871 Mini ITX motherboard, based on the Intel Q77 Express chipset and designed for the new 22nm 3rd generation Intel Core processors in the LGA1155 socket. The high-performance MANO871 supports Intel 3-D transistor, Intel Turbo Boost 2.0 technology, Intel Hyper-Threading technology, 16 GB DDR3 1333/1600 memory, and PCI Express 3.0 x16 slot.

[News ID 16198](#)

boards & solutions ECE

Editors

Jürgen Hübner
phone +49(0)8092-2477413
fax +49(0)8092-2477429
jh@iccmmedia.com

Wolfgang Patelay
wp@iccmmedia.com

Tony Devereux
devrex@teyboyz.freemove.co.uk

For Reader Inquiries and Address Changes please contact:

info@iccmmedia.com

Sales & Marketing Director

Manfred Blumoser
phone +49(0)8092-2477411
fax +49(0)8092-2477429
mb@iccmmedia.com

Claudia Mellein
cm@iccmmedia.com

Christiane Lockner
cl@iccmmedia.com

Sales Office - UK and USA, Benelux, Scandinavia

Blue Sky Communications
Malcolm Cameron
21 Cliffe Avenue
Westbrook,
Margate, Kent CT9 5DU, UK
phone +44 (0)77 88-10 84 11
fax +44 (0)80 82-80 10 57
mc@blue-sky-communications.com

Sales Office - Asia

Jean Cheng, jean@i-media.com.tw
Vivian Hung, vivian@i-media.com.tw
Innovative Media Information & Services
7F-3, No. 26, Sec. 2, Ming-Quan East Rd.
Taipei 104 Taiwan
phone +886 2 2563 1186

Head Office

ICC Media

ICC Media GmbH
Rauwagnerstr. 5
85560 Ebersberg / Germany

Editorial Office UK

36a Blackacre Road
Theydon Bois
Essex, CM16 7LU

Copyright© All rights reserved.

No part of this publication may be reproduced or transmitted in any form or by any means without the prior express written permission of ICC Media.

Although we make every effort to present up-to-date, accurate information, boards & solutions will not be responsible for any errors or omissions or for any results obtained from the use of such information. The magazine will not be liable for any loss caused by the reliance on information obtained on this site. Furthermore, boards & solutions does not warrant the accuracy or completeness of the information, text, graphics in this magazine. The opinions expressed in the articles are those of the authors and not necessarily the opinions of the publisher.

❖ **Fujitsu enhances 32-bit FM3 MCU family with release of 93 new products**

Fujitsu Semiconductor Europe announces the launch of the fifth wave of products in its FM3 family of 32-bit RISC microcontrollers based on the ARM Cortex-M3 processor core. In total, Fujitsu Semiconductor is releasing 93 new products in its High Performance and Low Power Group for a vast variety of applications. The High Performance Group with a total of 72 new products that include the MB9B520M Series, the MB9BF524MPMC has been designed to enable simple and cost efficient inverter control, making products from the group optimal choices for household appliances, office automation equipment, and industrial equipment.

[News ID 16219](#)

❖ **Kontron: ETX COM extends lifecycle of PCI/ISA-based applications**

Kontron has introduced a low-energy and cost-effective version of its ETX 3.0 Computer-on-Module ETX-OH. The new ETX 3.0-compliant Kontron ETX-OH T16R incorporates the new AMD Embedded G-Series APU T16R, which features an extremely low average power consumption of only 2.3 Watts. While operating at the same power consumption level as the AMD Geode-LX-based solutions, it delivers up to three times the level of performance. The Kontron ETX-OH T16R, with its native PCI and ISA support, provides the ideal upgrade path for AMD Geode-based ETX designs and for low-power systems with discontinued ETX modules. Additionally, the new module extends the availability of the ETX standard for at least five more years.

[News ID 16263](#)

❖ **Atmel: 8-channel LED driver for LCD panel backlighting**

Atmel announced a new family of 8-channel LED drivers with an integrated boost controller to deliver a complete power management system with patented Efficiency Optimizer to enhance power efficiency for LCD backlighting applications. Atmel's MSL3080/86/88 LED drivers are ideal for industrial LCD backlighting applications such as instrumentation, medical, avionics, military, kiosk, automotive and rugged displays. The MSL3080/86/88 LED drivers also feature proprietary control scheme and robust design delivering greater than 92 percent power efficiency for up to 20W LED backlit LCD displays.

[News ID 16229](#)

❖ **Infineon: flash-based security controllers with highest security certificate**

Infineon Technologies announced that its new Flash-based security controllers have been awarded with the highest security certificate (Common Criteria EAL 6+) by the Federal Office for Information Security. The new SOLID FLASH security chips with "Integrity Guard" are aimed at use in contactless and contact-based applications demanding highest security levels such as Government IDs, contactless payment transactions or embedded systems. The new SOLID FLASH security ICs are based on Non Volatile Memory (Flash, EEPROM) technology and manufactured in 90nm process technology.

[News ID 16299](#)

❖ **Apacer: memory card to support the SATA II 3Gb/s transmission mode**

Apacer has introduced a new CFast memory card to support the SATA II 3Gb/s high-speed transmission mode. Apacer has upgraded the capacity and speed of their industrial CFast memory cards. Additionally, these cards come in MLC solutions and support extended operating temperatures. Apacer's latest industrial CFast card, features a peak reading speed of 160MB/s, breaking the speed limits of the CF cards currently used by industrial enterprises.

[News ID 16212](#)

❖ **FTDI: USB controller series features battery charging detection**

Future Technology Devices International has announced the release of its FT12 series of high performance USB controller ICs. Operating at 12 Mbps/s and designed to the USB 2.0 specification, the new controllers support direct memory access operation, while providing system interfaces for 8-bit parallel bus and SPI Slave. The FT12 series is configurable as a standard device class, and as such there is no need to add USB drivers.

[News ID 16233](#)

❖ **SiLabs: ARM Cortex-M3 MCUs and "power-aware" development tools**

Silicon Laboratories introduced the lowest power ARM Cortex-M3 processor-based microcontroller family and first-of-a-kind "power-aware" development tools. The Precision32 SiM3L1xx MCUs and development environment leverage mixed-signal innovations to enable developers to reduce power consumption to 175 μ A/MHz in active mode and less than 250 nA in sleep mode with the real-time clock enabled at 3.6 V.

[News ID 16244](#)

❖ **TI: new Smart Meter SoC improves reliability in e-meter designs**

Texas Instruments is now sampling a fully integrated and optimized Smart Meter System on Chip for smart electrical meter designs. The integration of metrology, application and communication functions in one single chip allows developers to simplify designs, increase flexibility and reduce system costs for smart e-metering applications. By eliminating the need for additional discrete components and redundant interfaces, the integration increases the reliability of smart e-meter designs.

[News ID 16266](#)



Elma. **Embedded where quality is imperative.**

We engineer reliable electronic equipment for aerospace, telecommunications, industrial applications and science. We know what „mission-critical“ means. We guarantee functionality even under the most challenging circumstances. We are ready for the next project.

We are ready for your project.

 **electronica 2012**
Hall A2 • Stand 274



Please call us for more information:
+49 (0)7231 9734 0 • www.elma.com • info@elma.de

■ Freescale: sub-gigahertz wireless MCU based on ARM Cortex-M0+ core

Freescale Semiconductor announced the Kinetis KW01 wireless microcontroller, expanding its Kinetis MCU line with a device ideally suited for wirelessly networked smart energy applications. Several protocols are emerging globally for outdoor and indoor smart energy networks that require robust communication and low power consumption.

[News ID 16278](#)

■ Agilent enhances connectivity software for electronic test instruments

Agilent Technologies announces the latest release of its Iosuite software for use with electronic test instruments. The new release continues to improve the customer experience, with support for Microsoft Windows 8 and Windows Server 2012 as well as enhanced USB connections. The suite's PXI Resource Manager features upgraded PXI/PXIe interoperability and support for the IVI VISA plug-in specification, which allows for communication to third-party PCI/PXI devices through compliant plug-ins.

[News ID 16282](#)

■ Kontron: ARM-based module for imaging-centric low profile applications

Kontron launched its first ultra low power, low profile ARM-based Computer-on-Module specifically designed to extend the proven and scalable Computer-on-Modules-based usage model to new modules with ARM and SoC processors. The new Computer-on-Module ULP-COM-sAT30, offers a low profile solution that measures 82 x 50mm and integrates NVIDIA Tegra 3 Quad Core ARM 1.2 GHz technology.

[News ID 16224](#)

■ Microchip expands low-cost dsPIC DSCs and PIC24F microcontrollers

Microchip announces a new addition to the 16-bit PIC microcontroller and dsPIC Digital Signal Controller portfolios with the cost-effective dsPIC33FJ32MC104 family which offers up to 32 KB Flash, 16 MIPS of performance, and small pin outs for cost-sensitive motor control, consumer, medical and industrial applications.

[News ID 16303](#)

■ Deutsche Telekom and Digi International collaborate on M2M market

Digi International and Deutsche Telekom announce a collaboration to enable easy access and control of remote devices used in machine-to-machine applications throughout Europe. Digi will integrate Deutsche Telekom's industrial-grade SIM cards into its wireless gateways and routers and M2M SIM management functionalities into the iDigi Device Cloud.

Digi M2M solutions are used in numerous applications, such as connecting and monitoring remote assets like storage tanks, vehicle fleets, solar power arrays and other remote devices. Therefore, Digi's M2M solutions are often used in places where rough weather, movement, vibrations and extreme temperatures can interfere with the optimal functionality of integrated SIM cards.

[News ID 16288](#)

■ TI: low-price kit for ARM Cortex-M4 developers

Expanding its LaunchPad portfolio to the ARM ecosystem, Texas Instruments announced a new low-price, easy-to-use Stellaris LM4F120 LaunchPad evaluation kit. The core of the new LaunchPad is a Stellaris LM4F120 MCU with best-in-class low power, integrated analog and floating point performance and lends itself to the highly flexible and modular design environment of the LaunchPad with abundant peripherals for real-time digital signal control.

[News ID 16211](#)

■ Microchip: additions to the 70 MIPS dsPIC33E and PIC24E product families

Microchip announces new additions to the 70 MIPS dsPIC33E and PIC24E product families which build on Microchip's motor-control and general-purpose device families which include integrated op amps and a Charge Time Measurement Unit for temperature sensing or mTouch capacitive touch sensing. The new Digital Signal Controllers and microcontrollers feature 70 MIPS of performance for motor control, sensing, actuators and other embedded applications.

[News ID 16298](#)

■ XMOS demos multicore microcontroller technology at electronica 2012

XMOS will use electronica 2012 to showcase new developments in its XCORE multicore microcontroller family. Demonstrations at the show will include docking solutions for current and next-generation smartphones and reference platforms for AVB and USB audio. The company also plans a number of exciting product announcements that will be revealed closer to the time of the show.

XMOS is the de-facto standard in USB Audio 2.0. Visitors to electronica will be able to discover the company's range of USB reference designs that deliver bit-perfect 24-bit audio and round trip latencies of less than 3ms. The XCORE architecture allows designers to fine tune each reference design with exactly the right combination of general control interfaces, and to implement DSP-based audio effects such as filtering and mixing.

[News ID 16172](#)

COMPANY		PAGE
AAEON		52
Acromag		27
ADLINK		7
ams		51
Artila		46
ATP		29
Avalue		41
congatec		45
Digi-Key		2
E.E.P.D.		21
EBV		11
Elma Electronic		49
embedded-logic		23
ept		48
Express Logic		25
Garz & Fricke		47
Green Hills		5
Holtek		15
Infineon		13
JTAG Technologies	30/31	
Mathworks		19
Maxim		9
Micro-Star Int'l		37
MSC	3/39	
Schroff		43
SEGGER		35

Advertisers Index

■ Freescale and INSIDE to demonstrate secure postpaid smart meter design

Freescale Semiconductor and INSIDE Secure are demonstrating a new secure postpaid electricity meter with near field communication connectivity at the Metering Europe trade show in Amsterdam. The demonstrator shows how easily an electricity consumer can use an NFC-enabled smartphone or other NFC device to read the meter and securely transmit usage information to the utility company for payment.

[News ID 16267](#)

■ Fujitsu: FM3 MCU can now be deployed in SEVENSTAX architectures

The Internet Protocol Suite from SEVENSTAX is now also available for Fujitsu's single- and twin-Ethernet ARM Cortex-M3 microcontrollers from the FM3 family. The FM3 Twin-MAC MCUs are high-end members of the FM3 family and can be deployed for a wide range of applications – such as factory or home automation and the intelligent control of illumination and alarm systems, to name just two. With the porting to the FM3 architecture, SEVENSTAX now also supports this microcontroller family.

[News ID 16264](#)

■ Atmel: MCU-based RF transceiver IC family for the automotive and smart RF

Atmel announces the availability of a new family of low-power, high-performance microcontroller-based RF transceivers designed specifically for the automotive and smart RF markets. With lowest power consumption, high sensitivity and high output power, the three new devices (ATA5831, ATA5832 and ATA5833) are ideal for automotive applications including remote keyless entry, passive entry go, remote start and tire pressure monitoring systems.

[News ID 16275](#)

■ TI: jumpstart automotive design with Hercules safety MCUs, PMIC and motor driver

Texas Instruments announces 12 new Hercules TMS570 ARM Cortex-R4 safety microcontrollers, complementary TPS65831-Q1 multi-rail safety power management integrated circuit and DRV3201-Q1 safety motor driver from TI. The Hercules TMS570 safety microcontrollers, along with TI's first functional safety PMIC and the industry's first functional safety motor driver, form a "safety motor control chipset" and maximize failure detection and mitigation while minimizing software overhead.

[News ID 16277](#)

■ Advantech: industrial touch computer powered by an Intel Atom

Advantech announces the PPC-3100 Panel PC, a new industrial touch computer with excellent computing performance powered by an Intel Atom processor, providing the best human-machine interface applications for equipment control in the automation industry. Compared to its predecessor, PPC-3100 is smaller in size and features convenient settings with a streamlined appearance and easier to use interfaces.

[News ID 16237](#)

■ Microchip: dsPIC DSCs optimized for digital power and lighting applications

Microchip announces a new family of dsPIC33 GS Digital Signal Controllers optimized for digital-power applications via integrated high-speed ADCs, a zero-wait-state signal processing core, and flexible high-resolution PWMs. These peripherals are integrated for streamlined interoperation, enabling sub-microsecond digital control loops. Other key features of this family include on-chip analogue comparators with programmable hysteresis and rail-to-rail operation, and an on-chip PMBus address selection current source to reduce external components.

[News ID 16231](#)



www.ams.com

"innovation distinguishes between a leader and a follower."

- steve jobs

at ams, the future of sensors is here today.
electronica. hall a5. booth 107.

AAEON Solutions with 3rd Generation Intel® Core™ Processor

What's new?



GENE-QM77

3.5" Subcompact Board



COM-QM77

COM-Express Module Type 6



IMBA-Q77

ATX Motherboard



EMB-QM77

Mini-ITX Motherboard



IMBM-B75A

µATX Motherboard



TKS-G21-QM77

Fanless Turnkey-Solution



AEC-6877

Fanless Embedded Controller



AAEON[®]
an **ASUS** ASSOC. CO.



electronica 2012
inside tomorrow

Visit **AAEON** at Hall **A6.315**

AAEON Europe

Ekkersrijt 4002, 5692 DA Son, The Netherlands
TEL: +31-(0)499-462020
Fax: +31-(0)499-462010
E-mail: info@aaeon.eu

AAEON Technology GmbH

An der Trift 65d, D-63303 Dreieich, Germany
TEL: +49-(0)61033-7479-00
Fax: +49-(0)61033-7479-49
URL: www.aaeon.eu



**Intelligent
Systems
Alliance**