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February 01/14

Energy

Medical

Industrial

Tom Bradicich
National Instruments

Joyce Mullen
Dell OEM

Ido Sarig
Wind River

SPECIAL ISSUE

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Exhibition & Conference
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INDUSTRY VIEWPOINTS on the **INTERNET of THINGS**
What's Ahead for 2014 and Beyond

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**Rugged Computer Boards and Systems for
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Dear Reader,



Once again it's time for the embedded community to meet from 25th to 27th February 2014 at the fairgrounds of NürnbergMesse to participate at the world's biggest event for the international embedded - industry – the 12th embedded world Exhibition&Conference 2014. This year the event will present an even bigger range of products, more space and a larger international involvement.

This year the keynote speech proves once again that embedded designers will find information about actual and future trends which impacts embedded systems. The main topic this year will be the Internet and its importance regarding security for the embedded industry. David Kleidermacher, Chief Technology Officer (CTO) of the operating system and development tools provider Green Hills Software, tackles the topic of security in the Internet of Things in his keynote. Despite believing the "Internet of Things" to be a natural evolution for embedded systems, he sees the rapid assimilation of trillions of objects into the Internet over the next decades as posing an unprecedented privacy and security challenge that must be dealt with in advance. His presentation will discuss these challenges, offer a security strategy for developers to meet them, and demonstrate the technical and economic competitive advantages for secure things in the Internet of Things.

Jacob Appelbaum's keynote "You really are the legitimate target for surveillance" will be the highlight of the embedded world student Day on 27 February 2014, when he will address over 1,000 university students on the third day of embedded world. Appelbaum, US Internet activist, journalist and expert on encryption methods and IT security, was spokesman for the disclosure platform Wikileaks. Again and again he urgently appeals to the responsibility of every individual to defend civil rights such as the protection of the private sphere. Another recognized expert on Internet law speaks in addition to Appelbaum: Professor Dr. Nikolaus Forgó. In his keynote on "Privacy & European Law" he will describe the legal situation concerning Internet use and also covers the rights in spheres like Facebook, Twitter and Co.

The M2M Area starts in 2014 with a record number of exhibitors. Machine to machine communication (M2M) is a topic that keeps coming up at embedded world. 42 exhibitors present their new products for wireless machine-to-machine communication on over 900 square metres in hall 4. One of the major components of an embedded system is an energy-efficient, fail-safe and sound display. At the electronic displays Area in hall 1 – also larger in 2014 – 46 companies will present on 1,400 square metres with their products for LCD, OLED, PDP, LED or ePaper, but also with flexible displays, human-machine interfaces, graphical user interfaces, touch screens or 3D displays.

As you can see – there are a lot of interesting trends going on in the embedded world – and you should visit the event in Nuremberg to get the news. **You'll find us in hall 5 booth 171.**

I hope to meet you there.

Yours sincerely
Wolfgang Patelay
Editor



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Troy Smith, Director, Intel Intelligent Systems Alliance, talked with executives of Wind River, National Instruments and Dell OEM about their thoughts on IoT challenges and opportunities in the healthcare, industrial control, mass transit, and energy markets.

Getting the most from ARM Cortex-M3 and M4 microcontrollers **Page 14**



This article provides a closer look at some of the more interesting but often-overlooked features found in Cortex-M3 based microcontrollers (MCUs), as well as new M4 variants.

Opportunities and challenges in smarter connected control **Page 18**

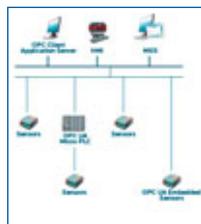


Smarter connected control is needed to satisfy the increasing commercial and consumer demands of manufacturing, transport and communications. Xilinx is addressing this challenge with the Zynq-7000 All Programmable SoC, the first device integrating an ARM dual-core Cortex-A9 MPCore processor with programmable logic and key peripherals on a single chip.

Speed is the key to fast-moving embedded markets **Page 28**

Although market demands have accelerated with the growth of the internet, it is possible to keep pace with them through smart sourcing strategies that take advantage of off-the-shelf single board computer technology. Maximising that advantage means choosing a supply-chain partner best placed to put that technology in your hands consistently.

End-to-end data access with embedded OPC Unified Architecture **Page 30**



Embedded OPC Unified Architecture (UA) offers native open data connectivity that is more secure, easier to integrate in multi-vendor environments, and opens doors to new markets, as demonstrated by AREVA.



Cover Photo: Intel



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Industry Viewpoints on the Internet of Things

What's Ahead for 2014 and Beyond



Troy Smith, Director, Intel® Intelligent Systems Alliance, talked with executives of Wind River, National Instruments and Dell OEM about their thoughts on IoT challenges and opportunities in the healthcare, industrial control, mass transit, and energy markets.

Research by IDC, Intel, and the United Nations suggests that the Internet of Things (IoT) is at an inflection point, with the number of connected devices predicted to reach to 50 billion by 2020. For the IoT to reach this point though, we must find a way to network the 85 percent of today's equipment that, according to IMS Research, is isolated in legacy infrastructure. Looking for solutions to this IoT implementation challenge, I talked with three executives of

companies which are part of the Intel® Intelligent Systems Alliance:

- Ido Sarig, IoT General Manager, Wind River, an Associate member
- Dr. Tom Bradicich, R&D Fellow and Corporate Officer, National Instruments, an Associate member
- Joyce Mullen, Vice President/General Manager Global Alliances and OEM Solutions, Dell OEM, a Premier member

Our conversations focused on healthcare, industrial control, mass transit, and energy – some of the most promising and active IoT markets. Dell, NI, and Wind River are providing critical leadership in these applications by collaborating closely with Intel and the other 250+ global members of the Alliance. With solutions ranging from modular components to market-ready systems, these companies are delivering the performance, connectivity, manageability, and security developers need to unleash the IoT. Here are their thoughts on the challenges and opportunities in these emerging markets.



Ido Sarig, IoT General Manager, Wind River

Q: What are the biggest issues in connecting legacy equipment?

A: “For security and safety reasons, many legacy devices were simply not designed to connect to an IP-based IT system. This makes bolting on connectivity difficult. There’s no single standard or solution. Some will need a wired connection. Some will require a wireless connection – and there are so many to choose from. We

have one customer with a billion devices they want to connect. This effort will require selecting and dealing with a wide variety of protocols.

Regulated industries provide a special use case. If you cannot offer end-to-end secure connections, you won't even get in the door. Security is essential to safety, too. From the electrical grid to healthcare to mass transit, bad things can happen when the wrong people gain access to the network and devices. Fortunately, security is one of Wind River's strengths. For 30 years we have provided safe, secure and certified operating systems for highly regulated industries and mission-critical applications where security is paramount and failure is not an option.”

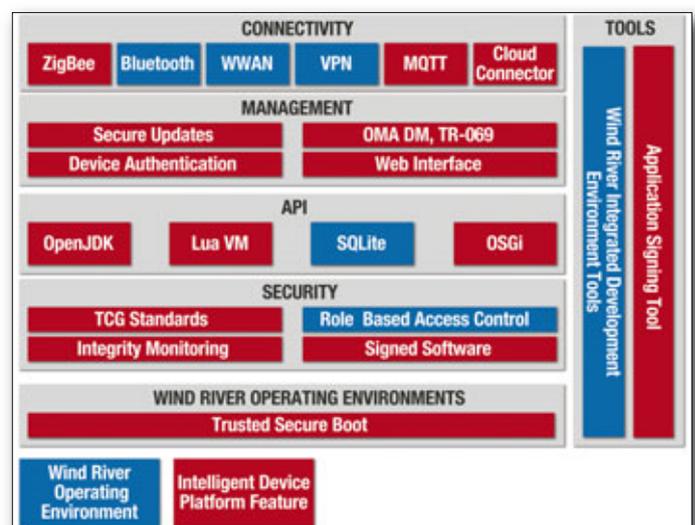
Q: How does the Wind River Intelligent Device Platform (IDP) support connection of legacy equipment?

A: “IDP is a complete software development environment designed to play a major role in enabling intelligent, secure systems-to-systems gateways and hubs. As part of Intel's gateway solutions for the IoT, IDP provides a turnkey, integrated hardware and software solution for addressing connectivity and security. The solution supports an extremely wide range of wired and wireless protocols, including WiFi, 2G, 3G in LTE, various flavors of Bluetooth, personal area networks, LoWPAN, ZigBee, and more.”

Q: How will developers use this platform to help more industries participate in the IoT?

A: “Imagine a factory floor with two hundred standalone robots. Each has a USB port for programming and periodic firmware updates. If you use these ports to connect the robots to IDP-enabled gateways, you have nearly instant secure connectivity through a wide variety of protocols. For security, the gateway provides a hardware-based root of trust that ensures that as the gateway boots up, it's secure and hasn't been tampered with. The connection itself is done over the Secure Socket Layer (SSL), so data is protected in transit. We protect access to the data from the back end as well through role-based access control.

To help developers, IDP comes with a development environment and several programming environments. We expect most customization to



The Wind River Intelligent Device Platform (IDP) provides all the components for a complete software development environment for enabling intelligent, secure systems-to-systems gateways and hubs.



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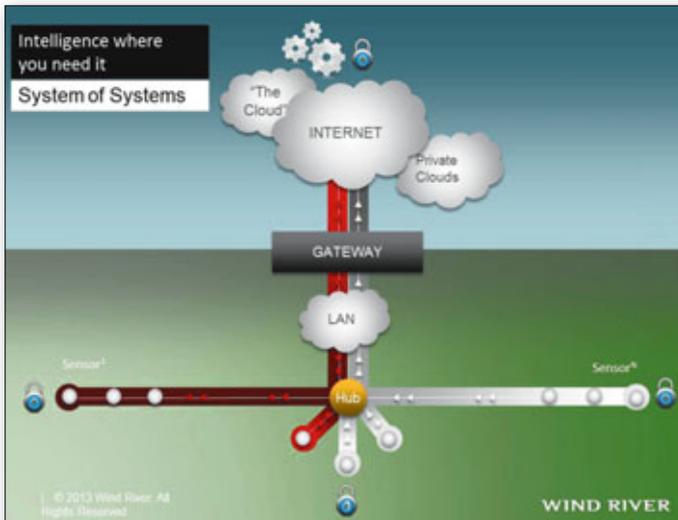
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Connecting sensors and other devices to IDP-enabled intelligent gateways enables nearly instant secure connectivity through a wide variety of protocols.

be done either through OpenJDK or Lua VM. By providing the connectivity and security, we give developers a head start for getting to market faster. The rest is the developer's domain, where their expertise comes into play."

Q: How do Intel® processors help solve interoperability and security issues?

A: "IDP is optimized to run on Intel® processors. This enables us to tap into the scalability of Intel® architecture to address a wide range of use

cases, as well as to make use of unique capabilities of Intel® silicon. Some applications require low-cost, low-power chips. The Intel® Quark SoC X1000 addresses that market. Some applications require more compute power. The Intel® Atom™ processor E3800 product family meets those needs. On the roadmap, we have plans to extend this intelligent gateway platform all the way to boards based on Intel® Core™ processors, and perhaps even Intel® Xeon® processors. In addition, there are important manageability and security features. An example of leveraging the capabilities of Intel silicon is secure boot, which provides a hardware-based root of trust that is essential to a secure end-to-end secure solution."

Q: Why did you integrate McAfee solutions into IDP?

A: "Using multiple layers is a best practice in security. By integrating McAfee Embedded Control into IDP, we're able to add advanced whitelisting capabilities. This means that even if a hacker manages to penetrate physical barriers, circumvent various integrity checks, and get malware installed on a gateway device, McAfee Embedded Control will prevent it from actually executing and causing any damage."

Q: Which industries will benefit most from your solution?

A: "IDP is a very generic solution—any industry can benefit from it. That said, our initial focus will be industrial control, mass transit, and energy. These industries represent large volume sales and need our security and safety features. Other industries can benefit as well. In retail there are enormous numbers of unconnected electronic cash registers and other point-of-sale (POS) devices. In countries with a sales tax, the most efficient method of ensuring compliance is connection back to a tax authority's central computer through a secure, intelligent gateway. There's already interest in IDP to provide that."



Dr. Tom Bradicich, R&D Fellow and Corporate Officer, National Instruments

Q: What are the challenges of harvesting the Big Data generated by the IoT?

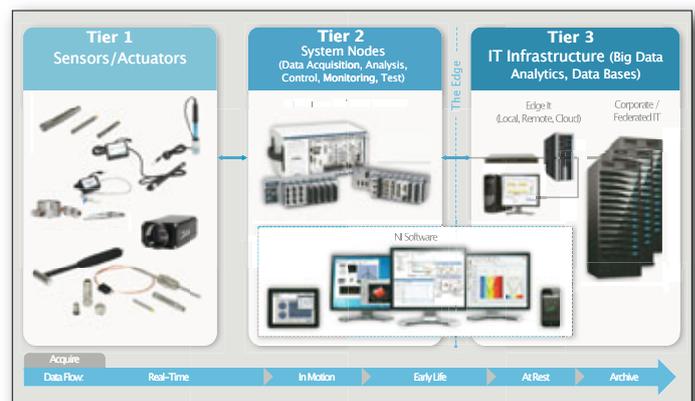
A: "Analog is the oldest, fastest, and biggest among all other types of big data. Analog data can be as big and fast as 40TB a second during high energy physics experiments, to many terabytes accumulated over days in monitoring generators or power grids. Harnessing this analog data presents special challenges. Data acquisition can be geographically dispersed; the data can be voluminous; and, all the accumulated data must be digitized. In addition, accurate and timely analog-to-digital (A/D) conversion presents engineers with a trade-off of speed (sample frequency) versus accuracy (sample bit sizes). Finding the right tradeoff, coupled with the requirement to pre-process the data in the data acquisition nodes, requires sophisticated instruments."

Q: How is National Instruments addressing the issues?

A: "National Instruments (NI) is developing solutions for these challenges through an end-to-end strategy that stretches from sensors to the cloud. Along with key partners, we are facilitating complete solutions incorporating key solution ingredients, such as NI PXI and NI CompactRIO data acquisition and analysis systems, along with design, engineering analytics, and visualization software, such as NI LabVIEW and NI DIAdem. The ingredients of these solutions are portioned into three tiers. At the very edge of the IoT are the Tier 1 sensors, which capture the analog data. The PXI or CompactRIO networked system nodes in Tier 2 facilitate the A/D conversion and process early analytics and visualization. The data then flows into Tier 3, traditional IT infrastructures, usually hitting a network switch or router first, and then into servers and workstations for further analytics."

Q: What role do Intel® technologies play in these solutions?

A: "Intel products are key ingredients in both Tier 2 and 3 of this solution. PXI and CompactRIO systems are controlled by a PC or a custom embedded control module powered by an Intel® Atom™ processor or Intel Core processor. The compute power of these processors is essential to system performance in running complex NI software. For example, NI LabVIEW performs in-motion and early life analytics and visualization. Its development and runtime environment works with NI software libraries that include signal processing, image processing, and waveform signal analysis. NI DIAdem software enables viewing synchronized mixed signal data, historical trends, and comparing multiple data sets. Both PXI and CompactRIO systems depend on Intel® components for data analytics, data management, and systems management. In fact, Intel processors provide vital RASM (reliability, availability, serviceability, and manageability) functions, such as Intel® Active Management Technology (Intel® AMT) for remote monitoring, remediation and repair, and Intel® Trusted



National Instruments' three-tier solution for integrating big analog data into the Internet of Things.



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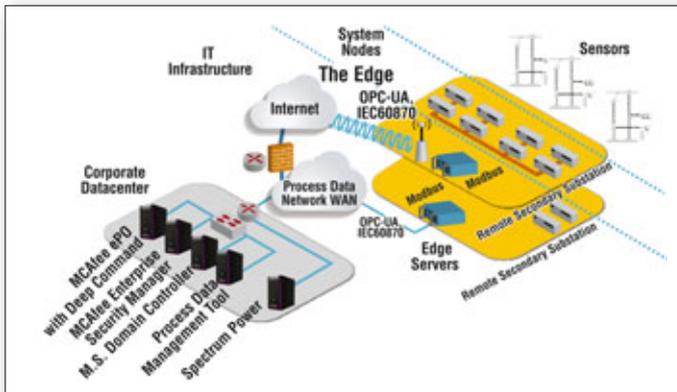
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Collaborative end-to-end synchrophasor solution from National Instruments, Intel, Dell and OSISOft enables smart grid monitoring and phase measurements.

Execution Technology (Intel® TXT) to prevent unauthorized software from launching. These RASM technologies are very important for these sensitive, geographically dispersed, mission-critical IoT applications.”

Q: How are you collaborating with Intel and other Alliance members to create end-to-end solutions?

A: “One excellent example is the end-to-end synchrophasor solution National Instruments has created with Intel, Dell, and OSISOft. This exciting smart grid collaboration includes premier products from all of us. The NI CompactRIOs are software-designed to operate as Phasor Measurement Units (PMUs). We’re particularly enthused about the CompactRIO’s compliance to the IEEE C37.118.A:2011 standard. NI’s ‘Graphical Systems Design’ approach allowed us to meet this standard quickly, resulting in the first compliant PMU in deployment. The accuracy of the PMU data measurements is complemented by Dell IT systems—network gear, servers, and storage—that are powered by the latest Intel processors. OSISOft’s PI software provides the Big Analog Data™ management, analytics, and visualization, as well as data security that meets agency requirements. It’s a complex solution that is made seamless and practical by our collaborative end-to-end solutions approach.”

Q: What applications can benefit from your solutions?

A: “End users are already benefitting from these solutions in three major segments: Condition/Asset Monitoring, Scientific Research, and Automated Manufacturing Test and Control. Our end-to-end solutions and partner approach for smart grids, smart factories, and smart monitoring is particularly appealing because it lowers customers’ integration risk. This, in turn, speeds up their time to value and gets them up and running faster and more efficiently.”



Joyce Mullen, Vice President/General Manager Global Alliances and OEM Solutions, Dell

Q: Healthcare is one of the leading IoT markets. What are the key opportunities in this space?

A: “The healthcare industry is experiencing a dramatic shift in patient care, augmenting traditional face-to-face clinic visits with remote patient monitoring and telemedicine. Supporting this shift is a key opportunity for IoT-driven devices that are designed for use by the patients and caregivers across different geographical locations.

In remote healthcare, Dell sees four IoT opportunities. The first is on-premises patient monitoring. In this case, IoT-driven, non-invasive devices are used to enable continuous monitoring of hospitalized patients without the time and cost of having caregivers visit patients at regular intervals. The second opportunity is remote patient monitoring. Here, powerful wireless applications connected through IoT solutions securely monitor patients at home, sharing information with medical professionals and providing real-time alerts when needed to emergency responders.

The third opportunity is telehealth preventive care. For this, imagine IoT-driven public kiosks, wearables, smart pill-bottle caps, and other devices that can track health and daily activities. These devices can provide advice and reminders on everything from diet and exercise to taking medicine.

The fourth opportunity we’re seeing is consumerization of patient care. It’s obvious to us that patients and insurance providers need to maintain closer relationships. One way to do this is provide incentives for healthy lifestyle practices that are substantiated by monitoring devices. We also think patients should be able to access their health plans on the go through wireless kiosks and tablets to help make the best choices at all times and in all places for their care.”

Q: How are Dell and Intel collaborating to help the industry leverage the IoT?

A: “The two companies are working together to deliver IoT-driven end-to-end healthcare solutions. Based on Intel-powered hardware and technologies, and fueled by Dell’s extensive healthcare experience in customized software and services, we are helping fulfill industry needs in performance, connectivity, interoperability, security, analytics, imaging processing, and regulatory compliance.

Our joint efforts include development of solutions and proof-of-concept demonstrations that will enable faster adoption of IoT trends in medicine. The goals of this collaboration are to overcome the technological challenges, such as the connection of legacy equipment, and to provide thought leadership and best practices for the healthcare industry in general. Dell OEM Solutions recently worked with Intel to help SoloHealth with the necessary technology to expand its line of FDA-approved self-service health kiosks. Another kiosk project, the HealthSpot station, uses Dell hardware powered by Intel Core and Intel Xeon processors to give patients immediate access to medical diagnostics from board-certified doctors via high-definition videoconferencing and interactive, digital telehealth tools. This enables smart, simple care within anyone’s reach.”

Q: What role do Intel® processors play in Dell’s efforts?

A: “Powerful Intel processors are the key to multi-function healthcare solutions because they can simultaneously support the real-time trans-



The HealthSpot Station is a private, walk-in kiosk staffed by a medical attendant. Once inside, patients connect to healthcare providers via high-definition videoconferences and use integrated medical devices to help with diagnosis.

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mission of high-definition audio and video while also gathering the data from attached peripheral medical devices, such as heart monitors, CT scanners, X-ray and ultrasound machines, blood pressure cups, thermometers, and more. All these devices integrate easily with the Intel platform for a seamless solution. The ability of Intel processors to enable Dell devices to simultaneously gather data, run diagnostic procedures, communicate with the patient, and display data gives healthcare practitioners what they need to effectively treat patients remotely.”

Q: What’s on the horizon for Dell’s customers?

A: “There are a lot of exciting things coming up as we evolve our joint IoT strategy and help lead the next wave of healthcare advances. We are working with everyone from small startups with novel approaches to large multinational corporations experienced in building out hospitals and clinic services. Through working with Intel, we expect to enable a new world where patients can participate in their own healthcare in new ways that help improve patient care and hold down medical costs.”

Bringing New Intelligence to the Internet of Things

Our discussion with these Alliance members illustrates the leadership this global ecosystem is providing in unleashing the possibilities of the IoT from the device through the cloud. By offering integrated computing solutions that can accelerate the design process, Intel and Alliance members like Dell, National Instruments and Wind River are helping developers deliver scalable, interoperable solutions.

To learn more about the ways the Alliance is supporting the expansion of the IoT across the spectrum of embedded industries, visit:
intel.com/go/intelligentsystems-alliance

For information on the latest products and services from Alliance members supporting expansion of the IoT, see the Intel® Intelligent Systems Alliance Solutions Directory at:
intel.com/intelligentsystems-alliance-solutions

Hall-Stand 1-310

Rutronik: TFT, passive LCD and OLED displays from DLC

Rutronik Elektronische Bauelemente and DLC Display have concluded a global franchise agreement. This encompasses the entire DLC product portfolio of TFT, passive LCD and OLED displays. The Chinese manufacturer DLC offers a comprehensive product range of TFT displays with diagonal dimensions of 1.44" to 19". They are optionally available with integrated projective-capacitive touchscreen technology (pCap), resistive touch technology or without touchscreens.

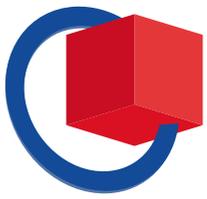
[News ID 1068](#)

Hall-Stand 4-450

Altera: simplify integration of FPGAs and data converters using JEDEC JESD204B standard

Altera announces the availability of a broad range of JESD204B solutions designed to simplify the integration of Altera FPGAs and high-speed data converters in systems using the latest JEDEC JESD204B standard. The interface standard is used across many applications, including radar, wireless radioheads, medical imaging equipment, software defined radios and industrial applications. Altera’s JESD204B solutions include intellectual property cores, reference designs, development boards and interoperability reports for the industry’s latest data converters.

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embeddedworld Preview

Microcontrollers



Lead Story:

Getting the most from ARM Cortex-M3 and M4 microcontrollers

Getting the most from ARM Cortex-M3 and M4 microcontrollers

By Rasmus Christian Larsen, Silicon Labs

This article provides a closer look at some of the more interesting but often-overlooked features found in Cortex-M3 based microcontrollers (MCUs), as well as new M4 variants.



■ Many embedded developers are familiar with the ARM Cortex processor architecture, but few have the opportunity to become sufficiently acquainted with this popular architecture to take full advantage of its unique features and capabilities. This is especially true for the new ARM Cortex-M4 processor, which boasts an improved architecture, native digital signal processing (DSP) capabilities and an optional floating-point accelerator, which a savvy programmer or hardware engineer can exploit to their advantage.

Since many target applications for Cortex-M based MCUs are portable and derive their power from batteries or energy harvesting systems, most of the ideas we will explore involve techniques for reducing the overall energy consumption of a design. In many cases, however, these energy conservation techniques are also helpful tools for designing processor-optimized applications that provide: more cost-effective solutions, more processing margin available for upgrades and new features, as well as performance and features that help products stand out in crowded markets.

Much like the original 16-bit processor cores created by Advanced RISC Machines (ARM) in the 1980s, the ARM Cortex series is based on a Harvard-style RISC machine with a modest silicon footprint that enables high performance

as well as code and memory efficiency. The architecture has evolved considerably over the past decade, branching into three distinct sub-families (or profiles) created to meet the requirements of a particular application space: A-profile products are optimized for high-performance open application platforms, R-profile processors include features for enhanced performance and reliability in real-time applications, and the M-profile processor series was developed for use in deeply-embedded MCUs in applications where performance must be balanced with energy efficiency and low solution cost. Popular applications for the Cortex M series include smart metering, human interface devices, automotive and industrial control systems, white goods, consumer electronics products and medical instrumentation.

The idea behind the Cortex-M3 architecture was to design a processor for cost-sensitive applications while providing high-performance computing and control. These applications include automotive body systems, industrial control systems and wireless networking/sensor products. The M3 series introduced several important features to the 32-bit ARM processor architecture including: non-maskable interrupts, highly-deterministic, nested, vectored interrupts, atomic bit manipulation, and optional memory protection (MPU). In addition to excellent computational performance, the

Cortex-M3 processor advanced interrupt structure ensures prompt system response to real-world events while still offering low dynamic and static power consumption.

The Cortex-M3 and M4 processors share many common elements including advanced on-chip debug features and the ability to execute the full ARM instruction set or the subset used in THUMB2 processors. The Cortex-M4 processor instruction set is enhanced by a rich library of efficient DSP features including extended single-cycle 16/32-bit multiply-accumulate (MAC), dual 16-bit MAC instructions, optimized 8/16-bit SIMD arithmetic and saturating arithmetic instructions. Overall, the most noticeable difference between M3 and M4 is the optional single-precision (IEEE-754) floating point unit (FPU) available with the M4.

The success or failure of an embedded design often rests on finding the right balance between system performance, energy consumption and solution cost. In many cases, developers can use the unique features of the Cortex-M processor to optimize for product cost or energy appetite while maintaining, or even improving, its performance. For example, the Cortex-M core has native serial I/O capabilities that can be used to save energy, simplify development and free up peripherals to be used for other application tasks.

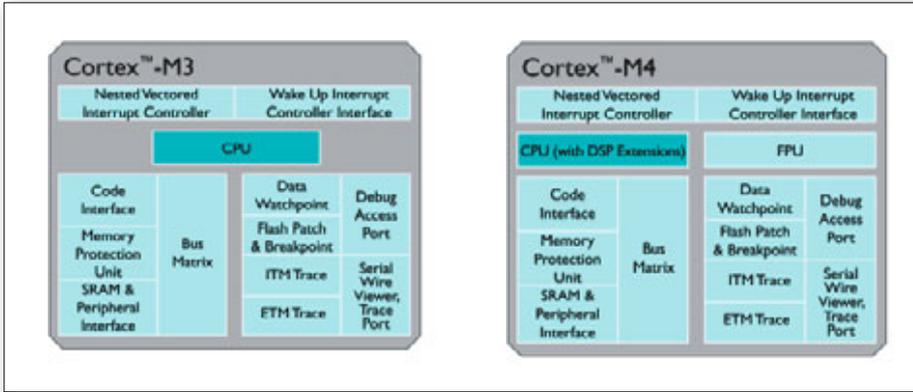


Figure 1. Comparison of the Cortex-M3 and M4 processor cores

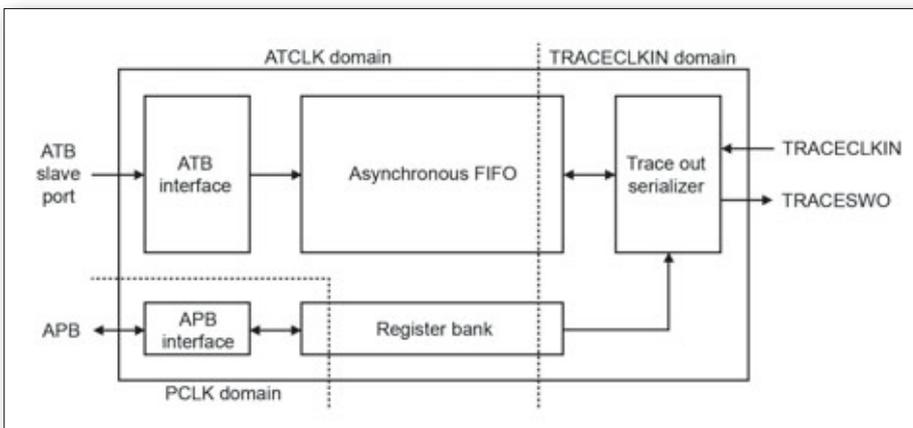


Figure 2. The dedicated ARM Cortex SWO interface saves I/O Pins and speeds up debugging.

Besides the traditional serial wire debug functions, ARM Cortex-M based microcontrollers also offer an instrumentation trace interface through their single-pin Serial Wire Viewer Output (SWO)³, as shown in figure 2. This port can be used to pass printf-format debug messages directly to application code. SWO allows the debug messages to be viewed directly from any standard IDE. Additionally, these messages can be viewed through a standalone SWO viewer such as Segger J-Link SWO Viewer software⁴ or the energyAware Commander from Silicon Labs⁴. Since the SWO output is built into the core HW itself, this is an inherent benefit of the Cortex-M core. SWO doesn't waste any of the regular UARTs of the MCU, which might already be committed to the application.

Another important advantage of SWO-based debugging is that it allows the MCU to maintain an active debug connection when it enters its lowest sleep modes where, in most cases, the logic for traditional debug connections is inoperative. The instrumentation trace of the SWO can also be used for sampling the program counter to help IDEs create statistics on how much time is spent in each of the program functions. These statistics can be combined with current measurements to help fine-tune the energy consumption of a design.

Cortex-M based MCU vendors are beginning to recognize this benefit, and some manufacturers have already incorporated power profile and current measurement hardware into their development platforms for this purpose. For example, all starter and development kits for the EFM32 Gecko MCUs from Silicon Labs include live power measurement outputs, which can be coupled with the program trace in the energyAware Profiler tool⁶. Figure 3 shows how this allows the designer to pinpoint which program functions are the highest energy drains and allows fast debugging of other energy-related problems.

The ARM Cortex-M processor Sleep-on-Exit instruction is another twofer feature that can save both CPU cycles and energy. This is especially useful in interrupt-driven applications where the processor spends most of its time either running interrupt handlers or sleeping between interrupt events. When entering an interrupt service routine (ISR), the MCU must spend several instruction cycles pushing the present thread state onto the stack and then popping it upon return. In applications where the processor returns directly to its sleep after an ISR, a conventional MCU must still recover its stored state information before the thread code can put the device to sleep. Likewise, its

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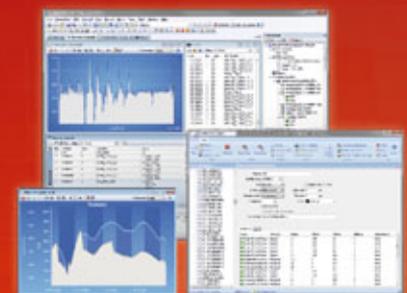
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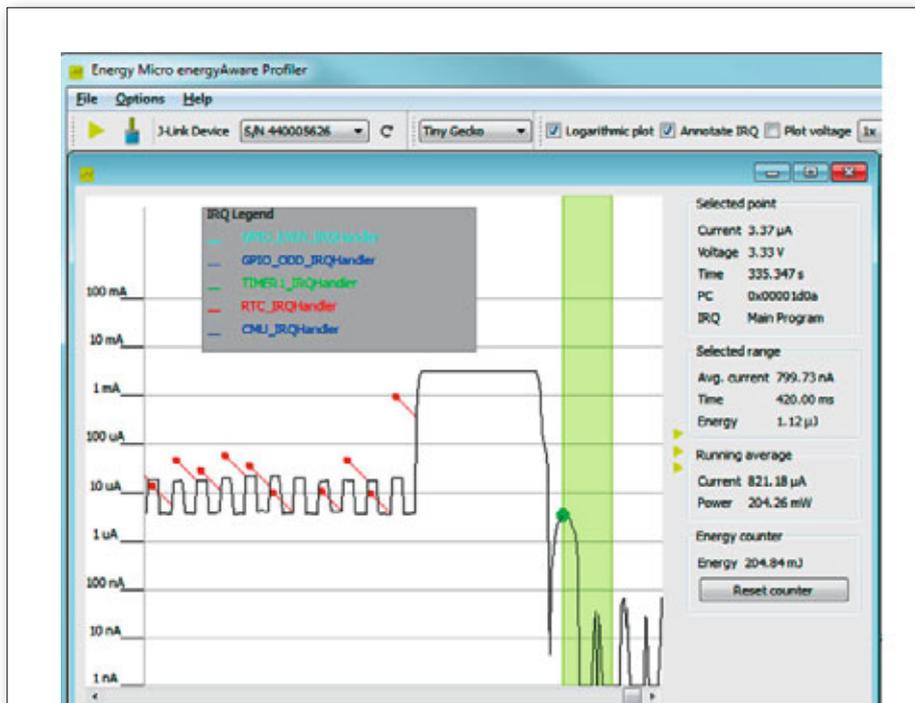


Figure 3. Software and hardware tools that pinpoint which functions are using the most current eliminate the need for oscilloscopes and multimeters and enable fast debugging.

state must be pushed to the stack again when the next interrupt wakes the device. When an ARM Cortex-M based microcontroller Sleep-on-Exit is enabled, the device will enter sleep directly after the ISR finishes without returning to the thread (figure 4). This preserves the processor in the interrupt state, saving the precious machine cycles normally required to push the normal state onto the stack during wake-up. Eliminating the stack push and pop cycles saves both the time and energy otherwise consumed by unneeded instruction cycles, as well as any code a conventional MCU would need to manage the stack between its sleep and wake states. And, should the processor be awakened by a halt debug request, the unstacking process will be carried out automatically.

Like many MCUs, Cortex-M3/4 processors can often achieve energy savings in interrupt-driven applications by running at a relatively high clock rate. This counter-intuitive but commonly used energy-saving tactic works well if the processor spends much of its time in a sleep mode where the savings from its reduced active time far outweighs its slightly higher operating current. Put simply, expending 10 percent more power for 20 percent less time represents an overall energy savings.

This technique can be applied to any Cortex-M series processor, and applications that involve compute-intensive tasks also can often benefit from the added capabilities of the Cortex-M4 processor. Its single-cycle DSP instructions and optional floating point accelerator can

greatly reduce the number of execution cycles required for functions such as digital signal conditioning, filtering, analysis or waveform synthesis. Some applications simply need the processing horsepower of a DSP. For example, some security systems employ a device that senses glass breakages using acoustic analysis. Breaking glass is accompanied by a distinctive series of sounds and vibrations that culminate in a resonance at the characteristic natural frequency of the glass, in this case around 13kHz. Most systems employ a sensor interface that only wakes up the processor when tell-tale frequencies are detected, but designs using a Cortex-M4 DSP-enabled CPU achieve additional energy savings by performing the actual glass break analysis more quickly than software-based solutions.

Even greater energy savings can be realized in these applications using M4-based MCUs that include advanced sleep modes and autonomous peripherals that perform many routine tasks while the CPU remains asleep. For instance, the Cortex-M4 equipped Wonder Gecko MCU7 has five distinct low-energy modes including a 20nA shut-off state and 950nA deep sleep mode (running real-time clock, with full RAM and register contents retained and brown-out detector enabled).

The same features that enable energy savings can also yield other advantages. For example, applications such as ultrasonic/acoustic water meters, which must operate for years on a small battery, require the MCU to remain in

sleep mode as long as possible. In addition to helping to reduce the MCU wake time, the Cortex-4 DSP and floating-point math instructions also eliminate the need for expensive ultrasonic flow transducers by using sophisticated filtering functions to extract the necessary information from the output of inexpensive acoustic sensors. In this application example, the Wonder Gecko MCU peripherals provide additional energy savings by acting as an analog state machine that wakes the Cortex-M4 processor only when needed.

While by no means complete, this modest collection of tips and tricks should give you a good idea of how you can exploit some of the Cortex-M series lesser-known features to your advantage in your next design. The References section at the end of this article provides the details you'll need to put these and other important features of the ARM Cortex-M family to work.

In addition, the EFM32 Gecko and Wonder Gecko MCU families from Silicon Labs provide examples of how the choice of an ARM-based MCU with the right combination of I/O, accelerators and other advanced peripherals can improve the performance, energy consumption and solution cost of a design. For more details about these energy-friendly MCUs, see the Additional Reading list8, which provides additional information on the unique autonomous peripheral system and other advanced capabilities of EFM32 MCUs. ■

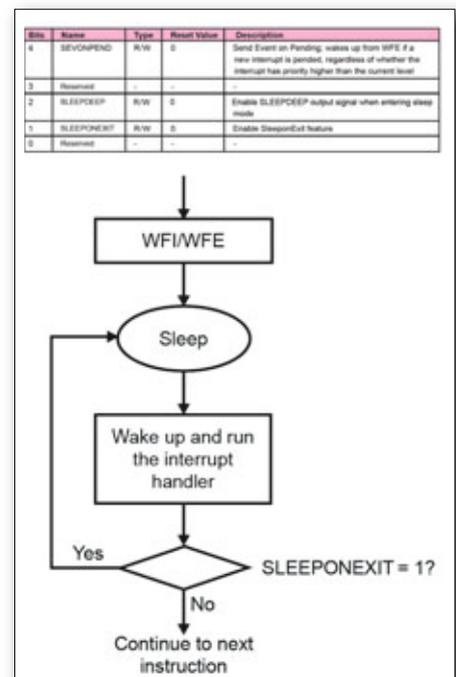


Figure 4. The ARM Cortex-M Sleep-on-Exit capability reduces power consumption by avoiding unnecessary program execution and by reducing unnecessary stack push and pop operations. [Courtesy of "The Definitive Guide to the ARM Cortex-M31".]

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Opportunities and challenges in smarter connected control

By Giles Peckham, Xilinx

Smarter connected control is needed to satisfy the increasing commercial and consumer demands of manufacturing, transport and communications. Xilinx is addressing this challenge with the Zynq-7000 All Programmable SoC, the first device integrating an ARM dual-core Cortex-A9 MPCore processor with programmable logic and key peripherals on a single chip.



■ The desire for more and better is intrinsic to human nature, and is a powerful driver demanding more feature-rich, powerful and cost-effective systems within numerous aspects of life. Broadcast technologies, for example, are required to deliver increasingly lifelike and enjoyable viewing experiences. Communications systems must support richer and more immediate connections between people. Cars and public transport are expected to offer greater safety and enjoyment with better environmental credentials. Manufacturing technology needs to deliver continuous improvements against metrics such as throughput and quality control. And our desire for unflinching security whether at home, at work, or in public places demands all-seeing detection with the ability to record events and recognise or ideally identify offenders.

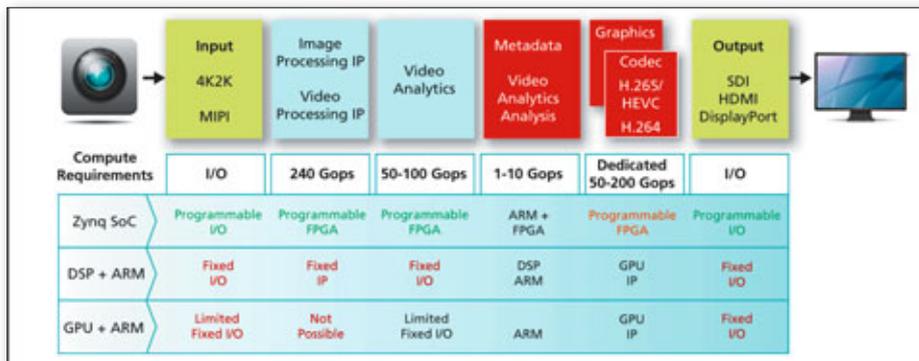
Smarter systems combining high-speed computing, local decision-making capability and high-bandwidth network connectivity hold the key to meeting many of these increasing demands. Communications systems of all types, from consumer broadband services to networked manufacturing automation need to recognise, process and route diverse types of data traffic efficiently, with awareness of any bottlenecks in the network. As another example, precision positioning and motion controls in industrial robotic equipment and automated

machinery require high-performance control systems capable of rapidly executing digital motor-control algorithms in multiple axes simultaneously. On the other hand, powerful image-recognition algorithms – often operating in real-time – are critical for equipment such as advanced driver assistance systems in the latest cars, industrial automation and quality control systems, and networked video surveillance cameras.

The increasing expectations placed on smarter connected applications across numerous industrial markets are driving demands for high-speed processing such as digital imaging and analytics, as well as essential control processing, to be performed closer to the network edge, rather than following a conventional centralised architecture. Some examples include networked security surveillance systems capable of performing basic processing on full-colour, high-resolution video to detect suspicious activity, and forward only the relevant data to a central controller performing higher-level functions such as comparing data from the captured images against a biometric database. Another is pedestrian recognition in driver-assistance systems, which must apply advanced high-speed algorithms to distinguish pedestrians from other objects such as road furniture or parked vehicles. In the manufacturing automation field, equipment such as assembly equipment

or food-preparation systems use sophisticated image-recognition algorithms to inspect manufactured items at high speed, or sort items such as harvested apples by size, attractiveness or presence of any defects. Safety systems also are adopting smart connected technologies to allow greater flexibility and improve protection for factory workers. Examples include virtual safety barriers implemented using one or more video cameras to monitor the space around machines in a production area, or other hazards that cannot be satisfactorily protected using physical barriers. A virtual system can allow unrestricted movement of robotic equipment, for example, yet is able to issue a warning and ultimately shut down the machine if the boundary is breached by a human operator.

In cases such as these, real-time response is typically needed but is increasingly difficult to achieve using a conventional centralised and software-based approach to image processing. For some time now, designers of high-performance embedded systems – particularly real-time systems – have been using FPGAs to accelerate functions that cannot be performed quickly enough in the main processor or DSP. It is also worth noting that safety-critical systems are significantly easier to validate when implemented in hardware, allowing developers to avoid the need for rigorous testing of safety-critical software.



The All Programmable SoC provides a flexible architecture and enables complex functions to be performed in hardware.

As system performance demands have increased relentlessly, this trend has become progressively more advanced and entrenched. However, performance demands in some applications are now pushing beyond the limitations of board-speed interconnections between separate processors and FPGAs. In addition, new demands are emerging for small and lightweight equipment such as mechatronic assemblies or video cameras for use in covert surveillance, gantry-mounted machine vision, and automotive applications. As a result, system designers are under continued pressure to achieve greater hardware integration and miniaturisation. Another important factor is the constant need to adapt to keep pace with changing standards, and to support continuous evolution of successful products as designers seek to add new, faster, and better functionality.

Some standard ICs are available, particularly in the digital-imaging field, which integrate ARM-based control processing with a DSP or Graphics Processing Unit (GPU). Some drawbacks of these devices can include an excessively rigid processing architecture and limited or

inflexible I/O resources. Processing performance can be insufficient as end-user markets continue to push for systems offering more sophisticated features and faster response. These limitations may also restrict future product development, by preventing implementation of new features or performance upgrades without significant hardware redesign such as adding an extra standalone FPGA.

Xilinx is addressing the performance and integration demands facing future generations of smarter connected systems with the Zynq-7000 All Programmable System on Chip (SoC). This is the first device to integrate an ARM dual-core Cortex-A9 MPCore processor as well as programmable logic and key peripherals on a single chip. There is also a comprehensive supporting infrastructure of tools and IP that enables system developers to create differentiating features and quickly deliver new innovations to market. This infrastructure includes the Vivado HLS (High-Level Synthesis) Design Suite, IP Integrator tools, OpenCV (computer vision) libraries, SmartCORE IP, and specialised development kits. With the combina-

tion of an ARM application processor, programmable logic including configurable DSP resources, and peripherals including flexible I/Os capable of supporting a wide variety of industry-standard protocols up to multi-gigabit data rates, the Zynq-7000 All Programmable architecture eliminates the performance bottlenecks encountered between conventional discrete processors, FPGAs, and I/O transceivers. Over 3000 on-chip connections between the processor and logic enable developers to overcome the limitations of conventional board-speed interconnects by exchanging data at silicon speed.

The Zynq SoC provides an ideal architecture for hosting smart connected applications, particularly where high-performance real-time video processing is required. SoC is able to implement signal processing to capture image data from a camera sensor, and can support a wide range of I/O-signals to accommodate diverse camera connectivity requirements. Subsequent pixel-level processing or video processing, followed by compute-intensive analytics leveraging the parallel-computing capabilities of FPGA logic are also performed on-chip. The Zynq device is also able to perform post processing of the analytic data, execute any graphics processing, and finally encode the resulting signals for transmission.

The Zynq SoC ARM application processor and FPGA logic work together. Complex algorithms can be implemented in FPGA logic for example, to accelerate execution and offload the application processor and thereby help meet system performance requirements. To connect the system to a centralised controller or display, the programmable I/O in the Zynq SoC allows developers to target a vast number of market-specific or industry-standard

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communication protocols and video transport standards. Proprietary standards can also be supported. By providing flexibility to adjust and optimise processing resources, the Zynq SoC contrasts with a conventional DSP or GPU-based IC which may not provide sufficient compute performance to execute all the required algorithms within the number of cycles available. An additional standalone FPGA may be needed to support such an IC.

To help developers take full advantage of the flexible, configurable resources of the Zynq device, the Vivado HLS Design Suite dramatically simplifies tasks such as partitioning of hardware and software, to allow tasks to be quickly reassigned if they are seen to be restricting performance. Vivado HLS is particularly well suited to embedded-vision applications, and is designed to be easy to use by developers who are accustomed to working with

vision algorithms written in C and C++. If an algorithm is executing too slowly, or is overloading the application processor, Vivado HLS allows developers to automatically synthesise the algorithm in Verilog or VHDL to run in the SoC FPGA logic. This eliminates any need to manually convert C or C++ code into equivalent HDL code, which can add significant development time and design risk to the project. In addition to avoiding this risk, developers can also take advantage of Vivado HLS to adjust processor versus logic trade-offs very quickly at the systems level, and then run the revised design immediately in the Zynq SoC to ensure optimal system performance for the intended application. The Zynq SoC development infrastructure provides further support for embedded vision applications by also including the OpenCV industry-standard open-source library of algorithms that help accelerate the design of vision systems. The OpenCV

library is continually expanding, and now contains over 2500 algorithms written in C, C++, Java and Python, which are contributed by the open-source developer community. This range from simple functions such as image filters to advanced functions for analytics such as motion detection. Vivado HLS allows developers targeting the Zynq SoC to synthesise or compile these algorithms into RTL code optimised for implementation in the SoC FPGA logic.

Xilinx has also created the SmartCORE IP intellectual property suite, which provides access to embedded vision IP meeting the needs of diverse market segments. Developers can quickly implement SmartCORE IP cores and algorithms from the OpenCV library within an embedded vision project using Xilinx IP Integrator, a plug-and-play tool that supports both schematic entry and command-line environments. ■

Hall-Stand 4-206

Altium: new release of TASKING C compiler for power architecture

Altium announces a new major release of its TASKING C compiler solution for automotive application development, supporting the Power Architecture based microcontrollers from the Freescale Qorivva/5xxx series and STMicroelectronics SPC5 series. In addition to various improvements on code optimizations for speed and size, the new compiler brings device support for the MPC56xx and SPC56x microcontroller series, while also allowing users to develop applications already for new devices by selecting the corresponding e200 core level.

[News ID 931](#)

Hall-Stand 4A-118

SiLabs: 8-bit wireless microcontrollers for IoT

Silicon Labs has expanded its family of 8-bit Si10xx wireless microcontrollers with two new options optimized for both cost-sensitive and performance-intensive designs. By combining its ultra-low-power MCU technology with its sub-GHz EZRadio and EZRadioPRO transceivers in a single-chip solution, Silicon Labs has created new energy-friendly wireless MCUs that achieve industry-leading RF performance with the

lowest overall power consumption in their class. Supporting worldwide frequency bands from 142 to 1050 MHz with low-power sleep and active modes for extended battery life, the Si106x and Si108x wireless MCUs address the low energy and RF connectivity requirements of home automation, security and access control, sensor networks, asset tracking and long-range control applications for the Internet of Things.

[News ID 970](#)

Hall-Stand 4A-210

Freescale: Kinetis miniature MCUs for next generation IoT devices

Freescale Semiconductor is extending its Kinetis portfolio of microcontrollers to include Kinetis miniature MCUs, which offer massive design potential in a tiny industry leading package. Intelligent devices, especially in the Internet of Things era where connectivity and portability is crucial, continue to grow in complexity while shrinking in physical size. Starting at 1.9 x 2 mm, Kinetis mini MCUs use wafer-level chip-scale packaging and maintain the scalability and feature rich IP available across the entire Kinetis portfolio.

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EPI-QM87 ▶ EPIC

Intel® 4th Generation Core™ i7/i5/i3
Processor EPIC Module

- One SODIMM Up to 8GB DDR3L 1333/1600, Triple Display, 18/24-bit Dual-channel LVDS, 1 DVI, 2 HDMI, 2 SATA III, 1 Mini PCIe, 6 USB 3.0, 2 USB 2.0, 4 COM, 8-bit DIO, 2 GbE, HD Audio, Support mSATA



EPS-QM87 ▶ Embedded System

Fanless Intel® 4th Generation Core™
i7/i5/i3 Rugged Embedded System

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Baseboard Design



COMeMini-Carrier Baseboard for COM Express® Mini Type 10

- PCIe mini card and SIM card for wireless communication
- Scalable with COM Express® Mini modules
- Extended temperature range
- Up to 2x CAN 2.0B
- Reference case (up to protection class IP65)
- Power supply 6,5 - 32 V for mobile and industrial use
- Industrial feature connector for IO extensions (GPIO, I2C, SPI, RS232)



SMARcpico-Carrier Baseboard for SMARC™ Standard

- Compact pITX form factor
- Extended temperature range
- Power supply 6,5 - 32 V for mobile and industrial use
- HDMI, USB Host, GBit LAN, PCIe mini card socket, µSD card socket etc.
- Industrial feature connector for IO extensions (GPIO, I2C, SPI, RS232)

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Exhibition Highlights

Hall-Stand 1-479

Syslogics: Embedded computer and HMI systems on show

At this year's Embedded World, Syslogics will be presenting embedded computer and HMI systems for various industry branches. It will be placing the focus here on embedded computer solutions for mobile use. Whether for use with trains, driverless transport systems or industrial machinery, Syslogics can supply the right device. Syslogics touch panel computers from the Projective Capacitive Touch Panel Series comprise a scratch-proof and wear-free touchscreen, thereby meeting the high requirements from industry in terms of robustness and durability. The touch panel computers are designed for an extended temperature range of between -25 and +65° C and suitable for continuous operation (24/7) and are therefore able to stand up to extreme environmental conditions.

As well as their robust touchscreens, the touch panel computers are also equipped with an impressive Syslogics embedded platform taken from the Compact 71 Series, thereby making them ideal for industrial

control systems in harsh environments – especially as the fanless devices are maintenance-free and therefore suitable for 24/7 operation. With the Compact 71 Series, Syslogics offers single-board and box computers developed especially for use in trains, vehicles and mobile machines. Thanks to the uncompromising industrial design, the Syslogics devices are able to withstand not only shocks and vibrations but also extreme temperatures. All computers of the Compact 71 Series manage entirely without moving parts. They are suitable for continuous operation (24/7) and all components are designed for an extended temperature range of between -40 and +85° C.

Thanks to their interface configuration, the Compact SL and Compact ML embedded computers belong to the group of all-rounders among Syslogics industrial computers. The dual-board Compact ML computers are fitted as standard with two Ethernet, two isolated CAN, four USB and six serial interfaces. The industrial computers of the Compact ML Series are also expandable with PC/104 cards and radio modules.

[News ID 1100](#)

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Hall-Stand 4-450

Altera showcases FPGA and SoC designs at embedded world

Altera announced its participation at Embedded World 2014. On their booth, Altera will discuss their portfolio of ARM Cortex A9 and A53 based SoC devices and will showcase a number of FPGA and SoC-based demonstrations. In collaboration with partner Exor International, Altera will demonstrate an implementation of an integrated programmable logic controller and a human machine interface system running on a single 28 nm Altera Cyclone V SoC. Software is provided by Exor International and 3S-Smart Software Solutions to deliver an integrated solution combining embedded control software and graphics libraries. A vision processing demonstration that will use FPGA based processing acceleration logic, created using OpenCL, to highlight the performance improvement an FPGA-based design can deliver for video object detection and automotive driver assistance applications will also be on the booth. Another application will highlight the use of SoC FPGAs in automated control systems and the flexibility of FPGA devices. Together with their partner Enterpoint, the demonstration will showcase the use of Enterpoint's off the shelf SoC-based development boards in a prize grab game machine. On the booth Altera will also demonstrate the use of the high productivity ARM DS-5 Altera edition tool suite. This tool suite, complete with FPGA adaptive debug features and supporting all of Altera's SoC devices, will be demonstrated on Linux and bare metal. Altera will also be showing many operating systems, including Linux, VxWorks, QNX and Windows Compact Embedded 7 running on the ARM processor inside the Cyclone V SoC devices.

News ID 1107

Hall-Stand 4-351

Pentair highlights flexible Interscale enclosure family at embedded world

At the embedded world trade fair, Pentair will be presenting new and ongoing developments in its Schroff brand in the field of embedded systems. The focus will be on enclosures, systems and power supply solutions. A particular highlight will be the first product in Pentair's new, flexible Interscale product family: a series of enclosures for non-standardized smaller form factors. The Schroff Interscale M case is made from metal and has been developed for a variety of applications, e.g. as a fanless fieldbus enclosure, or for single-board computers or ARM modules, mobile diagnosis or therapeutic equipment for medical systems, PC-based point-of-sale systems, video monitoring for building services or peripheral control units for industrial applications. Three versions of the case are available, an off-the-shelf version, a modified version and a customized version, all of which are designed on the same basis. The off-the-shelf Interscale M, available in 1, 2 or 3 U and various widths and depths, consists of four elements: a robust U-shaped body, front and rear panels, and a cover. Pentair also

continues to widen its portfolio of products for different bus technologies. Here the company will present small systems for high processing and graphics-handling capacity that offer high levels of modularity, expandability and redundancy. These include 2-slot AdvancedTCA systems, 2-slot AMC systems and small 3 U high CompactPCI Serial systems with 205 mm depth and 28 HP width along with systems for MicroTCA and VPX. These small form-factor Schroff modular systems are based on trusted product platforms such as standard subracks or chassis and are configured to customer requirements from off-the-shelf components including cooling, power supply etc., with dimensions that can be adapted to specific conditions.

News ID 1111





100GbE FMC Carrier FPGA - AMC534

- Altera™ Stratix V GT FPGA
- Distributed processing for performance & reliability
- Dual zQSFP+ ports to front panel

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Application-Ready Platforms



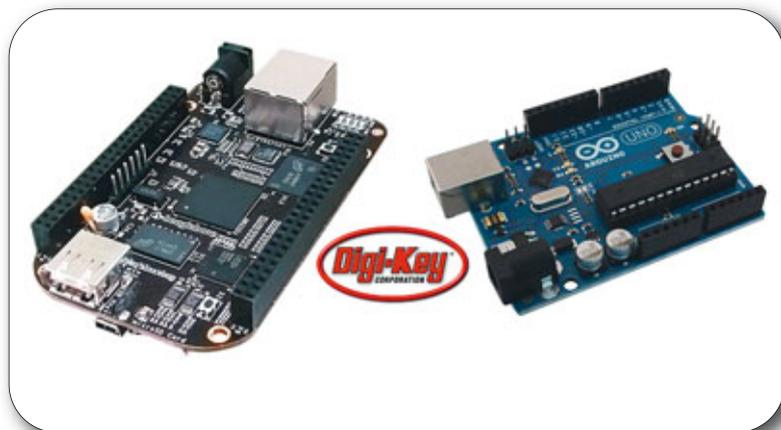
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Speed is the key to fast-moving embedded markets

By Mark Zack, Digi-Key

Although market demands have accelerated with the growth of the internet, it is possible to keep pace with them through smart sourcing strategies that take advantage of off-the-shelf single board computer technology. Maximising that advantage means choosing a supply-chain partner best placed to put that technology in your hands consistently.



■ Fifteen years ago, a group of observers of Internet-based trends wrote a collection of theses that explored how the rise of the World Wide Web would change the nature of business. In the Cluetrain Manifesto, the authors declared “markets are conversations” in which customers and suppliers need to participate. This realisation had some important consequences for the nature of product design and marketing, they argued.

In the past, it was reasonable for a company to embark on a development programme more or less in secret to create a product with a fixed set of features, functions and a defined price. The market could choose to accept that product or not but once the project was initiated it was more or less set on a specific course. Development practices evolved to maximise the profitability of this approach – trading the cost of non-recurrent engineering (NRE) for end-product manufacturing cost to produce highly customised hardware. This would allow the maximum pricing flexibility in the market after launch in case the feature set did not align entirely with customer expectations.

A decade and a half on from the release of the first version of the Cluetrain Manifesto, we can see the effect that the internet has had, and the accuracy of its predictions. One of the key findings was that “networked markets get

smart fast” and, in what they called the Cluetrain Corollary: “the level of knowledge on a network increases as the square of the number of users times the volume of conversation... networked markets are not only smart markets, but they’re also equipped to get much smarter, much faster, than business-as-usual”.

An important – and perhaps the most important – effect of the connectedness of the modern, internet-driven marketplace is the involvement of a much wider range of customers in product direction. Customers now drive much of product development in a variety of ways. A more traditional approach is the inclusion of early-access programmes for well-known customers who can take prototypes and provide almost instant feedback. This approach had its beginnings in the Agile software development methodology in which programs could be released for customer use well before they are finished to ensure that the functionality and user interfaces reflect their requirements.

An even more open approach can be seen in the rise of pre-product funding programmes, hosted through Internet sites such as Kickstarter or Indiegogo. In these programmes, companies can determine the level of interest in a product idea and tune their offering to take into account user feedback. In the middle, there are social-media platforms that allow customers to send direct

feedback to companies and their engineers. Because of the increased communication among users and potential customers, the authors of the Cluetrain Manifesto noted another result of the internet-mediated market: that customers can move to another offering if their current supplier is too slow to react. The traditional way to deal with this issue was to work in secret. However, as ideas now travel fast, there is no guarantee that someone else has not had a very similar idea. The key is to move faster than the competition, which brings traditional product-development models into question even for embedded-systems products where the waterfall-development model has prevailed for decades.

The increased software content of embedded systems and the devolution of real-time functionality into the software domain – through the use of high-speed processors, DSPs and FPGAs – makes it possible to use Agile techniques for embedded products. Because of the real-time nature of these applications, they need to be more feature-complete than Agile office-IT software before they go into customers’ hands. However, an interactive development process means that the end-users are able to incorporate the user-interface and functionality enhancements they value the most. A consequence of the increased need to incorporate feedback into product evolution is the re-

quirement for flexibility. This is at odds with the traditional requirement to build a customised solution in which all of the components have been carefully tuned and cost-engineered. Not only is there not enough time in the development cycle to support this, the need to redesign and re-implement hardware results in repeated NRE expenditure that cannot be clawed back through volume sales. Reducing NRE means exploring the capabilities of off-the-shelf solutions and being ready to move from one variant to another as product requirements change. Single-board computer solutions provide the combination of performance and flexibility that engineering teams require. They provide high-performance processors together with an array of flexible periph-

erals with support for less-common interfaces through plugin modules that can be used across product generations. Memory and power supply options for SBCs ensure that products can be easily right-sized for a given application. Through these options, modern SBC designs provide support for mass customisation without incurring high NRE costs and time. Because embedded systems developers require maximum flexibility in their hardware choices to support high-speed product life cycles, it is vitally important that their supply chain partners can accommodate this. Breadth of choice in SBC platforms is essential to ensure that important points on the price-performance curve are covered. Not only that, stock levels need to be maintained at sufficient levels to ensure that

not only prototyping volumes are supported but that a product can move to early and full production without incurring delays. It is not enough to have an SBC in the catalogue only to find that it will not be available for several weeks. It needs to be shipped when the customer needs it, because as the Cluetrain Manifesto says, their own customers will not wait.

Although market demands have accelerated with the growth of the internet, it is possible to keep pace with them through smart sourcing strategies that take advantage of off-the-shelf SBC technology. Maximising that advantage means choosing a supply-chain partner best placed to put that technology in your hands consistently. ■

Hall-Stand 4A-300

Mouser Electronics now stocking Axiomtek

Mouser Electronics entered into an agreement with Axiomtek to supply their extensive offering of Single Board Computers, Industrial Motherboards, and embedded systems. As a leading member of the Intel Intelligent Systems Alliance, Axiomtek is focused on bringing intelligent systems and solutions to embedded systems engineers worldwide. Mouser is stocking a wide selection of Axiomtek solutions, such as the Mini ITX form factor MANO series of socketed industrial motherboards, and Pico ITX embedded motherboards, a credit card-sized form factor used in space-constrained embedded applications.

[News ID 1015](#)

Hall-Stand 1-548

ADL: 3.5-inch SBC supports 4th gen Core Quad/DC i3/i5/i7 processors

ADL Embedded Solutions announces its ADLQM87HD 3.5-Inch SBC based on 4th Generation Intel Core Quad/DC i3/i5/i7 processors. The ADLQM87HD features Intel's 4th generation Intel Core processors with Intel's latest HD Graphics 4600 engine and support for DirectX11.1, OpenGL 4.0, and OpenCL 1.2. The ADLQM87HD also introduces the

Intel's new AVX2 instruction set and TPM 1.2 and USB 3.0 functionality. The ADLQM87HD also supports a broad set of features including video ports for DVI/VGA and HDMI/DP, 3x RS232 COM ports, 4x SATA 6Gb/s with RAID 0, 1, 5, 10 support, 8x USB2.0, 3x USB 3.0, two bootable Gigabit Ethernet LAN ports, and HDA 7.1. Expansion possibilities include a miniPCI socket as well as a 2x40-pin PCIe expansion connector with four PCIe x1 lanes or one PCIe x4 lane for additional breakout or mezzanine board functionality.

[News ID 1039](#)

Hall-Stand 1-306/1-448

AAEON launches new railway box PC

AAEON releases the new high-end AEV-6356 Railway BOX PC to satisfy the versatile needs of railway business. The AEV-6356 adopts a powerful Intel Core i7-3517UE Processor and is EN50155-TX certified, which governs the operation, design, construction and testing of electronic equipment used on rail vehicles and in railway applications. This certification also regulates running at a wide operating temperature between -40°C ~70°C and 80°C for 10 minutes.

[News ID 1000](#)



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End-to-end data access with embedded OPC Unified Architecture

By **Liam Power**, MatrikonOPC

Embedded OPC Unified Architecture (UA) offers native open data connectivity that is more secure, easier to integrate in multi-vendor environments, and opens doors to new markets, as demonstrated by AREVA.

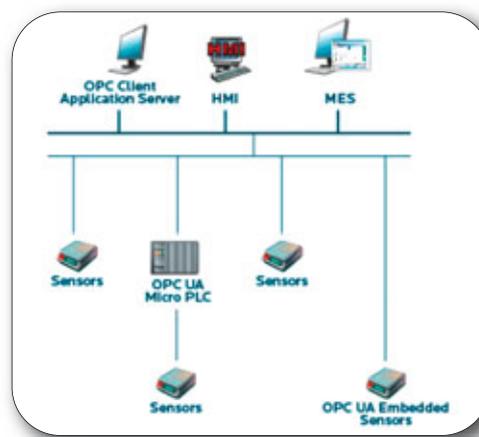


Figure 1. Embedded OPC UA connectivity

■ OPC Unified Architecture (UA) is the OPC Foundation's next generation of OPC standards. Learning from past successes and challenges as well as the evolved needs of modern control automation environments, the OPC Foundation has stayed true to the original vendor-neutral data connectivity philosophy but has redefined and upgraded the flexibility, power, and security of the entire OPC model. Rapidly gaining traction in many industrial spaces outside of process control (e.g. building automation), OPC UA was designed from the ground up to be platform- and OS-independent, enabling seamless communication between all components of an automation system and the enterprise.

Thanks to OPC UA flexibility, OPC UA applications can be developed for non-Windows platforms such as Linux and for embedded systems running an RTOS (Real Time Operating System), or even for so-called bare metal environments where there is no operating system. OPC UA can be embedded in microcontrollers costing less than \$5. Why embed an OPC UA server in a device? In a word: simplicity. For end users, the Holy Grail of data connectivity is finding the easiest, most efficient and cost-effective way to access their data when and where they need it – all without adding additional PCs and performing additional configurations and mainte-

nance. Having OPC UA run natively (embedded) right on the devices themselves makes good sense.

If you have embedded an OPC Server directly in the device you can create an optimal solution for almost every application. Because the OPC tags are natively present in the device, the commissioning engineer simply has to point and click to choose the OPC tags he wants to visualize or log. Because the network is using OPC from end to end there is no need to manually create OPC tags and map process variables from other protocols. This greatly reduces commissioning time and reduces the potential for error. Because OPC UA communications can be authenticated and encrypted, the installation has the potential to be more difficult for an attacker to compromise. Simply getting inside the network boundary is not sufficient to carry out an attack on a process.

While the data from embedded UA servers would typically be routed via a central server or redundant servers, there is always the option to connect to the device directly if required. This provides many options for device configuration and management as well as cost reductions for very small installations. Finally, OPC UA is more than an industrial automation protocol. It also contains an extensible information model that makes it very attractive to

many vertical markets. Adding OPC UA support to your device offers the potential to open up new markets.

An example for this is the company Areva. They recognized early on the potential of OPC UA in sensors and started integrating them into monitoring instruments (SIPLUG) for valves and their associated electric drives. The solution is used in the nuclear industry for monitoring critical systems in remote environments, without negatively affecting the availability of the system. Before this, SIPLUG utilized a proprietary data exchange protocol, just like most of the applications in the nuclear energy sector. This meant however that integration into existing facility infrastructures was difficult, and the outlay for various aspects, such as data buffering or data analyses, was always linked with extra costs.

From an end-user perspective, the native OPC UA connectivity enables direct embedding of Areva products into the infrastructure, without the need for any additional components: The solution allows the reporting and trend monitoring system of Areva to access the SIPLUG data directly. This means that the need for additional drivers and infrastructures can be dispensed with completely. What's more, additional values, such as pressure and temperature values available at the factory level, can be



Figure 2. Areva SIPLUG valve monitoring device

utilized easily in order to improve the precision of the data evaluation. With Areva, OPC UA can be used to provide access to SIPLUG data within the upper levels of a company via an open, international standard (IEC62541). The challenge of end-to-end data availability has

therefore been solved. In addition to the reliability of the data, integrated security is also an important aspect for the utilization of OPC UA. The minimal memory requirements, which start at 240kB flash and 35kB RAM, can be integrated into the smallest Areva devices.

The demand for control automation products that are easy to integrate into a company's data-sharing infrastructure is on the rise. OPC UA, the latest generation of the world's most popular open data connectivity standard allows for OPC UA servers to run on virtually any platform or OS – including embedded applications. By using a high quality OPC UA Embedded Server software development kit you can quickly add value to your industrial electronic devices. The OPC UA Embedded Server SDK is a software development kit that allows to quickly and easily add an OPC UA Server to embedded products. The scalable, standards-based SDK can be integrated into every class of device, from discrete sensors and actuators to programmable controllers and beyond. You can add real value to your product by enabling direct point-and-click configuration, management and monitoring from any OPC UA client. ■

Hall-Stand 1-128

Innodisk: peripheral modules for embedded systems

Innodisk is introducing a new line of peripheral modules for embedded applications. Users will be able to interface to LAN, serial ports (USB/RS232-422-485/PCIe), storage devices and video displays easily through these space-efficient embedded peripheral boards. The embedded peripheral modules offer a full set of signal conversion and expansion options to embedded systems. Output signal functionality ranges from LAN, serial ports (USB/RS232-422-485/PCIe), and SATA interface cards, to display cards outputting analog VGA and digital signals (HDMI/TTL/LVDS).

[News ID 1070](#)

Hall-Stand 2-430/2-220

Advantech: QSeven modules with ARM Cortex-A9-based Freescale i.MX6 processors

Advantech announces the ARM-based QSeven module ROM-7420, powered by a Freescale ARM Cortex-A9 i.MX6 Solo/Dual 1GHz high performance processor that delivers multimedia on a low-power platform. Compliant with Qseven Specification 1.20, the ROM-7420 features compact size (70 x 70 x 8 mm), feather weight (21g), and ultra low power consump-

tion: only 3W. ROM-7420 is especially well suited for portable devices and mobile communications; the fanless design and full HD support are ideal for various low-power applications in HMI/Signage, industrial automation, cloud computing and hand held devices.

[News ID 1085](#)

Hall-Stand 1-538

ADLINK: fanless embedded computer is hardware ready for Intel vPro technologies

ADLINK announced its new Matrix MXE-5400 fanless embedded computer based on 4th Gen Intel Core i7-4700EQ quad-core processor. The MXE-5400 delivers outstanding performance, excellent manageability, optimized connectivity, and rugged design in a compact package. Maintaining the ingenious design principles of ADLINK's Matrix series for withstanding harsh environments, plus implementation of ADLINK's proprietary SEMA (Smart Embedded Management Agent) tool, the MXE-5400 maximizes manageability and security for a wide range of applications, making it the optimal solution for outdoor intelligent transportation, digital surveillance, security, and industrial automation applications.

[News ID 1091](#)



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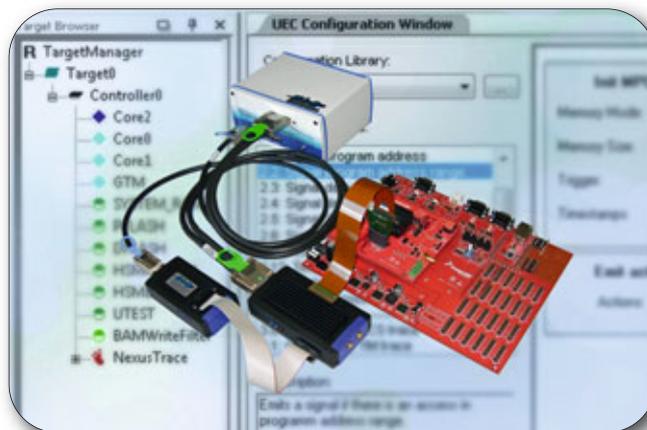
Driven by Safe Electronics



Trace extended to make the peripherals visible

By Jens Braunes, PLS

Code and data trace allow only a limited view of the real-time behavior of current embedded systems. Apart from debug information coming from system busses and cores, there are often special signals inside the peripherals which may be important for debugging, test and system analysis, and are available by extended signal trace.



Practical experience shows that highly complex systems with more than one core as well as with powerful peripherals only become controllable with new trace technologies. The well established Universal Emulation Configurator from PLS is the right tool to deal with this on-chip trace logic. Embedded World 2014 will also show emulation devices from Freecale and STMicroelectronics.

On-chip trace has been established as the state-of-the-art technology for debugging and comprehensive system analysis. It is commonly used for testing and performance measurements. Except for a few, most microcontroller architectures are available with on-chip trace and all major debug tool vendors promote their support for it. In general, the term on-chip trace means the recording of instruction execution – known as instruction trace – and the recording of data transfers between cores and memories and on the system busses – known as data trace. To meet customers' requirements of global system observability, major silicon vendors have extended their trace solutions and added signal trace for peripherals.

Last year Infineon introduced with the Aurix family powerful new automotive microcontrollers onto the market. With the combination of three TriCore 1.6 CPUs, a lockstep mechanism and an access permission system, Aurix

is ready for ambitious powertrain applications demanding high performance and sophisticated security features. A wide range of peripherals perfectly matches the needs of present car drives including hybrid and electrical vehicles. As a specialty, Infineon has licensed the Generic Timer Module (GTM) from Bosch and integrated it into the controller family. The GTM allows realization of flexible and complex timer-controlled algorithms as well as efficient and parallel signal processing. Besides complex and optimized data paths inside the GTM, the module itself is comparable to a multi-core processor. A couple of RISC-like cores inside the GTM allows programming of parallel channel programs. However, in addition to that, the GTM consists of a lot of modules for generating, filtering and transmitting signals.

Debugging and system analysis of such complex and powerful microcontrollers require sophisticated on-chip debug support and trace. Henceforth, for run-time analysis not only program and data trace from cores and busses are needed, but also a bunch of single-bit and multi-bit signals from peripherals and the GTM must be taken into account. Therefore, for Infineon the challenge was to extend its trace solution to meet these requirements. However, with up to a few hundred single-bit signals needed to be part of the trace output, the trace hardware located on the die, and not least the trace port,

quickly reach their limits. The only solution is to limit the amount of signals coming out from the peripherals and the GTM according to the actual debug use-case.

For this purpose Infineon has extended the On-Chip Debug System (OCDS) of the Aurix MCUs with a trigger switch (figure 1). It allows to transfer selected bunches of signals from peripherals as well as the GTM to different sinks of the debug system. One of those sinks is the Multi-Core Debug Solution (MCDS) – the trace system of the present Infineon microcontrollers. The vast amount of accrued data is preselected by means of multiplexer cascades. Typically, sets of 16- or 32-bit signals form so called trigger sets, while the containing signals are the fix for each trigger set. Selected trigger sets are then transferred by OCDS trig-

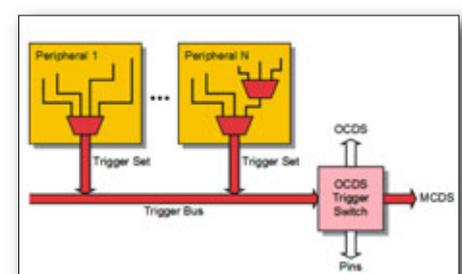


Figure 1. Trigger switch for observation of peripherals

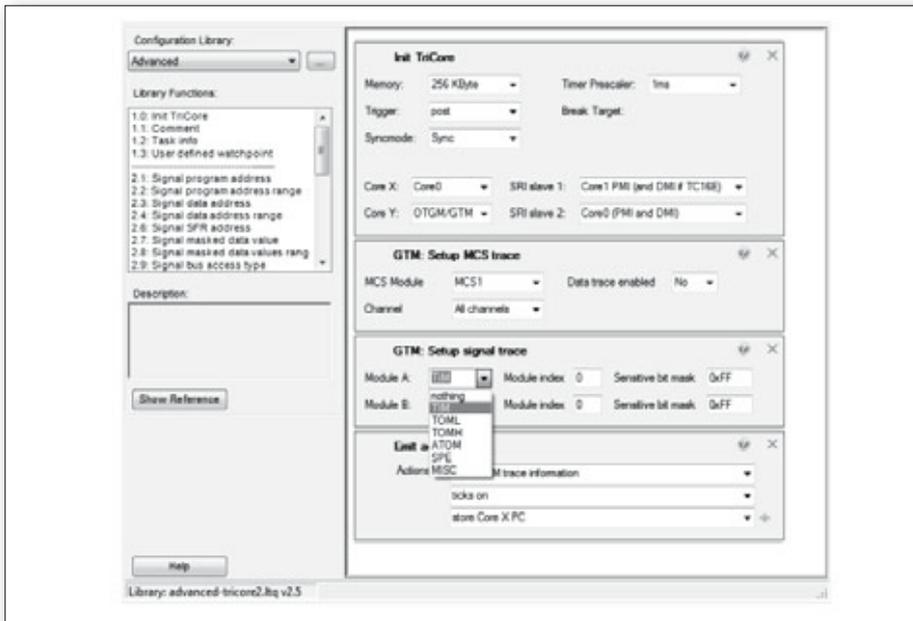


Figure 2. Configuration trace

Index	Tick	Address	Interpret	GTM Signal	Trace Client	GTM Module
0:	14	-334 59 us		TOM_OUT_low=0b11111111	GTM	TOMO
0:	15	-334 59 us	0x70014070 ADDI R1, 0x000001	GTM	MCS1 Ch1	
0:	16	-334 55 us	0x700095C4 CALL 0x70009440	Core0	Core0	
0:	17	-334 55 us	0x700095C4 CALL 0x70009440	F_OUT=0b00000000	GTM	TIMO
0:	18	-334 54 us		TOM_OUT_low=0b11111111	GTM	TOMO
0:	19	-334 54 us			GTM	MCS1 Ch1
0:	20	-334 54 us	0x70148074 JRP 0x0000		Core0	
0:	21	-334 50 us	0x70019000 MOV A4, #10		Core0	
0:	22	-334 50 us	0x70019002 MOV8 d15, 0x0012		Core0	
0:	23	-334 50 us	0x70019004 ADDI d15, d15, -0x7170		Core0	
0:	24	-334 49 us	0x70019006 MOV8 A #15, 0x0012		Core0	
0:	25	-334 49 us		F_OUT=0b00000000	GTM	TIMO
0:	26	-334 49 us		TOM_OUT_low=0b11111111	GTM	TOMO
0:	27	-334 49 us	0x7014806C ADD R0, ZERO, 0x0052		Core0	
0:	28	-334 48 us	0x7001900F LDA #15, [r15], -0x7100		Core0	
0:	29	-334 48 us	0x70019017 LD A, #15, [r15] 0		Core0	
0:	30	-334 45 us		F_OUT=0b00000000	GTM	TIMO
0:	31	-334 45 us		TOM_OUT_low=0b11111111	GTM	TOMO
0:	32	-334 45 us	0x7014806F Data: 0x00000000 Write		GTM	MCS1
0:	33	-334 45 us		F_OUT=0b00000000	GTM	TIMO
0:	34	-334 45 us		TOM_OUT_low=0b11111111	GTM	TOMO
0:	35	-334 45 us	0x70148068 JRP 0x0010		Core0	
0:	36	-334 42 us	0x70019054 MOV A #7, d15		Core0	
0:	37	-334 42 us	0x70019058 Fvaldatch, RET		Core0	
0:	38	-334 38 us	0x70019054 Interrupt: ST & [r7] 0, #15		Core0	
0:	39	-334 38 us		F_OUT=0b00000000	GTM	TIMO
0:	40	-334 38 us		TOM_OUT_low=0b11111111	GTM	TOMO

Figure 3. Peripheral trace of the Generic Timer Module (GTM)

ger buses to the internal trace interface. The trace interface itself does not know anything about the origin and content of the trigger sets. It just sees data packets. Therefore, when the captured trace data is to be decoded, the tool needs to know the actual configuration of the multiplexers and which trigger sets are selected to be part of the trace data.

Peripherals like CAN, FlexRay, DMA controllers or GTM, obviously, influence the run-time behaviour. The integration of their debug signals into the trace system – from now on the term signal trace is used for that – now allows reconstructing an almost complete system state by the debug tool and the observation of interactions between CPUs and peripherals. We have seen that with the new trace sources – the peripherals – a lot of additional trace data becomes available. However this data flood is hardly controllable. The on-chip debug hardware alone does not have the performance to capture all the data and put them off-chip to the debug tool. On-chip data are already filtered

to keep the required bandwidth for the trace to be reasonable. Of course this is also a matter of analysis efforts. The bigger the information flood the more difficult it is for the tool, and in the end for the developer, to identify possible functional errors or performance bugs. A comparatively easy method to configure the multiplexers and filter mechanisms of the Aurix on-chip trigger switch and MCDS is to use the Universal Emulation Configurator (UEC). UEC is part of the Universal Debug Engine (UDE) by PLS, and has been in use for the single-core Infineon controllers for years and well as for the new Qorivva MPC57xx family by Freescale. The flexible concept behind UEC allows a combination of common program and data trace with the new signal trace (figure 2). That way, a trace task can be created completely with one single tool, without the need to separate between on-chip trigger switch and MCDS. Of course, for trace analysis data from different trace source have to be merged and displayed in a combined view. Figure 3 shows an example of such a combined trace.

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Socket			
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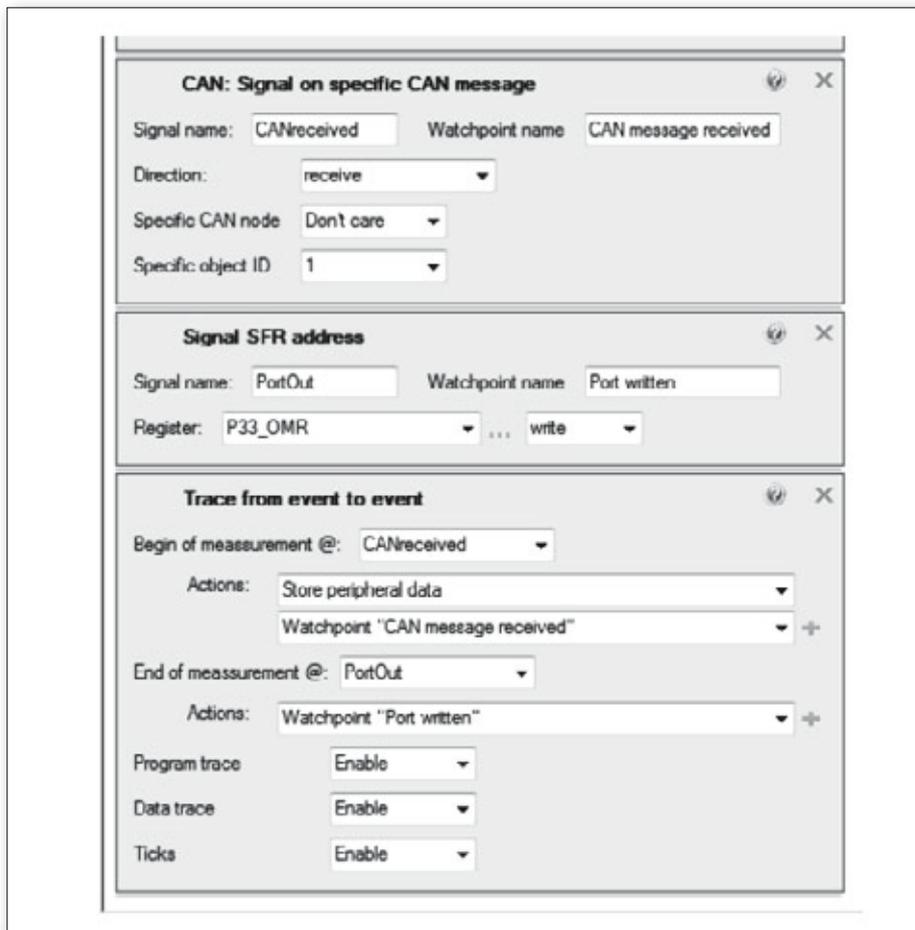


Figure 4. Trace task for the CAN peripheral

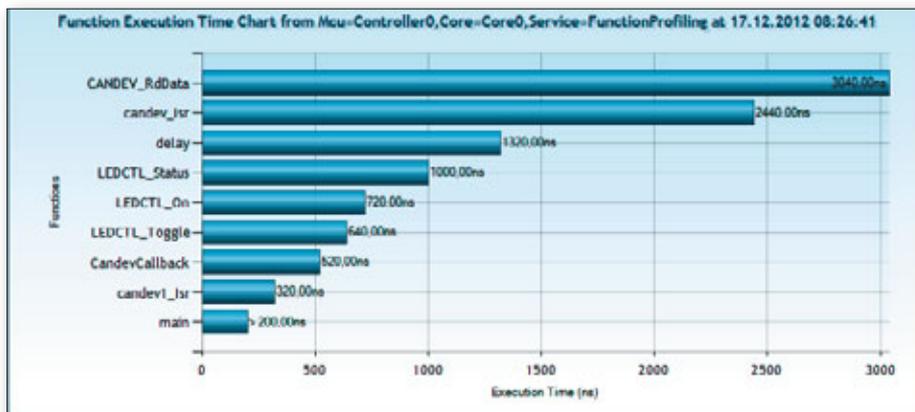


Figure 5. Function profiling

Of course, the combination of program or data trace and signal trace from peripherals provides substantive benefits if a certain event or interaction between different parts of the controller is of interest. As an example, with trace the time an interrupt service requires

from an incoming CAN message to respond with a signal on an external port pin can now be easily measured. The on-chip trace recognizes a particular message on the CAN bus – it is even possible to filter for the origin and message type – and starts the trace recording.

The write access to the port pin is visible to the trace unit as well and can be used as an event to stop the trace. Figure 4 shows the trace task configured with the graphical editor of the Universal Emulation Configurator (UEC). Apart from the time measurement, the configuration contains the setup for a complete program and data trace as well. Using trace based profiling, time consuming sequences within the interrupt service routines can be easily identified (figure 5).

Will signal trace become mainstream? This is an interesting question. For industrial and automotive application signal trace is certainly an important extension to the controller debug functionality. However, you get these things only with some investments in hardware and tools. To keep the hardware costs within limits, Infineon pursues their concept of two different controller types: an emulation device with all the additional hardware for high level debugging and trace, and a production device to be built in the products only with basic debug support. Apart from Infineon with its MCDS, another important player in the area of trace support for industrial and automotive controllers is the NEXUS forum.

They recognized the need for signal trace too and extended the new revision of the NEXUS standard 2012 with a new trace type called in-circuit trace. The first implementation of that new trace type can be found in Freescale Qorivva MPC57xx family. However, in-circuit trace is only used to capture special counter values provides by a debug module called the sequence processing unit. Peripherals are not connected to the trace system except the GTM, which is also licensed from Bosch. For signals and special data of the GTM, vendor-defined messages intended to capture debug information which does not fit in the standard NEXUS messages are used. Whether Freescale will decide to extend its trace support to the other peripherals too is at the moment not known.

The coverage of peripherals by the trace system is certainly an important step forward to fully testable embedded applications. With that trace becomes more and more an instrument for system analysis of complex and complete systems-on-a-chip, and not only for the cores. Now the mission for tool vendors, like PLS, is to provide software tools such as the Universal Emulation Configurator which allow to fully utilize the trace features and to unrestrictedly define tailor-made measurement tasks. ■

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Hall-Stand 5-216

CES: conduction-cooled video I/O and processor XMC

Creative Electronic Systems announced the VPP-8112 video I/O and processor XMC. The VPP-8112 accommodates various input and output channels with powerful image processing capability in a small conduction-cooled format. The VPP-8112 features the DaVinci digital media processor from Texas Instruments. It incorporates an ARM Cortex-A8 processor, running an embedded Linux system, a floating point VLIW DSP, a video image co-processor for H.264 and MPEG-4 video compression, decompression and a 3D graphics processing unit.

[News ID 924](#)

Hall-Stand 2-130

MSC: starter kit for nanoRISC processor modules with TI AM335x

For evaluation and test of the MSC NANORISC-AM335x family of processor modules with Texas Instruments AM335x ARM processor, MSC offers the ready-to-use MSC NANORISC-SK-MB2 starter kit. The kit consists of the versatile MSC nanoRISC-MB2 baseboard with power supply, a 7" WVGA TFT display and a 7" PCT touch panel. A Debian Linux operating system installation on a bootable SD card or downloadable or free is ensuring immediate operation of the starter kit.

[News ID 1036](#)

Hall-Stand 1-370

DATA MODUL: fanless 3.5" SBC powered by Atom E3800

With the ECM-BYT DATA MODUL introduces a new 3.5" SBC powered by the latest Intel Atom processor E3800 product family or Intel Celeron N2920/J1900 processor. Based on the 22nm Silvermont microarchitecture, these new processors are designed for intelligent systems and applications with low power consumption and high performance requirements. The ECM-BYT is a fanless design that supports one 204-pin DDR3L SODIMM system memory with up to 8GB DDR3L 1333/1600 SDRAM capacity. It supports dual-channel 18/24-bit LVDS and dual display (CRT + LVDS, HDMI + LVDS or CRT + HDMI) configurations.

[News ID 958](#)

Hall-Stand 2-346

Diamond: rugged PCI/104-Express SBC with Intel N2800 CPU

Diamond Systems now offers Atlas, a rugged PCI/104-Express single board computer (SBC) based on Intel's dual core Cedar Trail N2800 CPU. Offering a speed of 1.86 GHz and dual core hyperthreading technology that enables

applications to run in parallel, the new SBC provides exceptionally efficient processing. The Atlas SBC combines excellent Intel Atom CPU performance, a wealth of on-board I/O and a conduction cooled thermal solution at a competitive price. Its rugged design makes it exceptionally reliable in harsh applications including industrial, on-vehicle and military environments.

[News ID 1082](#)

Hall-Stand 2-530

Nexcom: robust multifunction railway computer

The latest NEXCOM railway computer nROK 5500 is tailed to host a multitude of train based applications including onboard surveillance, internet access service, and passenger infotainment systems. The EN50155-certified nROK 5500 features powerful Intel Core processors, three 3G and Wi-Fi connections, eight Power-Over-Ethernet ports for IP surveillance cameras, large data storage, robust fanless rackmount enclosure, and extended operating temperature support. The nROK 5500 is a perfect solution to help railway service providers keep passengers connected, entertained and safeguarded aboard.

[News ID 946](#)

Hall-Stand 5-176

Eurotech: public-private partnership in HPC

Eurotech, a founding member of the European Technology Platform for High Performance Computing (ETP4HPC), announces that a Public-Private Partnership has been signed today between ETP4HPC and the European Commission in the form of a contractual arrangement with which the EU and industry will provide vital funding for research and innovation activities in the High Performance Computing sector, which is considered as one of the essential factors to Europe's industrial leadership in the next years.

[News ID 941](#)

Hall-Stand 1-206

Phytec: Cortex A8-based SBC for industrial use

The phyBOARDS are full system Single Board Computer available in stock for immediate delivery. phyBOARDS are a universally deployable solution consisting of a System on Module populating a carrierboard that provides I/O connectivity. Choose among available interface features and processing power that best meet the requirements of your application. phyBOARDS are cost-optimized as well as designed for industrial use and long-term availability.

[News ID 1035](#)



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The pulse of innovation

Hall-Stand 1-511**DFI: COM Express basic module powered by 4th gen Intel Core processors**

DFI launches a new COM Express basic module, the HM920-QM87 with BGA 1364 packaging technology for the latest 4th generation Intel Core processor family. The HM920-QM87 is built on 22-nanometer process technology offering higher processing performance, superior graphics display support, and evolutionary improvements in system memory and I/O interfaces. It is DFI's new COM Express product that supports the mobile-based Intel QM87 Express chipset boasting a 5~15% CPU performance increase over the previous generations.

[News ID 989](#)

Hall-Stand 1-520**Swissbit: storage solutions for all industrial applications at embedded world**

At embedded world, Swissbit will be presenting the S-40 and S-40u series, i.e. the first SD and MICRO SD memory cards with autonomous data maintenance that require no intervention by host or application. This enables the memory cards to offer much longer data retention than conventional SD or MICRO SD cards. Another highlight will be the recently launched X-55 series.

Compared to standard MLC SSDs, Swissbit's EM-MLC 2.5" SATA SSD drives achieve endurance values up to ten times higher while maintaining consistent data retention, in line with the JEDEC standard. The sophisticated diagnosis and monitoring features as well as deletion technology such as Secure Erase make the X-55 series ideal for cost-sensitive industrial applications that nevertheless have tough requirements.

[News ID 1003](#)

Hall-Stand 1-310**Rutronik presents portfolio of embedded boards at embedded world**

Rutronik Elektronische Bauelemente is presenting its portfolio of embedded computing boards, displays, memory components, auto ID, wireless modules and intelligent sensors with maximum depth of integration for the embedded systems of the future at embedded world 2014. For this reason, Rutronik is today responding to the requirements for the future project Industrie 4.0 and the integrated approach for all networked applications.

At its trade fairs stands, Rutronik is exhibiting the technological foundation for the Internet of Things and Services in all functional and practical details. These include a comprehensive portfolio of RISC-based board solutions

with module solutions as well as single-board computers from various manufacturers. Highlights of the x86 segment are the industrial AMD embedded G-series 'eKabini', Intel's new Atom platform 'Bay Trail' and the 4th generation Intel Core i technology. In the storage area, Rutronik is exhibiting the new EM-MLC (Endurance Managed - Multi Level Cell) SD, microSD and SSD Flash memory cards, some with Lifetime monitoring tools, as well as MLC SSDs for the expanded temperature range. Rutronik is introducing TFT displays with integrated projected-capacitive and resistive touchscreen technology as well as without touchscreens in sizes up to 19" from its new franchise partner DLC Display. It will also exhibit TFT displays with integrated projected-capacitive touch f

rom NLT Technologies. In the Wireless segment, and as the sole distribution partner in Europe, Rutronik is displaying the complete certified development tool RFduino with integrated antenna. It can be operated with Arduino firmware as well as with software from Nordic Semiconductor. An interested developer has supplied the distributor with a few hundred discovery kits for the M24SR64 dual interface EEPROM from STMicroelectronics with short range RFID standard. Experienced product and application engineers will be available to provide fair visitors with expert advice.

[News ID 987](#)

Hall-Stand 4-548**Toshiba shows "Digital Kiosk" at Embedded World 2014**

At Embedded World 2014, Toshiba Electronics Europe will be showcasing technologies from across its wide range of standard and custom semiconductor solutions. Among the featured demonstrations is a "Digital Kiosk" that combines TransferJet, NFC and Qi wireless charging technology to show an example use case in which rich digital content, including HD video, can be purchased and downloaded swiftly to mobile devices, such as smartphones. Other sections of the stand will highlight solutions that help to accelerate application development in areas including automotive, industrial, multimedia, telecoms, smart communities, networking, home appliances and consumer devices.

Toshiba's Digital Kiosk is a fully finished concept system that shows how various emerging wireless technologies can function together to deliver new services. The single formed plastic unit comprises an LCD screen with platter for smartphone charging or wireless connection, and status LEDs. To operate, the user taps a kiosk app icon on their smartphone,

previews the available video content via the Kiosk screen, and, if decides to buy, presses the Purchase button and places the smartphone on the kiosk's platter.

The NFC authentication and payment process will then initiate and, once complete, content will be downloaded via TransferJet to the phone with up to 560Mbps. The phones are equipped with Toshiba uUSB TransferJet dongles. Users also have the option to recharge the phone handset wirelessly on the platter.

Other sections of Toshiba's stand focus on NAND-based storage technology including SD cards, USB flash drives, embedded NAND, SSD and HDD; automotive solutions for ADAS and instrument cluster; and micro-controllers - including high-performance, low-power ARM-based MCUs. In addition to the Digital Kiosk, wireless products will include Toshiba's latest Bluetooth 4.0 devices, together with starter kit. Mobile peripheral devices, CMOS sensors for industrial applications, and the AppLite application processor will also be featured.

[News ID 994](#)

Hall-Stand 1-511**DFI: COM Express Compact module with AMD Embedded G-series SoC**

DFI launches the KB968, a new Type 6 COM Express Compact module in its product line based on the AMD Embedded G-Series System-on-Chip. This is DFI's first Compact module powered by AMD Embedded G-Series SoC which is delivering up to 70% overall improvement over AMD G-Series APU.

This new module with the latest AMD embedded G-Series processor-based SoC platform that features power efficiency, high performance, and enhanced multimedia capabilities is well-suited for intelligent systems that display videos, graphics and interactive content such as gaming machines.

[News ID 1058](#)

Hall-Stand 1-606**PEAK-System: CAN to WLAN gateways in plastic housing with a flange**

PEAK-System complements its new gateway product family by two other WLAN-enabled devices. The PCAN Wireless Gateways facilitate the connection of CAN busses over WLAN. For this, CAN frames are wrapped in TCP or UDP message packages and forwarded from one device to another over the IP network. Configuration of the devices is provided by a convenient web interface.

[News ID 1099](#)

Hall-Stand 4-359

EKF: peripheral slot board with quad DisplayPort graphics

The SV1-CLIP is a peripheral slot board for PICMG CompactPCI Serial systems and acts as carrier for a MXM 3.0 graphics module. The SV1-CLIP is provided with four DisplayPort connectors for attachment of video monitors. MXM is an industry standard for embedded graphics modules. Combined with the AMD Radeon E6460, the SV1-CLIP achieves its maximum performance when inserted into a CompactPCI Serial Fat Pipe Slot (PCIe x 8).

[News ID 1075](#)

Hall-Stand 4-150

F&S: i.MX6 ARM Cortex-A9 CPU in credit card format

F&S Elektronik Systeme expands its s PicoMOD product family for another module – the new PicoMODA9. It has a size of 80 x 50mm only (140 pin plug connector) and with its ARM Cortex-A9 CPU (Single-/ Dual-Core CPU), the PicoMODA9 offers up to 4GByte RAM and 1GByte Flash. Other interfaces are Ethernet, USB Host, USB Device, CAN, I2C, SPI, 4 Serial, GPIOs, uSD-Card, ADR-DATA Bus and Audio LIN IN/OUT. The module comes with a display connection in digital RGB (up to SVGA), as well as a touch connection for 4-wire resistive touch and PCAP touch (via I2C). Furthermore, the PicoMODA9 has a 25 poles connector with LVDS and display control signals, offering the possibility to control a display via RGB and one via LVDS simultaneously. The board is supplied with 3.3V.

[News ID 1072](#)

Hall-Stand 2-310

IBASE: 3.5" SBC with 4th generation U-series

IBASE announces its latest 3.5-inch embedded computing platform, the IB908. This compact SBC supports 4th Generation Intel Core processor family U-series with BGA1168 socket that offers significantly lower power design compared to previous generations. The IB908 is the ideal platform for demanding applications in space-limited environments requiring low power, flexible expansion and superior performance, such as industrial automation, communications and POS/Kiosk.

[News ID 1037](#)

Hall-Stand 1-306/1-448

AAEON: Mini-ITX industrial motherboard for gaming, NVR and automation

AAEON releases the Mini-ITX industrial motherboard EMB-H81A which is particularly designed for gaming, NVR and industry automation markets. With a 4th generation Intel

Core i Series processor and Intel H81 Express chipset, it supports up to 16GB of DDR3 1333/1600MHz memory for two SODIMMs. Its two SATA 3.0Gb/s and two SATA 6.0Gb/s ports provide ample storage space. Additionally, this board offers seven USB2.0 ports, two USB3.0 ports, one keyboard/mouse and six COM ports. Users can enhance board functionality with one PCI Express x 4, one Full Size Mini PCIe Socket (with mSATA optional slot). The EMB-H81A has two Gigabit Ethernet ports and also supports independent displays via VGA, DVI and LVDS.

[News ID 1077](#)

Hall-Stand 2-230

MEN: Box PC controls precise positioning of Deutsche Bahn trains

MEN's family of modular and robust box PCs is growing steadily and is in many cases a compact and cost-efficient alternative for applications which, until now, have been implemented using industrial PCs. The latest project of Deutsche Bahn and MEN, for example, uses a box PC for precisely positioning a train. The box PC controls all functions required for the exact positioning of a train on the railway network of Deutsche Bahn. For this, the box PC, which is equipped with two antennas, receives GPS data sent from several satellites and forwards them to the control center via UMTS, where the position and the current speed are calculated.

[News ID 1045](#)

Hall-Stand 1-511

DFI: Mini-ITX motherboards powered by Atom processor-based SoC

DFI launches 2 new Mini-ITX industrial motherboards – BT160 and BT161. The two models use the Intel Atom processor E3800 product family providing low-power consumption while substantially faster and more capable than other chips available today. This unique equipment delivers excellent graphical capabilities, computing, and media as well as a built-in security engine – all on a sub-10-watt system-on-chip making it suitable for a wide range of industrial designs.

[News ID 1004](#)

Hall-Stand 1-328

Axiomtek: 15.6- and 18.5-inch industrial widescreen multi-touch LCD monitors

Axiomtek announced the arrival of the P6157W and P6187W, its new 15.6-inch and 18.5-inch industrial widescreen multi-touch LCD monitors. Designed with durability required to meet the challenges of operations in harsh environments in mind, these attractive flat panel monitors. Axiomtek's P6157W & P6187W

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15.6-inch and 18.5-inch TFT Industrial Widescreen Multi-touch LCD Monitors are rugged, with IP65/NEMA 4 rated spill- and dust-resistant front panel. Built with the most advanced, multi-touch, projected capacitive technology and functionalities to serve ease and practicality of use, these monitors were intended to help enhance operational efficiency and boost productivity.

[News ID 1076](#)

Hall-Stand 4-611

R&S presents high-performance oscilloscopes

Rohde & Schwarz continues to expand its oscilloscope portfolio for various fields of application and will showcase many highlights at embedded world 2014. Tailored to the demands of testing and developing electronic circuits, the new models in the R&S RTM family integrate time domain, logic, protocol and frequency analysis in a single device. The R&S RTM-B1 logic analysis option adds 16 logic channels to the R&S RTM. With a sampling rate of 5 Gsample/s and memory depth of 20 Msample, the R&S RTM is the best in its class for digital and analog channel performance, allowing users to precisely measure long signal sequences. The smart operating concept of the new R&S RTM models ensures extreme ease of use.

The R&S RTM-K31 and R&S RTO-K31 power analysis options provide users with specialized measurement functions to automatically test the quality of modern switching power supplies – including the mains voltage quality of the input range and the safe operating area (SOA) of the switching transistor. A wizard guides the user through all measuring steps and provides diagrams illustrating where to connect current probes and other probes to the device under test. During power analysis, users will appreciate the high sensitivity and dynamic range of the R&S RTO and R&S RTM oscilloscopes. These properties allow the output ripple of power supplies to be characterized exactly and small voltages or currents in converters to be measured with precision.

[News ID 1011](#)

Hall-Stand 4-116

Cadence at embedded world 2014

At embedded world, Cadence Design Systems demonstrates the latest in development solutions for infotainment systems, early software development, and integration and verification of embedded subsystems. The company will present and demonstrate solutions from analog/mixed-signal simulation to complex system configuration to hardware/software co-development.

One of these solutions is the Cadence System Development Suite. The suite accelerates system integration, validation, and bring-up with a set of four connected platforms for concurrent HW/SW design and verification. In 2013, new technologies for a faster software execution and virtualization of the chip environment were added to the suite.

The System Development Suite is comprised of:

- Cadence Virtual System Platform - a solution for early software development at the architectural and prototype design phases.

- Cadence Incisive Verification Platform - a complete family of tools optimized for block- and chip-level verification with testbench simulation as a focal point.

- Cadence Verification Computing Platform (Palladium XP) performs advanced simulation acceleration and emulation in a single environment.

- Cadence Rapid Prototyping Platform – an FPGA-based prototyping solution combining high-capacity FPGA boards with a complete implementation and debug software flow.

- Cadence also presents its media access controller IP for Ethernet-based automotive connectivity at the show. Cadence helps the automotive industry evolve to higher Ethernet speeds and meet consumer demand for high-performance in-vehicle networking applications. The company also introduces its Cadence Sigrity signal integrity and power analysis solutions for system-level verification and interface compliance. The power-aware signal integrity tools integrate the Allegro and Sigrity technologies, providing signoff-level, accurate signal integrity analysis for PCBs and IC packages.

[News ID 936](#)

Hall-Stand 5-360

Wind River to showcase IoT technologies and trends at Embedded World

Wind River will present and exhibit at Embedded World 2014. The company will focus on Internet of Things technologies and trends and the associated opportunities and challenges. Presentations, product demonstrations and live customer applications at the Wind River booth, will widely reflect this theme.

Wind River's presentations at Embedded World 2014 will address the following emerging trends and pertinent industry challenges:

Applying Connectivity, Manageability and Security to Critical Infrastructure: Wind River will cover how software development environments with pre-integrated ready-to-use

components such as device security, smart connectivity, rich network options, and device management can be used to secure, manage, and connect IoT gateways in the critical infrastructure market.

The Redefined Real-Time Operating System: Wind River will discuss its VxWorks RTOS that has been reinvented in response to changes in the embedded market landscape. The company will cover the products new features in-depth that address the IoT, M2M applications, cloud, and security.

Internet of Things Security: Wind River will outline how to adapt and apply the security approaches used in IT to deeply embedded resource-constrained environments, while maintaining and improving security in a massively connected, application specific, and often times safety critical embedded world. The company will also discuss the approach of delivering real-time threat intelligence with operational resilience through an end-to-end comprehensive security solution to protect business processes from multiple threat vectors.

Virtualization: Wind River will cover how open virtualization technologies can enable many applications and functions to run dedicated operating systems and hardware to consolidate into one system. The company will also investigate real-time virtualization using open source kernel virtualization machine technology to deliver extremely low latency with near native hardware performance, high throughput and virtual node management.

Wind River will also be showcasing a wide range of demonstrations, including its RTOS and open source technologies, software platform for IoT, and solutions for the automotive market.

[News ID 982](#)

Hall-Stand 4-600

3S-Smart Software: Raspberry PI programmable in IEC 61131-3 and UML

On the "embedded world" trade fair, 3S-Smart Software Solutions presents add-on products for the CODESYS Development System which considerably extend the functionality of embedded devices both for developers and users. CODESYS IDE for the development of application software according to IEC 61131-3 is used in different embedded devices, e. g. for automating mobile production machines, as an interface to programmable automation devices and in building automation. Add-on products around CODESYS can be purchased in the CODESYS Store an automation app shop.

[News ID 1034](#)

Hall-Stand 4-100

ASSET announces support for ARM64 bit architecture

At upcoming Embedded World, ASSET will be announcing support for ARM64 bit architecture. Arium SourcePoint debugger from ASSET will support the ARM Cortex-A57 and Cortex - 53 processor architectures. The ARM Cortex- A57 is ARM's highest performing processor, designed to further extend the capabilities of future mobile and enterprise computing applications including compute intensive 64-bit applications such as high-end computer, tablet and server products.

[News ID 1040](#)

Hall-Stand 1-340

SILICA showcases ArchiTech hardware solutions

SILICA will be highlighting the benefits of its ArchiTech strategy during Embedded World. ArchiTech provides a solutions-oriented development ecosystem including a portfolio of boards created in collaboration with key vendors together with Board Support Packages, software drivers and training.

ArchiTech boards being introduced by SILICA at Embedded World include:

Hachiko: a development board for the brand new Renesas RZ/A MCU based on an ARM Cortex A9 core. This board offers low cost streamlined design for applications such as Door Entry Phones, Vending Machines, Barcode Scanners, Surveillance, and Data Communication Modules. Tibidabo: a high-end development and reference board powered by the Freescale i.MX 6Quad and running on Linux. The board is particularly suited for digital signage and gaming applications requiring the high performing GPU and two LVDS interfaces. All the boards available from SILICA under the ArchiTech brand have been developed as reference designs with real industrial applications in mind. ArchiTech provides schematics, gerber files and a common SDK across the range meaning customers only need to learn to use just one tool, which is not vendor specific. Similarly all BSPs are developed in house by the ArchiTech team.

[News ID 1098](#)

Hall-Stand 4-310

PLS enables real multicore debugging even with deeply embedded systems

PLS Programmierbare Logik & Systeme is exhibiting the Universal Debug Engine 4.2 at embedded world 2014. The UDE 4.2 features greatly enhanced control and test methods for multicore targets, optimized visualization options during system level testing as well as the dedicated support for a wide range of the

very latest 32-bit multicore SoCs from various manufacturers. Control of a multicore system and debugging is carried out with the UDE 4.2 in a consistently designed user interface. Various colors determinable by the user and user-definable groups of views for individual function units ensure a fast overview and simple navigation, also in complex SoCs. Individual cores can be specifically selected and also synchronized for control by the debugger.

[News ID 1087](#)

Hall-Stand 1-360

Softing: FPGA based PROFINET implementation passes testing for Net Load Class III

Softing's PROFINET device implementation has passed the Class III category of the "Net Load Test" performed by PROFIBUS&PROFINET International (PI). This tough-to-reach performance objective ensures that PROFINET field devices that are based on Softing's protocol software will operate at the highest level of robustness and reliability even under tremendous network load. Softing's off-the-shelf industrial Ethernet communications board FPGA RTEM CIII served as the hardware platform for the Net Load Test. The

PROFINET protocol software is optimized for and executed by the on-board FPGA. The use of FPGA technology ensures that the tested behavior is also achieved in customized scenarios, e.g. if using the same CPU for the application and for the communication.

[News ID 1067](#)

Hall-Stand 4A-119

TES and ELSYS: 3D-surround-view solutions for automotive applications

TES and ELSYS Design will display their latest technology platforms and introduce a 3D-surround-view solution for automotive applications. TES Electronic Solutions and ELSYS Design, both subsidiaries of ADVANS Group, are two companies specializing in the design of electronic systems. Their offer combines services and solutions for innovative and complex projects. At Embedded World 2014, representatives of TES and ELSYS Design will attend with a common booth. They will present demos of their latest technologies and solutions, including the latest customisable Embedded Platforms for use in industrial tablets, professional infotainment and advanced drive assist systems.

[News ID 1047](#)



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Hall-Stand 4-560

Arrow: embedded processing and wireless technology at Embedded World 2014

The theme of Arrow Electronics' presence at Embedded World 2014 in Nuremberg will be 'Intelligent Systems.' The company is exhibiting in the show's M2M section and will be focussing on two main areas: embedded processing and wireless technology. The technologies covered by embedded processing will include microcontrollers and processors, distributed sensing, high efficiency power, and board level solutions. Wireless connectivity will be represented by 802.15.4, Wi-Fi, Bluetooth, NFC/ID, cellular modems and data plans, gateway solutions and data analysis. Arrow will demonstrate how it supports customer needs from individual components to complete system solutions. The company's 80m2 booth will showcase interlinked technologies under the headings Connect (wired and wireless interconnection), Sense (embedded processing) and Control. Power over Ethernet, IO Link and Industrial Ethernet solutions will also be featured, along with the Arrow Testdrive evaluation programme, which now includes over 1500 tools from 44 suppliers. Arrow's Engineering Solutions Center will also be represented.

[News ID 975](#)

Hall-Stand 5-345

ESCATEC at embedded world 2014

ESCATEC will be showing a range of products that it has designed and made for customers from around the world. These range from luxury watches with interactive touchscreens to life-saving medical products and from high performance network analysers to disposable temperature sensors for medicines in transit. An integral part of the design of each of these is the embedded computing and software, which provides the control and Human Machine Interface, and forms part of ESCATEC's world-class quality control standards. The ESCATEC Group provides fully-integrated electronic and mechatronic design and manufacturing solutions to assist customers in achieving success in their market. Its one-stop solutions and service enable companies around the world to operate more profitably, sustainably and efficiently. The Swiss-owned company perfectly blends Swiss business philosophy and attention to quality, precision and detail with the advantage of low-cost, mass-volume manufacturing capabilities in its Asian factories.

[News ID 1050](#)

Hall-Stand 4A-128

Avnet Memec: focus on connectivity at embedded world 2014

Avnet Memec is focusing on connectivity solutions at this year's embedded world and will highlight different solutions and products enabling wired and wireless connectivity. The technology-focused area concentrates on the topics Analog, MCU and ISM as well as Data Processing and Communication displaying products and solutions from Allegro MicroSystems, Applied Micro, Finisar, Intersil, Marvell, Microchip, Microsemi, Quetcetl, Renesas, Sierra Wireless, and Silicon Labs. Furthermore, Cirrus Logic, Coilcraft, PLX Technologies and Semtech will each feature a supplier partner focused station, presenting their product and solution range for power supply or energy management for example. In the Internet of Things corner supported by Echelon, visitors can learn more about 'Prototyping your application on the Raspberry Pi or Beagle Bone Black' and 'Productizing your application on Echelon silicon and modules.'

Once more at embedded world 2014, Avnet Memec will exclusively host the Maxim Integrated Tech Lounge, a dedicated area where Maxim Integrated is showcasing several demonstrations for power supply, energy measurement and signal-chain applications. Among the demo highlights will be Maxim's new family of synchronous high-voltage

buck converters which satisfies all requirements for industrial control designs; the compact MAX78700/MAX78615+LMU isolated energy measurement chipset with preloaded firmware, enabling designers to measure AC or DC power usage from any phase without the need for bulky sensors, optocouplers, or an extra power supply for the measurement subsystem; and, in the signal-chain area, the smallest reference design for IO-Link smart industrial sensors.

[News ID 1053](#)

Hall-Stand 4-440

EBV announces sensorTAG demokit

EBV Elektronik announces sensorTAG, an innovative product that demonstrates various sensing technologies around a Bluetooth Low Energy communication link in a small form factor. This new 'Release' from EBV is a one-stop-shop with sensorTAG, a battery-powered sensor Hub, and a USB-to-BLE nanoDONGLE (9x17 mm). sensorTAG provides an industry-standard sensor portfolio (STM, Freescale, TI) combined with TI BLE connectivity, and includes EBV system knowledge & support for related software and hardware. A NXP humidity/light sensor is also featured as demonstration device. The Sensors chosen by EBV represent a complete offer enabled for low power operation and are either 'high-runners' in the industry or bring innovative and exciting features for the latest applications. The selected products are either MEMS including accelerometer, gyroscope, magnetometer or relative humidity plus light sensor, and thermopile (contactless IR temperature measurement) enabling an important range of physical parameter monitoring.

[News ID 1044](#)

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EXHIBITION HIGHLIGHTS

Hall-Stand 4-520

Rigol: data acquisition/data logger system features up to 320 channels

Rigol expands its product offering with a new data acquisition/data logger switch unit. The M300 combines a DMM with a gauge head selector switch. The highly versatile system can be extended with 5 plug-ins and optionally with a 61/2 digit DMM, 10 different switch and control modules of bipolar switches to matrix cards. For direct connection to a PC or notebook, all relevant interfaces such as LAN (LXI) USB, RS232 and GPIB are available.

[News ID 1061](#)

Hall-Stand 5-340

Express Logic: ThreadX/SMP for multi-threaded MIPS InterAptiv cores

Imagination Technologies and Express Logic announce expanded support of Express Logic's ThreadX RTOS for Imagination's MIPS CPUs. Adoption of the MIPS interAptiv CPU extends ThreadX support of multiple generations of MIPS CPUs, which range from deeply embedded cores to high-performance applications processors. To provide support for the interAptiv family of multi-threaded multicore CPUs, Express Logic worked closely with Imagination and its partners to add new features to the ThreadX/SMP RTOS that enable it to support all multi-threaded MIPS cores.

[News ID 945](#)

Hall-Stand 4-408

Digia: Qt 5.2 features full Android and iOS support

Qt 5.2 adds support for Android and iOS to its extensive range of desktop, mobile and embedded operating system platforms and enhancing its core performance and functionality, Qt 5.2 is positioned as the only cross-platform development framework for UI and non-UI creation to enable intuitive and highly performing platform-independent software applications no matter the target device or screen size. Under the Qt Enterprise offering, Qt 5.2 opens the door to increased mobility of enterprise applications and paves the way for enterprise-ready multi-screen applications that users can experience from desktop to smartphone to automobile to TV.

[News ID 968](#)

Hall-Stand 4-310

PLS: Universal Emulation Configurator supports MPC57xx and SPC57x devices

The Universal Emulation Configurator from PLS Programmierbare Logik & Systeme is now also available for the emulation devices MPC57xx from Freescale and SPC57x from STMicroelectronics. With the help of this special tool for definition of trace and measurement tasks for on-chip emulation logic, the full potential of the emulation devices can be used for the first time without any limitations for troubleshooting and software quality assurance.

[News ID 906](#)

Hall-Stand 4-216

IAR: simplified designing and testing of state machine-based embedded applications

IAR Systems launches a new version of its state machine tool suite IAR visualSTATE. Version 7.2 includes several new features for further simplifying large design projects for embedded applications based on state machines, as well as updated user guides and a new license management system.

[News ID 988](#)



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Hall-Stand 4A-118

SilLabs to unveil ultra-low energy solutions for IoT

Silicon Labs will showcase an array of semiconductor, software and systems solutions for the Internet of Things market at Embedded World 2014. Targeting connected device applications for the IoT, the mixed-signal technology leader will demonstrate its latest energy-friendly ARM based microcontrollers, ZigBee and sub-GHz wireless connectivity solutions, high-accuracy sensors and its next-generation embedded development platform.

Silicon Labs' demonstrations will highlight the energy efficiency and performance of its flagship embedded products, as well as the ease of use of its energy-aware development tools:

Discover how EFM32 Zero Gecko MCUs – the world's lowest energy 32-bit MCUs – can be combined with small-footprint, accurate and easy-to-use sensors to create innovative smart home, smart energy and security applications for the IoT that can sense temperature, relative humidity, ambient light, intrusion and gestures, all within the extreme power constraints required for long battery life.

The Simplicity Studio development platform provides a unified, comprehensive ecosystem and portal for developers using Silicon Labs' 32-bit EFM32 Gecko MCUs and 8-bit MCUs. Simplify your design effort with Simplicity Studio's IDE, hardware configurator, build tools and real-time power analyzer, supported by demos, software examples, data sheets, application notes and access to technical support and community forums.

Discover the right energy-saving EFM32 Gecko MCU solution for your next embedded application. Silicon Labs' 32-bit portfolio includes more than 240 orderable EFM32 Gecko products based on ARM Cortex-M0+, M3 and floating-point-enabled M4 processors. No other MCU vendor can match the energy efficiency of Gecko MCUs for battery-powered IoT and wearable computing applications.

Si106x/8x s wireless MCUs provide an energy-friendly, single-chip MCU + transceiver solution to address the power and space constraints of battery-operated, wirelessly connected devices. Silicon Labs' Si4356 EZRadio receiver provides an easy-to-use sub-GHz wireless solution for remote controls, RKE, sensor networks, security and smart homes. The Si4356 receiver combines ultra-low power (50 nA standby current) with excellent sensitivity to enable superior battery life. This small-footprint (3 mm x 3 mm) standalone receiver is easy to configure and comes with tested, ready-to-use antennas.

Continuing its tradition of showcasing development tools at Embedded World, Silicon Labs will have EFM32 Zero Gecko MCU starter kits and sensor boards available to give away to qualified developers visiting.

[News ID 1041](#)

Hall-Stand 4-325

Green Hills: agreement with HP on Secure Android Smartphones and tablets

Green Hills Software announced that it is teaming with HP to offer trusted mobile devices built with Green Hills Software's INTEGRITY Multivisor virtualization technology for Android and enabled by HP's secure mobility service, to the UK public sector. As part of a new teaming agreement with Hewlett-Packard Enterprise Services (UK), Green Hills Software is piloting a secure mobile device initiative combining HP's secure mobility end-to-end service and Green Hills Software's INTEGRITY Multivisor security technology.

[News ID 937](#)

Hall-Stand 1-606

PEAK-System: evaluation board for industrial communication

For the ARM7 microcontroller gridARM, PEAK-System provides an evaluation board as development platform. The Linux-based system leads out the microcontroller interfaces Gigabit Ethernet, High-speed CAN, USB 2.0, RS-232, SPI, and I²C. Furthermore, the board has 8 digital inputs and 8 outputs as well as 5 analog inputs that can be influenced or displayed by the board components for testing purposes. As mass storage, a microSD card can be used in the corresponding slot.

[News ID 1110](#)

Hall-Stand 5-348

AdaCore: GNAT Pro selected for financial system development

AdaCore announced the adoption of the GNAT Pro Ada Development Environment by Deep Blue Capital, a propriety trading firm. DBC rotates teams through the world time zones at its Amsterdam-based offices to trade twenty-four hours a day on all of the world's major stock exchanges. DBC employs algorithmic trading systems developed in Ada with AdaCore's GNAT Pro development environment; these systems gather market information and automatically send buy and sell orders with minimal human intervention. DBC, a small company with fewer than twenty employees, can operate globally because of its efficient and reliable software.

[News ID 1074](#)

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LDRA helps verifying Russian avionics software

LDRA has secured contracts with Russia's five major avionics suppliers. LDRA's contracts assist with the verification of EASA and FAA regulations that suppliers must comply with for both fixed and rotary-wing aircraft to be used in domestic and international markets. The LDRA tool suite automates and streamlines the certification process, helping these avionics suppliers to achieve DO-178C/ED-12C and DO-254/ED-80 most cost effectively.

[News ID 943](#)

Hall-Stand 1-602

EKH: COM Express carrier board characterization

EyeKnowHow extended its service portfolio. Beside the Signal Integrity measurements EKH provides a solution to characterize COM Express carrier board designs. In order to enable this service EyeKnowHow developed a Com-Express characterization board together with our partner congatec. This board allows connecting all high speed lanes on a ComExpress baseboard to SMA connectors.

[News ID 1038](#)

Hall-Stand 4-548

Toshiba: Bluetooth starter kit and software for dual mode development

Toshiba Electronics Europe has introduced a starter kit that is designed to get users of its TC35661SBG-501 ("Chiron-501") Dual Mode Bluetooth IC up and running with their designs quickly. The starter kit is based around a Panasonic PAN1026 module featuring an embedded "Chiron-501" IC with a dual mode Bluetooth protocol stack and profiles and includes a Toshiba TMPM369 ARM Cortex-M3 based MCU with 512KB flash memory.

[News ID 1060](#)

Hall-Stand 4-218

Vector Software: VectorCAST Global Services is offering project consulting services

Vector Software launches VectorCAST Global Services. The new organization will be responsible for helping customers implement

industry focused, best-practice-based methodologies to improve software quality. Comprised of embedded software development and test experts, the team will focus on providing complete embedded test solutions that reduce cost, risk and time-to-market for customers. The VectorCAST Global Services group will offer project consulting, best practices workshops, continuous-test process implementation, and industry standards compliance analysis.

[News ID 1059](#)

Hall-Stand 4-426

NI: enhanced version of Multisim SPICE simulation environment

National Instruments introduces Multisim 13.0, a SPICE simulation environment used by educators, students and engineers worldwide to explore, design and prototype circuits. Multisim 13.0 offers comprehensive circuit analysis tools for analog, digital and power electronics. The graphical, interactive environment helps educators reinforce circuit theory and bridge the gap between the classroom and hands-on laboratory learning.

[News ID 969](#)

Hall-Stand 1-310

Rutronik includes PIC32MZ 32-bit MCUs from Microchip in its program

Microchip presents the new 24-member PIC32MZ Embedded Connectivity family of 32-bit MCUs. It provides class-leading performance of 330 DMIPS and 3.28 Core-Marks/MHz, along with dual-panel, live-update Flash (up to 2MB), large RAM (512KB) and the connectivity peripherals - including a 10/100 Ethernet MAC, Hi-Speed USB MAC/PHY and dual CAN ports. Twelve members of the PIC32MZ family are available at distributor Rutronik as of now, the remaining twelve along with additional package opinions are expected to become available in May 2014. The PIC32MZ includes a full-featured hardware crypto engine with a random number generator for high-throughput data encryption/decryption and authentication (e.g. AES, 3DES, SHA, MD5 and HMAC), as well as the first SQI interface on a Microchip MCU and the PIC32's highest number of serial channels.

[News ID 927](#)

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■ 4th Generation Intel Core Processors across form factors & applications

In this webinar ADLINK and Intel share insights into the power efficiency, performance and graphics advantages provided by the 4th generation Intel Core processor family and how they can be applied across form factors and vertical markets with ADLINK solutions.

■ Isolated 4-Channel, Thermocouple/RTD temperature measurement system

This Circuit Note introduces a completely isolated 4-channel temperature measurement circuit optimized for performance, input flexibility, robustness, and low cost. As all „Circuits from the Lab“ from Analog Devices, this reference circuit is engineered and tested for quick and easy system integration. It supports all types of thermocouples with cold junction compensation and any type of RTD (resistance temperature detector) with resistances up to 4 kΩ for 2-, 3-, or 4-wire connection configurations.

■ Dense FPGA processing engine with high bandwidth interconnects

FPGA-based processing is often used in airborne sensors, where space and weight are premium. This White Paper describes one such processing platform supplied by VadaTech. In this application, multiple sensor inputs are fed into a highly connected FPA cluster and the result output over Ethernet. Being a mil/aero application, it was originally assumed that the most appropriate platform would be VPX, but in this instance a MicroTCA solution provided both size and cost benefits.

■ Gateway to new horizons: Intel Atom E3800-based Qseven and COM Express modules

congatec goes Bay Trail: In this two short webinars, congatec Marketing Engineer Zeljko Loncaric introduces the new Atom E3800-based Qseven and COM Express modules. The new conga-QA3 Qseven modules based on the Intel Atom processor E3800 family provide twice the performance over its predecessor plus an optimized product lifespan.

The also new Atom E3800-based conga-TCA3 modules offer an attractive entry price for COM Express. The Intel Atom processor E3800 product System-on-Chip family (formerly Bay Trail) offers much higher level of graphics performance than previous generation of embedded Atoms.

■ HPEC proof-of-concept delivers breakthrough I/O data bandwidth

High performance embedded computing (HPEC) has made tremendous leaps in performance and capability, with new implementations adding to the advancements. However, a major challenge for HPEC platforms remains, “How do I get more high-bandwidth data to the processors?” Kontron took a major step towards solving this problem with its HPEC proof-of-concept (PoC) platform, which delivers 40 Gigabit Ethernet (GbE) equivalent data transfer rates via PCI Express 3.0. The platform delivers breakthrough I/O data bandwidth in a small footprint for next-generation embedded radar/sonar applications.

■ Rules for the production of high quality C++ code

This document is presented by PRQA and defines a set of rules for the production of high quality C++ code. The guiding principles of this standard are maintenance, portability, readability and robustness. Justification with examples of compliant and/or non-compliant code are provided for each rule. On 3rd October 2013, High Integrity C++, HIC++, one of the most respected, longest established and widely adopted C++ coding standards, marked its 10th anniversary with the publication of major new update (Version 4.0) which extends its scope to cover C++11 and beyond. Over the past decade a staggering 24,000 copies of this coding standard have been downloaded. This standard adopts the view that restrictions should be placed on the use of the ISO C++ language without sacrificing its core flexibility. This approach allows for the creation of robust and easy to maintain programs while minimizing problems created either by compiler diversity, different programming styles, or dangerous/confusing aspects of the language...

■ Embedded processors for next generation HMI solutions

Renesas' RZ/A1 embedded microprocessors offer solutions for creating sophisticated HMI implementations for the “smart society” of the future. The ARM Cortex-A9 based RZ/A1 series comes with the most on-chip RAM in the industry: 10 MB. Nowadays more and more HMI applications have display requirements, such as smooth zooming of 2D graphics and touch screen capability, so there is a strong demand for support for WXGA display, higher CPU speed, enhanced 2D graphics functions, and so on. The RZ/A1 Series meets these demands by providing vastly improved functions and capabilities compared to the previous SH7260 Series products. The large on-chip RAM capacity means that the internal memory is sufficient to handle instruction codes during program execution and large volumes of image data required for HMI applications such as graphics processing.

■ Securing transport and rail networks

Both law and logic dictate that networked transportation systems must be as secure as possible. But there are other transportation systems - for trains, buses, heavy industrial equipment and other rolling stock—that aren't part of a closed control loop and that utilize widely available commercial interfaces, including Wi-Fi, 3G/4G cellular, USB, Ethernet, RS232 and RS485. These are non-mission critical systems that may include passenger counting, asset management, and GPS location. “One example is a project we're doing for DC Metro,” explained Kurt Hochanadel, Corporate Product Marketing Manager at Eurotech. “They have a wear leveling project where we're reporting the wear level on the wheels of the trains. We're actually on the wheels, measuring wear and reporting to their back-end asset managers through a Wi-Fi access point technology.

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