Cover Story:
Assured performance in extreme environments

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Finally, it’s time again: the summer! The weather is sunny and hot temperatures let us sweat in the offices during daytime at work but after work it’s a pleasure to visit beer gardens, swimming pools or lakes to refresh swimming in the cool water. And summer is like every year the time where the ECE/B&S magazines publish their yearly edition including, the

Yellow pages 2017 (starting page 26)

This year’s edition of our Embedded Companies Directory is split into 2 sections. The first part provides you with short company profiles, including a QR code which leads you to the full company profile (including overview about products & services, contact information, product news…). The second part of the Yellow Pages is a reference list showing in which product categories the companies are active.

But as usual there is once again much more useful information collected for you in this edition. A good example is our cover story (starting at page 6) which describes the requirements of designing robust embedded products for extremely harsh environments. It says that delivering truly rugged solutions requires a focused strategy beginning with R&D and ending with robust products because reliability in extreme environments means much more than only putting commercial motherboards into an upgraded enclosure – it demands a rentless pursuit of assured performance. The article describes in detail the huge effort in all stages of the embedded product design the manufacturer is made to ensure the optimum reliability in extreme environments. And in the time of Internet of Things there is much more to do than just creating reliable und robust products: secure wireless and wired network connections are paramount.

Therefore it is no surprise that you’ll find information about how to create secure communication links for embedded systems. One article describes the new requirements on hardware and software performance for secure communications and the associated networks which are needed. The other one explains detailed how to shield microcontrollers with a new level of protection on a par with larger systems, without the need of having know-how in cryptography. And the rest of articles in this issue are although not mentioned here are also of great importance for the embedded industry.

Enjoy reading!

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The Embedded Companies Directory
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Assured performance in extreme environments

By Daniel Piper, ADLINK

This article shows that delivering truly rugged solutions requires a focused strategy beginning with R&D and ending with robust products. Reliability in extreme environments means more than putting commercial motherboards into an upgraded enclosure; it demands a relentless pursuit of assured performance.

As the performance density of integrated circuits increases, every new generation of microprocessor gives embedded computer vendors the opportunity to address a wider range of applications. Many of those opportunities now exist in industries that demand more, not only in terms of processing performance but in the overall system specification. Unlike clock speed, memory bandwidth or communications interfaces, these requirements are not so easily documented on a data sheet. They concern how the system will behave in environments that are extremely hazardous to off-the-shelf computing platforms.

Electronic systems are generally susceptible to extremes in terms of temperature, humidity and vibration. It is relatively easy for a manufacturer to describe a computing platform as ruggedized if it has been housed in an enclosure that provides some protection to environmental conditions, but if that protection doesn’t extend to every component within the system, the guarantee may be empty. Nobody invites failure but many industries cannot afford to take that kind of risk; a single component failure can take an entire mission-critical system offline and in many industries, that is simply not an option. Because of its inherent reliability, many industries now choose to specify rugged electronics. The high reliability requirements of the military, defense and aerospace industries may have led the way, but now other industries, such as drilling and mining, mass transit and medical as well as all automation industries, benefit from cost-effective and powerful ruggedized solutions for harsh shop floor, outdoor or in-vehicle applications.

But OEMs need to be careful. Although something may be marketed as designed for extreme environments, or ruggedized, further inspection often reveals components within the system that are not designed to be exposed to constant extremes in temperature, humidity or vibration. If that is the case, the entire system is compromised.

Thus, ruggedization isn’t something that can be covered by only utilizing a rugged enclosure; it requires an approach to product design that takes nothing for granted. It must start with R&D that is focused on taking electronics systems to extremes. It demands component selection based on their suitability and not just their features. And it requires that at every step of the design and manufacturing processes, the rugged credentials are verified and validated. Only through this robust approach to product development can a manufacturer really deliver solutions that can be labeled as Extreme Rugged.

In order to deliver reliability at this level, a manufacturer needs to have complete faith in its products and processes; it must push its own limits beyond even the customer expectations. Only by doing this can a manufacturer have complete trust in its own products and ask the same from its customers. Of course, all manufacturers offering rugged computer platforms claim to test their products and comply with industry standards for high reliability, but without a demonstrable commitment to testing at every stage, with documented results that support a robust improvement process, testing remains largely subjective.

This commitment must even extend to customer support. Unlike many manufacturers, ADLINK is a leading embedded computing vendor that involves the customer at the earliest stages of product development, providing a custom service that ensures the product(s) not only meet the vendors own high standards for extreme ruggedness but meet the exact requirements of the customer, too. This level of commitment to customer satisfaction results in embedded solutions that are guaranteed to meet the end-user needs. Extreme rugged embedded solutions developed are tested and certified to operate across an extended temperature range of -40°C to +85°C (-40°F to +185°F). This is far more specific and measurable than the assurance offered by many
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While some manufacturers may feel testing is a true focus on rugged design understanding that testing must be an integral part of the entire product development and manufacturing process. Testing should be applied at the earliest stages of design, through a wide variety of protocols and methodologies. ADLINK has developed its own Extreme Temperature Testing (ETT) methodology that forms part of the selection process for individual components. In addition, it follows a high-margin circuit design approach that favors components that are proven to function reliably, even when exposed to extremes in temperature across wide voltage ranges. This helps deliver products like the Extreme Rugged COM Express Type 6 Computer-on-Module, for example.

As part of this approach, ADLINK employs IT Equipment (ITE) 180-compliant high-temperature PCB substrates, as recommended by the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE). As part of the testing process, all components have documented evaluations for MTBF and full derating calculations. Once a design has been approved it moves to the prototyping stage, which involves more validation and testing using a process intended to really uncover the potential weaknesses of a design. Using repeated test cycles, prototypes are tested to their extremes through combinations of temperature and six-axes vibration stress tests. Inevitably, this arduous process reveals the operating limits of a design, providing valuable data on how to improve the overall product at the earliest possible point – and long before it has the chance to fail in the field.

The same stringent approach to validation is applied to any thermal management solutions employed, both active and passive. This may also involve the use of advanced Computational Fluid Dynamics modelling software, which can help test a design under a number of scenarios during the prototype stage. It may even involve the use of wind tunnel testing to evaluate the effectiveness of heatsinks.

Highly Accelerated Life Test, or HALT, is an important part of this test methodology, as is ETT. It puts components through a series of tests carried out at extremely high and low temperatures, but involves more than placing a motherboard in an oven or chiller. To be truly useful and conclusive, the process requires tests to be carried out in a methodical way, often to a specific customer requirement.

Making testing part of the entire product development process means ETT is used at multiple points in the design cycle. This starts with functional tests that ensure the board boots up across the entire extended temperature range. Engineering samples of a prototype are then subjected to four-corner testing; testing that a board remains stable and reliable at the minimum and maximum temperature and voltage design parameters. Following this, ADLINK test engineers will put the board through thermal shock tests and HALT testing. Only when the design has passed all these tests can it progress to a pilot production run, during which engineers will continue to subject the board to functional and burn-in tests under ETT conditions, in order to fully assess yield.

Once in production, the HALT methodology steps up a gear, by putting increasing levels of stress on components. This includes more temperature cycling, applied over shorter periods of time, along with more aggressive six-axes vibration testing, both in isolation and concurrently. Throughout the application of HALT, engineers constantly monitor and measure critical elements of the system under test, including the processor, interfaces and memory sub-systems. In the event of a fault developing it is analyzed until the cause is identified and a potential design improvement can be evaluated. This process continues until the stress applied causes the component to fail; tested to destruction.

All the data gathered during all of seven HALT stages is used to improve the overall design process. The seven stages of the ADLINK HALT process are as follows. 1) Power on units in continuous functional test loop. 2) Progressively increase extremes of temperature. 3) Induce six-axis vibration. 4) Margin power (±5%). 5) Stress to failure. 6) Evaluate failure. 7) Implement design improvements.
Only those products that pass all ETT and HALT tests are labeled as Extreme Rugged, giving customers the assurance they need to put their own products into service. Every test carried out is documented and recorded in a database, which is made available to customers upon request. The same test data is used for own quality assurance audits.

The inclusion of six-axes vibration testing is not arbitrary; extreme environments are typified by exposure to this kind of operating condition. Because of this, it is standard for ADLINK rugged components to meet the main standards imposed by the US Department of Defense; MIL-STD-202G Electronic and Electrical Component Parts Test, and MIL-STD-810G, which is intended to evaluate the performance of equipment when exposed to a lifecycle of environmental stresses. The former includes an exhaustive list of test conditions, including subjecting components to 50G shocks and 11.95 grams of random vibration between 100Hz and 1kHz on multiple axes. In order to meet these stringent requirements, ADLINK employs a range of proven solutions including thicker PCBs and sockets designed to provide higher levels of retention, as well as special attention to high-mass and vulnerable components. This methodology extends to the enclosure design, which delivers a solution that can really be certified Extreme Rugged.

As well as temperature and vibration, other aspects of extreme environments can impact performance and functionality. This extends beyond humidity to include salt spray, as well as airborne contaminants. To address these potential hazards, ADLINK offers conformal coating which is designed to protect sensitive components from particulates such as dust, as well as high levels of moisture which can lead to short-circuits or corrosion. Conformal coating offers protection against these hazards, as well as dendritic growth and general abrasions.

Figure 3. Inside the tiny footprint of the Extreme Rugged HPERC system for defense applications lives the power of a third generation Intel Core i7 processor and optional GPGPU parallel processing engine. Dual removable secure erase RAID-0 SSDs provide 12Gb/s throughput and security for deployment in hostile environments.
An acrylic coating known as HumiSeal 1B31 is a quick drying and flexible coating that can resist moisture, it can also include a UV tracer that can help with final inspection. The coating can be applied as a spray, by submerging the board in a bath or as a flow coating; however it is applied, the final coating measures on average 3mm in depth and (as the name implies) conforms to the contours of the board. Other coatings available include epoxy, urethane, paraxylene and silicon-based coatings. The wide range of ADLINK Extreme Rugged products have all relevant industry certifications up to MIL-1-46058, ISO-7637 and IPC-CC-830, and meet the applicable EMC, safety and environmental standards for rugged solutions in markets such as networking and communications, automation and process control, test and measurement, security and even gaming. The design service provided extends to individual semi- and full-custom design, as well as using stackable modules to create bespoke solutions that are fully supported by off-the-shelf standard products, with long lifecycles and often lower costs. The customized approach includes peripherals and interfaces, as well as offering an assured and future-proof upgrade path. Finally, the Extreme Rugged products are also supported by lifecycles that exceed seven years.

**Product News**

- **Mouser to distribute SAMSUNG ARTIK Smart IoT platform globally**
  Mouser Electronics announces a global distribution agreement with Samsung to distribute the SAMSUNG ARTIK family of modules, development kits, and accessories. The SAMSUNG ARTIK Smart IoT platform is designed to help developers capitalize on easy-to-use, open and enterprise-grade APIs, SDKs, and tools to quickly bring wearable, smart, and Internet of Things solutions to market. News ID 5290

- **acced: dual 4G LTE router with waterproof sockets**
  The transporter series 4G routers are specially designed and manufactured for industrial use in harsh environments as well as rail and other vehicles. The devices meet the requirements of EN 50155 for electronics in rail vehicles and are particularly robust with respect to extreme ambient temperatures, damp, soiling, vibration and voltage fluctuations News ID 5272

- **Artila: Linux-ready IoT gateway for M2M applications**
  Artila Electronics launches a highly integrated compact Box Computer, Matrix-710, based on ARM Cortex-A5, especially for industrial control, automation gateway, mobile gateway, smart energy application. Matrix-710 adapts the innovated technology of ARM processor coupled with the open Linux operating system, which provides the backbone for innovative smart IoT solutions. News ID 5273

- **SINTRONES: all new SBOX-23XX series for outdoor video surveillance**
  SINTRONES announce the new SBOX-2300 and SBOX-2320, an intelligent, fanless, embedded industrial automation digital signage system. Powered by Intel Braswell N3710/N3160/N3060 Quad Core CPU up to 2.56GHz, with up to 8GB 1 x DDR3L-1600 SO-DIMM. SBOX-2300 and SBOX-2320 provide such high-performing yet cost-effective, multi-purpose devices for outdoor video surveillance. News ID 5418

- **Manhattan Skyline: SBC with NXP i.MX 6 processor**
  The armStoneA9 is a compact and very powerful SBC in PicoITX form factor, perfectly suited for the development of compact applications. The Cortex-A9 CPU by NXP is available in Quad-/Dual-/ and Single-Core version and ideal for multimedia applications. The CPU has functions such as 2D/3D acceleration, Window Layer, FPU, NEON, MPEG4, as well as OpenVG and it can be provided for more than 10 years. News ID 5332

- **A.R. Bayer DSP Systeme: SoM with Blackfin, Spartan-6 & DDR3 RAM**
  XynergyBF537 is a compact, flexible and powerful system-on-module based on a Blackfin ADSP-BF537 and a Spartan-6 FPGA. The FPGA has immediate access to a 64M x16 DDR3 RAM useful for bulk data processing. The module comes in a 200-pin SO-DIMM and has the same pinout as the notorious Cortex-M4 based XynergyXS SoM. News ID 5382

- **Eurotech: multi-service IoT gateway and cellular adapter for LTE Cat 4 speed**
  Eurotech announced two new products that provide pre-certified 4G/LTE cellular connectivity: the ReliaGATE 10-12, which further extends the ReliaGATE Multi-service IoT Gateway family for industrial applications, and the latest models of its ReliaCELL rugged USB cellular adapter, now supporting LTE Category 4 transmission speeds, that greatly accelerate IoT deployments. News ID 5279

- **MEN: rugged Box PC with Intel Apollo Lake I for mobile communication**
  The BL51E is a fanless and maintenance-free embedded computer for IoT and memory-intensive applications in trains, buses or commercial vehicles. An assortment of communication interfaces make the box PC variable. The device can be used from -40 to +85°C and complies with EN 50155 and ISO 7637-2 standards. BL51E is equipped with an Intel Atom E3950 with 1.6 GHz, and offers CPU performance scalability by a variety of other dual/quad-core processors from the Intel Atom E3900 series. News ID 5373

- **Data Modul: TFT custom sizes for design products**
  BATRON, the Data Modul brand for high-quality graphics and alphanumeric passive and active LCD displays for special applications, is cooperating with designers from Iliax&Wiesel (I&W) on “Design Visual Solutions” for the automotive sector. BATRON is supplying user-friendly panels designed for installation in products including white goods and audio, events and conference systems. The latest 11” TFT display was now integrated in portrait format for automotive showrooms from I&W. News ID 5365

- **Kontron expands product and services portfolio in association with S&T Group**
  Kontron will merge with S&T Deutschland. After the merger the brand “Kontron” will continue to provide its customers with integrated solutions for embedded modules, boards and systems, Internet of Things and Industry 4.0 applications. With more than 2,300 experienced engineers from both OT and IT backgrounds, Kontron together with S&T will offer further innovative solutions for the seamless and secure connection of embedded systems into the Embedded Cloud. News ID 5395

- **congatec announces ComX standardization initiative**
  congatec announced the extended standardization initiative ComX that goes beyond the current specifications for computer-on-modules. This ComX standardization targets two pillars, the API and middleware standardization including APIs for IoT Gateways or embedded features of COM Express Type 7 server-on-modules as well as approved circuit diagrams and logic for demanded carrier board implementations such as FPGA integration, switching logic for USB-C, or for SMART battery logic. News ID 5262
Industry 4.0 and the IoT: paths to secure data communication

By Konrad Zöpf, TQ-Group

Against the background of Industry 4.0 and the IoT, the need for secure communications and the associated networking of systems and components is increasing. New requirements on hardware and software performance are the result, as described in this article.

IoT (the Internet of Things) is the hot topic today and requires a secure system. However, this should not be confused with functional reliability, which is used to describe the reliability and resistance to a system outage. Rather it refers to vulnerability to the outside world. Usually, external attacks are intended to cause damage or gain an economic advantage by tampering.

Until now, secure systems could only be developed with a lot of individualization effort. For more than three years now, research and the business world have been occupied with the topics of Industry 4.0 and IoT. Basically, these topics depend on the necessity of having the increasing volumes of data available everywhere at all times. The whole subject describes a very complex topic, starting with small controllers that accept data from actuators and sensors and transfer these data to the cloud. One clear trend can be seen in different market segments. More and more clients are asking for solution modules that cover the stricter requirements in the security and safety area.

Until now, embedded systems were usually stand-alone solutions and possessed only limited connection options, if they had any at all. In this way, it was relatively easy to ensure the security of a system because access was possible only on a very limited basis. With newer systems, easily accessible communication options are required. Networked production systems must have suitable countermeasures to protect against external access (from the Internet, say) and against internal attacks, too. It must be ensured that the sender is the person or device that it purports to be (authentication). It must be verifiable later that only this sender transferred the data or message (non-repudiation). The data were not modified over the transmission path (validation). The data are encrypted and cannot be read or interpreted by others (secrecy). The hardware of the sender or receiver cannot be manipulated (protection).

All these countermeasures require high-performance hardware and secure software. Another aspect critical for security is that only a safe (reliable) system secured against outages (safety) is able to resist external attacks. In addition, hardware accelerators integrated into the CPU support the software and reduce the load on the CPU. This has a direct effect on the performance of the system and on the power consumption.

Versatile countermeasures are needed to implement a secure system. The most important of these are described in the following. These include High Assurance Boot (also called a Secure Boot), trusted execution, hardware accelerator for cryptography, secure debug controller, protected memory access (encryption) and hardware security measures (tamper detection, runtime integrity checker – RTIC).

A secure system boot must ensure that only authenticated program code may be run on the CPU. Usually, this software is the boot loader. Secure Boot, also known as a High Assurance Boot, is an important element in security measures and prevents the CPU from executing untrusted or unauthorized...
code. It must also be ensured that unauthorized modifications to the CPU configuration by unauthorized program modifications are detected and prevented. This makes it impossible to read sensitive data from the chip without authorization. The operating process for a secure boot usually contains the following steps: signing of the image, encryption of the image and use of a secure boot sequence.

The term TrustZone from ARM is used for a concept that separates a non-secure or untrusted environment in the hardware from a secure, trusted environment by blocking non-secure software from accessing secure resources. Within this process, the software is in either a secure or a non-secure environment. Software switches between these two environments, known as the secure monitor (Cortex-A) or as the core logic (Cortex-M).

In the basic configuration, the TrustZone technology offers system-wide security and the potential of creating a trusted platform. The system can be designed such that every part is also a part of the secure environment including the debugger, peripherals, interrupts and memory. Parts to be protected against software attacks and prevalent hardware attacks can be defended by using a security system such as TrustZone from ARM.

For secure data communications, hardware-supported security acceleration may also be used together with a purely software-based solution. The CPU can, of course, perform security countermeasures and run the algorithms for security operations by itself, including the encryption algorithms and checksum calculations. This is supported by the fact that the programmer alone can design the algorithm. Programmers by themselves can decide how to design the algorithms and can incorporate the newest security research results into the software on a near-real-time basis, a capability that provides the greatest possible flexibility. To design secure data communications on a CPU-based software solution, a lot of computing power is needed.

This is countered by the facts that considerable effort is needed to create the programs, the programs are prone to errors and the CPU is burdened with tasks that are perhaps needed for the actual application. In addition, a general-purpose CPU is not optimized for algorithm calculations. In terms of program execution time, power consumption and throughput per watt, a general-purpose CPU is not really efficient. For this reason, more and more CPU fabricators are implementing hardware accelerators in many microcontrollers and processors. These accelerators are modules that perform the security tasks, or some of them, in hardware, reducing the load on the CPU.

<table>
<thead>
<tr>
<th>Hardware Cryptographic Accelerators (CAAM)</th>
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<tbody>
<tr>
<td>Symmetric key authentication: AES-128/256, with DPA protection</td>
<td></td>
</tr>
<tr>
<td>DES, 3DES</td>
<td></td>
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<tr>
<td>ARC4</td>
<td></td>
</tr>
<tr>
<td>Asymmetric Authentication (public key)</td>
<td></td>
</tr>
<tr>
<td>RSA (up to 4096)</td>
<td></td>
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<tr>
<td>Elliptical curve “ECDSA” (up to P-521)</td>
<td></td>
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</tbody>
</table>

- MD5, SHA-1, SHA-224, SHA-256
- DryICE (On-chip voltage, temperature, frequency monitoring)
- Dedicated tamper pins, 10 pins total (can be configured to be 10 passive or up to 5 active pairs)
- Tamper logging
- On-the-fly DRAM data encryption/decryption with AES-128
- Yes, lock bit can disable the access of the key
- DPA protection for AES
- On-chip zeroable 8x4 kB secure RAM
- Off-chip key/data blobs AES-256 master key (CAAM/SNVS)
- Yes – Secure JTAG controller (with electrical fuses)
- On-chip zeroable 8x4 kB secure RAM (32 kB)
- Yes – General purpose OTP fuse for customer use
- Zeroable master key (256 bit)
- General purpose 32-bit register
- Secure High Assurance Boot
- Up to 2 kbit eFuse
- Yes (export disable fuse – disable all crypto except hash engine and RNG)
- Yes – 256-bit master key storage with secure RTC (real-time clock) power (SNVS)
- Run-time integrity checker and security controller
- Random number generator (NIST SP 800-90)
- ARM TrustZone
- 2x EMV-compatible SIM V2 & EMVSIM module

Table 1. Safety functions supported in the i.MX6UL CPU from NXP as an example (source: NXP)
Another function is DRAM encryption. This is a coprocessor that, with the help of specialized operations, improves the throughput of software-based encryption algorithms and cryptologic hashing functions. Software libraries usually come from the controller manufacturer. Depending on the controller manufacturer, flash memory protection is also offered. By activating various security functions, access to the memory contents by way of a JTAG interface (debug controller) is prevented by means of a stored key.

In terms of CPUs, very different security functions in the form of a hardware module are used as described depending on the CPU fabricator and the time at which the CPU was put on the market. In this case, the hardware manufacturers are providing innovative functions to meet market requirements. Security concepts for the memory are usually permanently integrated into the TrustZone with the CPUs. The RTIC (runtime integrity checker) allows verifying the memory contents during the system boot and during runtime. If a deviation or tampering is found, an interrupt is sent to the security hardware monitor.

Another function is DRAM encryption. This prevents manipulation of or attacks on the system memory. Tamper detection can be used to make manipulation attempts and physical attacks on the device or even on the pin of the CPU more difficult, to limit or prevent them. Table 1 shows the functions supported in the i.MX6UL CPU from NXP as an example. These functions can be applied by the user to implement a secure system.

Besides the hardware, the operating system to be used is a very important factor that must be considered when evaluating a CPU and ultimately an embedded module intended for use as the foundation of an IoT/Industry 4.0 system. Particular attention must be paid to make sure that, for the selected operating system, there is already support for the hardware accelerators, if necessary. Selecting the correct software for the upcoming project should not just consider the device requirements. An overall concept describes how all needed functions can be brought into line with the necessary requirements. Considering the tasks to be performed, how and in what areas a system must be made secure, the appropriate OS offers different drivers suitable for various market segments such as medicine, industry, railroad, automotive, up to and including military applications.

When comparing earlier applications to those of today, the CPUs provide more and more interfaces. Starting with UART, USB, PCI, SPI, field buses and Ethernet, more and more wireless interfaces such as Wi-Fi, NFC, Bluetooth or the cellular telephone network are being used. Wired interfaces, with the exception of Ethernet, are used only within a limited environment. It is easier to attack radio-based solutions and Ethernet from outside if they are part of a public network. Consequently, when using radio-based solutions, particular attention must be paid to ensure that the vendor can provide an appropriate security concept including an update capability.

An operating system should consider as many attack vectors as possible to satisfy the security requirements of IoT applications. The term attack vector indicates various vulnerabilities such as access rights of data and users and encryption mechanisms that attackers may undermine. Commercial operating systems use their own security models here, usually specific extensions and functions that can be considered secure. Another advantage to this is that a true microkernel is used. This offers fewer vulnerabilities compared to monolithic operating systems.

For example, if new security gaps or bugs are discovered in Linux, everyone is responsible on their own to maintain their system. This can quickly result in considerable expense. For system development using Linux, it is recommended that the user revert to the security features integrated into the CPU to be able to withstand the different types of attack scenarios (side-channel attacks, differential power analysis, crypto analysis, physical attacks).

Clients, even those dependent on comprehensive security concepts, will be supported in the future with all embedded modules from TQ-Systems on the basis of the security functions available in the CPUs. Chiefly those clients looking to use cost-effective solution modules consisting of the module and security-related software benefit from the many years of partnership with various CPU manufacturers. Even in the case of upcoming certifications, TQ-Systems is available as a competent development partner and supports the client.

Solution modules consisting of embedded modules with various CORE architectures and specially matched security concepts extending from accepting data to transferring data to the cloud allow starting a development effort faster and faster without complications for systems that ensure networking takes secure data transmission into consideration. Comprehensive hardware and software support also promises both a quick entry and the efficient and cost-effective implementation of security-related project requirements.
EMBEDDED COMPUTING

Intel Core GEN 7 processors – a fresh breeze for embedded systems

By Peter Ahne, Portwell

Kaby Lake captured the embedded world quickly. The first board-level products were introduced in parallel to the launch of the processor family, and just a couple weeks later at the Embedded World trade show almost every manufacturer had it on table. From there, it was only a short way to the systems on offer now.

Almost 13 years ago Intel launched the Pentium M and made the transition from the pure hunt for more performance by constantly rising the clock frequency as it used to be in the days of the Pentium X processors, to the age of less power consumption. In 2006, the Tick-Tock model with its continuously improved production technology was announced – every Tick represented a fabrication process with a new die shrink. Every Tock delivered an update of the processor architecture. In alternating cycles, this represents the long-established Tick-Tock Model, standing for a new microarchitecture. Back then, some may have asked themselves; “When will Intel with Tick hit the physical limits?”

The answer is ten years. Intel engineers meanwhile needed a significant slowdown in the frequency of “shrink” processes. In order to make this possible, a so-called refresh instead of a Tick, was established. Refresh means that production technology and microarchitecture remain the same, while an internal improvement of the processor leads to an increase in performance. Additionally, there may be a new graphics engine or any other add-ons which contribute to this performance increase. This new development process is called PAO: Process–Architecture–Optimization. For many of us, the introduction of this new model has raised the question: “Does it make sense to take this step?” One thing is clear: the Intel Core i7-7700 offers sufficient computing power for most users. Improvements can be found in the details. Hence the Kaby Lake processors clearly stand out from their preceding Skylake through an optimized production process and a correspondingly faster basic clock frequency. As a consequence, in terms of working speed, the i7-7700 gains an edge over the previous Sky Lake i7-6700 - even though the gap is relatively small. The improvements in energy efficiency, the new graphics engine and the support of a new data storage technology, make the essential differences. All these relatively small improvements add up to a great leap forward.

Same as with the 6th generation, the Embedded Community is able choose from a wide range of 17 processors. Again, Intel Celeron provides a vast variety for price-sensitive and less demanding applications, from the i3, i5, i7 up to Xeon, on the shelves. As there have not been any major changes in basic architecture, compared to the 6th generation, there should not be any surprises in terms of production and availability of the Atom Family latest offspring. Any Windows applications, however, which have not yet migrated to Windows 10, will stay behind with the 7th generation of core processors. It is not to be expected that Intel will go further with Kaby Lake to integrate Windows 7 and 8.1 in the list of supported operating systems. But what are the technical innovations and what is the good in them?

Processor: as already mentioned, the improvements in production process and architecture do only have a small impact. Compared to its predecessors, the power loss was frozen and decreased minimally. The computing performance will now be 5 to 10% higher in range, depending on the processor and, in particular, on the application.

New graphic: significantly more has changed in terms of graphic. In general, and with only a few exceptions, Kaby Lake comes with the new Intel HD 630 graphics. This guarantees a smooth playback of video and image material in ultra-high-resolution (3840x2160 pixels) without judders. Kaby Lake hardware with 630 graphics support the HEVC standard with 10 bits as well as the competing VP9 format. Regarding graphics performance, there should be a performance boost up to 65% as well as improved color depth and quality.

Innovation in storage technology: with the introduction of Kaby Lake, Intel provides a memory technology that promises new standards in data throughput. The new Optane technology has to be differen-
tiated in Optane Memory and Optane SSD. SSDs with Optane technology should be working on all current platforms, whereas for Optane memory, a Z270 platform is required - Intel has established a corresponding logo, which can be used by mainboard manufacturers, providing that at least one M.2 connector is available. Speaking of storage technology: good old DDR3 may survive with Kaby Lake, as the integrated storage controller supports both the current DDR4 (up to 2,400 MHz, with Sky Lake still 2,133 MHz) and the old DDR3L standard (maximum 1,600 MHz).

**Product News**

- **Concurrent: deployable conduction-cooled 3U VPX product**
  Concurrent Technologies is now shipping deployment quantities of the rugged conduction-cooled TR E5x/msd-RCx processor board having passed all the prerequisite qualification tests. These include storage and operation over extreme temperature ranges, as well as reliable operation when subjected to three-axis shock and random vibration tests according to the VITA 47 standard.
  News ID 5400

- **SINTRONES launches VBOX-3611 series in vehicle computing solutions**
  SINTRONES announced the new VBOX-3611, VBOX-3611-POE and VBOX-3611-V4. The new series are newly developed In-Vehicle computing solutions based upon industry leading structure to be compatible with multiple access technologies. It is the perfect solution to upgrade existing systems for enhancement.
  News ID 5416

- **Pentair: easily configure front panels and generate 3D drawings**
  The newest 3D configurator from Pentair Schroff is now available. The state-of-the-art user interface retains the same look and feel as the Novastar configurator that was released at the end of 2016, and offers new features including a drag and drop function to easily configure front panels and generate 3D drawings. In addition, 3D CAD drawings, bills of materials, quotations, and graphics are generated in real time, make the configurator a valuable tool for design engineers.
  News ID 5260

- **IBASE: dual-HDMI fanless signage player for demanding graphics requirements**
  IBASE unveils its SI-122-N dual-HDMI fanless signage player equipped with 3rd Generation AMD Embedded G-Series SoC that features high processing performance and optimized for demanding graphics requirements. The latest SI-122-N dual-HDMI player delivers smooth, high-definition video for each display to bring viewers the ultimate experience in picture quality.
  News ID 5246

- **MEN: M-module with eight relay outputs**
  The M-Module has been developed according to the ANSI Mezzanine standard and extends a carrier board with eight relay outputs, which can be read out via a read-modify-write access. The M-Module M43N supports eight relay outputs with free potential switching of the signals. The status of each relay can be read out via the read-modify-write access. The implemented relays guarantee maximum reliability and long service life.
  News ID 5265

- **Apacer: dual-PCB miniature module integrates CAN bus and GPS**
  Apacer Technology has developed the dual-PCB EFC-G/EFC-R module series which integrates CAN bus communication module and GPS functions. When used with on-demand telematics cloud SDK, it provides the control center with comprehensive smart automotive solutions, such as real-time fleet management, vehicle safety monitoring and driverless car monitoring.
  News ID 5288
MCUs build foundation for integrated hardware/software platform

By Stefan Ingenhaag, Renesas Electronics Europe

The key to building a presence in a new market with an innovative new technology is to construct that technology on a solid foundation. To achieve that goal, embedded designers need an extensive line of compatible and scalable MCUs to maximize software and hardware reuse.

Designers eyeing new applications in the embedded and rapidly emerging IoT market need a highly scalable, upwardly compatible family of MCUs that combine high efficiency with competitive price/performance characteristics. Synergy MCUs are designed from the ground up to serve that purpose. Based on the ARM Cortex-M family CPU cores, these new microcontrollers combine extremely low power consumption with excellent deterministic behaviour in a small package. The range of potential embedded applications for these new MCUs runs the gamut from simple tags designed to attach to a cow’s ear to monitors in household appliances. Given the wide variety of application requirements, crafting the right MCU feature set is no small task. But some functions are clearly essential. One is connectivity.

Most of the MCUs in the embedded market today supply a base set of peripherals including a wide array of connectivity options. Synergy MCUs take this one step further. The top-of-the-line MCU family, for example, offers dual Ethernet with IEEE-1588 synchronization, USB HS, plus many serial interfaces including UART, IIC, SPI, IrDA, QSPI, SSI, SDHI and CAN interfaces. As embedded and IoT applications move toward the edge of the network where systems are often measuring the environment, analog interfaces play an increasingly crucial role. To meet this need the MCUs add a full array of analog-to-digital and digital-to-analog converters, analog comparators and temperature sensors. In addition, the MCUs add a variety of timing functions that are typically used in motor and industrial control applications.

Time to market is a huge factor in the success of any company. The ability to reuse hardware and software helps design teams shorten development time. Synergy MCUs are architected from the ground up to provide a seamless scalability and peripheral compatibility among products, enabling customers to extend software reuse by using common peripherals based on a consistent memory map. MCU scalability enables customers to easily migrate from one product to another in the same family or between families. And the use of a concentric package design allows customers to easily migrate from one package to another with minimum hardware changes.

In addition, a common CPU architecture based on ARM Cortex-M CPU cores enables seamless code migration across the entire MCU family. Taken together these characteristics make it a truly scalable and compatible solution, enabling customers to maximize reuse of software and hardware and, in the process, shorten development time and reduce time to market.

Given the fundamental role connectivity plays in every IoT design, solutions at every level of the network are vulnerable to malicious attacks. The threats can occur at every stage of the product lifecycle. During manufacturing a less-than-honest employee could clone firmware or the security configuration of a product. Once the product goes into the field hackers could replace firmware with malware...
PIC18F "K40" MCUs feature Intelligent ADC with Filtering and Signal Analysis Capabilities
8-bit PIC® MCUs are ideal for Touch and Signal Conditioning

The Core Independent Peripherals (CIPs) in Microchip’s PIC18F “K40” family of 8-bit PIC® MCUs support filtering and signal analysis for advanced touch and signal-conditioning applications.

Among the intelligent analog CIPs is an Analog-to-Digital Converter with Computation (ADC2) for averaging, filtering, oversampling and automatic threshold comparison. The MCUs also integrate safety-critical CIPs and hardware PWMs with multiple communication interfaces and generous on-chip Flash and EEPROM. These features, combined with 3V operation, enable the PIC18F “K40” family to increase design flexibility whilst also reducing system cost.
or exploit a software update session to inject malware into a system. And if system parameters are lost, firmware could be susceptible to an eavesdropping attack. Clearly product designers must address a wide array of potential security concerns, not only to ensure the integrity of their product, but also to reassure prospective consumers before they buy into this new market.

To protect embedded systems from these threats, Synergy MCUs add significant security capabilities in hardware where they are less susceptible to attack. As an example, when each MCU in the Synergy product line is manufactured, it is assigned a 128-bit unique ID which can be used to generate keys to protect applications and assist provisioning. Synergy includes on a chip a true random number generator for use with industry standard specifications such as NIST SP800-90 recommended deterministic random bit generators (DRBGs). Many of the MCU members also feature Memory Protection Units (MPUs) that can be used to read- and write-protect an area across the entire addressable memory map. Developers can use this feature to create a secure region that is protected from access by a rogue program. Hardware accelerators are also featured for symmetric cryptography and asymmetric cryptography as well as HASH.

At the low power end of the market where many embedded and IoT solutions are expected to emerge, Renesas selected the ARM Cortex-M0+ CPU core. Optimized for battery-powered applications, this core combines a state of the art low-power architecture with optimized low-power modes, faster wake-up time and low-power peripherals. Utilizing these capabilities Renesas engineers have developed the S1 Series MCUs for very low power, cost-sensitive embedded and IoT applications where developers may be considering migrating from an 8- or 16-bit solution. With these new devices they now have access to the processing resources of a 32-bit MCU.

For higher levels of integration, Synergy S3 Series MCUs, represented here by the S3A7 device, offer more memory and a wider array of peripherals than the S1 Series.
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S3 Series MCUs offer essential security and encryption building blocks such as GHASH, AES and True RNG. In addition, the Series features a flexible Segment LCD controller and high accuracy analog peripherals such as a 14-bit A/D converter. Finally, on-chip operational amplifiers and high-speed analog comparators make the S3 Series MCUs a solution for IoT building automation applications.

For higher performance applications, the S5 Series MCUs use an ARM Cortex-M4 CPU core running at between 100 MHz and 200 MHz. Targeted at more complex embedded applications, this Series offers more memory on-chip including up to 2MB of code flash, 64KB of data flash and 640KB of SRAM. These MCUs are fabricated using the same high performance 40nm process used for the S7 Series. The S5 series also offers a higher level of encryption for IoT applications. These devices feature True RNG, AES, DES/ARC, RSA/DSA and Hashing functions. In addition, rich connectivity such as Ethernet controller, USB HS and QSPI make the S5 devices suited for economical HMI applications in the appliance market that require a Graphics LCD controller with 2D drawing engine and JPEG Codec.

At the top end of the performance spectrum, the initial devices in the S7 Series deliver high performance using a 240 MHz ARM Cortex-M4 CPU core. This MCU series features a wide array of peripherals and significantly more memory on-chip including an industry-leading 4MB of code flash and 640KB of SRAM fabricated using a high performance 40nm process. These additional resources give embedded developers substantial new design options particularly when their solutions require memory resources to buffer large high-speed messages, perform calculations in background, or run multiple software applications concurrently.

The S7 Series devices are suited for applications that require a higher level of encryption and security. The MCUs feature True RNG, AES, DES/ARC, RSA/DSA and Hashing functions. In addition to superior performance, the S7 Series offer high speed, high precision analog interfaces such as high-speed analog comparators and 12-bit A/D converters with an outstanding sampling rate of 2.5 Msps. The S7 Series also feature multiple high-speed connectivity options including USB HS, Dual Ethernet controller and QSPI. When combined with an integrated Graphics LCD controller with a 2D drawing engine and a JPEG Codec, this feature set makes this Series suited for HMI, factory automation and building applications.

With up to 2MB of code flash and an extensive array of security and connectivity capabilities, Synergy S5 Series MCUs offer a platform for higher performance embedded applications.
Simplify life with logic

By Manu Venkategowda, Microchip

This article explains how a configurable logic cell can simplify the implementation of complex functions on a PIC microcontroller.

Sometimes, something simple can have great benefits. Most embedded engineers need a variety of signals or logic to address the end application needs. They resort to designing complex board logics to address these needs. But what if there was a simple way to do something more complex? Some microcontrollers have flexible peripherals to perform the functions needed for complex applications. That is where the Configurable Logic Cell (CLC) comes in. The CLC peripheral has been added to the set of peripherals for Microchip PIC microcontrollers (MCUs) and allows users to design a simple function that can interface with the MCU. This CLC peripheral lets the user specify combinations of signals as inputs to a logic function, and to use the logic output to control other peripherals and IO pins, providing users the flexibility to design the function of their choice.

To keep things simple, the CLC is supported in Microchip MPLAB Code Configurator (MCC). This enables the designer to easily drag and drop logic gates to connect the inputs and outputs in a GUI format, and generate C code with the click of a button, greatly simplifying implementation of the CLC modules. Core Independent Peripherals (CIPs) handle their tasks with no additional code or supervision from the CPU to maintain their operation. The CLC is one such CIP that simplifies the implementation of complex control systems and gives developers ample design flexibility at the same time, off-loading the CPU to boost the microcontroller performance. Keep reading to learn how the CLC can be used to implement signal phase detection, complementary waveform generation or multiple parameter monitoring in an application. With a wide variety of inputs, triggers and outputs, the possibilities with the CLC are endless.

The CLC is a user-configurable peripheral, similar to a programmable logic device (PLD), but integrated into a microcontroller. Internal and external inputs can be chosen as inputs to the CLC. The CLC receives inputs from other peripherals or from an input pin. It then performs the intended logic operation and provides an output that can be used to control other peripherals or another IO pin. The CLC can receive signals, such as internal clock signal, an output of another peripheral and peripheral events such as a timer input. The selected input signals can be directed to the desired logic function through the signal gating stage.

The CLC supports various logic functions such as AND, OR, NOT, XOR, NAND, NOR and XNOR. In the CLC, the outputs of the data gating stage are inputs to the logic function selection stage. The output polarity stage is the last stage in the CLC and the desired polarity can be selected. The CLC can be used as a stand-alone peripheral in implementing sequential and combinational logic functions, thus facilitating quick event triggers and responses. It can also be used with other peripherals to help extend their capabilities, by facilitating custom implementation of complex functionalities in hardware.

Being a core independent peripheral, the CLC effectively reduces the CPU bandwidth requirement for an application, by offloading many simple and logic event responses from the CPU to the peripheral. It also reduces Flash and RAM requirements since software algorithms are not required. Logic functions implemented in hardware have faster event response compared to logic functions implemented in software. Additionally, the CLC supports a higher level of integration without any external components, reducing the overall PCB size.

The versatile features and simplicity of the CLC extend the design capabilities of a PIC MCU. One good example that demonstrates the capabilities of a CLC is in a phase detector. A phase detector can be used for many applications including distance measurement. It works on the principle that when
a continuous RF wave is transmitted towards a target, the distance to the target is proportional to the phase shift between the transmitted and received waves. The CLC can be used to measure the phase difference between two signals of the same frequency. The transmitted and received waves are used as inputs to the CLC and the phase difference between the two signals at the CLC output can be used for calculating the distance between the source and target.

In the phase detector implementation using CLC, the AND-OR logic function in the CLC can be used to implement an XOR function to measure the magnitude of phase difference and the D-Flip Flop (D-FF) logic function helps in obtaining lead and lag information of the signals. Besides square waves, it is possible to measure the phase between other types of analog signals such as sinusoidal waves. Figure 1 depicts the configuration of a phase detector using CLC.

The source signals, whose phase difference is to be measured, are fed as inputs to two comparators, which are configured as zero-cross detectors (ZCDs). The ZCDs convert the input analog signals to square waves of the same frequency. If source signals are square waves, then ZCDs are not required. The square waves are internally routed as inputs to multiple CLC modules. CLC1 and the input capture (IC) peripheral are used for determining the magnitude of phase difference. CLC1 is configured in AND-OR logic function from which XOR functionality is derived. The XORed output of CLC1 is externally connected as the source signal to the IC. The pulse width of the XORed output gives the magnitude of phase difference between the two waves and is measured by the IC. If the CLC1 output produces no signal, then the source signals are in phase.

In order to determine the phase lead and lag information of two input waveforms, the CLC is configured in a D-FF mode with one square wave used as a D input and the other used as a clock. The output of CLC2 being high or low will determine if D input leads or lags in phase with respect to the clock input. Measuring the phase angle between two signals of the same frequency is useful in many applications, including metering, digital power systems, communications and medical instruments.

Another way to use the CLC is in a complementary waveform generator (CWG). The CWG produces a complementary waveform with a dead-band control from its input source. A dead-band time is inserted between two signals to prevent shoot-through current in various power supply applications. This application illustrates the use of the CLC peripheral’s edge detection and interrupt capabilities in generating a complementary waveform with a single capture/compare/PWM (SCCP) module as its input source.

Often, applications, such as motor control, require several complementary waveform generators to control their functioning. The multiple capture/compare/PWM (MCCP) module can produce complementary waveforms with non-overlapping signals by controlling the dead band at its output. However, if the application requires more instances of MCCP than those available in the device, then the SCCP, in combination with the
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CLC, can be used. The CLC peripherals with the SCCP can be used to generate a complementary waveform with the required dead band, as the SCCP on its own cannot generate non-overlapping signals. A dead band can be added for both edge-aligned and centre-aligned SCCP outputs. Figure 2 shows the configuration of CLC1, CLC2 and CLC3 to control the dead band of the SCCP output in an edge-aligned mode. For example, a full-bridge motor driver circuit can be driven by using an MCCP peripheral with its output producing a complementary waveform. However, if several such full-bridge motor driver circuits are to be driven, and the number of MCCP peripherals available on the device is insufficient, then an SCCP, in combination with the CLC, can be used.

Often, applications require the monitoring of different parameters, such as temperature, pressure and humidity, at the same time. If these parameters should start crossing the upper or lower thresholds, the necessary action can be taken to avert catastrophic results.

Multiple comparators are available as source inputs to the CLC. In a microcontroller, a comparator can be used to monitor only one parameter. The output of multiple comparators can be combined using the CLC, to monitor multiple parameters. Necessary action can be taken when any or all of the monitored parameters exceed a certain limit. Figure 3 shows the configuration of the CLC to monitor two different parameters.

In practice, this application finds its use in monitoring temperature and pressure in an industrial plant, so that the plant can be shut down if either of the parameters exceeds a pre-set threshold. It can also be used for monitoring voltage levels in an offline uninterruptible power supply.

Product News

- **Intel: FPGA technology supports NEC in face recognition technology**
  Intel technology is powering a face recognition engine that can rapidly and accurately identify people, even when they are moving and in a crowd, to help detect and prevent possible incidents at critical facilities and public venues. NEC relied on Intel Arria 10 field programmable gate arrays operating on Intel Xeon processor–based servers to increase the performance of its NEC NeoFace facial recognition engine to a level where an individual can be identified smoothly from a high-resolution image with dozens of faces.
  News ID 5398

- **Infineon simplifies speed measuring sensor designs**
  For reliable and fast measurement of speed, Infineon Technologies is offering the new Hall sensor TLE4922 as well as the “Speed Sensor 2Go” design kit that goes with it. The TLE4922 was developed for industrial and automotive applications, where fast and reliable measurement of speed is critical, such as speed detection of crankshafts and transmissions in two-wheelers and three-wheelers.
  News ID 5388

- **Wibu-Systems: unbreakable software protection technology**
  Hundreds of participants from all corners of the globe have taken part in a hackers contest aimed at cracking a game protected with Blurry Box, the pinnacle of encryption recently launched by Wibu-Systems. The outcome: No one could break the latest software protection technology introduced by the leading provider of secure license management in the industrial world.
  News ID 5377

- **ept: Colibri SMT connectors now optionally with a thicker gold coating**
  ept’s Colibri PCB connectors, which have a pitch of 0.5 mm, are a reliable choice in COM express and high-speed applications up to 10 Gbps. In response to customer demand, these high-speed connectors are now also available as a Heavy Au version for deployment in challenging environments. A contact coating of 0.76 µm gold ensures reliable contacting and excellent signal integrity even under challenging conditions such as shocks, vibration, and other environmental stresses.
  News ID 5370
Security for microcontrollers with IP protection and licensing

By Marco Blume, Wibu-Systems

All products are designed to beat the competition. The effort that went into their development should pay off for as long as possible. This article explains how to shield microcontrollers with a level of protection on a par with larger systems – without having to dive into the depths of cryptography.

Microcontrollers are all around us: digital watches at our wrists, smartphones in our pockets, tablets on our desks, light switches in our smart homes, and in the cars in our garage. Not to mention the clever little coffee maker on the countertop. Wherever we turn, we see devices that have long left the era of “on and off” switches behind. This has added so much comfort to our lives. Nowadays, watches can read emails, and air conditioning knows when we are in the room. Satnav systems know where traffic is heaviest. Our smartphones know where we are heading, because our calendar is synced across all of our devices.

That is one side of the coin: the brave new comfortable world. There is another side we need to remember: the challenge of protecting our data, shielding our networks from attack, and not falling prey to software or hardware pirates. Just like a new home owner would never move in without locks installed on doors and windows, the design of intelligent devices also needs protection from the very start. But the entire package needs to fit – the most modern lock will not keep criminals out if the door itself is a thin sheet of plywood. This example should remind developers that they need to see security holistically in the design process to end up with a completely integrated solution against as many attacks as possible.

The level of protection depends on the quality of the measures taken and later compliance. This is where many developers enter unfamiliar terrain. Most are specialists in their areas and not experts for cryptography or secure software design. Users would ideally not be reminded of any security matters at all, and security must not hike up the costs.

The predictions for IoT applications are mind-bending: the IoT is expected to contribute around $15 trillion to global GDP in the next 20 years (source: General Electric), with 28.1 billion units installed by 2020 (source: IDC). These are not only impressive figures; they are also a wake-up call for the security issues created by the IoT revolution. Wibu-Systems has teamed up with Infineon to develop CodeMeter µEmbedded, an efficient firmware protection for systems using the XMC4000 microcontroller family, especially in the Industrial IoT. This article presents the integration on an XMC microcontroller as an example that can be adapted to nearly any other microcontroller platform. The functional principle stays the same.

The IoT comes in many shapes and sizes: Industrie 4.0 or smart homes and smart cars. What they all need is uncompromising security. Typical use cases include the authentication and licensing of components, monitoring and protection of system integrity, protection of data and communication channels, and the safety of upgrades and updates. This needs integrated solutions based on secure hardware to protect our infrastructure and its many components against attacks, fraud, and manipulation. Since all embedded systems used in the IoT are built around microcontrollers, this is the first line of defense.

The challenge for secure microcontrollers lies in making the chosen solution simple to integrate and usable even under tough industrial conditions. Wibu-Systems has developed CodeMeter µEmbedded based on its CodeMeter technology. The solution focuses on secure firmware updates and feature upgrades. Code integrity, license monitoring, protection against reverse engineering, and copy protection are key. Safety (for the user) is not an issue – the laws in this area are legion. Security (for the device) is, however, not guaranteed by similar legislation or universally accepted regulations. The CodeMeter µEmbedded use cases cover the most common security aspects. 1) Integrity protection: the microcontroller must only work with firmware from a defined source that must not be changed without proper authority. 2) IP protection: users in the field need to be able to load the firmware, so it needs to be protected against reverse engineering. 3) Licensing: there should be
The Eclipse-based platform makes software development easy with a vast periphery and developers an easy-to-use solution, Wibu-Systems. These developers can use commercial third-party tools to translate the C source code for ARM processors and use familiar tools like DA VE and ExProtector. The protected file can be transferred to a regular industrialized firmware or licensed again without replacing the firmware. The process is only completed if the signature is correct and intact.

In the secure production environment, the XMC4000 is equipped with a secure boot loader. A license file is created and bound to the controller ID. The actual license is only produced and the firmware v.1.0 loaded onto the device at that point. This can be scripted for an automated process, as there is no difference to a regular industrialized firmware download. Alternatively, the DAVE plug-in can take care of all steps for manual trials or small-batch production.

Use Case 1: firmware update in the field. This use case protects the firmware against reverse engineering by only allowing the device to load firmware that has not been tampered with. The firmware is created in DAVE and automatically signed and encrypted with ExProtector. The protected file can be transferred to the user without other safeguards, since it cannot be decrypted or changed outside the XMC4000. Any manipulation would break the signature and prevent the secure boot loader from loading and decrypting the firmware.

Use Case 2: feature upgrade in the field. This use case revolves around one universal firmware that users can upgrade with new features. The licenses are bound to the unique ID of the microcontroller and entitled during production. With the right license file, additional features can be activated in the field.

CodeMeter µEmbedded can also be used to store symmetric and asymmetric keys in protected memory. These keys can then only be used on devices with the right ID e.g. to check device licenses, track production volumes, or load encrypted application code onto the devices. The users benefit from the ability to use familiar tools like DAVE and CodeMeter Protection Suite, which handle all cryptographic operations. A new plug-in for DAVE gives the developers a neat interface to configure their XMC4000 microcontrollers and create encrypted firmware updates or license files.

The XMC4000 family of microcontrollers for industrial applications was made with digital power converters, high-resolution timers/PWM channels, and interfaces for all common industrial communication standards. The XMC4800 series comes with on-chip EtherCAT (Ethernet for Control Automation Technology) for simple and cost-efficient real-time Ethernet communication.
features in the field. The firmware itself is not replaced, not least to avoid costly testing and certification. The controller ID is ideally stored in CodeMeter License Central during development. The users can then buy new features from the device maker portal by entering their controller serial number. An encrypted license file is created for that system, where it e.g. activates additional movement patterns. Wibu-Systems offers a comprehensive package that makes it easier for developers to achieve powerful and flexible protection for their microcontrollers. No cryptography experts are required. Everything needed from encrypting software to managing licenses is already integrated and ready for use. Wibu-Systems offers the micro-embedded solution ready to use for Infineon XMC 4000. The package can be adapted and integrated for other platforms.

**Product News**

- **LieberLieber: from data streams to models**
  After gaining valuable experience in the handling of machine languages found in widespread use in industry applications during an initial cooperation, LieberLieber is making new strides with the new “CDL for Model-Integrated Intelligent Production” (CDL-MINT). CDL-MINT was established with the support of the Federal Ministry for Science, Research and Business (BMWFV) as well as the two industrial partners CertiCon and LieberLieber, and opened on May 22nd, 2017.
  News ID 5379

- **Cypress and Arrow announce Quicksilver IoT development platform**
  Cypress Semiconductor and Arrow Electronics announce a new development platform that enables engineers to quickly bring a broad range of connected IoT products to market. The new Quicksilver kit features Cypress’ Wireless Connectivity for Embedded Devices (WICED) platform and incorporates the robust connectivity of the Cypress CYW43907 802.11n Wi-Fi microcontroller.
  News ID 5415

- **Farnell: real time spectrum analyzers for radio network maintenance and interference hunting**
  Farnell element14 is now shipping the new RSA500 and RSA600 series Real Time Spectrum Analyzers from Tektronix. The RSA 500 series offers rugged, portable real time spectrum analysis for interference hunting, spectrum management and network maintenance tasks.
  News ID 5393

- **Wittenstein: SAFERTOS available with OSEK OS adaptation layer and automotive runtime monitor**
  Wittenstein high integrity systems release its enhanced Automotive Package, built around SAFERTOS, the ISO 26262 ASIL D pre-certified Real Time Operating System. The Package comprises SAFERTOS, certified to ISO 26262 ASIL D, SAFECheckpoints, a runtime verification monitor, and a new OSEK OS adaptation layer, allowing SAFERTOS to become a drop-in component for most automotive platforms.
  News ID 5393

- **SEGGER introduces PRO version of SystemView system analysis tool**
  SEGGER has announced SystemView PRO, which allows recording and live analysis of interrupts, task switches, API calls and other events without limiting recording time or number of events. To facilitate analysis of large amounts of data, custom event filters have been added to the feature set of this latest version of the powerful system analysis tool.
  News ID 5256
This year’s edition of our Embedded Companies Directory is split into 2 sections. The first part provides you with short company profiles, including a QR code which leads you to the full company profile (including overview about products & services, contact information, product news,...) on the embedded-control-europe.com portal. The second part of the Yellow Pages is a reference list showing in which product categories the companies are active.

**A.R. BAYER DSP Systeme**

A.R. Bayer DSP Systeme GmbH was founded in 2003 by Andreas Bayer, a first hour DSP specialist, with a focus on DSP products and services. The company is a spin-off of Bayer DSP Solutions which began operations in 1995. A.R. Bayer DSP Systeme GmbH is an ISO9001-2008 certified company.

[www.dsp-sys.de](http://www.dsp-sys.de)

**AdaCore**

AdaCore provides open source tools and expertise for the development of mission-critical, safety-critical, and security-critical software. AdaCore’s flagship products are the GNAT Pro and SPARK Pro development environments and the CodePeer automatic code reviewer and validator. Customers around the world trust GNAT Pro and AdaCore.

[www.adacore.com](http://www.adacore.com)

**ACCEED**

Acceed is an internationally operating distributor of industrial computers and components and is located in Düsseldorf, Germany. Acceed offers its customers a carefully attuned product portfolio from the fields of Industrial Network Technology, Communication and Signal Processing for the application areas of Automation, Test Management and Quality Assurance as well as Research and Development.

[www.acceed.com](http://www.acceed.com)

**ADL Embedded Solutions**

ADL Embedded Solutions is a leading provider of customizable, embedded solutions for demanding thermal and rugged environments. ADL’s diverse portfolio of products range from SBCs based on the AMD Geode™ and Intel® Atom® processors up to 4rd generation Intel® Core™ processors built in PC/104 and 3.5” form factors and full costom design, all of which can be delivered as part of a full system, or individual boards.

[www.adl-europe.com](http://www.adl-europe.com)

**Acromag**

Acromag is a multi-million dollar international corporation that combines more than 50 years of process monitoring and control experience with a solid background in high-tech computer design. Established in 1957, Acromag built its reputation designing critical measurement instrumentation equipment. Acromag, Inc. was soon recognized internationally as a leading designer of analog and digital control products for the industrial I/O market.

[www.acromag.com](http://www.acromag.com)

**ADLINK Technology**

ADLINK Technology is enabling the Internet of Things with innovative embedded computing solutions for edge devices, intelligent gateways and cloud services. ADLINK’s products are application-ready for industrial automation, communications, medical, defense, transportation, and infotainment industries. Many products are Extreme Rugged, supporting extended temperature ranges, shock and vibration.

[www.adlinktech.com](http://www.adlinktech.com)
Advanced Micro Peripherals

Advanced Micro Peripherals is a leading manufacturer of embedded video solutions - offering the latest MPEG-4 / H.264 (AVC) codecs and video overlay / annotation technologies on a wide range of embedded board form factors including PC/104, PC/104-Plus, PC/104-Express, CompactPCI and mini PCI modules.

www.ampltd.com

Axiomtek

Founded in 1990, Axiomtek is one of the major design and manufacturing companies in the Industrial Computer & Embedded field. Since our establishment, Axiomtek has successfully gained worldwide recognition for our innovative designs and outstanding customer satisfaction. Our customers come to us when they want a single, reliable, and valuable source for their industrial computer and embedded platforms.

www.axiomtek.com

ADVANTECH Europe B.V.

Founded in 1983, Advantech is a leader in providing trusted, innovative products, services, and solutions. Advantech offers comprehensive system integration, hardware, software, customer-centric design services, embedded systems, automation products, and global logistics support. We cooperate closely with our partners to help provide complete solutions for a wide array of applications across a diverse range of industries.

www.advantech.eu

Cadence Design Systems

Cadence Design Systems is a leading global EDA company. Cadence customers use our software, hardware, and services to overcome a range of technical and economic hurdles. Our technologies help customers create mobile devices with longer battery life. Designers of ICs speed their products to market using our hardware simulators to run software on a 'virtual' chip—long before the actual chip exists.

www.cadence.com

Artila Electronics

Artila Electronics is an emerging force in the industrial computer field. Unlike other industrial computer providers in the market who mainly use x86 plus Windows solutions, Artila focuses on ARM-core RISC CPUs with embedded Linux solutions, matched with Artila’s 10 plus years of experience in RS-232 / 422 / 485 industrial communication and TCP/IP networking.

www.artila.com

Concurrent Technologies

Concurrent Technologies designs and manufactures a wide range of modular products for use in critical embedded applications. Our primary focus is to provide long-life, highly reliable CPU boards based on Intel® Core™ i7 processors or low power Intel® Atom™ processors, NVIDIA® Tegra® GPGPU modules, switch fabric boards, XMC/PMC I/O modules, mass storage carriers and development systems.

www.gocct.com

Atlantik Elektronik

We scout out the trends on the global markets where technologies are used, and are experts in design-in of innovative semiconductor products. Atlantik Elektronik has a good eye for new developments in technology and anticipates trends while they’re still no more than a whisper. We’re committed to staying firmly ahead of the rest of the market - and ahead of our time.

www.atlantikelektronik.de

congatec

congatec is a leading supplier of industrial computer modules using the standard form factors Qseven, COM Express, XTX and ETX, as well as single board computers and EDM services. congatec’s products can be used in a variety of industries and applications, such as industrial automation, medical technology, entertainment, transportation, telecommunication, test & measurement and point-of-sale.

www.congatec.com
Data Modul

DATA MODUL offers perfectly tuned embedded computer systems based on x86 and ARM/Xscale-architectures. From the pre-configured kit up to the custom specific baseboard design, the whole bandwidth of Embedded Solutions is available.

www.data-modul.com

EKF Elektronik

As an independent systems manufacturer, EKF concentrated, from the very beginning, on complete solutions for industrial problems by using the latest in technology, with a focus on high reliability and long-term availability of all products. In 1998, EKF started development and manufacture of CompactPCI® boards and systems. In addition, EKF is currently developing solutions for new standards such as CompactPCI® Serial, incorporating the PCI Express® and other high speed technology.

www.ekf.de

ERNI Electronics

ERNI develops and manufactures a wide variety of connectors, backplanes and complete systems, soldering assemblies and Cable Assembly. ERNI is a globally active enterprise with branch offices in Europe, North America and Asia.

www.erni.com

ETAS

ETAS provides innovative solutions for the development of embedded systems for the automotive industry and other sectors of the embedded industry. As a systems provider, ETAS supplies a multifaceted portfolio that covers the range from integrated tools and tool solutions to engineering services, consulting, training, and support.

www.etas.com

Eurotech

Eurotech designs, creates and delivers full IoT solutions, including services, software and hardware to leading systems integrators and enterprises. With Eurotech solutions in place, clients have access to the latest open source and standardized software stacks, flexible and rugged multi-service gateways and sophisticated sensors to bring actionable data from the field into business operations.

www.eurotech.com
Express Logic is a leader in royalty-free RTOS software. Our ThreadX® RTOS is used in over 2 billion electronic products. Our NetX™ IPv4 and NetX DUO™ IPv4/IPv6 TCP/IP stacks, USBX™ USB Host/Device/OTG protocol stack, FileX® MS-DOS-compatible file system, GUIX™ graphical user interface and the TraceX® graphical event-analysis tool support applications in consumer, medical, industrial, automotive and aerospace applications.

Green Hills Software

Founded in 1982, Green Hills Software is the largest independent vendor of embedded software solutions spanning from embedded to enterprise. Green Hills is the only company with an operating system certified and deployed to IEC 61508 SIL 3 (industrial), FDA Class III (medical), EN 50128 SWIL 4 (railway), EAL6+ High Robustness (security), and DO-178B Level A (avionics).

HCC-Embedded

HCC has a unique position in the microcontroller market as a company almost exclusively focused on the development of embedded middleware with no dependence on a proprietary operating system. Specializing in middleware for USB, TCP/IP and Flash storage, the company has become a leader in high value, reusable software components.

Hyperstone

Hyperstone, a fabless semiconductor and microprocessor design company, was founded in 1990 and is based in Konstanz, Germany. Together with subsidiaries in Taiwan, USA and with other worldwide partners, Hyperstone serves a global customer base. Since July 2003, Hyperstone has been a member of the CML Microsystems Plc group.

IAR Systems provides world-leading software tools for developing embedded applications. Established in Sweden in 1983, IAR Systems enables companies worldwide to build products of today and innovations of tomorrow, mainly in the areas of automotive, consumer electronics, industrial automation, medical devices and telecommunications.

IBASE Technology is an ISO 9001, ISO 13485 and ISO 14001 certified company that specializes in the design and manufacturing of industrial PC products. IBASE provides OEM/ODM services tailoring products to customers’ requirements. Our product offerings include industrial motherboards, embedded systems, panel PCs, digital signage players, network appliances and RISC platforms for various applications.

IEI Integration Corp. is a leading industrial computer provider. IEI’s products are applied in smart city applications such as factory automation, networking appliances, security, and in fields like IoT (Internet of Things), building automation, transportation, communication base stations and medical instruments. IEI continues to promote its own-brand as well as serving ODM vertical markets to offer complete and professional services.

Kontron, a global leader in embedded computing technology and trusted advisor in IoT, works closely with its customers, allowing them to focus on their core competencies by offering a complete and integrated portfolio of hardware, software and services designed to help them make the most of their applications.
Lauterbach
Lauterbach is the leading manufacturer of complete, modular and upgradeable microprocessor development tools worldwide with experience in the field of embedded designs since 1979. At the headquarters in Höhenkirchen, near Munich, the engineering team develops and produces highly proficient and specialized Development Tools, which are utilized all over the world under the brand TRACE32®.

www.lauterbach.com

Manhattan Skyline
Manhattan Skyline is a long-established specialist supplier of displays, touch screens and embedded systems supporting Original Equipment Manufacturers worldwide. As an ISO9001 registered company, it is our aim to provide you with a quality product best suited to meet the rigorous demands of your particular application.

www.mansky.co.uk

LDRA
For more than forty years, LDRA has developed and driven the market for software that automates code analysis and software testing for safety-, mission-, security- and business-critical markets. Boasting a worldwide presence, LDRA is headquartered in the UK with subsidiaries in the United States, India and an extensive distributor network. For more information on the LDRA tool suite.

www.ldra.com

MathWorks
MathWorks is the leading developer of mathematical computing software. MATLAB®, the language of technical computing, is a programming environment for algorithm development, data analysis, visualization, and numeric computation. Simulink® is a graphical environment for simulation and Model-Based Design of multidomain dynamic and embedded systems.

www.mathworks.com

LieberLieber Software
LieberLieber Software is specialized in the area of model-based software and systems development. We offer individual project consulting, project management and know-how transfer and has years of experience in the development of tailored software solutions. In the past years, we have realized large multitouch solutions, HTML5 applications for smartphones and classic logistics solutions for mobile industry PDAs.

www.lieberlieber.com

MEN Mikro Elektronik
Since its founding in 1982 – and with more than 250 employees worldwide – MEN Mikro Elektronik has focused on innovation, reliability and flexibility to develop and produce standard and custom computing solutions that employ the highest technology levels. The company provides a robust offering of highly reliable embedded COTS boards and devices widely used in extreme environmental conditions found in industrial and safety-critical applications.

www.men.de

Logic Technology
Founded in 1993, headquartered in Panningen, The Netherlands, Logic Technology has become a leader in Europe’s embedded market. The unique combination of high-quality products, support and consultancy services is most appreciated by embedded developers. It’s this All-Inclusive concept that enables developers to focus on their own key tasks and provides them with a sparring partner in every phase of their project.

www.logic.nl

MicroSys Electronics
MicroSys Electronics GmbH located in Sauerlach close to Munich, designs and develops embedded system solutions, for e.g. VMEbus, CompactPCI and other common bus infrastructures. From the beginning in 1975, custom-tailored solutions offering longevity are a strong part of MicroSys’ business as well. Successfully deployed products span from Computer on Modules up to fully integrated systems.

www.microsys.de
N.A.T.

N.A.T. is the expert in turnkey systems and high performance connectivity products for data and (tele-)communication solutions. The product portfolio is dedicated to embedded markets such as medical, energy, communication, defense&aerospace, industrial controls, automation, transportation, test&measurement, and research.

www.nateurope.com

Phaedrus Systems

Phaedrus Systems supports engineers at all stages of embedded development. We specialise in support for safety-critical and high-integrity projects. A portfolio of tools to provide all the elements required to create an integrated tool chain - from initial specification through to life cycle management – has been assembled specifically for this demanding area of engineering.

www.phaedsys.com

Neousys Technology

Based in Taiwan, Neousys Technology is a provider of fanless embedded computers. We offer high performance and reliable products with innovative design. With an experienced engineering team, application-oriented features are integrated into our embedded systems. Our products serve as ideal solutions for automation, machine vision, in-vehicle, transportation, GPU computing, surveillance and video analytics.

www.neousys-tech.com

PLS

PLS is among the worldwide leading suppliers of debugging solutions and complete development tools for 16-bit and 32-bit microcontrollers and System-on-Chips (SoC). Important architectures such as TriCore, Power Architecture, RH850, ARM, Cortex, XC2000/XE166, SH-2A, XScale and C166/ST10 as well as simulation platforms of different vendors are supported.

www.pls-mc.com

PEAK-System Technik GmbH

Founded in 1999, PEAK-System Technik is a leading provider of hardware, software, and services for the industrial communication. The focus is on the field busses CAN and LIN.

www.peak-system.com

PLUG-IN Electronic

The company PLUG-IN Electronic GmbH based in Eichenau near Munich, Germany, has been marketing hardware and software for PC-assisted measuring and automation technology since being founded in December 1990. The core business focuses mainly on hardware solutions, with software solutions only being offered on the basis of graphic programming environments.

www.plug-in.de

Pentair

We safeguard industrial controls, electrical components, data communications and electronics in virtually any environment, anywhere in the world. We offer more than 12,000 standard products as well as tailored solutions with the lead times you need to keep your project on schedule. And all of our solutions are developed, tested and certified to comply in many countries and applications.

schroff.pentair.com/en/schroff

Portwell

European Portwell Technology is a wholly owned subsidiary of Portwell, Inc, which designs and manufactures a full range of IPC products (Computer on Module, PICMG1.3 SBC/SHB, embedded computers, specialty computer platforms, communication appliances, HMIs, backplanes, redundant power supply, rack mount & node chassis), embedded architecture solutions, DVR system platforms and communications appliances.

www.portwell.eu
PragmaDev

PragmaDev Studio helps managing complexity inherent to developing state of the art systems. It integrates three different tools based on international standards. The tools target architects/system engineers, developers, and testers.

www.pragmadev.com

Rohde & Schwarz

For more than 80 years, Rohde & Schwarz has stood for quality, precision and innovation in all fields of wireless communications. The company is strategically based on five pillars: test and measurement, broadcasting, secure communications, radiomonitoring and radiolocation.

www.rohde-schwarz.com

PRQA

Are you looking for sharp improvements in the quality of your static analysis code? Congratulations, you have just found the missing part of the puzzle! Become more productive and skilled through PRQA static analysis solutions! We are specialised in static analysis products and services, promoting safe coding standards practices.

www.programmingresearch.com

SE Spezial-Electronic

SE Spezial-Electronic AG, founded in 1970, is an internationally operating distributor of electronic components. With 31 suppliers of active, passive and electromechanical components,

SE Spezial-Electronic is one of the leading service distributors in Europe. We offer an extensive selection of logistics services and we support customers in developing and manufacturing products.

www.spezial.com

QA Systems

QA Systems tools automate unit testing, code coverage, integration testing and static analysis to optimise safety and business critical embedded software and accelerate standards compliance. All our tools are independently certified by SGS TUV for use at the highest integrity level of safety related software development for all major safety standards and qualifyable for standards such as DO-178B/C.

www.qa-systems.com

SECO

SECO is a world-leader in electronic embedded solutions. Spanning its 35+ years of experience, SECO has shown the ability to adapt its know-how to new, challenging customers’ needs, and to provide cutting edge solutions to its partners. On the strength of its know-how and in contrast with recent outsourcing trends, SECO has always set the entire production cycle in-house, from the development stage to mass distribution.

www.seco.com

Razorcat Development

Focused on software testing tools for the embedded systems market, Razorcat has developed the unit testing tool TESSY for C-code modules that supports the most relevant MCUs, compiler environments and target platforms. The systematic test design tool CTE helps creating low redundant and error sensitive test cases. The Integrated Test Environment (ITE) provides solutions to handle complex test management projects.

www.razorcat.eu

SEGGER

SEGGER Microcontroller develops and distributes hardware and software development tools as well as software components for embedded systems. SEGGER’s intention is to cut software development time for embedded applications by offering affordable, high quality, flexible and easy-to-use tools and software components allowing developers to focus on their applications.

www.segger.com
SINTRONES

SINTRONES is a world-renowned & ISO 9001 certified company of intelligent transportation system products. We are dedicated to provide our customers with high quality certified computer system products that meet international traffic transportation standards certification, including EN50155, E-Mark, IEC60945 IACS E10, DNV, and MIL-810. Our in-vehicle computing solutions have been widely adopted and approved by many well-known international brands and companies in industries.

www.sintrones.com

Solid Sands

Solid Sands is based in Amsterdam, the Netherlands. Our mission is to improve the quality of C and C++ compilers, and their safe and secure use by providing the best possible compiler validation suite. With our knowledge of past, current and upcoming versions of the C standard, new analysis and optimizations techniques and new compiler use cases, Solid Sands stays at the forefront of compiler testing and validation.

www.solidsands.nl

Supermicro

We develop and provide end-to-end green computing solutions to the data center, cloud computing, enterprise IT, big data, high performance computing, or HPC, and embedded markets. Our solutions range from complete server, storage, blade and workstations to full racks, networking devices, server management software and technology support and services. We offer our customers a high degree of flexibility and customization.

www.supermicro.com

SYSGO

Since 1991, SYSGO provides operating systems and services for embedded systems. In the late 90’s, SYSGO pioneered the use of Linux in the embedded market with the ELinOS distribution. For safety and security critical devices, SYSGO offers PikeOS, the world’s first SIL 4 certified hypervisor for multi-core processors, which builds the foundation for smart devices in the Internet-of-Things.

www.sysgo.com

TenAsys

Software for embedded virtualization environments to support mixed workloads on multicore Intel processor-based PC platforms. The product portfolio includes eVM® for Windows® and INtime®—which make use of embedded virtualization technologies to partition platforms while permitting multiple workloads to run simultaneously and independently on the same platform.

www.tenasys.com

Ubiqconn Technology, Inc.

Ubiqconn Technology Incorporated is an innovative manufacturing company that specializes in industrial Internet of Vehicle (IoV) solutions and embedded Internet of Things (IoT) solutions. For Industrial IoV solutions, we continue to develop and expand the product range of logistics & transportation applications. For Embedded IoT solutions, we offer all series of low power System on Module to accomplish the needs of customization.

www.ubiqconn.com

Vecow

Vecow, a team of embedded computing experts, dedicates to designing, developing, producing and selling industrial grade computer products.


www.vecow.com

Verocel

Verocel specializes in software and complex hardware verification to the DO-178, DO-254, IEC 61508, ISO 26262, EN 50128 and IEC 62304 certification standards. Our unique skills in certification of software components have enabled dozens of customers to succeed. Verocel’s tools enable developers to comply with stringent certification requirements including full life cycle artifact traceability, source and object code coverage analysis, and stack analysis.

www.verocel.com
Through its motto “Perfection in Protection, Licensing, and Security”, Wibu-Systems expresses its mission to deliver the most secure, unique, and highly versatile. From this undivided dedication, CodeMeter was born - a comprehensive and award-winning suite of hardware and software-based entitlement solutions for the protection of software rights and technical know-how.

Wind River, a wholly owned subsidiary of Intel® Corporation (NASDAQ: INTC), is a global leader in delivering software for the Internet of Things. The company has been pioneering computing inside embedded devices since 1981, and its technology is found in more than 2 billion products. Wind River offers a comprehensive portfolio of solutions for addressing the system-level challenges and opportunities of IoT.

WITTENSTEIN high integrity systems is an RTOS company that specialises in safety, supplying advanced RTOS, safety components, middleware and Board Support components across a broad range of market sectors and applications. We supply RTOS and Software components from basic embedded designs, up to complex safety systems demanding the highest levels of certification.

Xilinx is the leading provider of All Programmable FPGAs, SoCs, MPSoCs and 3D ICs. Xilinx uniquely enables applications that are both software defined and hardware optimized – powering industry advancements in Cloud Computing, 5G Wireless, Embedded Vision, and Industrial IoT.

XiSy Software GmbH is a software company that deals with the requirements of graphics solutions for the embedded market. Since 1994, we have been product innovator and product supplier for exceptional technologies. In addition to the core technology - the graphics / web server - we offer a constantly growing range of tools for the development of user interfaces.
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<th>Real Time Operating Systems</th>
<th>Development Tools HW</th>
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Advantech: compact fanless IPC with Intel 6th/7th gen Core i socket type platform

Advantech launch the MIC-7700, a high performance, compact, fanless IPC with the latest Intel Core i socket-type CPU. MIC-7700 provides highly flexible expansion capability and excellent computing through the Intel 6th/7th generation Core i socket type processor, DDR4 memory, optional I/O modules and unique Advantech i-module products.

News ID 5358

Peak-System: four times CAN FD on a PCI Express card

Peak-System extends its CAN FD range and continues the series of the PCAN-PCI Express FD with a four-channel version. This allows computers with PCI Express slots to be integrated into CAN FD and CAN networks. The two additional CAN connections three and four can be easily connected to the two-channel slot bracket included in the scope of supply via flat-ribbon cables. Each CAN FD channel can transmit a maximum of 64 data bytes of a CAN FD frame with bit rates of up to 12 Mbit/s, is galvanically isolated up to 500 Volts, and can be provided with a CAN termination.

News ID 5357

Axiomtek: Qseven module with Intel Apollo Lake processor

Axiomtek is releasing the Q7M311, a brand new Qseven module with Intel Apollo Lake processor, dual display interfaces, 32GB eMMC memory, and wide operating temperature support. Q7M311 has adopted the 14nm Intel Pentium N4200 and Celeron N3350 quad-core/dual-core processors. The extremely small embedded module supports 4GB (or optionally up to 8GB) DDR3L memory onboard and 32GB eMMC flash memory (optional). With a seismic design and for industrial-grade temperatures, both the CPU and the DDR3L RAM are soldered to deliver reliable and excellent computing performance.

News ID 5335

Avalue: marine certified Embedded Box PC

Avalue Technology is unveiling a IEC EN60945 marine certified Embedded Box PC, EM-SKLU-Marine for maritime applications, such as control room or engine room, IBS (Integrated Bridge System), propulsion control or safety system and boat entertainment system. The EM-SKLU-Marine Box PC is powered by the latest 6th generation Intel Core i7-6600U Ultra Low TDP processor, which delivers a full range of I/O connectivity.

News ID 5300

EKF: small system racks combine CompactPCI Classic & CompactPCI Serial

Rugged, versatile, economic – the SRP-3201-BluBoxx series of miniature CompactPCI IPC systems from EKF is suitable for all industrial-trial requirements, even under harsh conditions. The small rack is built of high quality 19-inch components, and provides space for up to five CompactPCI boards.

News ID 5338

Syslogic: add-on boards attach to CPU via USB interface

The age of the IoT and Industry 4.0 has brought a wide range of applications for embedded systems with it. Syslogic responds to the different requirements by introducing flexible add-on modules and now launches three new expansion cards, one analogous and one digital I/O board, and an USB serial interface converter.

News ID 5305

Lanner: network appliance powered by Apollo Lake processors

The NCA-1031, powered by the Intel Atom x7-E3950 or x5-E3930 processor, is a desktop form factor network appliance designed for entry-level network security, gateway or vCPE. Intel’s Atom E3900 series CPUs aim to handle the rapid and ever growing complexity of network infrastructures by delivering the much needed compute performance and power efficiency for edge security deployment.

News ID 5282

Ams: 26-bit, 128-channel current-input ADC for photodiode arrays

Ams released the AS5900, a current-to-digital converter for use in computed tomography scanners which offers ultra-low noise, very high resolution and excellent linearity. The outstanding analog performance of the AS5900 will enable new CT scanners to produce sharper, more detailed images.

News ID 5403

Arbor: COM Express Mini Type 10 module with Pentium N4200 / Celeron N3350 SoC

ARBOR Technology announces the availability of the EmNano-i2402 COM Express Mini Type 10 module, based on the new Intel Pentium / Celeron processors. Based on this new premium class low-power design, the robust COM Express Mini Type 10 modules consume, on average, just 6 watts while providing increased graphics capabilities and overall performance. Up to 12 graphics execution units can support up to three HD displays or two 4k displays.

News ID 5320

Apacer: high-endurance microSDHC/HC card for all-day weather-proof surveillance systems

Apacer Technology has launched the new industrial-grade microSDHC/XC memory cards which are custom-built for video monitoring equipment to endure long hours of continuous data writing. Not only are Apacer microSDXC UHS-I(U3) memory cards available in capacities ranging from 4GB to 128GB, their Ultra High Speed Class 3 specification also supports smooth Full-HD, 3D and 4K video recording, which is particularly significant in video monitoring applications that require continuous recording and sustain high wear rate.

News ID 5261

EKF: CompactPCI PlusIO CPU card with 5th gen Intel Core processor

EKF presents a real all-in-one solution, the PC5-LARO rich featured CompactPCI PlusIO CPU board, equipped with an Intel Core mobile processor. The front panel is provided with two Gigabit Ethernet jacks, two USB 3.0 receptacles, and two mDP connectors (DisplayPort 1.2 MST, 4k UHD). Low profile SSD mezzanine modules are available as on-board mass storage solution, preserving the 4HP front panel width.

News ID 5269

More information about each news is available on www.Embedded-Control-Europe.com/magazine You just have to type in the “News ID”. —
Axiomtek is introducing the NA345R, its latest Atom x5-E3940 processor. The reliable net-1U rackmount network appliance supporting Ethernet ports using Intel i211 Ethernet con-figuration (IO-Link, digital input/output, analog input/output). News ID 5330

Microchip announces a new family of x Xtreme Low Power (XLP) technology 32-bit microcontrollers. The PIC32MX1/2 XLP family offers current PIC32MX customers an easy migration path to achieve higher performance at much lower power, enabling both increased functions and longer battery life in portable applications. The PIC32MX1/2 XLP family increases performance in small pin-count devices with little code rework for existing customers. News ID 5364

Microchip: latest PIC32 family increases performance while reducing power consumption

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Axiomtek: Intel Apollo Lake-based 1U network appliance with 6 Gigabit LANs

Axiomtek is introducing the NA345R, its latest 1U rackmount network appliance supporting the Intel Celeron processor N3350 up to the 6th Generation Intel Core processors. News ID 5245

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ATP Electronics is expanding and relocating its European Headquarters to Unter-schleißheim, Germany. The expansion of the EU office will serve the company’s growing memory business in the area, largely driven by the increasing demand for ATP’s 3D NAND based solutions. News ID 5324

Maxim: dual IO-Link master transceiver

Designers of Industry 4.0 applications can now achieve robust communications and reduce power dissipation by 50% with the MAX14819 dual-channel, IO-Link master transceiver from Maxim Integrated Products. Today’s fanless programmable logic controller and IO-Link gateway systems must dissipate large amounts of power depending on IO configuration (IO-Link, digital input/output). News ID 5330

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ANSYS 18.1 expands pervasive engineering simulation

Engineers can create next-generation products quicker and easier with ANSYS 18.1. In the fluids suite, ANSYS 18.1 delivers faster, higher fidelity – enabling users to simulate more quickly and accurately. Users will benefit from greater flexibility setting up periodic boundaries to deliver high fidelity results up to 9 times faster for in-cylinder diesel simulations. Turbomachinery designers can now reduce problem size and time to convergence radial turbomachinery simulations when they apply complex vibrational modes from a cyclic modal analysis to CFX flutter analysis. News ID 5280

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Bridgetek strengthens portfolio of hardware supporting its microcontroller & display product lines

Building on the success of its CleO smart display offering and the array of accessories that accompany it, Bridgetek has now brought wireless connectivity into the mix. Transmitting and receiving in the 2.4 GHz frequency band, the CleO35-WiFi module is compliant with the commonly used IEEE 802.11b/g/n Wi-Fi standards. With the objective of enabling the control and monitoring of smart devices within the domestic environment, it can achieve +20dBm output power when in 802.11b mode. News ID 5412

BridgeTek: expansive portfolio of hardware supporting its microcontroller & display product lines

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ST: drop-in solutions for IoT security

STMicroelectronics and Security Platform are bringing robust, efficient, and easy-to-use security solutions to IoT devices. ST’s STSAFE-TPM is a Trusted Platform Module that provides secure storage for data such as cryptographic keys needed to authenticate the system, using proven techniques such as anti-tamper, memory protection, and data-watching prevention. It meets industry-recognized security standards. News ID 5408

Manhattan Skyline: 5.5 inch Full HD AMOLED display

The G1549FH101GF is a Full HD resolution (1080 x 1920) active matrix OLED display with large colour gamut, great contrast and wide viewing angles. This display has a thickness of just 0.77mm with only 1.2mm of bezel giving better visual effects for the module. Colour saturation is 100% and view angles are greater than 80 (L/R/U/D). AMOLEDs do not need a backlight hence the compact dimensions compared to LCDs. Interface is MIPI – lane and on – cell touch technology is a feature. Pixel arrangement is V -Styelled. News ID 5354

MACOM: RF Energy Toolkit accelerates customers’ time-to-market

MACOM Technology Solutions unveiled a development kit targeted to help commercial OEMs quickly and easily adapt their product designs to incorporate GaN-based RF energy sources for a wide range of applications spanning cooking, lighting, industrial heating/drying, medical/pharmaceutical, automotive ignition systems and beyond. News ID 5334

Laird: compact solution for remote, wireless control movement of a locomotive

Laird is launching the Transport Locomotive Control Unit (LCU), a space-saving solution for industrial rail applications. The new Transport LCU, which is now available for supply, is installed inside the locomotive and serves as the controlling system for remote, wireless control movement of a locomotive through a railyard and is designed as a small space, easy-install solution. News ID 5308
Premier Farnell: Raspberry Pi add-on to support IoT device development

Premier Farnell announces an exclusive partnership with MATRIX Labs to manufacture and distribute MATRIX Creator to a global network of developers and makers of all skills levels. The MATRIX Creator is a Raspberry Pi add-on that provides multiple functionality and enables faster and more cost-effective development of IoT devices.

News ID 5394

Infineon: smart power switches with PROFET+2 and High Current PROFET

Car makers want in-vehicle electronic systems to provide a large number of energy-efficient functions in as little space as possible. Infineon Technologies supports this trend with its new power IC manufacturing technology SMART7. Infineon designed it specifically for automotive applications such as Body Control Modules or Power Distribution Centers.

News ID 5384

Swissbit: reliable boot medium for Embedded applications

Swissbit presents its latest technology for the industrial market: the embedded Multime-dia card EM-20. The eMMC combines an industrial controller with reliable MLC flash in a BGA153 package making it possible to solder the memory directly onto the printed circuit board of the target application. With capacities from 8 to 64 GB, all typical applications are covered. EM-20 replaces thus far commonly used NAND memory chips, which depend on elaborate operating system resources.

News ID 5317

Microchip simplifies design of low-power LCD applications

Microchip announces a new family of low-power microcontrollers featuring Core Independent Peripherals and intelligent analogue for driving Liquid Crystal Displays. The nine member PIC16F19197 family includes a battery-friendly LCD drive charge pump; 12-bit ADC with computation; a low-power comparator; and active clock-tuning of its high-frequency oscillator. They are the first 8-bit MCUs to be optimised for popular low-power and battery-powered touch-enabled LCD applications.

News ID 5309

FTDI Chip: advanced evaluation/development modules for USB 3.1 technology

To complement its FT602 USB 3.1 (Gen 1) video class FIFO IC, which has now gone into full scale production, FTDI Chip has introduced a pair of accompanying hardware modules. The UMF602A and UMF602X units enable bridging of a FIFO bus to a USB3.0/1 host and are equipped with either HSMC or FMC connectors.

News ID 5244

AD: 60V low IQ synchronous step-down controller

Analog Devices announces the LTC7800, a synchronous step-down DC/DC controller that operates at up to 2.25MHz for reduced circuit size and increased power density. Its low 45ns minimum on-time enables 24VIN to 3.3VOUT conversions while switching at a fixed 2MHz, avoiding critical noise-sensitive frequency bands including AM radio.

News ID 5391

LieberLieber: LemonTree 1.3 with optimized performance

The industry’s interest in LieberLieber LemonTree diff & merge tool for model-based development projects, continues to grow. Among the most well-known customers are Bosch, Deutsche Bahn, Hima, Infineon, McLaren, Mitsubishi Electric, Schaeffler, Toll Collect, Valeo and ZF Friedrichshafen, to name a few.

News ID 5383

SYSGO and Lauterbach consolidate their partnership

A new co-marketing agreement complements the long-term technical collaboration between the two companies, ensuring the compatibility of their various products, including release changes. Lauterbach already supports the recently unveiled PikeOS Release 4.2 on the platforms ARM, ARM64, PowerPC and X86. In addition, TRACE32 has had special functions for this real-time operating system as of PikeOS 3.3, with the result that the features of both products ideally complement each other.

News ID 5385

IAR: functional safety tools for Renesas automotive RH850 MCUs

IAR Systems announce an extension of its tools offering for safety-related software development with the launch of a functional safety edition for IAR Embedded Workbench for Renesas Electronics’ RH850 Family of automotive microcontrollers. The functional safety edition is certified by TÜV SUD according to the requirements of IEC 61508, the international umbrella standard for functional safety, as well as ISO 26262, which is used for automotive safety-related systems, and the European railway standard EN 50128.

News ID 5333

Lattice: reference designs support LoRa communication and ECC security

Lattice Semiconductor announced the availability of new reference designs based on its iCE40 UltraPlus FPGA devices to address emerging market requirements and to enable an expedited product development cycle. Expanding one of the industry’s most energy-efficient and programmable mobile influenced solutions, Lattice’s new reference designs for the iCE40 UltraPlus support LoRa communication, elliptic curve cryptography security, signal aggregation, machine learning and graphics acceleration.

News ID 5396

MACOM enabling rapid transition to 400G for cloud data centers with L-PIC chipset

MACOM Technology Solutions announced the production ready MAOP-L284CN, MACOM’s 100G CWDM4 transmitter L-PICTM (Lasers integrated with a Silicon Photonic Integrated Circuit) and supporting driver and controller IC chipset. To meet the bandwidth demands, resiliency and data redundancy requirements of today’s Cloud Data Centers, data center optical interconnects are transitioning from 100G to 400G, driving explosive demand for high-speed optical links.

News ID 5303

MAX17574 Himalaya synchronous step-down DC/DC controller

Infineon Technologies supports this trend with its new power IC manufacturing technology SMART7. Infineon designed it specifically for automotive applications such as Body Control Modules or Power Distribution Centers.

News ID 5306

Maxim: step-down DC-DC converters enable rapid compliance of safety standards

System architects can now rapidly comply to IEC and SIL standards to achieve long-term system reliability with the MAX17572 and MAX17574 Himalaya synchronous step-down DC-DC converters from Maxim Integrated Products.

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News ID 5303
**PRODUCT NEWS**

**Logic Technology: closing the gap between developers and designers**
The easy-to-use interface of the TouchGFX Designer allows designers to improve ideas and make fast changes. As the code is generated directly for the developer to pick up exactly where the designer left off, this process practically eliminates the gap between designers and developers—a gap which is often filled with hand-over documents, frustrations, and misunderstandings. TouchGFX Designer is the ideal tool, not only for a fast and efficient development process, but ultimately for creating superior products.

*News ID 5328*

**SEGGER: compact version of J-Link for verification and test beds**
SEGGER introduces the J-Link BASE Compact and the J-Link PLUS Compact. The compact variants of the J-Link models are designed for minimal footprint and to mount securely and unobtrusively into development or end user equipment. Two mounting holes and small size make it simple to place the J-Link into existing equipment housings or to reserve space for direct-to-PCB mounting.

*News ID 5361*

**Rohde & Schwarz and ADI reinforce long-term relationship**
For more than 30 years, Rohde & Schwarz, one of the world’s leading manufacturers of test and measurement, communications and broadcasting equipment, has been productively collaborating with Analog Devices, the leading global high performance analog technology company. With the signing of a new global procurement agreement, the two companies have given their relationship a new contractual foundation, ensuring a solid platform for current and future business.

*News ID 5337*

**Mouser: IoT modular platform for smart and connected cloud-based apps**
Mouser Electronics is now stocking the IoT Development Kit from ON Semiconductor. Combining hardware and software elements to enable rapid implementation of smart and connected cloud-based applications, ON Semiconductor’s IoT Development Kit provides engineers with all of the building blocks needed to speed the evaluation, design and implementation of medical-, home- and industrial-based Internet of Things designs.

*News ID 5339*

**TME: development kits from mikroLAB**
MikroBUS is currently the fastest growing standard of expansion boards in the world. It’s one of the phenomenal developer solutions offered by MikroElektronika, but not the only one. Currently, MikroElektronika’s offer includes kits dedicated for other major manufacturers, such as Atmel (Microchip), NXP, TI, Silicon Labs, ST Microelectronics, and FTDI.

*News ID 5346*

**Conrad Business Supplies adds high-performance USB digital oscilloscope**
Conrad Business Supplies has announced the immediate availability of Analog Discovery 2, a high-performance, pocket-sized, all-in-one USB oscilloscope from Digilent. Analog Discovery 2 is the most affordable all-in-one instrument with the performance and flexibility required for real engineering challenges.

*News ID 5329*

**Microchip extends extreme Low Power PIC32MM microcontroller family**
Microchip announces new PIC32MM “GPM” microcontrollers. These eXtreme Low Power (XLP) MCUs feature large memory in small packages to provide ample battery life for space-constrained applications. With the inclusion of several connectivity options, Core Independent Peripherals and feature-rich development boards, the “GPM” MCUs are well suited for digital audio applications, gaming/entertainment devices, IoT sensor nodes and portable medical devices.

*News ID 5350*

**IAR: Embedded Workbench now available for ARM DesignStart users**
IAR Systems will partner with ARM on the newly enhanced ARM DesignStart program. SoC designers now have the option to use the powerful development toolchain IAR Embedded Workbench for SoC development using DesignStart Cortex-M processors, making development faster and more reliable.

*News ID 5378*

**MACOM: PAM-4 technology chipset for single lambda 100G, 200G and 400G connectivity**
MACOM Technology Solutions announced a complete PAM-4 technology chipset for 100G data rates over a single wavelength enabling single fiber and four-lane parallel fiber connectivity for 100G, 200G and 400G Ethernet applications. This chipset features a new transimpedance amplifier, transmit and receive clock and data recovery devices and linear Electro-Absorption Modulated Laser driver module.

*News ID 5304*

**BridgeTek assists embedded system design with MCU, HMI & I/O expansion hardware**
With the objective of helping both the maker community and professional engineers too, BridgeTek continues to add new hardware to its CleO smart display platform. Compatible with both the CleO35 3.5-inch and CleO50 5-inch TFT formats, the CleOIO-Shield is an input/output expansion shield that connects directly on to the NerO system controller board.

*News ID 5376*

**Logic-Technology: Cortex-M and Eclipse/GNU Training Course**
Learn the skills you need to be a professional embedded developer with this 3-day hands-on training course in ARM Cortex-M development. This training will learn you everything worth knowing about the Cortex-M cores and the GNU compiler and debugger tool chain. You will also learn the ins- and outs- of the ECLIPSE IDE, and how to use it for advanced Cortex-M development and debugging.

*News ID 5271*

**Microchip: MCU with integrated 2D GPU and DDR2 memory**
Microchip announces the 32-bit PIC32MZ DA microcontroller family with integrated 2D Graphics Processing Unit and up to 32 MB of integrated DDR2 memory. This combination gives customers the ability to increase their application’s colour resolution and display size, up to 12 inches with easy-to-use microcontroller based resources and tools including the MPLAB Integrated Development Environment and MPLAB Harmony Software Framework.

*News ID 5307*

**Intersil: PMIC for application processors, GPUs, FPGAs and system power**
Intersil introduced a highly integrated programmable power management IC (PMIC) that delivers 91% efficiency at 1.1V output voltage for application processors, GPUs, FPGAs and high-performance system power. The new PMIC’s low RDS(ON) MOSFETs and programmable PWM frequency allows designers to use fewer low-profile external components, enabling a 50mm2 power-supply that is 40% smaller than competing solutions.

*News ID 5274*

**Rohde & Schwarz: multi-level IoT solution provides secure, globally managed IP connectivity**
Rohde & Schwarz Cybersecurity and Arkessa launch a joint multi-level IoT platform solution. It unlocks the full potential of IoT by enabling secure interactions across digital ecosystems of devices, people and systems. The Internet of Things (IoT) continues to expand rapidly and poses significant network connectivity and security risks. The unprecedented scale of deployment for connected endpoints and devices creates unique new challenges for the IoT ecosystem, including carriers and network operators.

*News ID 5352*
Arrow: Panther board speeds up development of IoT pattern matching applications

Arrow Electronics has extended its range of German companies will for the first time Government on 12 and 13 June 2017, three control purposes.

Keysight: insight in 5G, IoT, aerospace and defense design, test solutions at IMS 2017

Keysight Technologies will demonstrate the latest design and test solutions for components and systems used in 5G communications, internet of things, and aerospace and defense applications that solve the toughest engineering challenges at International Microwave Symposium.

News ID 5297

Infineon: preventing cyber-attacks in rescue services

Infineon: preventing cyber-attacks in rescue services

Electronic devices in emergency medicine are extremely powerful, but often insufficiently secured against unauthorized digital access. At the Digital Summit of the German Federal Government on 12 and 13 June 2017, three German companies will for the first time present a technical solution to secure medical devices against unauthorized access to their data.

News ID 5336

PragmDev to support ETSI conformance test suites

PragmDev Studio aims at supporting the full TTCN-3 test notation used by ETSI to produce its conformance test suites. As a first step, PragmDev Tester V5.2 has been verified to support the SIP (Session Initiation Protocol) for code generation out of the publicly available conformance test suites. Other ETSI conformance test suites will become available in the near future.

News ID 5362

Keysight Technologies launches E-Mobility test and measurement solutions

Keysight Technologies launches a suite of test and measurement solutions for the rapidly growing battery, HEV/EV and HEMS markets. The global electric vehicle market - ranging from mild hybrids to battery electric vehicles and HEMS - are fast growing and very dynamic, with a large number of new application areas and implementation characteristics.

News ID 5366

Cadence expands online tool access for ARM DesignStart customers

Cadence Design Systems expanded support for the enhanced ARM DesignStart program, including the newly added ARM Cortex-M3 processor and the ARM CoreLink SDK-100 System Design Kit, which includes the fully verified CoreLink SSE-050 subsystem, enabling engineers to further accelerate the delivery of mixed-signal internet of things designs.

News ID 5371

Vector Software: data and control coupling verification capability in VectorCAST

Vector Software announced the initial release of VectorCAST/Coupling. VectorCAST/Coupling provides data and control coupling verification for C and C++ source files. Coupling verification is mandatory for safety-critical avionics software development according to both RTCA DO-178B and DO-178C.

News ID 5311

Lynx demonstrates safety and security technology collaboration at IoT World Conferences

Combining certified safety-critical software platforms with LynxSecure Separation Kernel Hypervisor is allowing developers in regulated safety industries to use military-grade security technology to protect safety-certified systems from malicious attack. Combining the FAA certified LynxOS-178 RTOS with LynxSecure was the first example of this protection strategy, used in avionics and transportation applications.

News ID 5283

Cadence and MathWorks: new capabilities between MATLAB and Virtuoso platform

Cadence Design Systems has expanded its partnership with MathWorks through a new integration between the Cadence Virtuoso Analog Design Environment Product Suite and MATLAB, enabling customers to accelerate processing of large data sets when verifying custom, RF and mixed-signal designs.

News ID 5278
Atlantik Elektronik: Ethernet network connectivity for industrial machines
Atlantik Elektronik presents the xPico 110 industrial networking module, a compact device server module that has been developed by Lantronix to make it easy to IoT-enable legacy industrial devices. The Lantronix xPico 110 is specifically designed for industrial environments such as Building Automation, Renewable Energy, Industrial Machines as well as Access Control & Physical Security.

News ID 5277

Infineon: intelligent power module CIPOS Mini integrates power factor correction
Infineon Technologies introduces the new CIPOS Mini featuring power factor correction. The intelligent power module (IPM) combines a single switch boost PFC stage and a 3 phase inverter in one package. With the PFC integrated into the inverter module, the integrated CIPOS Mini IPM helps to reduce system size and the bill of material.

News ID 5257

TME: Riverdi TFT LCD displays with FT8xx controllers
The development of image display technology resulted in a wide range of displays on the market to choose from, based on different parameters and capabilities. Riverdi is one of the noteworthy manufacturers, who specializes in Thin Film Transistor LCD displays. Riverdi offers displays in various sizes from 2.8 to 7 inch, with the resolution of 240x320/320x240 to 840x480 pixels. Different models have different parameters – brightness, contrast, or colour depth.

News ID 5267

Mouser signs global agreement with D3 Semiconductor
Mouser Electronics announced a global distribution agreement with D3 Semiconductor. As part of the agreement, Mouser now stocks D3 Semi’s line of 650V superjunction power MOSFETs, which are designed for a variety of demanding uses, including enterprise computing power supplies, motor control, lighting and other challenging power management applications.

News ID 5286

ST: surface-mount intelligent power modules save space in energy-efficient motor drives
STMicroelectronics has added five space-saving surface-mount intelligent power modules (IPM) to its SLLIMM-nano family, giving the choice of IGBT or MOSFET outputs for in-motor or other space-constrained drives all the way from very low power ratings up to 100W.

News ID 5340

Microsemi: scalable SiC MOSFET driver solutions to accelerate customer designs
Microsemi and Analog Devices announced a scalable Silicon Carbide driver reference design solution based on a range of Microsemi SiC MOSFET products and Analog Device’s ADuM4135 5KV isolated gate driver. The dual SiC MOSFET driver reference design provides user-friendly design guides enabling faster time to market for customers using Microsemi SiC MOSFETs and supports the transition to Microsemi’s next generation SiC MOSFETs.

News ID 5285

Bosch: high-performance MEMS acceleration sensors for wearables
Bosch Sensortec announced a new family of MEMS acceleration sensors for wearable devices, offering high performance and ease of integration in compact packages. The BMA456 and BMA423 are specifically designed for motion and fitness tracking in wearables. The new products will be showcased at the Bosch booth 836 at Sensors Expo & Conference.

News ID 5389

Arrow: wireless sensing technologies for IoT applications from Libelium
Arrow Electronics and Libelium have signed a global distribution agreement. The deal extends Arrow’s portfolio for the Internet of Things with the addition of Libelium’s wireless and sensor technology and enables the companies to provide off-the-shelf IoT solutions that require minimal design effort before deployment. Libelium’s Waspmate hardware architecture has been designed to function with extremely low power consumption.

News ID 5292

u blosx: small quad band LTE Cat M1 module for multi-regional IoT and M2M applications
u blosx announced the world’s smallest quad band LTE Cat M1 module, the u-blox SARA R410M. By enabling remote devices to connect directly to 4G networks, the u-blox SARA R410M will aid the rollout of Internet of Things and machine-to-machine applications, from smart metering to connected healthcare, and from industrial control and monitoring to smart buildings and cities.

News ID 5243

Allegro MicroSystems: high current integrated DC motor driver IC
Allegro MicroSystems Europe has announced a new motor driver IC designed for pulse-width-modulated control of DC motors. Allegro’s A5950 is capable of peak output currents up to ±3 A and operating voltages up to 40 V. This new device is targeted at the automotive market with end applications to include heads-up-display, shift drive, door closure and engine thermal management applications.

News ID 5413

u blosx: new series of secure LTE advanced automotive telematics modules
u blosx announces the TOBY-L4 series of Automotive Grade telematics modules. The series integrates LTE, UMTS and GSM connectivity with a powerful embedded processor, enabling a wide range of applications on a single device. Connectivity is at the heart of the TOBY L4 LTE Cat 6 modules, providing full gateway capabilities in a single device capable of delivering up to 300Mbit/s data rates with carrier aggregation capability.

News ID 5327

Maxim: automotive LED controller for exterior lighting and improved safety applications
The MAX20078 synchronous buck, high-brightness LED controller from Maxim Integrated Products provides both fast response time and low electromagnetic interference for exterior LED lighting and improved safety applications. Ideal for matrix lighting designs, the LED controller allows designers to achieve high performance, ease of design, and fast time-to-market.

News ID 5349

Keysight: test platform to validate GCF RF NB-IoT and CAT-M test cases
Keysight Technologies announced its Test Platform 195 is the first and only test platform that includes RF NB-IoT and CAT-M validated test cases together in the Global Certification Forum (GCF).

News ID 5248

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Toshiba: stepper-motor controller saves space and ensures cooler, quieter running
Toshiba Electronics Europe has begun sampling a new 40V/3.0A stepper-motor control IC that requires no external current-sense resistors, and hence enables more economical and compact drives in equipment such as printers, office machines, surveillance cameras, banking terminals, banknote identification machines, and home appliances. Further new features increase efficiency, reduce heat generation, and enhance accuracy at high speeds.

News ID 5254

TI: GaN power design drives 200-V AC servo drives and robotics with 99-percent efficiency
Texas Instruments introduced an innovative three-phase, gallium nitride based inverter reference design that helps engineers build 200-V, 2-kW AC servo motor drives and next-generation industrial robotics with fast current-loop control, higher efficiency, more accurate speed, and torque control. Download the reference design today.

News ID 5401

Lattice: Ultra HD wireless solution to deliver Blu-ray quality video
Lattice Semiconductor announced an ultra-high-definition wireless solution to deliver Blu-ray quality video for broad market applications. Using the MOD6320-T and MOD6321-R wireless video modules based on Lattice’s SiBEAM 60 GHz technology and the SiI9396 HDMI 2.0 video bridge device, Lattice is the first to bring to market a 4K wireless video solution that transmits in the 60 GHz band, ensuring robust, low latency video transmission free from interference.

News ID 5342

Mouser: low-cost motor controller includes six-channel PWM module
Mouser Electronics is now stocking the MC9S08SU 8-bit microcontroller from NXP Semiconductors. This single-chip device for 4.5 – 18 V motor control applications delivers high performance with tight integration to help lower BOM costs and reduce footprint by up to 50 percent for space-constrained applications.

News ID 5341

Swissbit: industrial MLC flash memory with unrivalled values for endurance
Swissbit has reached a key milestone with its MLC technology durability. In December 2016, for the first time, a third of all flash products sold by Swissbit were based on MLC (Multi Level Cell). At the same time, sales of SLC products (Single Level Cell) also increased, firmly establishing Swissbit as a leading provider of industrial flash memory products.

News ID 5405

MACOM: SMT packaged mmW switch for 5G wireless demonstration systems
MACOM Technology Solutions announced the newest entry in its portfolio of components and integrated modules for 5G wireless infrastructure. Ideally suited for 28GHz, 37GHz and 39GHz frequency bands, the new SMT packaged MASW-011098 millimeterwave (mmW) switch is designed to meet the demanding bandwidth and link margin requirements of next-generation 5G demonstration systems.

News ID 5302

EVT: EyeVision 3D software with new features
The EyeVision 3D image processing software has a special command set to scan profiles, to do measurements based on those profiles and check if there is an error on those profiles. As it is a 3D profile, this means that the point are not only captured in their x- and y-directions but also their position in z-direction. Therefore the scan can also generate a point cloud image in addition to the profile image.

News ID 5252

SEGGER: J-Link EDU mini focuses on education sector
In another move to address demands from the educational community for professional but low-cost development tools, SEGGER introduces the J-Link EDU mini. Big things come in this small package, as it offers all of the advanced features associated with a commercial J-Link solution. These include the use of SEGGER’s leading IDE Embedded Studio, Ozone Debugger and GDB Server, as well as other powerful visualization tools, such as SystemView and J-Scope.

News ID 5326

eCosCentric introduces eCosPro v4.1 RTOS
eCosCentric announced the latest iteration of the eCosPro real-time operating system. The new 4.1 release of the eCosPro Developer’s Kit includes the latest Eclipse Neon IDE, delivers improvements to the eCosPro Eclipse plug-in and development tools, and integrates a variety of run-time enhancements.

News ID 5407

Cypress: automotive MCUs support CAN FD networking, eSHE security and high-quality sound
Cypress Semiconductor is sampling new devices in its Traveo automotive microcontroller family that provides secure, high-speed networking for classic instrument cluster applications. The new MCUs support the Controller Area Network Flexible Data-rate standard for high-speed, in-vehicle networking, allowing large amounts of data to be exchanged between each CAN node.

News ID 5410

Rohde & Schwarz: FSW signal and spectrum analyzer offers 2 GHz internal analysis bandwidth
Rohde & Schwarz is expanding the internal analysis bandwidth of its R&S FSW high-end signal and spectrum analyzer up to 2 GHz by introducing the new R&S FSW-B2001 option. This test solution enables R&D users to investigate wideband signals in detail without the need for an external digitizer. The R&S FSW-B2001 option provides 14-bit ADC resolution and wide dynamic range, characterized by excellent SFDR figures, for example -65 dBc for 1200 MHz bandwidth.

News ID 5406

Allegro MicroSystems: three-phase BLDC controller and MOSFET driver IC
Allegro MicroSystems Europe has announced a new three-phase brushless BLDC motor controller for use with N-channel external power MOSFETs. Allegro’s AMT4913 incorporates much of the circuitry required to design a cost-effective, three-phase motor drive system with maximum supply voltages up to 50 V. This new device is targeted at high current BLDC motor applications for speed, position, or torque control requirements.

News ID 5250

Microsemi: mid-range PolarFire FPGAs and evaluation kit available
Microsemi announced its PolarFire FPGA engineering samples are available for ordering. The PolarFire FPGA family provides the lowest power, cost-optimized mid-range devices spanning from 100K logic elements to 500K LEs.

News ID 5411

Cypress: 802.11ac high-performance Wi-Fi solution
Cypress Semiconductor announced a new wireless solution that delivers advanced coexistence combining 802.11ac high-performance Wi-Fi, Bluetooth and Bluetooth Low Energy (BLE) for IoT applications. The new highly integrated Cypress CYW4373 solution incorporates a USB 2.0 hub that provides a common WLAN and Bluetooth interface.

News ID 5310

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