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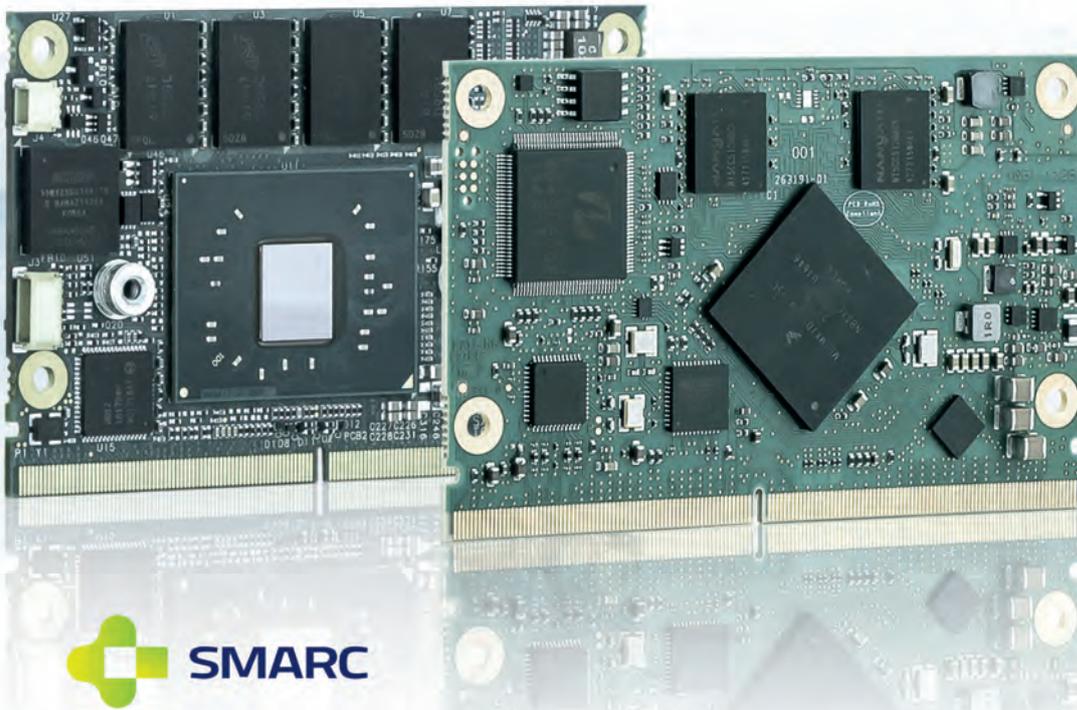
April 02/18

Cover Story:

From Edge to Fog to Cloud – IoT Computing with SMARC



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SPECIAL FEATURES:

■ INDUSTRIAL IOT - EMBEDDED COMPUTING - SENSORS

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Dear Readers,



Punctual with the publishing date of this issue of B&S/ECE, Hanover Industry Fair takes place, the largest and most important exhibition for the industry in general, held at the Fairgrounds in Hannover – and again the connected industry including Internet of Things (IoT) and Industrie 4.0 is the main topic this year but in a broader context. The combination of CeMAT with Hannover Fair according to the motto “Logistics 4.0 meets Industrie 4.0” is just one proof. Machine learning and artificial intelligence are influ-

encing the embedded world and vice versa. Machine learning best demonstrates its opportunities in any situation where companies are looking to derive new knowledge from past experience. The technology enables digital systems to identify recurring patterns in data and apply the resulting findings to new data streams e.g. for maintenance. In this way, trends and anomalies can be detected – in real time and within the running system. This allows manufacturing companies to use their petabytes of data in a way that benefits their business.

But Artificial intelligence is a growth factor for various other businesses. There is no master plan for using it – but some basic rules apply in every case. Intelligent robots and self-learning computers will have a huge impact on German industry in the coming years: Artificial intelligence (AI) could increase the gross domestic product by ten billion euros a year by 2030, according to McKinsey. They created five rules to build an AI-centric environment. First: Defining a business case is no easy task when it comes to artificial intelligence, the management consultancy wans, because information about AI remains incomplete and doubts can be widespread among employees. Second: Connect internal and external skill bases because AI experts are still fare too scarce. In Germany there is a gap of some 5.000 workers. Third: Store granular data. Data forms the foundation for every artificial intelligence. Companies must therefore store as much granular (i.e. sufficiently detailed) data as possible and make this information available in a relational, table-based database. Fourth: Combine existing knowledge with AI. AI will not lead to successful outcomes without careful attention to context. McKinsey recommends codifying your company’s own knowledge, i.e. recording and storing it, and integrating it into the AI algorithm, to best support machines’ self-learning. Fifth: Introducing AI should be an agile process. Simulations and tests in subsections of the company serve to continuously optimize results.

And consequent this issue is full of corresponding content. It starts with our cover story which describes the data transfer of IoT computing from Edge to Fog to Cloud with boards in the new SMARC form factor. Another two examples are the articles about the QorIQ processor which integrates four technologies needed for Industrie 4.0. and the protection of intellectual property for sensors in the IIoT. The remaining content round up this IoT issue.

I hope you’ll enjoy this issue!

Yours Sincerely

Wolfgang Patelay
Editor



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Cloud, Edge and Fog computing is everywhere and everybody is talking about it. In industrial surroundings traditional server approaches cannot provide the required robustness for operation in harsh industrial environments, but how can modular systems based on the tested SMARC Computer-on-Modules provide an efficient solution.

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During the development process of the Pentair Schroff COM carrier system, thermal simulations were used to optimize passive cooling through the cooling element. The result is a modular system that can be modified to meet various customer requirements through selection from a series of available cooling elements.

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In this article the author compares three different touch technologies and examines their suitability for industrial applications.

Cloud for flat-panel controllers and RFID readers 20



The first cloud for flat-panel controllers offers full connectivity to enable central parameterization and constant monitoring of the operational status of displays. This brings two clear advantages: higher ease of use and lower maintenance costs.

QorIQ processor integrates four technologies needed for Industry 4.0 22

NXP's new QorIQ Layerscape LS1028A processor integrates on a single chip the 4 technologies needed in next-generation industrial systems: time-sensitive networking, high-performance processing, hardware-accelerated user interfaces, and high security.

Enabling future oriented functionalities for motor control solutions 25



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SMARC

SPECIAL FEATURES:
 ■ INDUSTRIAL IOT- EMBEDDED COMPUTING- SENSORS

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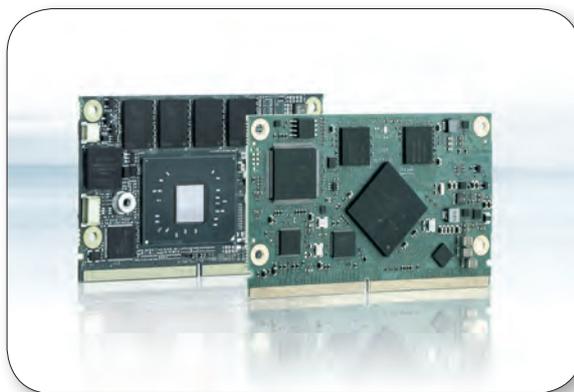
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From Edge to Fog to Cloud – IoT Computing with SMARC

By Martin Unverdorben, Kontron

Cloud, Edge and Fog computing is everywhere and everybody is talking about it. In industrial surroundings traditional server approaches cannot provide the required robustness for operation in harsh industrial environments, but how can modular systems based on the tested SMARC Computer-on-Modules provide an efficient solution.



■ The Industrial Internet of Things (IIoT) is one of the most challenging application spaces to design for, as there are pressures on the developer from clients, management, and the marketplace on price, performance, and functionality. Creating the next generation of intelligent industrial systems will require an elegant juggling act with all three.

There is a trend in IT to bring more web functionality out of the central server farms and inject it into the parts of the infrastructure and the devices operating as close to the user level as possible to reduce network traffic demands, among other things. Data collection and storage is already everywhere, in our pockets and in our homes with personal computers, smartphones, and smart home assistants. It is also the case now in production environments.

Cloud, Fog and Edge levels

Applying IoT technology to industrial systems makes a lot of sense, because we can use and manage the data involved to improve the production process and performance factors such as quality and cost. For example, in a chemical plant the process data is probably already monitored, and some factors, like the temperature and pH values of chemical reactions, can be controlled. Why not store that in data to analyze later? Another example is where products parts are mounted or fixed together

with screws, where you store the torque values of each screw to have quality control of all the devices that are mounted there. Peering through the Cloud Figure 1 looks at it from a structural perspective. At the bottom are the devices on the floor of the factory that control the production process directly, which is the area called EDGE computing. On the level above, there are the on-site server racks, which manage the process flow, or control data and monitor and maintain the data stored. The layer on top is the CLOUD, representing all off-premises functionality. The middle layer, which usually already exists in some form in legacy systems, gets new tasks because it must connect to that top-level functionality level, and is now called FOG computing.

So the Cloud is everything that is off the premises, the Fog is the level that's monitoring and controlling, and used to be already there before in the server room in the factory. The lowest level, Edge computing controls the floor and the automation control of motors, sensors, and actuators. These three levels have to function and work together, especially in security and safety, with new tasks to be done and new devices that need to be installed.

3 key functionalities of TSN

Another development coming up is TSN, time sensitive networking. Started in 2012 as an IEEE 802.1 working group, the TSN standard

defined a way of networking to ensure very low transmission latency and high availability of all participants. Originally intended to define a network for real-time audio and video streaming, this functionality is perfect to synchronize control of devices on the factory floor.

There are three key functionalities involved. The first is time synchronization, meaning all the devices participating in real-time communication have a common understanding of time. This can also be done with an internal clock, but that can be cost-prohibitive. Using the IEEE 1588 time synchronization eliminates the need for any extra clocks or any extra signals, as the time information is distributed throughout the whole network with this protocol.

The second key functionality is scheduling and traffic shaping, where all devices adhere to the same rules in processing and forwarding communication packets. Already a known concept from the telecom market, it means there are different slices for different traffic classes, allowing you to give a certain packet a different class, or a certain priority. The third is to ensure that all devices comply with the same rules in reserving bandwidths and time slots, possibly utilizing more than one simultaneous pass to achieve fault tolerance. That means TSN is a network that ensures that all partners are talking on the same time level, and also at a very high availability and low transmission latency network.

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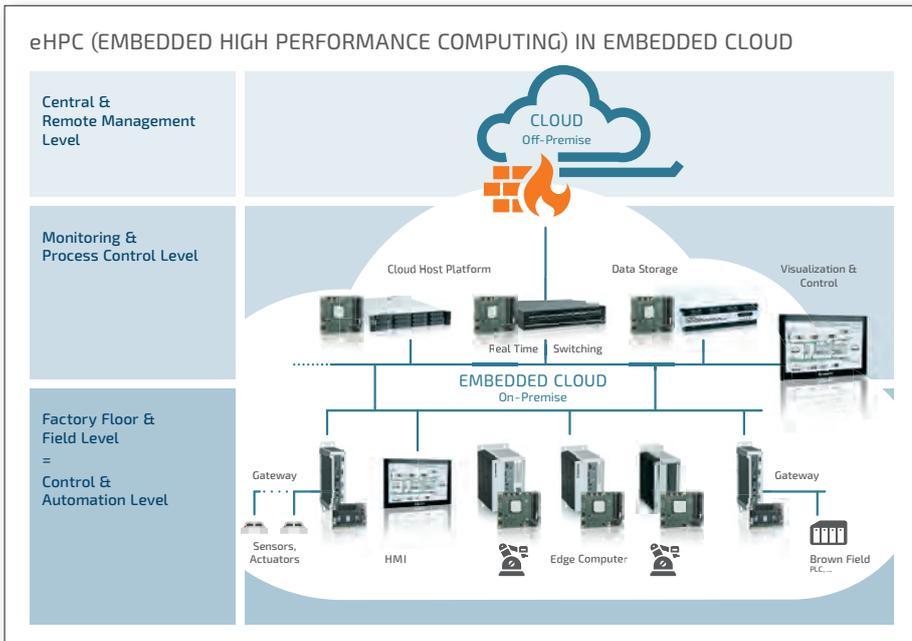


Figure 1. Computing at the Cloud, Fog, and Edge levels.

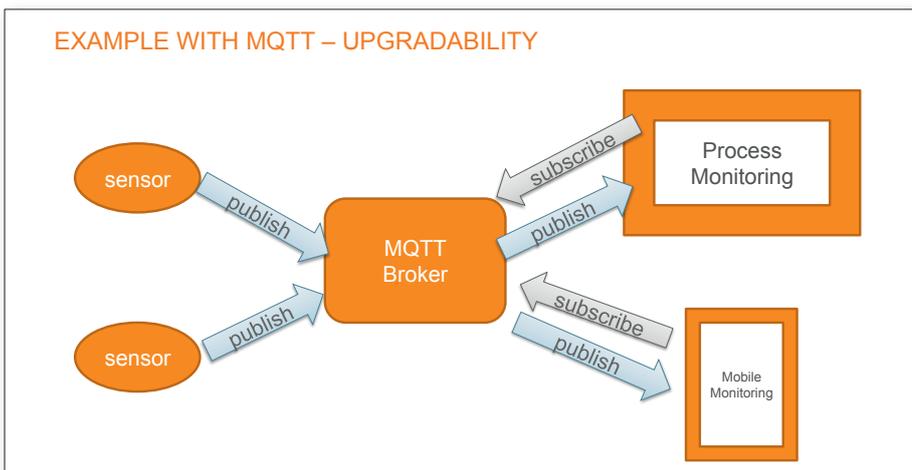


Figure 2. A simple sensor setup connected via ISO standard Message Queuing Telemetry Transport

Security is basic

For every connected device there are three basic rules. The most basic security rule is that every access is authenticated and authorized to that only someone who is allowed to do something can have access. The next rule is that all communication should be encrypted. The last rule, more an awareness, is that all software and firmware can be updated somehow.

But I want to point that out a little bit more in an example that comes from industrial IoT. The example in Figure 2 shows a simple sensor setup, which is connected via ISO standard MQTT, Message Queuing Telemetry Transport, a quite often-used protocol in IoT, located on the application layer, like HTTP, FTP, or DNS on top of TCP/IPN Ethernet. It is a simple subscribe and publish protocol, that allows a sensor, or publisher, to publish its data as a topic. For example, in Figure 2 we have the topic “Factory 1, floor 1, robot 3, oil

temperature”, which is regularly published by one sensor. If another client is working as a process monitor, it can subscribe to “Factory 1, floor 1, robot 3, #” and then get all that data. So, it’s a very simple, but effective, way to track control and coordinate process data.

Now, let’s apply the first security rule here, where every access should be authenticated and authorized. For authentication, we need all the participants to be addressed, which means every sensor, every client, and every device needs its own username and password, or its own key file. Authorization is to do what? In this example, the sensor on the top left is only allowed to send to the topic “Factory 1, floor 1, robot 3, oil temperature”. Being able to distinguish every detail about who is allowed to do what really makes sense, even when you are in a closed network, as there are intruders that might get access. Authentication and authorization might not be sufficient,

especially when there is no encryption in the network. When an unencrypted network client logs in, the credentials are transported in plain text, meaning everybody inside the network can sniff them out very easily. The only thing that you need is a network monitor and access to that network. We can avoid that by encrypting all the transport inside the network. MQTT is really simple because you can set it up on top of any security layer in TCP/IP.

The third rule is that every device’s software and firmware can be upgraded. Why is that necessary? Well, let’s go back in time, in 2014, when Heartbleed was an issue in OpenSSL, which allowed all the encrypted data be fully revealed to anyone. On a level of 0 to 10, it got an 11. That means all the encryption that we did was simply in vain. It could only be fixed by updating to a fixed version of the software. A second bug came up in 2014 called Poodle. Not as problematic as Heartbleed, but still quite an issue, as it also affected the clients through a fallback from TLS to SSL3, which could be forced by a client, could simply allow a “man in the middle attack”. Also, the fix was to update the software, and there is no proof that it will not occur again. Recently we’ve seen the Spectre/Meltdown issues, which are not as critical, as they only affect machines where already foreign code can be executed.

How to update doesn’t matter as long as it will be done, whether locally or remotely. All clients, all servers, all devices that host some firmware, host some software needs to have the ability to be fixed in case of a security problem. For example, when it comes to security, Kontron offers designers secure, trusted boot software to enable a chain of trust to ensure that the BIOS running in the system is authenticated. It is the same on the OS level, with secured operating systems, and there can be an additional level on the application side. All Kontron boards can be equipped with a Wibu Systems security chip with related software to allow full IP protection for running software, where the application code can be encrypted, and therefore, not be reverse engineered. So we can have fully software authorization from BIOS to the application level.

Another use case involves different licensing models. Software can be restricted by runtime, number of program fetches, and other factors, presenting completely new business cases where software as a service can be brought down to the edge layer.

SMARC

When you build an intelligent electronic device, you can go with an out-of-the-box solution, or a full custom design, or something in-between, a modular scalable solution

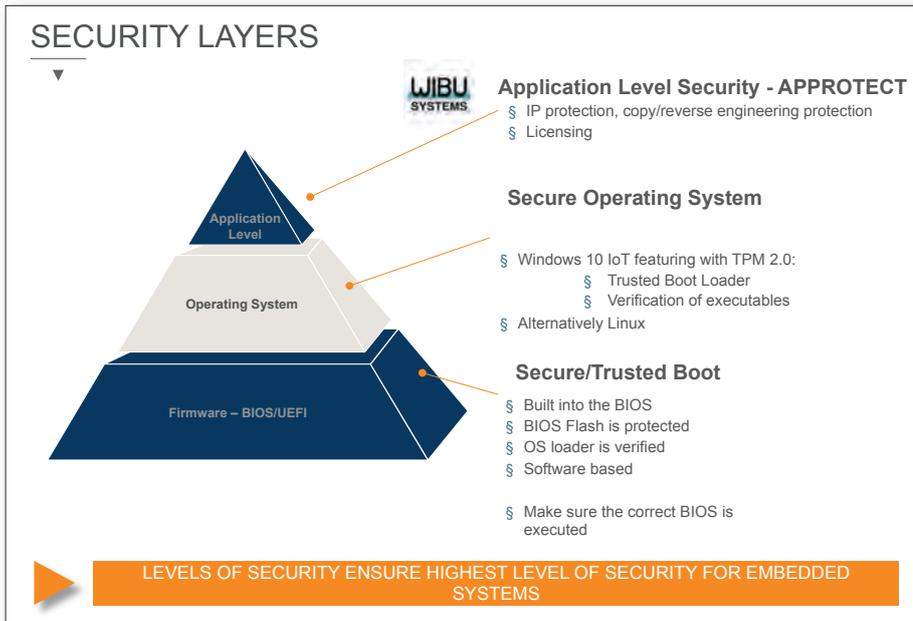


Figure 3. When it comes to security, Kontron offers designers secure, trusted boot software to enable a chain of trust



Figure 4. Kontron's KBOX family is a true industrial computer platform, designed to enable predictable productivity in any connected environment

that can be tailored to the application. The out-of-the-box solution is something that you drop in and it works, like a motherboard or video card. If you have some additional requirements, a full custom design is something that you choose when you have very high volumes. A computer and module solution is something that you choose when you have some mid-sized volume, and is a very good compromise between the out-of-the-box solution and the full custom solution.

When it comes to a modular solution you have again two choices. There are proprietary single-vendor computers and modules, or there are standardized computers and modules available from multiple sources. A standard solution offers you a second source so you don't rely on one vendor, letting you scale your devices in performance, power, and price.

Kontron offers the SMARC low-power embedded architecture platform for Computer-on-Modules, based on ARM and X86 technology, to address this issue. SMARC offers a wide range of common computer interfaces, and allows a wide functionality to be implemented. On the graphics side, there is LVDS, HDMI and DisplayPort++, and a camera interface with MIPI-CSI, as well as the typical high-speed interfaces like PCI Express, USB, SATA, and GB LAN, and then all the slower interconnectivity interfaces like audio, I2C, Serial, and such. Compared to other form factors like COM Express and Qseven, SMARC has a few advantages compared to them regarding interfaces. SMARC offers 2 times 1GB LAN interfaces, making it suitable for small gateways that need to address different networks. SMARC also offers four serial COM and two CAN ports, an interface still used in industrial automation.

The SMARC MXM 3.0 connector is currently used in the commercial computer market, so there are many vendors available, and it is proven to be rugged and very resistant to shock and vibration. With 314 pins, it offers more than COM Express Mini, which has 220, and Qseven, which has 230 pins, and the combination of carrier and modules allow a very flat and slim designs.

When it comes to integration, Kontron offers a network card based on PCI Express to bring any computer system directly into a TSN network. SMARC-sXAL is an ATOM® based module for more performance driven applications. There are currently five different CPUs available, the industrial-grade 3E series Atom X5 and X7 boards, and commercial-grade Celeron and Pentium products.

They can connect 1GB to 8GB DDR3L, with ECC support, which is available on the E series. Flash is from 2GB to 64GB in eMMC 5.0, and the graphic connection is fully supported for LVDS, HDMI, and DP++, with triple display support so you can connect three monitors. Then, almost all SMARC 2.0 interfaces here are supported on that module. Operating systems supported include Windows 10, Yocto Linux, and VxWorks.

A good example is the SMARC-sAMX7, the latest available Cortex A7 based ARM SMARC module from Kontron. It is equipped with either a solo or a dual i.MX7 processor from NXP, with an additional Cortex M4 core integrated for small controller applications, where usually an additional microcontroller is used on the carrier.

Another example showing that SMARC is a good choice for industrial IoT is Kontron's KBOX family. There are a variety of PCs intended for IoT, and several are equipped with SMARC modules. The KBOX C series is more for high performance and offers COM Express, and the two KBOX A series incorporate SMARC functionality. If you need ARM-based solutions, then SMARC is the better choice. Also, the height is better on SMARC, so you can have low-profile platforms, and it is better when you need a camera, or when you need a second Ethernet, or when you need CAN.

Looking forward

To summarize, with SMARC you can have the best performance for your IoT applications within the range between ARM and Atom class. It is scalable, enables high connectivity with a wide variety of interfaces, and with Kontron App Protect, you have a security layer to ensure your designs are as safe as they are functional. Properly deployed, this scalable, modular set of solutions can greatly advance your automation system design. ■

Development of a cooling system for a COM carrier system

By Stefan Djuranec, Pentair Technical Solutions

During the development process of the Pentair Schroff COM carrier system, thermal simulations were used to optimize passive cooling through the cooling element. The result is a modular system that can be modified to meet various customer requirements through selection from a series of available cooling elements.



Figure 1. The COM carrier system: 1) removable cooling element; 2) adapter plate; 3) removable front and top covers for easy access to the electronics.

■ Increasing electronics density and higher power dissipation require continuous improvement of heat dissipation solutions for electronic components and systems. This is why the cooling design for the Schroff COM carrier from Pentair was integrated into the development process and monitored in parallel from the start of development. Using state-of-the-art simulation methods, a wide range of solutions can be validated before actual development starts. The result is a modular set of components that makes it possible to support a wide range of customer requirements while still presenting the right solutions quickly.

■ In the past, an iterative development process in the test lab using prototypes achieved satisfactory cooling results. However, this method is no longer practical due to the high cost and development time (time to market). The specific problem is that prototypes and samples are usually not available until very late in the development process. There is always a risk of design changes in later project phases, which may cause delays and higher costs.

Computational development methods, on the other hand, have made tremendous advances in recent decades with respect to accuracy and user-friendliness. Thanks to the computing capacity of state-of-the-art hardware, these methods have become an efficient tool. This

method does require that developers make a few simplifications and design assumptions, requiring in turn that the simulations be validated using measurements and trials of the physical cooling devices. Using simulations, the number of trials and versions can be significantly reduced. This is why a combined method was used for developing the cooling concept of the Schroff COM carrier. The system was designed with the aid of thermal simulations and a series of measurements were then carried out on the real parts to validate simulation results.

The goal is for the Schroff COM carrier to support COM express modules up 45W using only thermal conduction and convection air flow. In this design, the exposed surface of a heat sink must not have a temperature over 50°C in order to prevent burn injuries. In addition, demand is growing for easy module replacement, which requires an easy-to-open case with simple cooling device removal. For this reason, an adapter plate is used (figure 1). This plate is permanently connected to the heat spreader of the COM module, sealing the case against the ingress of dirt, water and electromagnetic waves. In addition, the plate establishes the thermal connection between the heat spreader and the cooling element. Thermal gap fillers compensate for tolerances and unevenness.

The cooling elements are specially designed for the carrier system at the beginning of the process with the help of simulations. In order to efficiently achieve a wide range of variants for the test series, additional cooling elements from standard profiles are procured from suppliers. Because the positions of the primary heat sources vary on different COM modules, dummy modules with load resistors and heat spreaders with easily adjustable thermal loads are created for the measurements. The components in the thermal conduction path (modules, heat spreaders, adapter plates and cooling elements) are equipped with temperature sensors at all four corners and on both sides. The sensors are sunk into grooves made in the surface and glued in with thermal adhesives to ensure that they do not interfere with heat transfer. The trials are carried out in a climate chamber with the option of adjusting the ambient temperature. In addition, potential disturbance variables are evaluated and minimized at the beginning of the test series. Each individual measurement is carried out for as long as it takes to achieve a steady state.

At the beginning of the measurements, it was shown that the thermal inertia of the cooling element is very high and that the measurements must be prolonged over several hours before the cooling element reaches a steady state. This is due in particular to the high

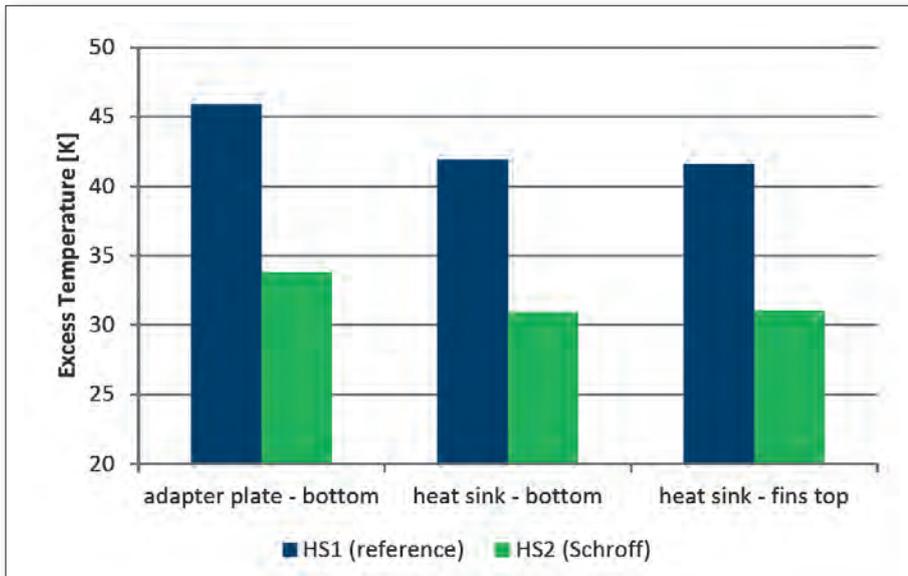


Figure 2. Measurement results for the over-temperature (measured temperature relative to the ambient temperature) for the comparison element (KK1) and the series-oriented Schroff cooling element (KK2).

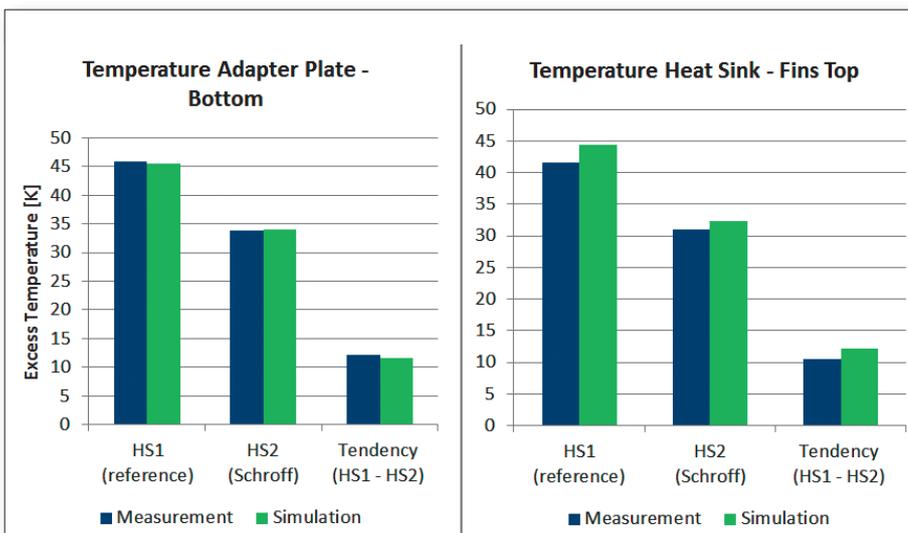


Figure 3. Comparison of the measurement results on the adapter plate and the fin temperature for the two cooling elements

thermal storage capacity of the heavy cooling element in comparison to the relatively low power of 45W dissipation of the COM express module. Even small disturbances, such as the entrance of laboratory personnel into the climate chamber, are evident on the measurement curves. The conditioning system of the climate chamber proves to be a major interference factor.

This conditioning system uses multiple fans to circulate the climate chamber air, resulting in an air temperature distribution that is as homogeneous as possible. Air movements caused by this process increase the heat transfer on the cooling element, which results in trials that achieve very low temperatures for the electronic components during conditioned operation. For this reason, the additional tests

are carried out in the climate chamber with protection from outside influences and with the conditioning system switched off. Measured values attained this way for the cooling system and, in particular, for the thermal resistance of the cooling element are a better match with the manufacturer specifications and simulation results. The measurement results are visualized using the example of two different cooling elements that have significantly different shapes. On one hand, clear differences in the measured values are to be expected, which simplifies the comparison with simulations. Secondly, this setup allows for observation of how well the simulation tool deals with the unique features of the various components. The Schroff-manufactured flat and wide cooling element featuring even fins is a production-oriented model that

roughly meets the cooling requirements mentioned. The comparison model is a tall and short element from the market with shaped fins. Based on the manufacturer specifications, it is clear from the beginning that this model will provide substantially lower cooling performance. However, it will be interesting to use this element to learn whether the simulations are able to reproduce the cooling effect of the fins with sufficient accuracy. According to the data sheet from the manufacturer, the cooling element has a thermal resistance of approximately 0.8K/W, assuming horizontal mounting and unobstructed convection.

An initial look at the test results (figure 2) for the series-oriented cooling element makes it clear that the surface temperature at the top of the fins is just over the 50°C required at an ambient temperature of 20°C, the same result that was inferred from looking at the design calculations. The comparison cooling element very clearly exceeds this requirement. The surface temperature at the end of the fins would reach more than 65°C. It is also important to note here that the thermal resistance of the comparison cooling element is below the specified value of 0.8K/W. The measurements yielded a resistance of a little more than 0.9K/W. This is presumably due to the fact that the entire bottom side of the element is not connected to the heat source, and instead the element is connected only through the surface of the adapter plate. It is interesting to note here that the glass-fiber-reinforced gap filler between the cooling element and the adapter plate causes differences in the temperature reduction between the versions. Obviously, it is difficult to guarantee the same heat termination over the foil in all cases. Lower fluctuations can be achieved when softer foils without glass-fiber reinforcement are used. The differences for the reinforced foils, however, are reduced to a low enough level overall that the advantages of working with them outweigh the aforementioned disadvantage.

Figure 3 shows a comparison of the simulation results and physical measurements for the versions described. It is easy to see that the simulations are quite capable of predicting the physical measurements. This is only possible using an adequate configuration of the material properties in the simulation model. This means that the simulation model is capable of reproducing the tendencies accurately with a maximum deviation of 1.5K, which is crucial for variant comparison. It is also capable of calculating the absolute values of the temperatures with sufficient accuracy and with an absolute deviation below 3K, which corresponds to a relative tolerance of maximum 7%. This allows for a precise design of the system to meet specific requirements. ■

PCAP Touch displays - what does the future hold?

By Markus Hell, DATA MODUL

In this article the author compares three different touch technologies and examines their suitability for industrial applications.



Figure 1. Example of a touch panel with Force Touch in a medical application

■ The triumph of PCAP Touch technology started in the consumer market of the 2000s. Displays with PCAP Touch have now reached professional products, and operating concepts with touch functions in industrial applications with one-finger/multi-touch, slides, etc are largely known, and functional principles and design possibilities are recognized. Research and thought in development departments is continuously dedicated to the development of demand-based, application-specific and potential revolutionary touch methods/technologies. Which current enhancements and further developments are promising and/or upgradeable? For which applications in which industries would certain specific technologies be useful/possible or even necessary? What could touch panels of the (near) future look like?

PCAP Touch technology is a familiar element of everyday life as well as of industrial products of all industries. Technical features such as operation under water or with gloves, an extended temperature range, EMC conformity and various assembly options for different requirements (SITO and OGS touch displays, film/film and glass touch displays) today are included in the scope of supply of a PCAP Touch control unit. The technologically highly specialized optical bonding is provided by various suppliers such as Data Modul in differing

quality. Three variations of demand-focused operating concepts of added value built upon the existing projecting capacitive technology or enhancing this are currently the focus: PCAP with haptic feedback, with gesture control and with Force / 3D Touch.

Touch panels with haptic feedback confirm, via direct re-transfer of the force to the user, their interaction on the touch sensor. Eye contact is therefore not absolutely necessary for this. The user ascertains the position of their finger on the sensor on the basis of the tangible feedback alone, and their interaction is thus confirmed. An extension of this kind is conceivable in applications where the user must be focused on an object/a patient/an action near the screen. Scopes of application here include the medical, automotive and entertainment industries. However, in many applications, a touch operation without eye contact is (still) not required. The benefits of haptic feedback are initially limited: as a general rule, device users see simply touching the surface as a sufficient form of tactile feedback for interaction confirmation. Integrating this additional function into an existing application is complex and expensive. It is necessary for the entire mechanical concept to be adapted, as the tactile providers of feedback, the mechanical actuators (vibrating motors, Piezo elements, linear drive mechanisms),

also have to be integrated. To enable the feedback in the first place, the surface has to be integrated in the casing on a floating basis, as otherwise no vibrations or the like can be transferred to the user. The moving medium (mostly touch and cover glass) is a factor that must be considered, as, in industrial applications, the cover glass that has to move is over 2 mm thick. This means that the requirements surrounding, among others, the system stability, lifespan, power consumption or the exertion of force on connecting elements cannot be fulfilled to optimum effect.

Hover gesture refers to the touch-free interaction through gestures in a defined space and over given axes (X, Y, Z). The identification of gestures takes place either via an electromagnetic field in addition to a touch surface, or completely on camera basis. The GUI of the display is not covered by the fingers, and the view of the screen remains unimpaired. The surface is almost completely unaffected by soiling, and the interaction with the touch sensor can take place without eye contact. The user behavior is determined by familiar operating concepts: on a screen, a user mostly resorts to learned operating patterns. The user experience crucial for product success is unfamiliar due to the gestures that need to be learned. To adapt HMI systems to gesture control, wide-ranging adaptations in the GUI



Figure 2. Schematic layout of a Force Touch panel

design are also required, and it is also necessary to reconsider the usability. This technology (still) does not meet the requirements for safety management in the industry, e.g. implementation of redundant systems; an erroneous activation due to incorrect recognition is possible. Camera-based recognition of gestures was successfully integrated in gaming and automotive applications, but the attempt to introduce hover gestures in the mobile telecoms market was less successful.

PCAP with Force or 3D Touch has the greatest development potential in the industry. The pursued goal here is to recognize a change in the Z axis and thus the level of pressure applied by measuring the surface of the touch point. The exerted force can also be measured through additional pressure sensors. With mobile devices that have thin cover glass in particular, the surface curvature of the glass is thus measured. In the case of Force Touch, the interaction takes place independently of the pressure applied to the touch surface, which means that additional possibilities for use are available on the interface. The classic right click on the mouse can then potentially take place by increasing the input pressure. The redundancy of the signal evaluation is one of the important details for industrial production. This occurs in the case of applications with Force Touch via touch controllers and of evaluation electronics such as that of force sensors. The function of the device can then be triggered - if desired - when both signals are registered. This is an essential requirement in medical applications. This dual channel redundant touch recognition could be a useful addition e.g. in intensive care. Especially since the PCAP operating unit remains insusceptible to conductive fluids, as it is triggered without additional pressure despite the electrode short circuits of the touch. Force Touch provides advantages in the development of industrial PCAP enhancements of added value, so the Munich-based visual solutions provider Data Modul is focusing on evaluations with force sensors which are integrated in the edge of the touch sensor. Cover glass in the industry is usually too thick for the measurement of the surface curvature on the touch glass (> than 2 mm) and high-resolution touch sensors for large diagonals (> 15.6") are difficult to create.

An existing package consisting of TFT, touch glass, cover glass with optical bonding can be used almost unchanged as a starting basis; the enhancement with Force Touch takes place on an additional basis; the industrial customer does not have to go without the existing benefits of touch technology, such as complete protective glass. But this enhancement represents a challenge for existing client applications. The touch unit provides the touch coordinates plus the force values per coordinate, but the software must be able to interpret these. This means: a consideration of the respective adjustment of the client software and of the graphic surface (GUI, usability) in product development/conversion. Force Touch systems require proprietary driver solutions. There are no standardized interfaces so far; isolated solutions are a valid possibility here.

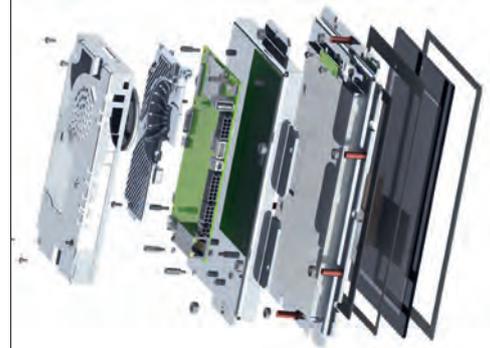
The bottom line: PCAP Touch technology has found its way into professional operating concepts via consumer products. This has increased user expectations/wishes/requirement/demand for operating concepts of a similar kind in the industry. The successes and potentials of all current and future further developments are exclusively defined through usability and design. There is no significant demand for hover gesture in handheld devices and mobile devices in the consumer market or in the industrial market, and, so far, PCAP with haptic feedback has not taken hold as a technology in consumer electronics, nor is it found much - following the chronology - in industrial applications. However, in critical industrial areas with high safety control specifications such as intensive care or the food sector, the benefits of Force Touch technology are evident. The redundancy functionality combined with the tested PCAP Touch technology meets the user basic requirements. The integration of sensors for the measurement of mechanical force absorption or the touch-triggering surface remains a challenge. The latter requires special, non-standardized touch controllers and high-resolution touch sensors for touch surface measurement, development expertise and technological research. The market response will ultimately show which of the PCAP enhancements will take hold. A combination of several technologies such as haptic functions and force sensing remains promising. ■



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Product News

■ **F&S: WLAN/ BT and MIPI-DSI on 3.5 x 40mm only**

The first member of the new and compact PicoCORE COM product family by F&S Elektronik Systeme is offered with the NXP i.MX 7ULP ARM based Applications Processor. Further pin compatible PicoCORE COMs will follow. NXP enables its heterogeneous concept with Linux running on the ARM® Cortex-A7 core and FreeRTOS running on the ARM Cortex-M4 core.

[News ID 5991](#)

■ **Kontron and NXP collaborate on edge computing for the IIoT**

NXP Semiconductors and Kontron announce their collaboration to couple NXP's i.MX and Layerscape families of Arm-based processors with Kontron/S&T's expertise in hardware and software to create Industry 4.0 solutions. The products will leverage Microsoft Azure IoT and Time Sensitive Networking (TSN) technologies to meet the needs of next-generation Industrial IoT implementations for cloud, edge computing and factory floor innovations.

[News ID 6094](#)

■ **Cincoze: sunlight readable Panel PC and touch monitor for outdoor applications**

Cincoze to announce sunlight readable panel PC and touch monitor "CS-100 Series". The product series incorporates an ultra high brightness backlight module up to 1,600 nits which provides superior readability under a high-ambient light condition and even direct sunlight. CS-100 Series also supports wide range operating temperature (max. range: -20°C ~ 70°C) to ensure stability and reliability of the system in outdoor environments. Built with solid aluminum die-casting front bezel, true flat IP65 front panel protection and 7H anti-scratch projected capacitive touchscreen make it ideal for installation in harsh environments. Without compromising rugged functionality, CS-100 Series still keep slim-type design and provide the same look and feel within Cincoze display computing solution.

[News ID 6117](#)

■ **Portwell: 4x4-inch Mini PC board for digital signage, automation and medical**

Portwell launch the WUX-3350, a small form factor (SFF) embedded system board featuring the Intel Celeron and Pentium processor series, formerly codenamed Apollo Lake. The Intel processors integrate the low power Intel Gen9 graphics engine up to 18 execution units, enabling enhanced 3D graphics performance and greater speed for 4K encode and decode operations.

[News ID 6003](#)

■ **Concurrent enhances security for existing product ranges**

Concurrent Technologies announces a range of measures to help customers improve the security for their AdvancedMC, Compact-PCI, VME, VPX and XMC boards based on Intel processor devices since 2014 and which will also be available on all boards planned for release this year based on next generation technologies.

[News ID 6005](#)

■ **EKF: PCIe card fits into CompactPCI Serial systems**

The SA4-COUNTRY is a CompactPCI Serial carrier for a low profile PCI Express Card. The board is provided with a PCI Express x8 connector and accommodates a PCI Express card with maximum dimensions of up to 176 x 68.9mm. The card I/O bracket is covered by a metallic hood at the SA4-COUNTRY front panel.

[News ID 6139](#)

■ **congatec: MIPI-CSI 2 platform for vision-based ticketing and access control**

congatec introduces its first embedded x86-based MIPI-CSI 2 Kit that eases the integration of embedded vision technology into smart transportation checkpoints, access control and ticketing systems. The instantly deployable, industrial-grade platform is application-ready for the evaluation and deployment in harsh outdoor and in-vehicle environments.

[News ID 6151](#)

■ **SINTRONES: new in-vehicle computer supports full 4K video and 4 x POE operating**

SINTRONES launched the cost-effective VBOX-3210 series powered by AMD Radeon graphics via the third-generation Graphics Core Next architecture enables the AMD Embedded R-Series SOC Quad Core RX-421BD/RX-216GD and GX-224IJ/GX-215JJ. The new series are developed for new generation of various vehicle applications.

[News ID 6121](#)

■ **FRAMOS: ON Semi CMOS sensor for simultaneous 2D and 3D imaging**

ON Semiconductor has announced its new AR0430 CMOS digital image sensor. This device, available from the global imaging expert FRAMOS, combines classic 2D video imaging and 3D image recognition on a single sensor. The AR0430 CMOS sensor, with a small 1/3.1-inch optical format, delivers high-quality images with advanced 2.0 µm pixel stacked BSI technology; and, a 4 Megapixel resolution at 120 frames per second (fps).

[News ID 6013](#)

■ **Manhattan Skyline: Computer On Module with NXP i.MX 7ULP**

The first member of the new and compact PicoCore COM product family by F&S Elektronik Systeme is offered with the NXP i.MX 7ULP ARM® based Applications Processor. Further pin compatible PicoCore COMs will follow. The module is based on an i.MX 7ULP Applications Processor implementing the Heterogeneous Multicore Processing architecture with ARM Cortex-A7 core and ARM Cortex-M4 core.

[News ID 6134](#)

■ **Trinamic: breakout boards shorten time to market**

Time is a precious resource. Especially with technology, it's important to drive the industry by reducing your time to market. That's why Trinamic is rolling out open source BOBs for their chips transforming digital information into physical motion. From now on, one single, easy to use electrical component is everything needed for rapid prototyping – you no longer have to worry about building a final design or soldering SMD components before testing a prototype. The BOBs can be used on a breadboard or with flying wires, as all sensitive signals such as sense lines are routed on the BOBs themselves.

[News ID 5985](#)

■ **IBASE: AMD Ryzen and AMD EPYC embedded processor-based solutions**

IBASE Technology launched a series of new AMD Ryzen Embedded and EPYC Embedded processor-based products, including the MI988 Mini-ITX motherboard, SI-324 4x HDMI 2.0 digital signage player and FWA8800 1U rackmount network appliance. The MI988 Mini-ITX board and the SI-324 signage player come with the Ryzen Embedded V1000 to empower businesses with a stunning new level of true 4K@60p video performance, multi-display support and flexible power consumption to support rich multimedia capabilities.

[News ID 6042](#)

■ **Axiomtek: Pico-ITX SBC with multiple I/O options and slim design**

Axiomtek is introducing its new PICO316, a palm-sized fanless pico-ITX motherboard featuring the low-power consumption Intel Pentium processor N4200 or Celeron processor N3350. This pico-ITX SBC is created to support a variety of Industrial Internet of Things applications, especially those with graphic-intensive and limited-space requirements including automation control, medical imaging, digital signage, gaming and more.

[News ID 6009](#)

■ **Eurotech: ReliaGATE 20-25 achieves SAP-certified integration as built on SAP Cloud Platform**

Eurotech's ReliaGATE 20-25 has achieved SAP certification as built on SAP Cloud Platform. The ReliaGATE 20-25 helps organizations to optimize production processes by collecting and managing data in the field and offering advanced remote device management features like predictive maintenance and machine diagnostics. The SAP Integration and Certification Center (SAP ICC) has certified that ReliaGATE 20-25 is built on SAP Cloud Platform. Applications from partners that are built on SAP Cloud Platform are enhanced to work with cloud solutions from SAP and to run on SAP Cloud Platform.

[News ID 6176](#)

■ **SECO: COMe-C08-BT6 with up to six cores at up to 4.7 GHz**

SECO presents its latest product based on the brand-new Intel 8th generation Core/Xeon CPUs, unveiled just today, April 3rd, 2018, by Intel: COMe-C08-BT6. The launch is taking place at the same time with the launch of Intel 8th generation Core/Xeon, since SECO is part of the early access program.

[News ID 6167](#)

■ **Pixus: OpenVPX development platform features mix of conduction and air-cooled card guides**

Pixus Technologies offers OpenVPX platforms with a mix of card guides that allow IEEE 1101.10 air cooled and IEEE 1101.2 conduction cooled boards to be tested in the same enclosure. The Pixus OpenVPX Development Chassis allows the use of Rear Transition Modules (RTMs) and up to 8 backplane slots at a 1" pitch.

[News ID 6152](#)

■ **MEN merging with duagon**

MEN Mikro Elektronik and duagon Holding are merging to become a provider of software and hardware solutions for data processing and communication. The two companies expect their complementary product range and expertise as well as perfectly complementary sales structures to give them a leading position as manufacturers of safe computer and communication solutions in critical embedded applications.

[News ID 6178](#)

■ **ACCES I/O: software selectable USB multifunction analog I/O modules with speeds up to 1MHz**

ACCES I/O Products announces the immediate release of a new family of low cost USB analog I/O modules—the USB-AIO Family. This innovative line of 12 and 16-bit USB modules starts with its flagship model, the USB-AIO16-16F. This high-speed, 16-bit

multifunction analog input/output board is ideal for precision measurement, analysis, monitoring, and control in countless embedded applications.

[News ID 5988](#)

■ **Toradex collaborates with MVTec to simplify machine vision on Embedded devices**

Toradex announce the availability of HPeek by MVTec Software in its popular Toradex Easy Installertool. HPeek allows you to easily check the performance of your embedded device for typical machine vision applications without cost. The Toradex Easy Installer allows installation of the complete demo with just one click.

[News ID 6175](#)

■ **acceed: IIoT gateway and embedded controller combined**

Two technologies combined in a compact device - that is what acceed offers with the new MXE-210 in its portfolio. The controller, designed for robust use in the temperature range from -40 to +85°C, can be used both as an IIoT gateway and as an embedded platform for local controllers. This makes the MXE-210 particularly interesting for demanding applications in the areas of transport, automation, manufacturing and Smart city solutions.

[News ID 6016](#)

■ **VadaTech announces MicroTCA chassis optimized for FPGAs**

VadaTech announces the VT882, a 2U MTCA chassis that provides eight extended-size/full-size and/or mid-size AMC slots that can accept any AMC.1, AMC.2, AMC.3 and/or AMC.4 modules. It provides TCLKA, TCLKB, TCLKC and TCLKD as well as FLCLKA to each slot in addition to the JTAG signals. It also contains capability for full redundancy by having a redundant MCH, Power Modules, as well as redundant Cooling Units for high availability. Option for redundant/non-redundant clock is per MTCA specification.

[News ID 6107](#)

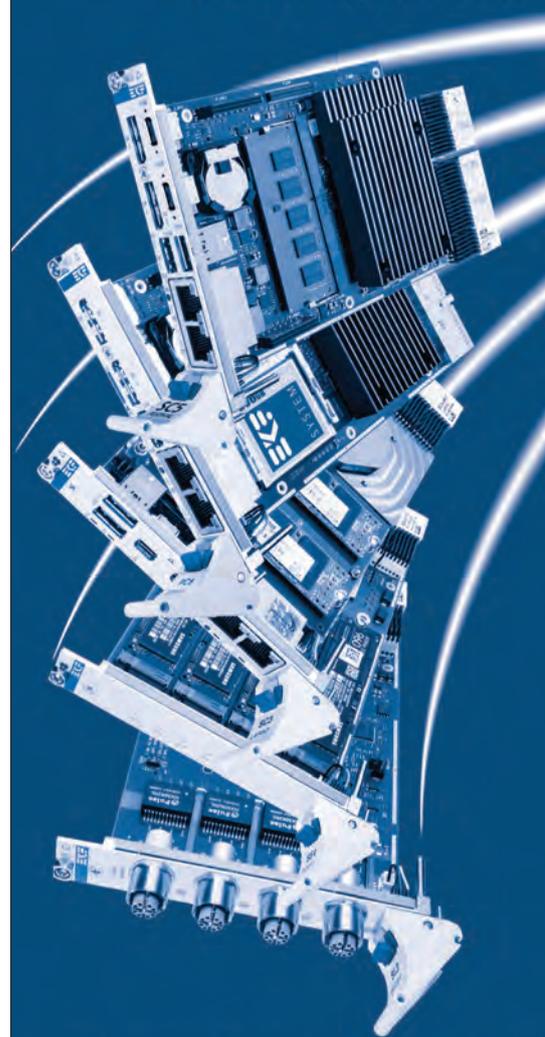
■ **Artila: Linux-ready Cortex-A7 SoM with preempt real time patch**

Artila Electronics announce a new SODIMM module based on NXP i.MX6ULL ARM Cortex A7 CPU core operating up to 800MHz speed with Linux OS. The new M-X6ULL is designed to meet the needs of many general embedded applications that require power efficient, high performance and cost optimized solution, as well as embedded systems that require high-end multimedia applications in a small form factor, this cost-effective M-X6ULL is ultra-compact in size with the form factor of 68 x 43 mm.

[News ID 6158](#)

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Implementation possibilities for efficient cooling of 19" cabinets

By Nicole Jeroschewski, Heitec

This article clearly shows the demand for good planning of cooling solutions in the cabinet area. This is no longer just about planning to be as cost-efficient as possible. Electronics and with it the dissipation of heat from the cabinet becomes more and more complex. It is no longer sufficient to take a look at the investment costs only.



■ The miniaturization of electronic components always results in the generation of heat in devices and thus in 19" cabinets. More and more components are being installed in narrower spaces, but the heat loss performance of the individual modules is usually not reduced accordingly. On the contrary, miniaturization is creating more and more power dissipation in ever smaller spaces. This leads to a continuous heat development in the cabinet. The result is shortened lifetime of the components due to excessive heat stress. Electronic components installed in a 19" cabinet are generally designed for a maximum operating temperature of 50 °C. The lifetime already doubles when the prevailing temperature is reduced by 10 °C. Therefore, cooling – whether passive or active – is essential for most applications today. There is a myriad of cooling solutions, which is why one has to choose from case to case which of these solutions brings decisive advantages for the respective application. The use of air/water heat exchangers is an option to cool cabinets. But also, the use of various cabinet coolers, such as side climate modules, roof-mounted cooling units or fan trays is a common approach to get cool air to the electronics and the heat out of the cabinet.

With air/water heat exchangers, the highest cooling performance can be achieved in the smallest possible space. The cooling of the air

inside the server cabinet is executed in such a way that the power dissipation from the cabinet is released via the heat exchanger to the water and led to the outside. This way, a cooling performance of up to 10kW can be achieved. The maintenance effort of this cooling solution is relatively low, but with the use of air/water heat exchangers, high infrastructure requirements are associated, which of course have an impact on the costs. IP protection of these devices is usually at an IP value of 55, which provides a fairly high level of protection.

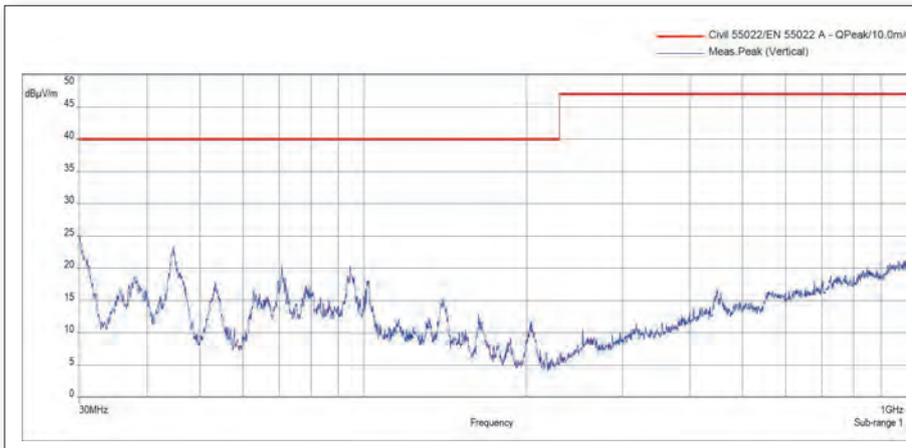
Side climate modules are used in cabinets specially prepared for this purpose – therefore, the installation is not possible at any time in any control cabinet and the installation costs are also not negligible. However, these air conditioning units produce a cooling performance of up to 3.5kW and are thus accompanied by a cooling potential that is not to be underestimated and which is required in many applications.

Roof-mounted fans are often used in cabinets when the warm exhaust air is to be sucked up and blown out of the server rack. These are very efficient in their cooling performance, but their installation is partly cost-intensive and furthermore, hotspots (air areas with conspicuously high temperatures), which predominate directly in the cabinet, are not pre-

vented very reliably. However, the advantages of roof fans are obvious when it comes to saving space in the cabinet itself. With 43, the IP protection of roof fans is in the middle range.

Fan trays have the advantage that they can be used specifically where the heat must be dissipated – so, hotspots can be directly cooled or prevented. However, it has to be accepted that one or the other height unit in the cabinet is used up for it. If the heat generation in the cabinet is manageable, it is not necessary to deploy an expensive cooling solution. Often complex cooling solutions are needed, which are accompanied by an expensive infrastructure. Nevertheless, for certain application areas, using a simple fan module is still the best solution. In most cases it can be retrofitted easily in the cabinet and is often also the much cheaper alternative. Therefore, before installing expensive cooling solutions, one should always think about how much cooling power is actually needed. With an IP protection value of 20, the protection performance is rather low. But since fan trays are installed directly in the cabinet, the protection that the cabinet itself offers is more important at this point.

With a review of the various cooling options that can be found, one quickly realizes that there is rarely a blanket statement to ensure that there is a cooling solution for cabinets



The electromagnetic compatibility of the cooling is also verified in the course of product release.

which is always cost and energy efficient. Therefore, an accurate analysis of the application is generally unavoidable. Factors such as the required IP protection and the required cooling performance are the values that should be looked at in more detail firstly.

The type of cooling solution that should be used also depends on other factors, such as the ambient temperature and the maximum permissible internal temperature of the cabinet. The ambient temperature has a decisive influence on the heat or the effective cooling in the cabinet. Temperature changes in the environment are detectable inside the cabinet one to one. Therefore, if possible, the cabinet should be set up in a place with lower ambient temperature, to keep the energy expenditure for the air conditioning as low as possible and in consequence, to keep the operating costs low as well. This logically results in the installation location. As expected, the most favorable thermal conditions arise for a free-standing single cabinet, so that heat can be emitted to the environment through all free surfaces via radiation and convection.

The component compactness – the distance of the components in the cabinet to each other – also plays a significant role in the heat development in the cabinet and in the emergence of so-called hotspots. Thus, in any case precise planning of positioning not only makes sense from a purely functional perspective. Furthermore, care must be taken to ensure that no bulky and large-scale components impede the suction of hot air from the interior of the cabinet to the outside, thus preventing undisturbed influx of cold air into it. In principle, cold air flow of all cooling solutions should always be directed near the most powerful components because the greatest power dissipation – and thus the most heat – is produced there. This arrangement ensures that the cold air supply from the deployed cooling solution directly reaches the components without any loss and cools them optimally.

So, not only the choice of the cooling solution needs to be considered. Many factors play an important role. But if you have opted for a cooling solution, it is important to ensure that the air flows are guided accurately and that air circulation is optimized. Not only is this arrangement proven to save energy, which makes a significant contribution to environmental protection in about 3.5 million active control cabinets in Germany – investment and operating costs can also be reduced to a minimum by precisely planning the cooling solution. The selection of individual components can play a decisive role. This is the reason why cooling solutions with low energy consumption are becoming more and more attentive. Even if the investment costs of these components in an energy-saving variant are usually slightly higher than the conventional components, they amortize themselves after a short period of time and are often even the more cost-saving alternative.

The optimal internal temperature of the cabinet is normally at +35°C. It makes no sense to adjust the temperature lower, because at a lower temperature there can be a significant condensation development in the cabinet. In addition, the devices and components forming condensate after cooling has been switched off or the door of the cabinet has been opened are getting undercooled. With its HeiCool Eco for installation in a 19" cabinet or carrier, Heitec has dedicated itself to the development of a particularly energy- and thus cost-saving fan tray. With just about one quarter of the energy consumption of a conventional fan tray on the market, it is truly beneficial for the user despite its marginally higher purchase price. With a standard price of approximately €2 per kWh and an energy saving ratio of 79%, the additional cost for the Eco fan tray is already amortized after about 16 weeks and the use of this cooling solution continues to pay off with every operating hour the HeiCool Eco is in use. This can be decisive from an economic point of view – and in

addition to considerable cost savings, companies are making a significant contribution to a positive carbon footprint. Because it is paradoxical – the components in use are becoming more and more efficient, but the cooling solutions required for this have to become more and more powerful, which at the same time makes them very energy hungry. The housing of the HeiCool Eco is made of a high-strength aluminium alloy – which is why the fan tray is also suited for use in the railway sector – and impresses with its high-quality optics and the special design of the air vents. The three energy-saving fans, with an energy consumption of just 4.4W per fan, are particularly low in energy consumption and with a flow rate of 175m³/h in the 230VAC version they are also still at the level of comparable conventional fans. If, for example, the cabinet needs to be cooled by 25K, the fans will be able to cope with a power loss of about 1400W. HeiCool Eco is available for various installation situations. In addition to a 19" variant for the conventional assembly in a 19" cabinet, there is also a version as a slide-in variant, in which the fan tray can be easily inserted and pushed out of the cabinet on a high-quality aluminium frame anytime.

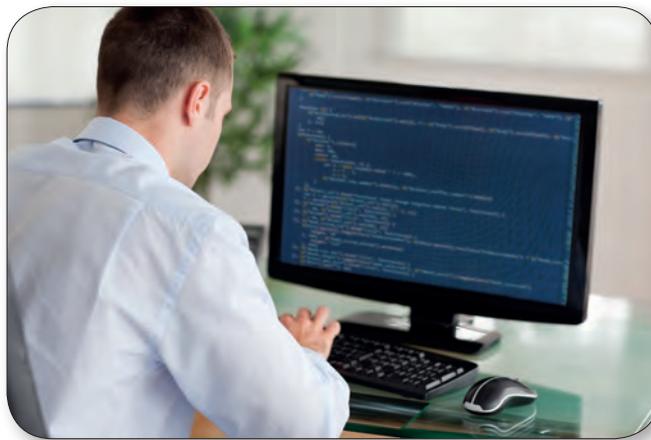
As a specific accessory, a thermostat (adjustable switch-on temperature for the fans) has also been included in the HeiCool program. Air deflectors for intelligently guiding the air flows in the cabinet complete the accessories program. With them, partial streams of cold air can be routed from front to back into thermally critical component space to avoid hotspots. In practice, the function of the air deflectors is such that cold air is sucked in upfront and passed through the subrack. The heated air is then expelled at the rear. These accessories, like the HeiCool Eco itself, are entirely dedicated to the topic of energy efficiency. With them and the thermostat, cooling is aimed to be possible wherever specifically necessary. This not only makes a decisive contribution to the protection of the environment – the purse is significantly disburdened as well.

Adding to the accessories program of Heitec Electronics, there is fan monitoring that reports when one or more fans are no longer working, and a fan control, which is suitable for use in fan trays, among other things. The fan control offers a variety of functions. For example, temperature thresholds can be defined, from which the fans are given a certain rotational speed. Other functions include, for example, an alarm when the maximum temperature is exceeded, as well as a status request via an integrated I²C bus. The modules for monitoring and control can be used for project-specific purposes in systems of completely different dimensions and requirements, too. ■

Getting the right Linux distribution for your embedded application

By Janez Ugovsek, Densitron

This article looks at how selecting the most appropriate distributions and pre-configured embedded systems have become critical success factors in speeding up new product development and time to market.



■ Nowadays in digital world, manufacturing and other industries are becoming more complex and increasingly automated. This is being driven by the ever-growing demands of B2B customers looking to achieve maximum output at minimum costs through the optimization of overall production efficiencies and streamlining of processes. One area of enhancement that has seen significant activity in recent years is that of Human Machine Interface (HMI). This platform of communication and information exchange between electromechanical processes and the operator is undergoing considerable evolution, with the introduction of feature-rich graphical displays, monitors and touch screens, already becoming increasingly popular in industrial applications. Whether this is part of a trend towards establishing The Industrial Internet of Things or simply to deliver more effective and user-friendly operator capabilities, the role of the HMI is now more important than ever.

■ This is a trend supported by the findings of a recent report published by Global Industry Analysts, Inc, which forecasts that the global value of the HMI solutions market will exceed \$5 billion by 2020 (Human Machine Interface (HMI) solutions: A Global Strategic Business Report – June 2015 (Global Industry Analysts, Inc)).

While innovation, new product development and delivering what the customer wants in terms of an enhanced Graphical User Interface (GUI) is the lifeblood of future success, so too is the time to market and the speed at which these latest solutions turn from concept into reality. In such a fast-moving society, reducing development time and speeding up time to market will help achieve that all-important product differentiator and maintain competitive advantage. One area of the solutions development cycle that has the potential to reduce time is in selecting the most appropriate Linux distribution that is best suited to the display and graphics technology and their application. While the very nature of these open-source Linux-based distributions make for easier configuration and customization, choosing the right one from the vast selection of distributions available, even for the most discerning software engineers, can be a challenge. Make the wrong selection, and additional development required to configure the distribution with your chosen GUI and it will not only cost time, it will also cost financially. Get it right however, and you will end up saving yourself a lot of time and effort, and enable you to deliver the finished solution a lot quicker to market. When it comes to choosing the right Linux distribution for your chosen GUI, there is rarely a perfect, ready-made solution. However, by working in

close partnership with a specialist technology provider, significant advantages can be gained through tapping in to their own expertise and understanding of which distributions, tools and peripherals provide the best fit in terms of your end-user requirements. In the case of Densitron, our software engineers have already developed fully optimized embedded boards that are pre-loaded with the latest QT cross platform software and pre-configured with the most appropriate distributions. This further streamlines development and customization requirements and accelerates integration by offering an almost instant plug and play solution.

In terms of the GUI, there are a number of Linux distributions that have been identified as being particularly suited to systems integration. Take for example Ubuntu based on the stable, multi-purpose and trusted Debian distribution. Ubuntu has become one of the most popular and best-known distributions. Not only is it well designed and easy to use for NAS and web-servers, it has also advanced the use of Linux as a desktop operating system more than any other distribution. Ubuntu comes as a managed package, with full hardware integration, and ongoing support through the availability of a repository of applications, software and pre-compiled packages for download, all enabling

quick and simple configuration. Adding to its flexibility, there are multiple variations of the distribution, including Xubuntu, Lubuntu, Ubuntu-server and Mythbuntu. Yocto is another distribution that is particularly suited for video and graphics drivers. In the case of Yocto, the package provides the tools and processes to make your own distributions, whereby the distribution administrator can make their own repositories of software. While Yocto requires a greater depth of knowledge and expertise in terms of development and customization, it is well suited for more deeply embedded solutions where for example multi-media drivers are more important than ease of use.

With any software development project, there will never be a miracle one-size-fits-all solution and when time is no object, then selecting a distribution with a familiar architecture will certainly work. However, when time is a critical factor in product delivery, then a fully optimized embedded board, pre-loaded with

the latest drivers, tools, cross-platform QT software and distributions ready for almost instant plug and play customization, will reduce time to market significantly. With software engineering and new product development being such a dynamic, fast-moving area, keeping up with the latest changes, enhancements and innovations is essential to ensure your solutions not only meet the demands of today, but also allow for future requirements. It's important to be open and willing to try, test and explore new opportunities. You only have to consider the potential that the independent Android platform could possibly offer in terms of its GUI. And while Android has been so successful in the mobile consumer environment, although it doesn't have the interface drivers for suitable for industrial applications now, who knows where this might take us in the future? So, while knowledge and expertise of existing software solutions is vital, so too is forward thinking vision where research and testing can explore and deliver future-proof solutions. ■

Product News

■ SINTRONES: ABOX-5000G1 features

GPU computing with CUDA technology

SINTRONES introduce the new ABOX-5000G1, a fanless in-vehicle computer with dedicated graphics card combining CUDA technology into IoT Connected Smart Cars & Vehicles application and supporting deep learning A.I., virtual reality, and autonomous vehicles.

[News ID 6125](#)

■ IBASE rolls out AGS series intelligent IoT gateway system

IBASE Technology rolls out its new generation Intel based AGS Series intelligent IoT gateway system aimed at industrial control and factory automation applications. It can be used as an IoT gateway serving as a platform to connect devices and securely transfer data to clouds, or as a Machine-to-Machine gateway providing interconnection of devices to enhance workflow, including wired and wireless, in various industrial environments.

[News ID 6165](#)

■ congatec: COM Express Type 6 module with AMD Ryzen embedded processors

congatec introduces the conga-TR4 COM Express Type 6 module based on the new AMD Ryzen Embedded V1000 processors. Setting a new benchmark for high-end embedded computer modules, AMD Ryzen Embedded V1000 processors deliver up to 3X more GPU performance than competitive solutions, and up to 2X increase in performance over previous generations.

[News ID 6038](#)

■ Interface Concept: XeonD-15xx processor-based 6U VPX DSP board

Interface Concept unveils the IC-INT-VPX6e, a Server Class Digital Signal Processing board, based on two Intel Xeon D-15xx processors (12-core version), in a 6U VPX form factor. The IC-INT-VPX6e combines unmatched performance at low power with the Intel Xeon 14nm SoC package, together with up to 64GB high-speed DDR4 memory.

[News ID 6097](#)

■ DATA MODUL: Coffee Lake COM Express module

With the current Intel Core platform, Coffee Lake H (eighth generation), having been officially launched, DATA MODUL can provide customers with samples of the corresponding COM Express Basic Type 6 modules. These reference modules can then be immediately put into production on baseboards, or used for customer-specific single board computers (ODM designs).

[News ID 6171](#)

■ Pentair: PXIe system offers high data transmission rates for test and measurement signals

Pentair is expanding its product range with a modular PXI Express system for test and measurement applications. As with all Schroff products, the off-the-shelf component options ensure flexibility and cost-efficient adaptation of numerous customer or application requirements.

[News ID 6177](#)

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Intel® Apollo Lake Series SBC based on N3350/N4200

LV-67U Mini-ITX, LE-578 5.25" SBC

New



LE-37H 3.5" SBC, LP-177 Pico-ITX



LP-150 Pico-ITX Embedded board based on Rockchip RK3128

New



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Cloud for flat-panel controllers and RFID readers

By Dirk Fistel, eCount embedded

The first cloud for flat-panel controllers offers full connectivity to enable central parameterization and constant monitoring of the operational status of displays. This brings two clear advantages: higher ease of use and lower maintenance costs.



Figure 1. Thanks to the eCOUNT eCLOUD for flat-panel controllers, there's no more need to climb ladders to configure your monitors. You can simply use your smartphone instead.

■ Industrial-grade OEM flat panels are used in many types of implementations, from large-scale digital signage solutions to medical monitors that hang over operating tables to embedded displays in many other industrial devices, machines and systems. That's why every OEM needs an application-specific controller that provides the necessary intelligence to process the respective video signals. It further supports display peripherals, such as the provision of sound and touchscreen functions and RFID readers, as well as the definition and storage of user-specific parameters such as brightness, contrast, gamma correction and color representation.

Wherever much configuration and parameterization is required, a user-friendly interface is highly welcome. Parameterizing a monitor via an on-screen display is only the minimum requirement in such cases. These days, OEMs and users want a lot more. The operator of a system catering menu board does not want to climb up a ladder to manually optimize the settings. He prefers a contactless method. A remote control would work, but it is all too easily lost, especially if used only sporadically. A better solution would be to provide an app for smartphones and tablets with a local WLAN or Bluetooth connection, similar to modern state-of-the-art TV sets. However, for the operator of several branches such a solution is not good enough. He wants to be able to distribute the settings to all stores with a few clicks. It goes without saying that it is not only the operators who demand this;

OEMs from many other sectors also appreciate the same level of comfort. They too want to be able to centrally monitor and conveniently configure their settings, such as the luminosity of the display when a set threshold is exceeded or undercut, and parameterize alarm scenarios, for example, to send an SMS to a service technician if the image source fails.

Today, the use of proprietary programming devices that require special cables for the connection of devices and costly on-site service is an unpopular solution. Instead, users and OEMs want to be able to leverage clouds and navigate a monitor via IP addresses to centrally manage and maintain their displays. Ideally, the cloud provides an HTML-based, responsive interface so you can use any client that supports a browser, from smartphones to tablets to desktop PCs. Everything can then be connected to this central cloud – from new displays in a wide variety of locations, alarm management systems with escalation routines and acknowledgment functions, to the integration of back office, ERP and CRM systems as well as content delivery platforms. For this purpose, eCOUNT embedded has developed a device-independent cloud solution with HTML interface for intelligent flat panel display controllers. This solution is first made available for the new CRTtoLCD-91 flat panel controller with 4K UHD support. As an industry first, the solution also integrates an optional RFID reader, making it possible for the display controller, and therefore also the flat screen of a system, to assume a central role

in authorization management. Since device, machine and system functions are nowadays almost exclusively accessed via touch displays and their peripherals, this is a highly efficient solution. For example, systems can be configured to boot by default with the screen off, and only turn on the display and/or touch function when an approved tag is detected. Once it is possible to centrally monitor the display usage or to manage authorization and user-dependent configurations centrally via clouds, even payment systems for pay-per-use applications can be connected. But OEMs do not have to go all that far in order to profit from the easy connection of display controllers to the cloud.

For example, the ability to track display temperature to avoid damage from overheating by proactively dimming the display is a very efficient way to make predictive maintenance even more effective. If the GPIOs that are part of the flat screen can also be configured and/or reset remotely, installation becomes more efficient as well: all that's needed is an on-site mechanic. The system can be conveniently configured from a cloud workstation anywhere in the world. By tracking switch operation and other analog inputs, it is also possible to gain valuable insights into the usage of the flat screens and their applications, plus the systems can always be kept up to date via remote firmware updates. By tracking operating times along with temperatures, predictive maintenance can be planned much more precisely with the help of MTBF calculations.



Figure 2. The eCOUNT eCLOUD offers comprehensive dashboards and a management system with which distributed flat screens can be administered centrally.



Figure 3. The first intelligent flat-panel controller with eCLOUD support is the new 4K CRT-toLCD-91 board.

The more distributed systems are installed, the more OEMs and operators benefit from a central cloud as it simply provides more convenience and services at more affordable prices. When the optional RFID reader for the display controller is also connected to the cloud, there are many more benefits. The use of specific RFID tags can then be authorized or denied from a central location, which makes authentication and authorization management highly efficient – for example, by grading into categories of simple users, experts and maintenance personnel. When RFID tag usage is tracked, OEMs can also develop completely new deployment scenarios, such as the

mentioned pay-per-use model. However, the RFID reader can also be used to simply call up a by user-preconfigured personal monitor settings, for example by selecting the desired settings from a step-by-step questionnaire via a cloud interface. Such individual settings are particularly popular in the medical field, because colour perception differs from person to person, so that one doctor may prefer a completely different configuration than the other. It is also easy to activate a DICOM Part 14 compliant display, for example to detect a carcinoma beyond doubt. When such configurations can be managed centrally, it becomes possible to assign them to specific endoscopic

devices or even diagnostic situations. Being able to centrally manage and distribute such settings opens up potential for new services.

So there are many OEM-specific uses for cloud-connected display controllers. A flat screen could even be used to log production data from customer projects, which could then be visualized via the cloud and passed on to ERP systems. A cloud-connected flat screen can be so much more than a touch-based graphics interface for man-machine communication. Providers of cloud-connected display controllers are therefore opening up entirely new, purely software-based sales opportunities for OEMs.

Version 1.0 of the eCOUNT eCLOUD for flat-panel controllers supports the 30 most popular features. These include input selection, mode, temperature, operating hour counter, power-on and, of course, all API functions such as backlight, brightness, contrast and audio volume as well as panel info and reset. When the RFID reader is integrated, the scope of functions expands to include additional RFID reader specific commands that can be triggered from the IoT platform. In the future, the cloud will be extended in version 2.0 and 3.0 to include further functions. Scheduled for release by the middle or end of 2018, version 2.0 will provide full support of all display controller and RFID reader APIs along with campaign management for the distribution of new settings or firmware. 2G/3G/4G interfaces will be supported, as well as a software development kit for the cloud gateway with integrated rule engine. As a result, this version will support all functions required for first field deployments. Version 3, which will go into development from the second half of 2018, will include interfaces to ERP solutions such as SAP or SQL, as well as dedicated apps for iOS and Android. At that point, the extended management portal with customizable dashboards and widgets will also become available.

The new eCLOUD for intelligent display controllers can be used with private or public clouds. Interfaces to all leading common cloud platforms such as Amazon, Google or Microsoft Azure are being added step by step. Upon request, the manufacturer can also provide additional, customer-specific cloud interfaces, so OEMs can always use their own specific cloud environment. The roadmap already includes solutions from embedded computing vendors such the WISE-PaaS Edge Intelligence Platform from Advantech, or the embedded cloud from S&T and Kontron. This paves the way for rapid deployment of these display controllers to the cloud environments of leading embedded and automation vendors. ■

QorIQ processor integrates four technologies needed for Industry 4.0

By Joseph Byrne and Jeff Steinheider, NXP

NXP's new QorIQ Layerscape LS1028A processor integrates on a single chip the 4 technologies needed in next-generation industrial systems: time-sensitive networking, high-performance processing, hardware-accelerated user interfaces, and high security.



■ Under a transformation known as Industry 4.0, leading manufacturers are busy conceiving and creating the intelligent industrial enterprise of the future. By merging their information technology (IT) and operational technology (OT) domains, they're building next-generation smart systems to optimize manufacturability, improve operations, enhance customer support, and analyze real-time data provided by the Industrial Internet of Things (IIoT). The IIoT concept, in its most reduced form, is about connecting embedded systems to the broader world. More broadly, it encompasses data analysis (often in the cloud), human interaction, and security. The challenge is to assemble in one place four requisite industrial IIoT technologies: networking, processing, user interface, and security. The new NXP QorIQ Layerscape LS1028A processor meets this challenge.

The merger of IT and OT is only possible by adapting the networks that bind each domain. Because the domains differ so greatly in function, their networks fundamentally differ. The IT domain encompasses systems that transform data into useful information. For a manufacturer, it includes common systems like accounting, email, and customer-relationship management, and it also includes manufacturing-specific systems for planning and logistics. These are computer-based systems without

hard real-time constraints and can use the best-effort approach of regular Ethernet. The OT domain includes the systems used to make materials into products, real-time embedded systems for process control, workflow management, and process monitoring. A factory may use an Industrial Ethernet technology that adapts standard Ethernet to deliver real-time response and work with legacy industrial communication protocols. Unfortunately, the many Industrial Ethernet protocols neither interoperate with each other nor with standard Ethernet, limiting the economies of scale for technology suppliers and thus slowing innovation. A single machine in a factory may connect to different Industrial Ethernet networks, each running its specific protocol, for different control functions, as figure 1 shows. The manufacturer must deploy gateways to pass data among the different networks or to IT systems.

Because of their limited interoperability, Industrial Ethernet protocols are not well suited to Industry 4.0. At the same time, standard IT-oriented Ethernet does not deliver the real-time performance that control systems demand. The IEEE, however, in 2004 had formed a group for audio/video streaming for consumer applications, later extending its efforts to meet professional standards. This group developed a family of audio/video

bridging (AVB) standards for synchronizing devices on a network to the same timebase (borrowing from IEEE 1588), traffic shaping, and admission controls. Although not perfectly suited to industrial applications, these standards provided a framework for managing Ethernet traffic.

Recognizing the potential to adapt AVB for industrial use, the IEEE group changed its name to Time-Sensitive Networking (TSN) and began revising the 802 standards family to address the needs of industrial and automotive applications, as well as improving features for professional audio-video use. New standards define time-aware traffic shaping and policing to enable scheduling critical traffic. To facilitate scheduling, new standards enabled the preemption of non-critical frames. A new standard for redundant network paths improves network reliability. Industrial companies can now deploy a single IEEE-standard Ethernet network that carries both the time-critical control traffic of OT systems and the regular best-effort traffic of IT systems. Now that pivotal networking technologies for the industrial IIoT are defined, these companies can focus on the strategic benefits of OT-IT convergence and Industry 4.0. Just as networks must support time-critical functions, so must processing. A real-time operating system (RTOS) helps ensure that a CPU is

available to receive and process control packets when they arrive on a TSN-enabled port. The ability to respond to control packets also helps the CPU to address events coming to the processor from other inputs and to execute loops controlling the system the processor is part of. These loops may need to run up to every 30 microseconds or faster - a degree of precision that a conventional IT-derived operating system cannot meet. The need for more automation requires increased processing capabilities in embedded controllers. Higher performance processing can be used to reduce control loop timing, moving robotic arms and assembly lines faster and increasing factory output. It can also increase the number of axes managed by a single motion controller, leading to robots with more articulated joints, which can operate in tighter spaces or perform tasks that the previous generation of factory robots could not address. Robots that can learn tasks from a human operator will require image processing, along with new machine learning algorithms.

Commercial RTOSs include VxWorks from Wind River and Nucleus from Mentor Graphics. These vendors have a long history of supporting the NXP QorIQ family and its predecessors. With the emergence of industrial-grade Linux, open-source alternatives are another option. These provide industrial enterprises and OEMs the agility to add new capabilities to their systems. Unlike IT-focused and non-real-time embedded Linux distributions, industrial-grade ones provide the determinism, manageability, industrial networking, and security required of OT.

One approach to adding real-time capability to Linux is to apply the PREEMPT_RT patch to the kernel to eliminate situations where a software process is blocked indefinitely by another process. In this scheme, applications are coded to the usual Linux API. Another approach taken by Xenomai is to add classic RTOS APIs to a Linux system, facilitating porting traditional RTOS applications to Linux. This supplier also provides mechanisms for device drivers to respond to peripherals in real time, firming up the real-time guarantees Linux can offer. To ease the transition to Linux from a classic RTOS, NXP is working with the industrial Linux community on a distribution integrating the various real-time enhancements and TSN stacks while maintaining standard Linux capabilities.

Processing capacity must also be available for analytics. The IoT is not only about networking embedded systems but about capturing data from sensors, analyzing the data, and directing the system responses. A common notion is that distant servers in the cloud perform the analysis. However, the amount of data to be transported and analyzed, the time-criticality of the decisions to be made, and the proprietary nature of the data will lead manufacturers to process manufacturing data locally. Analysis could be done not only on a computer at a factory site but even within production machinery, given sufficiently powerful processors. Beyond analysis, processing capacity in an Industry 4.0 regime will be used to manage operations remotely, to enable machines to coordinate among themselves autonomously, and to gain efficiencies from linking production data and IT systems such as those for enterprise resource planning.

Another function demanding processing power is the human-machine interface (HMI). Smartphone-inspired interfaces will increasingly permeate the staid world of industrial equipment. Easy-to-use, visual interfaces simplify operator control of machines. High-resolution screens enable viewing the output of high-definition (or better) cameras inspecting goods as they are manufactured. Driving these screens will be the same type of graphics processing units (GPUs) found in smartphones. Although this 3D performance of GPUs will be scaled down from what is in a smartphone to reduce cost and power, they will support large, high-resolution screens; overlays of



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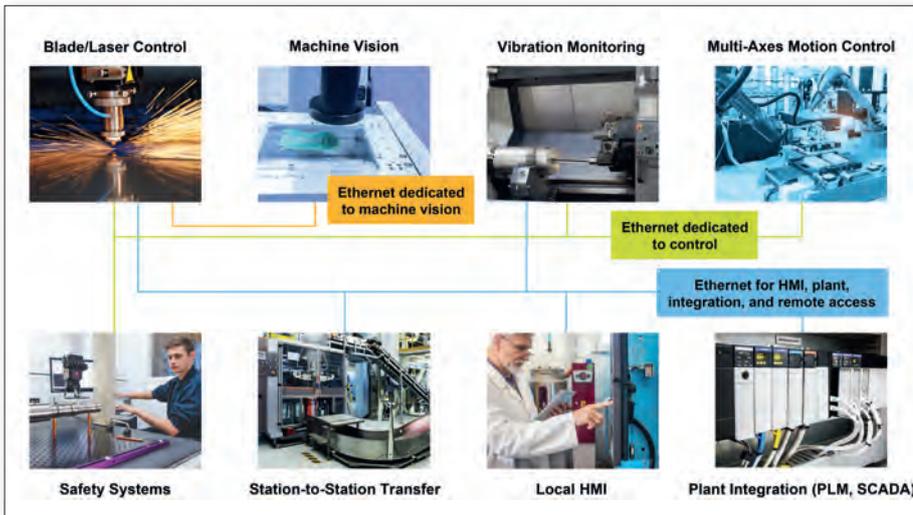


Figure 1. Modern machines which can be linked to the Industrial Internet of Things via different protocols.

graphics, video and text; and slick user interfaces. Convergence of OT and IT increases the risk of security threats. In the past, operations were isolated - almost impenetrable from the outside world. A hacker would need a physical link to attack a machine. A converged industrial setting erodes barriers isolating operations so that information can be shared among systems to improve efficiency. New barriers must be erected to ensure the integrity of systems while maintaining permeability to

data flow. The first step for equipment manufacturers is to secure processing platforms in their equipment. They must ensure that their systems execute only approved software and connect securely to other systems. These systems must be securely commissioned and periodically updated and resist tampering of their hardware and software. A recent NXP white paper on IoT security discusses security and trust considerations in more detail. Although the paper context is consumer IoT,

the same considerations apply to the Industrial IoT. The financial and safety risk in the industrial context is higher, however, amplifying its need for secure systems.

NXP is proud to enable Industry 4.0 equipment manufacturers to incorporate state-of-the-art networking, processing, HMI, and security in their designs with its new QorIQ Layerscape LS1028A processor. This SoC integrates in one place the technologies needed in next-generation industrial systems: time-sensitive networking, high-performance processing, hardware-accelerated user interfaces, and high security. The LS1028 integrates a four-port Gigabit Ethernet switch and two additional Ethernet ports running at up to 2.5Gbps, all implementing TSN protocols. Two powerful 64-bit ARM CPUs provide the computing performance required for modern industrial applications and support RTOSs such as Linux with preemptive real-time patches, Xenomai Linux, Nucleus from Mentor Graphics, and VxWorks from Wind River. The GPU and LCD interface of the processor allows it to support high resolution displays and touch screen inputs. NXP software includes an open-source industrial Linux SDK with real-time performance and support for TSN standards. Importantly, the processor integrates NXP trust architecture, helping to enable bullet-proof IoT security. ■

Product News

■ ST: new SDK makes motor-control design faster and easier

STMicroelectronics has further simplified development of advanced, energy-efficient motor drives on STM32 microcontrollers by harmonizing the latest STM32 PMSM FOC Software Development Kit with the STM32Cube ecosystem. The move extends opportunities for engineers to build sophisticated drives for equipment such as air conditioners, home appliances, drones, building automation, industrial machinery, medical devices, e-bikes, and many others, without needing specialized experience.

[News ID 6133](#)

■ Microchip introduces MPLAB PICKit 4 programming and debugging development tool

The debugging process remains an important area where many embedded design engineers would like to see improvements, according to AspenCore's 2017 Embedded Market Study. To address these needs and enhance the development experience, Microchip introduces the MPLAB PICKit 4 In-Circuit Debugger. The low-cost PICKit 4 in-circuit programming and debugging development tool is meant to replace the popular PICKit 3 programmer

by offering five times faster programming, a wider voltage range (1.2-5V), improved USB connectivity and more debugging interface options.

[News ID 6082](#)

■ Apacer to unveil ruggedized SSD technology

After 20 years in the industry, the company remains dedicated to showcase its industrial products and technologies at embedded world including top-range 3D NAND SSD, industrial DRAM, and TCG Opal 2.0 solutions. With the advent of Industry 4.0, Apacer expects to unveil all-new 3D NAND flash storage solutions to fulfill the macro demand in cloud computing, automated industrial applications, and big data analysis.

[News ID 6052](#)

■ CUI expands USB product line with USB Type C connectors

CUI's Interconnect Group announced the addition of USB Type C connectors to its USB product family. The UJ31 receptacle connector series and UP31 plug connector series conform to the USB 3.1 Gen 2 standard that supports data transfer speeds up to 10 Gbps and power delivery up to 100 W at 20 V. With

a reversible connector interface for simple and reliable mating, these USB Type C connectors provide designers with a compact, versatile solution for a variety of I/O applications in consumer and portable electronic devices, including high volume storage products, digital audio devices, and mobile computing equipment.

[News ID 5987](#)

■ Inova Semiconductors: standalone LED driver for in-car lighting

Inova Semiconductors announces a new standalone smart RGB LED driver and controller, the INLC100Q16. This is the latest member of Inova's ISELED family, a truly revolutionary concept for in-car LED lighting that substantially reduces costs, simplifies control and enables dynamically changing light. The next generation of in-car ambient lighting will typically comprise of 10 to 30 LEDs mounted on a flexible light strip. Each 'group' consists of one red, green and blue LED to form a 'pixel', which is then intelligently controlled by the ISELED smart RGB LED driver, effectively replacing the present cumbersome and costly work-around utilizing multiple microcontrollers and a slow LIN bus.

[News ID 6062](#)

Enabling future oriented functionalities for motor control solutions

By **Suad Jusuf**, Renesas Electronics

Smart... home... wireless... connected... IoT... control... opening not only new revenue sources but also new customization skills, adaptation capability and efficiency, high quality, user friendliness and minimized efforts. This is just part of the complex, feature-oriented solution development within the Industry 4.0 and Smart Home world which has already started.

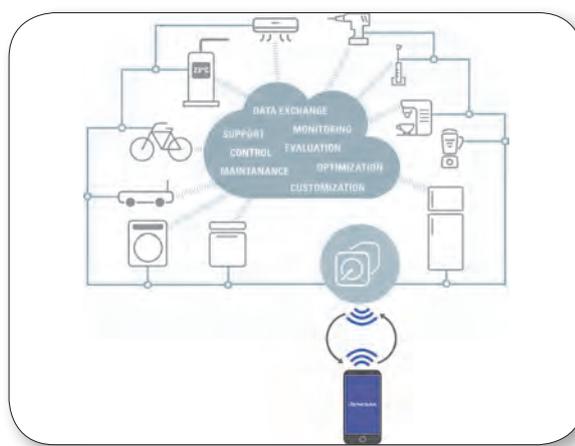


Figure 1. User orientated customized smart home motor-controlled appliances

■ Welcome to modern, feature-oriented productivity and growth with its own modern functionality like omnipresent wireless communication and IoT ability. This demand has to be considered, added and fulfilled as a requirement automatically within the solution development phase. It's a mandatory step that enables manufacturers to accelerate the development of new competencies and increase their ability to become more agile, efficient and predictive. Growing innovation, reinforcement of the request-oriented and customer-centric approach are the requirements for rapid return and new revenue sources. The end development of a complete solution also requires simplified but effective maintenance, support and services during the solution warranty and lifetime. Those attributes as a differentiator, combined with the skill of customized and user friendliness, are very important factors that influence the successful outcome of the solution and the satisfaction of the end user and customer nowadays. Renesas provides reference designs which are able to fulfil the needs of fast and cost- optimized solution development. This includes modern state of the art add-on features that enable future oriented functionalities within the motor control solutions area. The attributes of the reference designs delivered include sophistication and complexity moving towards simplicity, targeting

higher efficiency, quality and flexibility with the implementation of new modern add-on features. Products include the YROTATE-IT-RX23T, YROTATE-IT-RX24T and YROTATE-IT-S5D9. All three reference design kits are available for single/dual motor control (PMSM, BLDC, AC induction).

The main characteristic related to the control methodology is as follows: speed and torque control, sensorless Field Oriented Control (one- and three-shunt method), usage of Hall sensors and/or encoder unit ability, auto tuning, identification and calibration functionality, intuitive PC graphical user interface (PC-GUI), interface for an external high voltage/high current power stage (up to 1.5KW), proprietary debug Interface E1, and safety compliance Self-Test library IEC60730, and certificate by VDE.

Included within the control methodology of the available reference designs, the following modules and functionalities expand the development options and enable more agility and smartness: ALSTC (Adaptive Low Speed with maximum Settable Torque Control), ASO (Adaptive Speed Observer), ABC (Adaptive Boost Control (patented method by Renesas)), Wireless PMOD interface enabling usage of BLE, BT and Wi-Fi technology, Smart APP for iOS and Android based devices (YRO-

TATE-IT), Exchange Data by Email, SMS and Cloud Services is also possible. With one of the mentioned reference designs in the laboratory, developers can learn fast and familiarize themselves with the appropriate device as a component and the methodology behind the entire system. The possibility of a rapid prototype development and the ability to concentrate on the specific add-on functions of their own solution automatically lead to faster development and time to market.

Moving on to the next step, Renesas provides additional sources of feature sets and functionalities with the YROTATE-IT-XXX reference designs. These enable the implementation of wireless communication ability by enabling rapid test and evaluation through data capturing and sharing. These capabilities are easy to apply within the evaluation process and can be expanded with additional functionalities within the framework and end-development process.

The capability of wireless communication has been accomplished by integrating the PMOD adapter interface. This enables the implementation of PMOD- based devices by supporting one of the wireless communication technologies like BLE, BT or Wi-Fi. The YROTATE-IT-RX23T and – S5D9 reference kit now supports the Bluetooth low energy (BLE) wireless com-

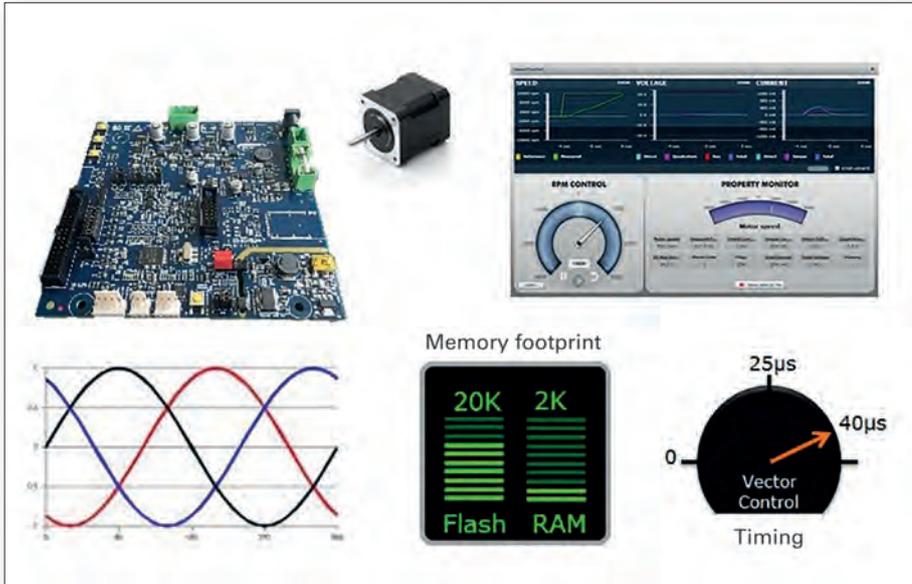


Figure 2. YROTATE-IT-Deliverables characteristics

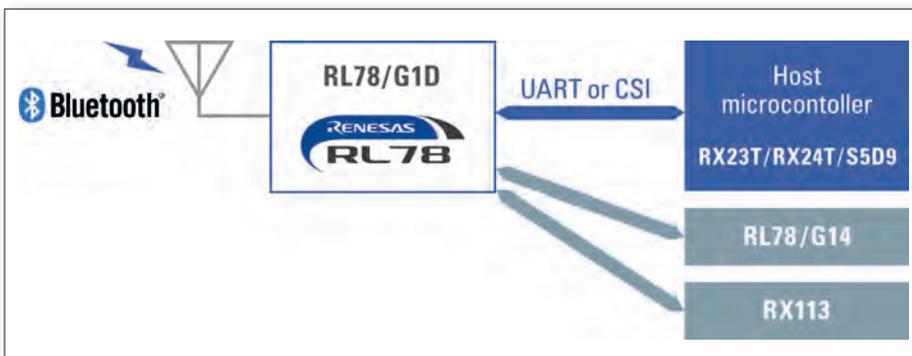


Figure 3. Application development using a host microcontroller

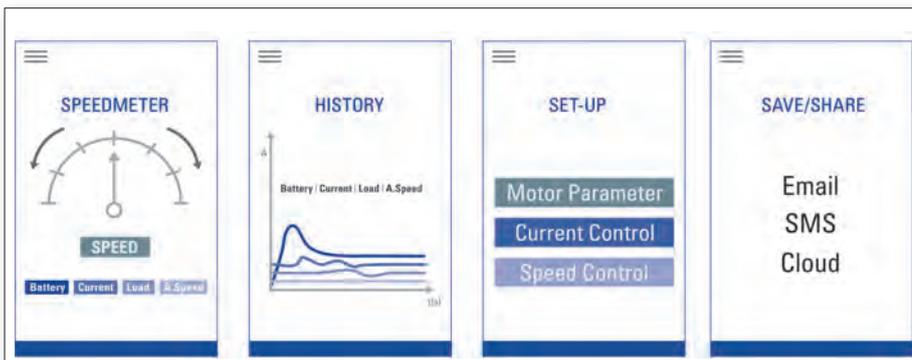


Figure 4. Storyboard visualization and presentation art process

munication technology. The Renesas PMOD BLE module used is the RL78/G1D based on the RY7011 device with 256KB program flash, 8KB data flash, 20KB SRAM and with the lowest power consumption of 4.3mA RF transmission mode and 3.5mA RF receiving mode in the industry.

While this describes the appropriate hardware capability of wireless communication, we can now turn to the next logical step of implementing the appropriate communi-

cation protocol and control software. The communication protocol software is based on predefined rules and interface specifications that must be complied with. Renesas protocol stack software takes over and simplifies the implementation of the BLE protocol. It also delivers a standard profile and custom profile mountable API on the top. Selectable configurations like embedded and modem mode (virtual UART) can be used. It is a good idea to define the approach before starting work on the storyboard. This could

involve answering questions on the goal to be achieved and requirements that need to be fulfilled. The target that Renesas aims for, with its wireless capable motor control reference design, is to have a flexible system reference design solution that allows customized and easy start-up, evaluation and development. It does this by incorporating all the attributes and needs of a modern compact motor control solution, offering and keeping in background all the flexibilities and options for further feature implementation and development adaption.

The requirements can be defined by clarifying which features are must-haves and which are nice to have – then finding a balance between the two. This can be clarified from the reference design point of view beforehand. The first step is to select and define the important data and parameters to be shared, monitored and manipulated so that understanding of the overall context of the solution process can be created and followed. The user friendly and customization options also need to be included.

Having done that as a first step, the definition of the main requirements and the characteristic of the smart control software have been delivered. Next comes the definition of the exact storyboard flow with all mandatory selections of the visualization and representation. This includes event processing, state machine flow and error handling. It is important to remember that user friendliness has a high priority as it is one of the main attributes defining the important final touch overall. All in one, a very complex process method with lots of mandatory steps that cannot be ignored or avoided.

Here we come now to the offered wireless motor control capable software as a smart phone APP YROTATE-IT. Based on the defined requirements and characteristic, following attributes and functionalities are available and offered: search and list valid devices, connection with one from the user selected external device available on the list, and menu bar which includes Run page, History page, and Set-Up page. Run page enables to set-up rotational speed, to monitor battery, current, load and actual rotational speed, allows Start/Stop running and changing rotational direction. History page is responsible for monitoring the reactional behavior of the system by visualizing the flow of the parameter: voltage, current, load and speed. Selection between the depicted flows of the parameters is also made as well as amplitude depiction and monitoring selectable Set-Up page. On Set-up page you can get the available motor, current and speed control parameter and set or identify the motor parameter. Set the

current and speed control parameter torque response and speed response. Finally, you can save or send the Set-up file via Email or Short Message into the Cloud.

For first impressions and capabilities of the YROTATE-IT-XXX reference design, all developers need is the demo reference kit based on their preferred device from their local supplier. They can then install the available YROTATE-IT smart app for free. It allows for immediate commissioning and provides developers with an initial experience of the reference control system and its characteristics. They can run a first evaluation, test and customization using their own

motor with no need to spend time to get familiar with the control hardware system and/or control software. Flexible support before, during and after the development is achievable and executable. Different settings and achieved results are shareable within the team and could be available as a database source of various types of information that can then be used for further tasks like service and maintenance, update, controlling, etc. beforehand and afterwards. The Renesas smart motor control app YROTATE-IT is available and can be downloaded/installed from the appropriate stores like, APP Store and Google Play for IOS and Android based devices accordingly. ■

Product News

■ Keysight to accelerate development and deployment of 5G networks

Keysight Technologies announced successful inter-operability testing of Keysight's User Equipment (UE) Emulation Solution and Samsung's new 5G base station based on 5G New Radio (NR) standards. Keysight and Samsung have agreed to align their plans to enable 5G base station testing and build an ecosystem of interoperable products.

[News ID 6076](#)

■ Vector: simplified measurement and calibration of ECUs and ADAS sensors with CANape 16.0

Vector integrates many new functions in the new version of the CANape measurement and calibration tool. In this way, calibration engineers can simplify their work and interactions with their ECUs. The storage of configuration files in containers accelerates important project transfer operations. Improvements have also been made in the field of ADAS development, in particular for the visualization of LIDAR sensor data.

[News ID 6008](#)

■ Rohde & Schwarz: FPC entry-level spectrum analyzer combines three key RF test instruments

Rohde & Schwarz has extended its R&S FPC spectrum analyzer family, adding the R&S FPC1500. The R&S FPC1500 is the world's first spectrum analyzer to include a one-port vector network analyzer with internal VSWR bridge, an independent CW signal generator and a tracking generator. Outstanding quality and innovation do not have to come with a high price tag. Despite its budget-friendly concept, the R&S FPC1500 is designed to the same quality standards as high-end Rohde & Schwarz instruments, providing solid RF performance and a comprehensive future-ready feature set.

[News ID 6174](#)

■ Green Hills: Compiler 2018.1 adds C++14 and meets highest levels of functional safety

Green Hills Software announced the availability of its Compiler 2018.1 for creating highly optimized 32-bit and 64-bit embedded C and C++ software applications for all leading embedded processor architectures, including Arm, Intel and Power Architecture. Key global customers and Green Hills compiler architects engaged on focused performance projects and as a result, customers see 3x faster vector processing speeds, and scores beating the LLVM Compiler even on LLVM's own benchmark suite.

[News ID 6095](#)

■ IAR enhances Amazon FreeRTOS integration for Arm Cortex-M-based IoT applications

IAR Systems has released a new plugin for the IoT Microcontroller Operating System Amazon FreeRTOS, providing a high level of control and visibility within IAR Embedded Workbench for Arm. The new plugin adds task awareness for all Arm Cortex-M devices, providing developers with full control of the execution at the task level and enabling display of the local execution context for each individual task within the IAR Embedded Workbench IDE.

[News ID 6086](#)

■ Renesas unveils Synergy website and solutions gallery for IoT developers

Renesas Electronics announced the newly updated Renesas Synergy Platform website and Solutions Gallery that place the power of the Synergy ecosystem – from software to hardware – into the developers' hands. The site refresh makes it easier for Renesas Synergy users to take advantage of the entire Synergy ecosystem including LTE cellular, Bluetooth low energy, advanced Wi-Fi connectivity, and comprehensive security solutions.

[News ID 6034](#)

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Intellectual Property protection for sensors in the IIoT

By Michael Gaudlitz, Gemalto

The IoT brings increasing intelligence to sensors. While the computing footprint for this is limited, the use of such integrated intelligence must be protected by licensing. With Sentinel Fit, Gemalto has developed the smallest licensing solution, which can be integrated into virtually any microcontroller.

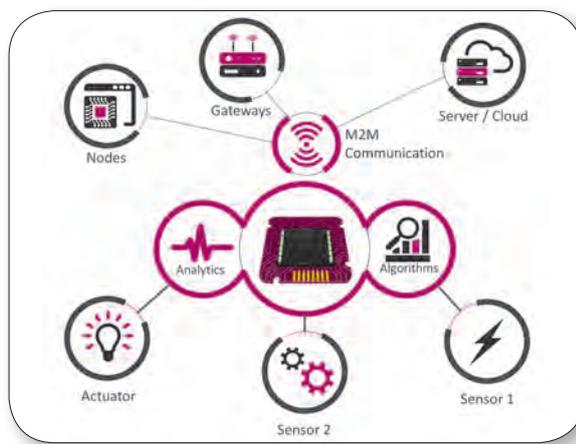


Figure 1. Microcontroller-based IIoT nodes with one or more sensors/actuators contain valuable code that deserves IP protection and should also be monetized through licensing solutions.

■ Most of the billions of IoT devices are smart sensors and actuators. They send data on fertilizer and moisture levels to vineyard owners, sometimes for each vine; they tell the driver where to find the nearest free parking spot; they turn off street lights when the moon is bright or there isn't anybody around; or they are integrated into all kinds of devices, machines and installations to provide status information to operator clouds. This invariably requires a certain device intelligence, not just for analyzing and processing the captured data but also for transferring it via different – sometimes encrypted – communication standards.

Let's take brightness sensors as an example. They measure brightness via photocells and convert the data into digital signals. If this data is analyzed directly in the smart sensor and parameters it can be defined, a basic level of intelligence is already implemented. If the sensor is able to send this data to IoT gateways via wireless interfaces, it is even smarter because this requires packaging the data for transmission and handling the entire communication. If the smart sensor is also capable of receiving data from other sensors – for instance, to add up measurements from three different sensors before transmitting them – it is even more intelligent. And if it then also features an integrated actuator that turns the lights on or off, the intelligence of the

decentralized sensor-actuator node contains enough lines of code to call for Intellectual Property (IP) protection. The same applies, of course, to analog communication modules that link less intelligent sensors and actuators in a modular manner.

Such protection is absolutely essential, because the more IP a smart sensor contains, the more interest from hackers and cyber criminals in gaining access to the device IP. They may steal the code to make their own pirated copies or for sabotage attacks. If an elevator gets stuck or the heating stays cold, as happened in November 2016 in Finland, this may be comparatively trivial. Yet even such manipulation of smart building electronics needs to be prevented effectively. The protection of IP through licensing is not just a security measure. It also opens up all kinds of opportunities from flexible license management. For example, vendors can develop platform strategies using standardized hardware and provide individual product variants based solely on software configurations. This allows them to achieve greater economies of scale that offer scope for defining new price and profit targets. Other options available to vendors include timed, pay-per-use and function-based licensing models. A flexible licensing policy for IoT sensors and actuators can enable entirely new business

models. Take, for example, the brightness sensor that is used in the home to control the sun blinds depending on the time of day and the angle of the sun light. The logic required is quite different from that of a street light sensor designed to dim the lights when the moon shines in order to save electricity. Both are smart sensors but require a different algorithm to achieve the application-specific functionality. For sensor manufacturers, this can lead to completely new sales scenarios, since the sensor manufacturer offer is no longer differentiated just by the physical capabilities of the sensor, but also by the integrated logic that the manufacturer of the street light or blind logic now buys as part of the package. All the latter has to worry about is installing an app in the cloud, on the tablet or the smartphone with which to manage the smart devices. Smart sensors will therefore also change the way in which suppliers work together in the electronics segment. Since the software is the key player in this, it needs protecting as well as licensing. Interestingly, the same licensing tools that are used by software vendors in the commercial sector can also be used here. At least, if they were designed to be completely independent of the used operating system and processor or microcontroller. Gemalto has developed such a solution with Sentinel Fit, which is also the smallest licensing system

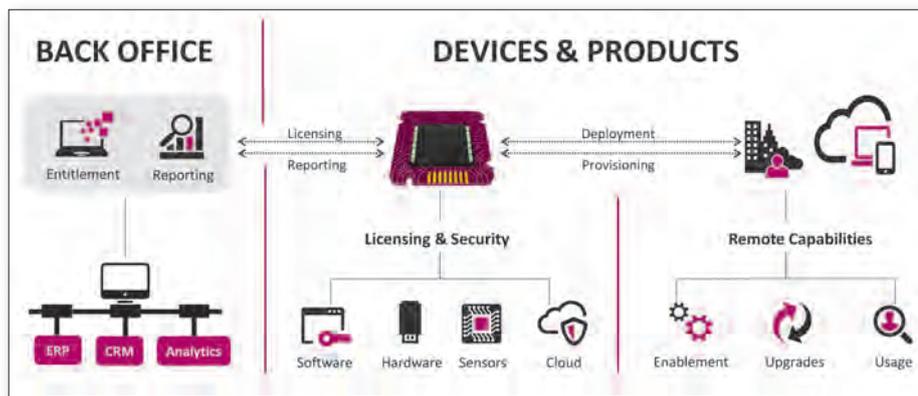


Figure 2. The more devices in the field are connected to the IoT, the more important it becomes – for deployment and provisioning as well as licensing and reporting – to connect all these devices as efficiently as possible.

in the world. It is platform-independent and can therefore be used in any microcontroller and operating system configuration capable of providing 1.5KB RAM and 6.5KB flash for the licensing footprint. It is suitable for many different devices – from smart headsets and wearables to home automation devices, smart city applications, smart meters and countless other industrial sensors, actuators and communication modules. The system can be used, for example, with typical microcontrollers such as the ARM Cortex M3/M4, Intel Quark or AVR/Arduino and Raspberry

Pi or 8051, 68k, PIC/MIPS or MSP430 with an embedded operating system or as bare metal installation without OS. For all these processors, Sentinel Fit offers the option to implement asymmetric RSA encryption as an off-the-shelf solution, which also allows remote updates to enable or disable feature access. As far as the technical specifications are concerned, the microcontroller needs to provide just 13KB RAM and 34KB flash for the licensing footprint. For even smaller footprints optional symmetrical AES encryption is available requiring only 1.5KB RAM and

6.5KB flash. Because licensing is not limited to specific microcontrollers or OS, it can be used in any configuration. This makes it also suitable for tablet or desktop processors, but in those cases, use of an even higher level of security is recommended. Having said that, operating a smart sensor completely without license protection is not advisable under any circumstances.

Sentinel Fit is available in C source code and integrates flexibly into existing embedded toolchains. Due to its modular design, unnecessary functions are easily removed to achieve an even smaller footprint. As the more powerful Sentinel RMS license management system is already available for development environments such as Labview or Matlab and Simulink, the flexible, open source Sentinel Fit can also be used here. It also offers a comprehensive modular kit for license and entitlement management that ranges from licensing tools to – optionally cloud-based – licensing management systems for OEMs, and also provides interfaces to leading ERP and payment systems for process automation. To this extent, professional licensing systems differ significantly from tools for generating a license key. If developers decide to use these professional tools, they automatically get the basis for the flexible marketing of their solutions. ■

Product News

■ Express Logic enables sensor and edge/gateway device connectivity to all leading cloud providers

Express Logic announced turnkey support for all the leading cloud providers. Among this group are Alibaba, Amazon Web Services (AWS), Baidu, Google Cloud Platform, IBM Cloud, Microsoft Azure, Oracle Cloud, Tencent, and Xively. Designed from the ground up to be industrial grade, and developed entirely in-house by Express Logic engineers, the X-Ware IoT Platform leverages its size, performance, safety, security, ease of use, and other advanced features to provide best-of-class IoT connectivity for deeply embedded IoT sensors, devices, edge routers, and gateways.

[News ID 6055](#)

■ Green Hills: Secure Platform brings wide range of connected car services

Green Hills Software announced the integration of u-blox automotive connectivity and positioning technology with the Green Hills Platform for Secure Connected Car. The Green Hills INTEGRITY real-time operating system and Multivisor secure virtualisation provide the trusted software foundation and impenetrable partitions to securely and safely combine Linux-based connected car services

with critical application and vehicle bus services utilising u-blox portfolio of connectivity modules.

[News ID 6022](#)

■ ESCRYPT expands security portfolio

In future, IT security for the Internet of Things will require a holistic approach. Because IoT applications are increasingly interconnected. This calls for lifecycle management and organizational integration alongside embedded security solutions. In light of these developments, ESCRYPT is expanding the security portfolio it offers its customers to include backend services that parent company Bosch has used for many years now to successfully provide cyber security solutions in workplaces and production facilities worldwide.

[News ID 6110](#)

■ ETAS: collecting measurement data for automated vehicle systems

To develop and test the advanced systems involved in vehicle automation, huge quantities of data need to be collected at high rates. ETAS has joined forces with partners to develop a vehicle-specific solution. Smart systems that automate driving, connect vehicles, and further mitigate their impact on the envi-

ronment are opening up a new class of vehicle. In the case of vehicle automation, this calls for exact monitoring of driving and environmental conditions, achieved by powerful sensors, image processing, and object recognition systems.

[News ID 6111](#)

■ Rohde & Schwarz: T&M tools to minimize multi-region drive tests for LTE modules

Rohde & Schwarz is collaborating with wireless module vendor Gemalto to overcome the problem of extensive real network drive tests in different countries. The solution is to automatically reproduce field-recorded network configurations of Gemalto Cinterion modules on an R&S CMW500 mobile radio tester.

[News ID 6025](#)

■ ANSYS: Discovery Live enables real-time digital exploration

ANSYS enables engineers to create smarter designs faster and more efficiently with the commercial release of ANSYS Discovery Live. Discovery Live will empower millions of engineers around the world to confidently simulate designs in real-time quickly and more economically.

[News ID 6011](#)

Mutual capacitance touch sensors improve vehicle user interfaces

By Tetsuya Tokunaga, ON Semiconductor

There is huge potential for touch control technology in the automotive sector but also major challenges to overcome. Before embarking on new designs, engineers need to take these into account. They need to specify semiconductor technology with the signal integrity to boost touch sensor performance and the configurability to optimize the system accordingly.

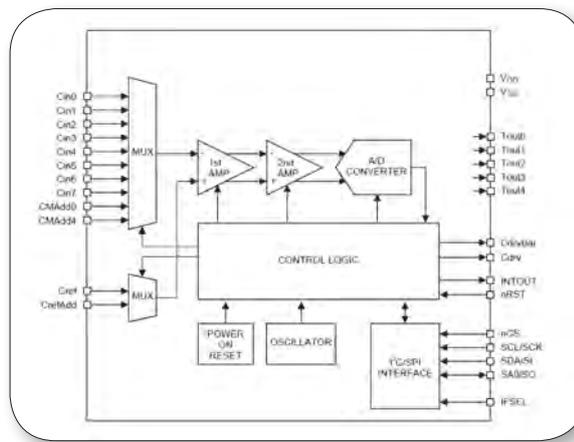


Figure 1. Functional block diagram of the LC717A30UJ

■ Consumers have developed greater expectations with regard to the performance and intuitiveness of touch sensor interfaces. This is quite clearly a consequence of the experiences they have had with items of portable electronics such as smartphones and tablets. The vast majority of people will therefore not accept anything less effective when it comes to other application areas, as touch control starts to see more widespread proliferation in a wide and varied selection of end markets. They want to derive the same sort of seamless smooth, glitch-free operation that they are used to elsewhere. Here we will look at the implications this has now that touch technology is starting to become popular in automotive designs.

The opportunities for touch-based control within the automotive sector are just starting to be appreciated by manufacturers and their tier one technology partners, providing them with a way to offer product differentiation in what has become an extremely competitive market. There are many places within modern vehicles that have been identified where this can be applied. Among the most prominent of these are HVAC controls, smart key entry systems (based on proximity sensing) and body electronics functions such as power window lifters. Of course, the decision-making process that relates to specifying touch sensing solu-

tions for such functions is very different from what would be applicable for portable electronics, home entertainment systems, white goods and suchlike. There are, as we will see, a number of important and highly distinctive aspects that define automotive deployment, which simply do not appear in other markets. These need to be given adequate consideration, or the touch system will fail to meet the application performance, reliability and longevity requirements.

The automotive environment is typically harsh and uncompromising. This is why electronic components that are used on vehicle systems need to have attributes that address this. When looking to utilize a touch sensor within such a setting, there are key criteria that need to be considered. Firstly, the touch sensor is going to be exposed to elevated levels of electromagnetic noise - with the various electric motors present in the vehicle, as well as the cable harnessing, the alternator coil and a multitude of other sources all contributing. If not properly addressed, this noise could impair the reliable performance of the touch system. Secondly, the nature of where these touch sensors are going to be situated means that they may have to contend with various physical stresses, such as mechanical shock, vibration, and elevated temperatures. Rugged construction thus becomes mandatory.

Capacitance touch sensors are, for these reasons, deemed to be the most suitable. Next, as there can be significant variations in electrical system level parameters from one vehicle to another, there needs to be scope for fine tuning before the car comes off the production line. Finally, given that there is such a plethora of different applications within the cabin and on the car exterior which could benefit from touch functionality, the sensor should include various features to match specific application needs; the ability to support different design arrangements, while keeping the number of components involved as low as possible, is important. As an example, some designs may result in the presence of an air gap between the sensor/PCB and the protective cover. This will normally mean that a light guide has to be incorporated into the set up (with repercussions in terms of both the bill of materials cost and the associated engineering effort). Employing technology that can alleviate problems of this kind will prove beneficial.

Capacitance touch sensors can be based on either of two different sensing technologies - these are self-capacitance and mutual capacitance. With self-capacitance, an increase in capacitance level is detected when the finger of the user approaches the sensor electrode. Though widely used, self-capacitance touch sensors can be susceptible to parasitic capac-

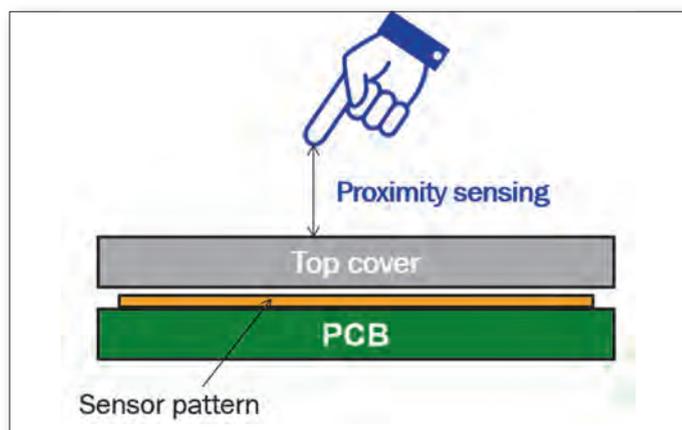


Figure 2. Use of mutual capacitance sensing in a smart key application

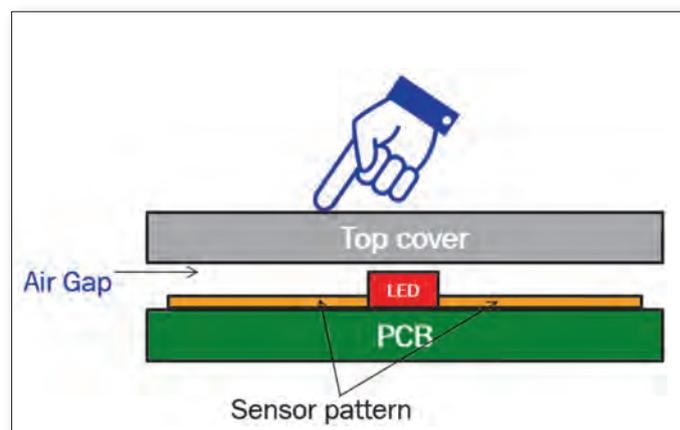


Figure 3. Mutual capacitance sensing applied to a power window lifter control where an air gap is present.

itance effects. They also have recognized limitations in terms of the range they can achieve. This means that they are not suitable for application scenarios where an air gap will be present. In contrast, a mutual capacitance arrangement has two separate electrodes and detection is based on a decrease in electrode force lines between them as the user finger comes closer. This methodology, provided that it is accompanied by good signal conditioning, supports longer range operation and is not impacted by parasitic capacitance to the same extent as self-capacitance. As a result, it is better able to deal with air gaps and inherently noisy application environments.

Using a mutual capacitance approach allows automotive engineers to deploy touch sensors that can serve a number of different purposes. The heightened sensitivity means that they can be utilized not just for touch but in proximity sensing, for instance. Figure 2 describes its use in a smart key vehicle entry application, where the driver is able to unlock the car door without having to come into contact with the door handle, through a change in capacitance being determined from some distance away. Figure 3 shows how this type of sensing system may also be applied equally well to a power window lifter control panel application. The nature of the cabin design means the protective cover

that the vehicle occupant touches is not likely to be in direct contact with the PCB on which the sensor is mounted therefore leaving a sizeable air gap. Via a mutual capacitance sensor arrangement, the need to fill this gap with a light guide (along with complex and expensive to implement optical bonding) can be avoided. The result can be a more streamlined and cost-effective system solution.

Advanced capacitance-to-digital converter LSI technology with industry-leading dynamic range from companies like ON Semiconductor can support significant performance improvements in capacitance touch sensors and thereby enhance their operation in automotive applications. Designed for use with mutual capacitance touch sensors, ON Semiconductor LC717A30UJ sets new standards in relation to touch sensitivity thanks to its parasitic capacitance cancellation mechanism.

It also has built-in noise rejection capabilities that help to mitigate the effects of electromagnetic interference often present in an automotive surrounding. This LSI can support the detection of capacitance changes down to femto-Farad (fF) levels, with a range of up to 150 mm being attained. As a result of this, it is not just equipped to deal with conventional touch functionality, but also proximity sens-

ing and sophisticated gesture recognition. In addition, it means that this device is able to operate when there is an airgap between the sensor/PCB and the protective cover. The need for inclusion of a light guide in the user interface design is thereby eliminated, allowing marked reductions in the bill of materials costs to be realized.

The LC717A30UJ has eight capacitance sensing input channels, making it highly suited to inclusion within systems that require an array of switches. Among its other features are an analog-to-digital converter for data translation, a dual-stage amplifier for determining capacitance changes on the analog outputs and an integrated multiplexer for input channel selection. I2C and SPI serial interfaces can be selected from, depending on the specific application requirements of the system. Furthermore, this highly robust AEC-Q100 compliant IC has a built-in automatic calibration function. This optimizes and self-calibrates the touch sensor system with regard to the characteristics of the electrode, as well as line capacitance and the surrounding environment. It simplifies the installation process and maximizes the effectiveness of the user interface in-situ, presenting the industry with a single chip touch/proximity sensing solution that is both accurate and reliable. ■

Product News

■ Wibu-Systems: CodeMeter provides secure storage for SGX native enclaves

Wibu-Systems has successfully completed the Intel Software Guard Extensions (Intel SGX) enablement process for CodeMeter on Windows platforms. CodeMeter is a technology that is laser-focused on the automatic or manual protection of software, firmware and data. It combines the latest hacker-proof encryption methods with secure hardware, software, or cloud elements where encryption keys as well as license and entitlement rights are safely stored.

[News ID 6122](#)

■ MACOM and STMicroelectronics to bring GaN on Silicon to RF applications

MACOM and STMicroelectronics announced an agreement to develop GaN on Silicon wafers to be manufactured by ST for MACOM's use across an array of RF applications. While expanding MACOM's source of supply, the agreement also grants to ST the right to manufacture and sell its own GaN on Silicon products in RF markets outside of mobile phone, wireless basestation and related commercial telecom infrastructure applications.

[News ID 5992](#)

■ Mouser: Renesas' latest versatile, low-power RX130 32-bit MCUs now shipping

Mouser Electronics is now stocking the RX130 Group of 32-bit microcontrollers from Renesas Electronics. With a new capacitive touch IP with improved sensitivity and robustness, the RX130 microcontrollers are ideal for devices designed with nontraditional touch materials or required to operate in wet or dirty environments, such as human machine interfaces, household kitchen and bath, motor control, and factory applications.

[News ID 6030](#)

■ Cypress delivers robust wireless connectivity to Raspberry Pi 3 Model B+ IoT SBC

Cypress Semiconductor announced its Wi-Fi and Bluetooth combo solution delivers robust wireless connectivity to the new Raspberry Pi 3 Model B+ Internet of Things single board computer. The Cypress CYW43455 single-chip combo provides high-performance 802.11ac Wi-Fi for faster Internet connections, advanced coexistence algorithms for simultaneous Bluetooth and Bluetooth Low Energy (BLE) operations such as audio and video streaming, and low-power BLE connections to smartphones, sensors and Bluetooth Mesh networks.

[News ID 6137](#)

■ QA Systems announce major new version of Cantata unit test tool

QA Systems announced the upcoming release of Cantata version 8.0. This is a major new release of the Cantata unit and integration testing framework for C and C++. This version automates test maintenance, custom code injection, and makes it easier to test across multiple embedded environments. A new Code Change Analysis feature has been added to cut test maintenance when C/C++ code is changed after initial testing. This identifies code changes which impact tests and gives detailed guidance on suitable test updates.

[News ID 6065](#)

■ HCC Embedded: MISRA-compliant embedded cryptography suite and manager

HCC Embedded has released its CryptoCore embedded-cryptography suite to ensure that IoT devices can be managed securely. All CryptoCore software libraries are managed through HCC's Embedded Encryption Manager (EEM), which provides a high-quality standard interface to any hardware or software cryptography implementation.

[News ID 6085](#)

■ Farnell: element14 now stocking Rohde & Schwarz RTC1000 and RTM3000 oscilloscopes

The Rohde & Schwarz RTC1000 oscilloscope is ideal for a broad range of users from embedded developers and service technicians to educators, who are looking for professional level functionality at a great price. State-of-the-art, high-performance technology, alongside an extremely silent design for better results, enables this multi-functional X-in-one product to meet even the demanding requirements of today's customers.

[News ID 6160](#)

■ Cadence: Sigrity PowerDC supports open neutral file format for thermal interoperability

Cadence Design Systems announced that Cadence Sigrity PowerDC technology supports Future Facilities' new open neutral file format, which solves the challenge of sharing design models between different thermal simulation toolsets. The PowerDC technology's adoption of the single, open-model file format streamlines the thermal supply chain, promotes interoperability and data exchange, and enables customers to improve their thermal and electrical designs while also accelerating their schedule.

[News ID 6147](#)

■ IAR Systems acquires Secure Thingz

IAR Systems has entered into a share sale and purchase agreement to acquire 100 percent of the shares in Secure Thingz, a provider of advanced security solutions for embedded systems in the Internet of Things. With the acquisition, IAR Systems secures its position as a frontrunner in offering solutions for security in embedded systems.

[News ID 6154](#)

■ Wind River to be acquired by TPG

Wind River announced that global alternative asset firm TPG will acquire the company from Intel. Wind River President, Jim Douglas, and his existing executive management team will lead the newly independent Wind River after the transaction closes. For nearly 40 years, Wind River has helped the world's technology leaders power generation after generation of the safest, most secure devices in the world. The company's software runs the computing systems of the most important modern infrastructure, including manufacturing plants, medical devices, aircraft, railway, automobiles, and communications networks.

[News ID 6168](#)

■ Phaedrus Systems: Tracealyzer 4 with new user interface and stunning live views

Perceptio has announced a major update of Tracealyzer, its tool for visual software tracing of RTOS-based embedded systems and IoT devices. Tracealyzer version 4 has been redesigned from the bottom up, spanning from much faster data processing to a fresh modern user interface with live visualization. It also sports a host of new features aimed at empowering embedded developers and enabling them to get their products to market faster with fewer bugs.

[News ID 6028](#)

■ Lynx: safe and secure hypervisor foundation for ETAS Autosar Adaptive Platform

Lynx Software Technologies and ETAS announced that, together with Robert Bosch GmbH, they are jointly working to provide the safe and secure hypervisor foundation for the ETAS RTA-VRTE platform software solution incorporating the AUTOSAR Adaptive Platform standard. RTA-VRTE supports the next generation of cross-domain and vehicle computer ECUs being introduced in upcoming vehicles.

[News ID 6078](#)

■ LDRA extends commitment to safety and security compliance

From its inception in 1975, LDRA has advocated across all industries for the international development, adoption and enforcement of rigorous software standards that ensure the safety and security of software-based electronics systems. LDRA has become a leader in standards compliance, automated software verification, software code analysis, and test tools, across all industries—automotive, avionics, rail, industrial safety, nuclear power, medical, and defense.

[News ID 6072](#)

■ Express Logic: X-Ware enables IoT on Microsemi's Mi-V RISC-V ISA

Express Logic's industrial-grade X-Ware IoT Platform—powered by ThreadX RTOS—provides turnkey support for Microsemi's Mi-V RISC-V instruction set architectures (ISAs). RISC-V, a standard, open ISA under the governance of the RISC-V Foundation, offers the open source community portability as well as the ability to test and improve cores more rapidly than they could using closed ISAs.

[News ID 6021](#)

■ Sensirion: air quality sensor for battery-driven applications

Sensirion now offers the ultra-lower power gas sensor SGPC3. The SGPC3 makes indoor air quality sensing available for mobile and battery-driven applications. With an average supply current of less than 0.07 mA the SGPC3 is able to provide indoor air quality measurements with several years of battery lifetime. Based on Sensirion's SGP multi-pixel platform the SGPC3 offers a complete gas sensor system integrated into a very small 2.45 x 2.45 x 0.9 mm³ DFN package featuring I2C interface and a fully calibrated and humidity-compensated air quality output signal.

[News ID 6170](#)

More information about each news is available on www.Embedded-Control-Europe.com/magazine
You just have to type in the "News ID". —

■ **Bridgetek: EVE graphics controllers with ASTC functionality**

Further extending its multi-award winning embedded video engine (EVE) product offering, Bridgetek has now introduced the BT815/6 series of highly advanced graphic controller ICs for next generation human machine interface development. Support for the Adaptive Scalable Texture Compression (ASTC) algorithm means that image quality can be significantly enhanced without needing greater bandwidth to be allocated as the compression algorithm allows for smaller compressed files.

[News ID 6079](#)

■ **PragmaDev: Studio V5.3 offers cyber physical system modeling capabilities with FMI support**

PragmaDev Studio is a recognized modeling tool to describe complex communicating systems. Cyber Physical Systems combine event driven and clock driven elements, critical parts and non critical parts. For that purpose PragmaDev Studio V5.3 introduces the support of Functional Mockup Interface FMI V2.0.

[News ID 5993](#)

■ **Maxim: uSLIC power modules revolutionize design for highly space-constrained applications**

Designers working on space-constrained applications can now dramatically reduce solution size and increase efficiency with the family of micro system-level IC (“uSLIC”) modules from Maxim Integrated Products. The MAXM17532 and MAXM15462 ultra-small (2.6 x 3.0 x 1.5mm), integrated DC-DC power modules are part of Maxim’s extensive portfolio of Himalaya power solutions that enable industrial, healthcare, communications, and consumer markets. With these modules, customers get the full benefits of industry-best switching regulators with the size and simplicity of a linear regulator.

[News ID 6155](#)

■ **Xilinx unveils adaptable computing product category**

Xilinx announced a new breakthrough product category called Adaptive Compute Acceleration Platform (ACAP) that goes far beyond the capabilities of an FPGA. An ACAP is a highly integrated multi-core heterogeneous compute platform that can be changed at

the hardware level to adapt to the needs of a wide range of applications and workloads. An ACAP’s adaptability, which can be done dynamically during operation, delivers levels of performance and performance per-watt that is unmatched by CPUs or GPUs.

[News ID 6143](#)

■ **Lattice: IP core support for iCE40 UltraPlus family**

Lattice Semiconductor released its new FPGA software, Lattice Radiant, targeted for the development of broad market low power embedded applications. With its rich feature set and ease-of-use, Lattice Radiant software’s support for iCE40 UltraPlus FPGAs greatly expands the device’s application across broad market segments including mobile, consumer, industrial, and automotive. iCE40 UltraPlus devices are the world’s smallest FPGAs with enhanced memory and DSPs to enable always on, distributed processing.

[News ID 6080](#)

■ **Renesas: MCU using advanced 28nm Embedded Flash technology**

Renesas announced the sample shipment of the industry’s first on-chip flash memory microcontroller using a 28 nm process technology. To contribute to the realization of next-generation green cars and autonomous vehicles with higher efficiency and higher reliability, the revolutionary RH850/E2x Series MCU incorporates up to six 400 MHz CPU cores, which makes it the first on-chip flash memory automotive MCU to achieve the industry’s highest processing performance of 9600 MIPS.

The new MCU series also features a built-in flash memory of up to 16 MB as well as enhanced security functions and functional safety. Targeting ASIL-D, the highest level of the ISO 26262 functional safety standard for automotive E/E systems, the RH850/E2x Series adopts the dual core lock step CPU structure that guarantees that the calculations performed by two CPU cores are identical. The RH850/E2x also provides up to four sets of CPU pairs, and features a variety of hardware functional safety improvements. In applications where a system malfunction could lead to life-endangering accidents, these features immediately detect faults should a malfunction occur and allow system safety

to be maintained. Renesas will provide safety analysis tools that can flexibly support a wide range of use cases to implement safe systems.

Under Renesas autonomy, an open, innovative and trusted platform for assisted and automated driving, Renesas provides end-to-end solutions that advance the evolution of vehicles towards next-generation green cars, connected cars, and autonomous-driving vehicles. The 28nm-generation automotive control MCU is a new breakthrough product featuring next-generation technology for achieving vehicle control, which, together with the R-Car Family of systems-on-chip designed for cloud connectivity and sensing, constitute the two main pillars of the Renesas autonomy Platform.

[News ID 6159](#)

■ **TI: 1-A DC/DC step-down power modules feature tiny MicroSiP packaging**

Texas Instruments two new 4-V to 36-V power modules that measure just 3.0 by 3.8 mm and require only two external components for operation. The 0.5-A LMZM23600 and 1-A LMZM23601 DC/DC step-down converters achieve up to 92 percent efficiency, which minimizes energy loss, and feature tiny MicroSiP packaging that shrinks board space by up to 58 percent. The converters expand TI’s power module portfolio to address up to 1-A performance-driven, space-constrained communication and industrial designs, including field transmitters, ultrasound scanners and network security cameras.

[News ID 6066](#)

■ **Apacer upgrades to new-generation DDR4-2666 memory modules**

The rapid confluence of artificial intelligence (AI) and the Internet of Things (IoT) have not only fueled an increasing demand for various smart application and smart devices and servers, but also increased performance demand in computing power and transfer speed. In response to the successive upgrade in Intel’s and AMD’s servers, desktop processors, and mobile processors platforms, as well as the increased support of adaptation of the DDR4-2666 specification, Apacer has outpaced its competitors in the mass production of DDR4-2666 memory modules for server and industry applications.

[News ID 6153](#)



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■ Sensirion: new evaluation kit for environmental sensors

Sensirion now offers its next evaluation kit generation – the SEK-Environmental Sensing. The SEK-Environmental Sensing allows engineers to evaluate sensors and develop innovative sensor applications even more quickly and easily. The kit combines plug-and-play hardware with an easy-to-use viewer software, the ControlCenter, enabling in-depth evaluation of all Sensirion environmental sensors. Each evaluation kit includes a Sensirion SensorBridge, all required connector cables, as well as various sensor samples.

[News ID 5990](#)

■ ROHM develops sensor IC for high-speed heart rate measurement

ROHM is offering an optical heart rate sensor for smart bands and watches, which, thanks to its high-speed 1024 Hz sampling, can be used for measuring blood pressure, stress and vascular age. The BH1792GLC is the second pulse wave sensor to be developed by ROHM. It is notable for its high detection accuracy and low power consumption of only 0.44mA during measurement. The 1024Hz sampling rate makes it possible to measure the heart rate up to 32 times faster than conventional solutions.

[News ID 6037](#)

■ Premier Farnell: new global franchise with Nordic Semiconductor

Premier Farnell announces the addition of Nordic Semiconductor to their extensive product offering, providing Farnell element14 customers with access to a market leading brand that provides a world class range of wireless devices.

[News ID 6181](#)

■ Würth and Infineon present wireless power development system 200-W-WPT

Under the name 760308EMP-WPT-200W, Würth Elektronik and Infineon are offering a 200-watt development system for wireless power transfer. What makes the development kit special is that the link between the transmitter and receiver coils can be used to transfer not only power but also data.

[News ID 6144](#)

■ HCC Embedded: MISRA-compliant EAP framework for secure IoT networks

HCC Embedded has released an embedded Extensible Authentication Protocol framework to support secure wireless connections for embedded devices. As part of this release, HCC provides support for many “flavors” of EAP, and the framework easily extends to include other protocols. Commonly used algorithms including EAPOL, EAP-TLS, EAP-IKEv2, and EAP-MD5 are available immediately.

[News ID 6058](#)

■ Microsemi: Libero SoC development software now certified to IEC 61508

Microsemi announced its Libero system-on-chip development software version 11.5 Service Pack (SP)2, offering a comprehensive suite of field programmable gate array (FPGA) design tools, has achieved functional safety certification from TÜV Rheinland according to the International Electrotechnical Commission (IEC) 61508-2, Annex F. With Microsemi now offering a Functional Safety Data Package, engineers designing products to conform to IEC 61508:2010 can utilize the company’s certified Libero tool chain to accelerate certification time.

[News ID 5989](#)

■ ADI: tiny µModule boost regulator for low voltage optical systems

Analog Devices announced the Power by Linear LTM4661, a low power step-up µModule regulator in a 6.25 x 6.25 x 2.42mm BGA package. Only a few capacitors and one resistor are required to complete the design, and the solution occupies less than 1cm² single-sided or 0.5cm² on double-sided PCBs. The LTM4661 incorporates a switching DC/DC controller, MOSFETs, inductors and supporting components. The LTM4661 operates from a 1.8V to 5.5V input supply, and continues to operate down to 0.7V after start-up.

[News ID 6180](#)

■ LDRA release tool suite for Mac OS

LDRA has responded to customer requests for high-quality development tools on the popular Mac platform with the release of the LDRA tool suite for Mac OS. The LDRA tool suite for Mac OS is a native Mac application environment offering the same capabilities as the LDRA tool suite on the Windows and Linux platforms. As a common practice, engineers developing on the Mac OS can leverage both Windows and Linux virtual environments, enabling them to choose their preferred environment for developing specific applications and to target diverse applications.

[News ID 6067](#)

■ Green Hills extends trusted instrument cluster solutions to Renesas’ R-Car D3 SoC

Green Hills Software announced its safe and secure INTEGRITY real-time operating system and supporting products/services portfolio for the R-Car D3 automotive SoC for graphical instrument clusters from Renesas Electronics. The highly integrated high-performance platform combines the trusted ASIL-certified INTEGRITY RTOS and development tools with the high-performance 64-bit R-Car D3 and its Open GL 3D graphics acceleration from the Power VR Series 8XE graphics processing unit from Imagination Technologies.

[News ID 6099](#)

■ ON Semi: image sensor platform enables new functionality for industrial camera design

ON Semiconductor has announced its X-Class image sensor platform, which allows a single camera design to support not only multiple product resolutions but also different pixel functionality. The first devices in the new platform are the 12megapixel XGS 12000 and 4k / UHD resolution XGS 8000 image sensors, which provide high-performance imaging capabilities for applications such as machine vision, intelligent transportation systems, and broadcast imaging.

[News ID 6129](#)

■ Infineon: OPTIGA Trust X provides robust protection for the IoT

The Internet of Things is changing the world as we know it – in industry and in the home. Smart industrial robots, refrigerators and washing machines already communicate with each other. Yet devices that are online can be attacked. That’s why Infineon Technologies is adding the OPTIGA Trust X to its OPTIGA Trust family.

[News ID 6000](#)

■ Maxim: small, low power 4-20mA sensor transmitter for industrial automation

Create small, low power, and highly accurate designs for industrial automation applications with the MAX12900 ultra-low power, highly integrated 4-20mA sensor transmitter from Maxim Integrated Products. Ideal applications include industrial automation and process control, loop-powered 4-20mA current transmitters, remote instrumentation, and smart sensors.

[News ID 5997](#)

■ service for industrial and trade sectors across Europe

Conrad Business Supplies offers European customers in industry, trade, computing, automotive, medical, cabinet construction and automation sectors an expanded cable and wire configuration service in cooperation with Koax24 and Litze24. The assembly service is fast, convenient and available to order via a secure, online configurator platform.

[News ID 6044](#)

■ MEN: cPCI Serial SBC with ARM Cortex A72 and virtualization functions

The G40A from MEN is an NXP ARM Cortex A72 LS1046A CPU module in CompactPCI Serial form-factor. Equipped with the quad-core CPU with NXP data processing accelerators, fast PCI Express 3.0, future-ready USB 3.0, SATA Gen. 3 interfaces, Ethernet interfaces on front and an integrated Ethernet switch, the G40A provides unprecedented power, speed, and communication advantages.

[News ID 6020](#)

■ **Conrad: custom cable configuration**
Infineon expands mobile-security portfolio

At the Mobile World Congress 2018, Infineon Technologies announced that it would be expanding its portfolio of mobile security solutions. The embedded Secure Element (eSE) product family now includes an entire system with Operating System, applications and NFC modem wrapped up in one. The Infineon solution demonstrates an accelerated transaction time, representing a significant breakthrough in mobile payment applications

[News ID 6056](#)

■ **ST: Sigfox software for STM32 MCUs**
boosts connectivity choices for IoT-device developers

STMicroelectronics has extended its STM32 software ecosystem with a Sigfox package that simplifies development and gives extra flexibility to connect Internet-of-Things devices to long-range, low-power wireless networks. The new X-CUBE-SFOX package is ready to use with ST's B-L072Z-LRWAN1 Discovery Kit, which is already LoRa enabled through I-CUBE-LRWAN embedded software.

[News ID 6049](#)

■ **TI: op amp and comparators reduce overall system footprint in IoT**

Texas Instruments introduced a small op amp and low-power comparators at 0.64 mm². As the first amplifiers in the compact X2SON package, the TLV9061 op amp and TLV7011 family of comparators enable engineers to reduce their system size and cost, while maintaining high performance in a variety of Internet of Things, personal electronics and industrial applications, including mobile phones, wearables, optical modules, motor drives, smart grid and battery-powered systems.

[News ID 5986](#)

■ **Abaco: 3U VPX solution to feature new Xilinx RF SoC technology**

Abaco Systems announced the VP430 Direct RF Processing System, the first 3U VPX COTS solution to feature the all new Xilinx ZU27DR RF system-on-chip (RFSoc) technology. It is also one of the densest analog FPGA DSP boards available, with eight ADC and DAC synchronized channels, and features the ability to synchronize multiple boards for even larger system applications. Abaco is taking orders now for the VP430.

[News ID 6169](#)

■ **AAEON: Eurotech to power IIoT gateways with ESF edge framework**

AAEON launch a partnership with Eurotech to integrate ESF (Everyware Software Framework) device and data management platform for its IIoT gateways. With the launch

of AAEON Europe's Industry 4.0 gateways embedding Eurotech's ESF, customers will now be able to fully leverage IoT Integrated services to simplify and scale their Industry 4.0 deployments.

[News ID 6031](#)

■ **Interface Concept ComEth4510a dual Planes L2/L3 Ethernet Switch, selected by Thales for a radar application**

Interface Concept announced that the ComEth4510a, a 6U OpenVPX Gigabit & 10/40 Gigabit L3+ Ethernet switch and IP Router, has been successfully integrated by Thales in radar applications. The ComEth4510a Ethernet switch provides a wide selection of 10/40 GbE interfaces together with high-speed switching capability (up to 664Gb/s) that significantly increase networking performances, required in defense and industrial application systems.

[News ID 6106](#)

■ **ADLINK supports SGeT's UIC with XRCE middleware for device-fog-cloud computing**

ADLINK Technology announced its support for the Standardization Group for Embedded Technologies' (SGeT) specification for a Universal Internet-of-Things Connector (UIC). In addition, ADLINK also announced advanced embedded middleware support that complements the UIC, with a 'plug-in' for XRCE real-time data distribution.

[News ID 6026](#)

■ **Portwell supports UIC standard**

Portwell announces broad support for the Universal IoT Connector (UIC), introduced by SGET. The SGET-defined software interface serves as a universal docking point for cloud services to embedded hardware. Portwell is one of the initiators of the SGET standardization group, which accelerated the definition of the standard. In order to guarantee rapid market penetration, Portwell supports the launch of the UIC with its comprehensive portfolio of modules, boards and systems.

[News ID 6089](#)

■ **Rigol introduces RSA5000 family of real-time spectrum analyzers**

RIGOL Technologies introduces the new RSA5000 real-time spectrum analyzers to complement the DSA800-TG family of low-cost spectrum analyzers. The devices are based on the new Rigol-developed Ultra-Real technology as a complete platform, which also allows to perform real-time measurements. The RSA5000 series features a compact, elegant design, touch-screen operation and a wide range of applications, and can also be used as a scalar network analyzer thanks to the additional 3.2 / 6.5 GHz tracking generator.

[News ID 6123](#)

■ **Kontron: new DIN Rail industrial computer series KBox A-15x**

Kontron extends its KBox portfolio by a family of DIN Rail industrial computers with high-performance Intel processors. The new KBox A-15x family is available with various performance class CPUs, depending on control task complexity and the performance required. The cost-optimized Box PCs are designed particularly compact for flexible deployment on DIN Rail. Its broad range of interfaces allows high interoperability, scalability as well as providing future security.

[News ID 6036](#)

■ **b-plus: visualization framework with various configuration options**

The realization of autonomous vehicles requires - from the concept phase to series production development - reliable time-synchronous recording as well as the associated visualization of a very large flood of data in the vehicle, which is constantly increasing due to ever improving sensors. The handling of these high data rates proves to be very complex and requires new development tools that are optimized for very high data volumes, perfectly coordinated with each other and can safely meet future challenges.

[News ID 6103](#)

■ **Express Logic to obtain Common Criteria EAL4+ Security Certification for X-Ware IoT Platform SC**

Express Logic has partnered with Brightsight, the world's leading security lab, to perform the deeply embedded industry's first EAL4+ security certification for cloud connectivity. The Norwegian National Security Authority (SERTIT) is the certification authority for this effort. Express Logic's new EAL4+ security certification effort represents another significant step forward by focusing squarely on IoT security needs of the embedded industry, making what is already the most safe IoT platform also the most secure.

[News ID 6064](#)

■ **ESCRYPT: smart control loop for detecting and blocking attacks makes vehicles immune**

These days, the trend is towards connected, partially, and highly automated driving functions - calling for comprehensive security solutions. Traditional defenses that protect single functions are no longer sufficient in the face of these developments. After all, the vehicles affected will be on the roads for many years to come - and therefore have to withstand many generations of hacker attacks. The answer to the problem is automotive security solutions that combine attack detection and blocking functions in a self-teaching control loop.

[News ID 6114](#)

■ SEGGER introduces new compression software

SEGGER announces emCompress-ToGo, a new member of the emCompress compression software family. Now with 3 products, SEGGER believes it has the optimum compression solution for any application. The latest software is based around SEGGER's new compression algorithm SMASH, which has been specifically developed for use in embedded systems with almost no RAM.

[News ID 6090](#)

■ IAR Systems joins RISC-V Foundation

IAR Systems has joined the RISC-V Foundation, a non-profit corporation controlled by its members to drive the adoption and implementation of the open, free RISC-V instruction set architecture (ISA) forward, and will contribute to the evolution of the RISC-V ecosystem. The company has seen an increasing demand from its customers to provide tools for the RISC-V ISA and is responding to that need by committing to bring support for RISC-V in the professional, leading development toolchain IAR Embedded Workbench.

[News ID 6083](#)

■ Infineon releases iMOTION motor control IC series

Infineon Technologies is releasing the IMC100 series, a new family of iMOTION motor control ICs. It provides a ready-to-use solution for the fast growing market of high efficiency variable speed drives. By integrating both, the required hardware and control algorithm, the IMC100 enables the shortest time to market for any motor system at the lowest system and development cost.

[News ID 6048](#)

■ Cypress: unified software suite to accelerate IoT product designs

Cypress announced a unified software tool suite that streamlines product designs for the Internet of Things. The new ModusTool-

box suite delivers the rich design resources of Cypress' WICED IoT connectivity libraries and the analog and digital peripherals libraries of its PSoC microcontrollers within the familiar, widely-deployed open-source Eclipse Integrated Design Environments. The software enables IoT developers to design in the connectivity, processing, sensing and security functionality they need, leveraging the superb performance of Cypress' Wi-Fi, Bluetooth and combo solutions, as well as its low-power, flexible and secure PSoC MCUs. Developers can personalize their user experience in the software to meet the unique requirements of their specific development with plug-ins, libraries and solutions from Cypress partners, as well as from the open source community.

[News ID 6075](#)

■ Lynx accelerates secure ADAS development with LynxSecure port

Lynx Software Technologies is accelerating the development of secure ADAS vision and machine learning solutions in automotive, transportation and industrial applications. It announced, that LynxSecure 6.0, the latest version of its Separation Kernel Hypervisor has been ported to the NXP S32V, one of the industry's most popular platforms for autonomous machine vision applications.

[News ID 6071](#)

■ Ikalogic wants to lead the way in T&M ergonomics

Three years ago, Ikalogic undertook an exciting change in company strategy, focusing mainly on the ergonomics of test & measurement instruments and setting a clear goal: Lead the way and set new standards to T&M ergonomics. "How comes an oscilloscope's interface almost didn't change in 5 decades?" is the question that kept pushing Ikalogic team to bring better UX (user experience) to this industry.

[News ID 6109](#)

■ MicroEJ and Software Imaging announce strategic partnership in Asia

MICROEJ announced its strategic partnership with Software Imaging to accelerate the development of Asian markets (Japan, Korea and Taiwan). In late 2016, MicroEJ opened their US Headquarters office in Boston, MA (USA), and now is expanding to the Asian market. MicroEJ and Software Imaging announced their partnership to promote MicroEJ offer and to increase business activities in Japan, Korea and Taiwan.

[News ID 6182](#)

■ TI: connecting building, factory and grid via Thread, Zigbee, Bluetooth 5 and Sub-1 GHz

To meet growing connectivity needs for buildings, factories and the grid, Texas Instruments introduced its newest SimpleLink wireless and wired microcontrollers. These new devices offer industry-leading low power consumption and concurrent multi-standard and multi-band connectivity for Thread, Zigbee, Bluetooth 5 and Sub-1 GHz. With more memory and unlimited connectivity options, the expanded SimpleLink MCU platform offers designers 100 percent code reuse across TI's Arm Cortex-M4-based MCUs to enhance and connect sensor networks to the cloud.

[News ID 6105](#)

■ Rohde & Schwarz: test solutions for Broadcom 802.11ax Wi-Fi devices

Rohde & Schwarz announced the availability of test solutions for the Broadcom Max Wi-Fi chipset portfolio, the industry's first complete ecosystem of 802.11ax Wi-Fi devices. In collaboration with Broadcom Limited, Rohde & Schwarz has successfully verified its R&S CMW test platform for the IEEE 802.11ax ecosystem, enabling wireless OEMs and ODMs to use Broadcom Max Wi-Fi chipsets for R&D, quality control, and production prototyping.

[News ID 6023](#)



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■ **ROHM: DC/DC converter works up to ten years on a single coin battery**

ROHM's BD70522GUL is an ultra-low-power DC/DC converter with integrated MOSFETs, which meets the requirements of the IoT market for a long battery life of up to ten years with a single coin battery due to its low power consumption of only 180nA. In recent years, the number of battery-powered devices such as smartphones and wearables for IoT has risen sharply. This increases the demand for smaller components that not only offer greater design flexibility and more space for integrating new features, but also extend battery life by reducing power consumption.

[News ID 6113](#)

■ **IAR Systems and Data I/O collaborate on modern workflows**

IAR Systems and Data I/O will be collaborating to deliver an integrated, modern workflow that will help developers and manufacturing professionals to make the transition of microcontroller firmware from development to manufacturing more efficient and improve quality for embedded designs. Up to now, the two companies have been part of separate stages of their customers' respective design and manufacturing processes.

[News ID 6035](#)

■ **TI: robust, noise-immune capacitive-sensing MCUs with CapTIvate technology**

Bringing capacitive-sensing capabilities to cost-sensitive applications, Texas Instruments announced an expansion of its MSP430 microcontroller family with CapTIvate technology. Developers can use the new MSP430FR2512 and MSP430FR2522 MCUs with integrated capacitive touch to add as many as 16 buttons as well as proximity sensing capability to industrial systems, home automation systems, appliances, power tools, home entertainment, personal audio applications and more.

[News ID 6093](#)

■ **congatec accelerates real-time hypervisor adoption for the embedded market**

congatec has acquired Real-Time Systems (RTS), a leading provider of hypervisor software for real-time applications in the embedded market. RTS will become a wholly owned subsidiary of congatec. The company will continue to operate independently, doing business as it always has, providing its software to run on any x86 hardware, but now with worldwide sales and technical support teams ready to support the product. Real-Time Systems' customers are OEMs from markets such as robotics, automation, mechanical engineering, medical technology or test and measurement systems.

[News ID 6092](#)

■ **Rohde & Schwarz: moveable over-the-air test chamber for 5G antennas and transceivers**

The new R&S ATS1000 antenna test chamber from Rohde & Schwarz allows developers and production engineers to perform over-the-air (OTA) measurements for 5G on their antenna modules, transceivers, chipsets and wireless devices. Antenna and transceiver measurements are possible in the frequency range from 18 GHz to 87 GHz. The system therefore supports all millimeter-wave frequency bands currently considered for 5G. The compact test chamber makes it possible to measure mobile devices in the far field.

[News ID 6017](#)

■ **LieberLieber Software: HIMA meets tough standards with LemonTree**

HIMA has used of Enterprise Architect since 2012. It was during a training course that HIMA became aware of LemonTree and recognized the great potential it holds for the versioning of EA models. Before long, a joint effort had been mounted to develop specific enhancements to LemonTree in order to satisfy HIMA's stringent requirements on "smart safety".

[News ID 6156](#)

■ **Luxoft: LuxTrace accelerates trace timing analysis by 10x in the automotive sector**

Luxoft has launched LuxTrace, a new and improved web-based version of TraceAnalyzer 4.0, a timing analysis tool for visualizing system timing in terms of the constituent ECUs, controllers, processors, buses and networks, which processes large traces up to ten times faster than the previous version.

[News ID 6157](#)

■ **Keysight receives certification for eCall test emulator software**

Keysight Technologies announced that the Keysight E6951A public safety answering point (PSAP) emulator has been certified by NavCert. The E6951A is part of Keysight's E6950A eCall Conformance Test Solution. The certification was awarded Dec.18, 2017.

[News ID 6006](#)

■ **AAEON to continue support of AMD Geode boards through 2021**

AAEON is working with AMD to ensure that the CPU manufacturer's popular Geode product line remains in service for many years to come. AAEON produces motherboards in a range of form factors that run on the LX800 processor. These boards take advantage of the processor's design features to deliver high-speed, low-power computing with excellent graphics capabilities, and they're ideal for rugged, thin devices and industrial automation applications.

[News ID 6074](#)



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■ **Socionext and Varjo collaborate on human-eye resolution VR/XR headset**

Socionext and Varjo announced the company's ongoing co-operation around Varjo's next-generation VR/XR solutions. Varjo's upcoming next-gen VR/XR headset is based on a combination of the company's patented human-eye resolution technology with Socionext's Milbeaut image signal processing solutions.

[News ID 6100](#)

■ **Silicon Labs: PoE ICs target IP cameras, wireless access points, IP phones and smart lighting**

Silicon Labs has released two new Power over Ethernet (PoE) Powered Device families delivering best-in-class integration and efficiency for a wide range of Internet of Things applications. Silicon Labs' Si3406x and Si3404 families include all necessary high-voltage discrete components on a single PD chip.

[News ID 6120](#)

■ **IAR Systems streamlines security development with new product offering**

IAR Systems announces a new product offering targeted for embedded security. The new offering will simplify the development of secure products and enable extended workflows with integrated security configuration. This enables companies to streamline the creation of secure products and incorporate security throughout the development and manufacturing process.

[News ID 6041](#)

■ **ST: LDO voltage regulator packs big performance in tiny footprint**

STMicroelectronics' STLQ020 low-drop-out voltage regulator relieves the familiar trade-offs between quiescent current, output power, dynamic response, and package size, to give designers extra freedom. By combining small size with high performance and energy efficiency, the STLQ020 is ideal for use in battery-powered consumer products like smartphones and tablets, smart watches, audio or media devices, and wearables.

[News ID 6173](#)

■ **Microsemi: third-party IP offerings for PolarFire FPGAs at embedded world**

Microsemi has expanded the third-party intellectual property offerings for its cost-optimized, low power, mid-range PolarFire FPGAs. With new support of artificial intelligence (AI)/machine learning IP and HDMI 2.0b interfaces, the company's PolarFire device can now be used in industrial artificial intelligence applications which leverage the rich resources in the FPGA, particularly the large quantities of digital signal processor math blocks and embedded RAMs.

[News ID 6029](#)

■ **Infineon acquires Merus Audio**

Infineon Technologies announces the acquisition of Merus Audio. The Copenhagen-based start-up creates energy-efficient integrated audio amplifier solutions. They maximize audio performance and battery playback time for smart home and battery-powered speakers while minimizing heat and design space. After the integration of Merus Audio, Infineon will be able to offer its customers a comprehensive and leading-edge Class-D Audio amplifier portfolio addressing the most demanding applications.

[News ID 6024](#)

■ **u-blox: F9 high precision positioning technology for industrial and automotive**

u-blox has announced the u-blox F9 technology platform, delivering high precision positioning solutions for mass market industrial and automotive applications. The platform combines multi-band Global Navigation Satellite System (GNSS) technology with dead reckoning, high precision algorithms, and compatibility with a variety of GNSS correction data services to achieve precision down to the centimeter level.

[News ID 6043](#)

■ **MEN: rugged COM Express module with AMD V1000**

The CB71C is an ultra-rugged COM Express module for rail, public transportation and industry applications, e.g. data acquisition, infotainment, transcoding and live 3D. It is 100% compatible with COM Express Type 6 Pin-Out and conforms to the VITA 59 standard, which specifies robust mechanics to ensure reliable operation even under the harshest environmental conditions.

[News ID 6088](#)

■ **Kontron: new embedded server ZINC CUBE C232 at embedded world 2018**

Kontron introduces its Embedded Server Kontron ZINC CUBE C232 at embedded world 2018. The compact, cost-optimized design, expanded storage functionality, as well as the modular concept render it particularly scalable. It is tailored for complex computing tasks requiring the processing and analyzing of huge amounts of data, such as machine learning or artificial intelligence.

[News ID 6091](#)

■ **VadaTech announces new Compact MTCA.4 chassis**

VadaTech announces the VT817 and VT819 chassis. The VT817 is a convenient low-cost MicroTCA.4 PCIe Gen3 Expansion solution, providing a flexible and effective method of incorporating MTCA.4 acquisition and control hardware into a PC processing environment. The shelf offers two AMC slots and an integrated MCH.

[News ID 6148](#)

■ **b-plus: HiL-reinjection of sensor raw data**

In order to optimize algorithms as early as possible in the development and validation cycle, developers use hardware-in-the-loop (HiL) systems for radar, camera and fusion platforms. Some of these, such as monitor HiL systems, are no longer sufficient for today's replay of multi-gigabit sensors. b-plus is now launching the first compact HiL-system that can already be used at the developer's desk. This enables the developer to deliver the best possible software status at an early stage and thus minimizes errors occurring in the later development chain.

[News ID 6098](#)

■ **Maxim: low-power MCUs extend battery life for wearables and other compact devices**

Designers of IoT sensors, environmental sensors, smartwatches, medical/preventive health wearables, and other size-constrained devices can now increase battery life and functionality using the ultra-low power MAX32660 and MAX32652 microcontrollers from Maxim Integrated Products.

[News ID 6172](#)

■ **deliver low quiescent current**

System designers looking to create small and highly efficient 40V load dump-tolerant applications can now utilize the ultra-compact, pin-compatible MAX20075 and MAX20076 step-down converters from Maxim Integrated Products. The MAX20075 and MAX20076 step-down converters offer the industry's lowest quiescent current and comes in an ultra-small size solution with integrated compensation.

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■ **ST: STM32 software package brings Amazon Alexa technology to simple connected objects**

The X-CUBE-AVS software package from STMicroelectronics enables Amazon's Alexa Voice Service (AVS) to run on STM32 microcontrollers, allowing simple connected objects such as smart appliances, home-automation devices, and office products to support advanced conversational user interfaces with Cloud-based intelligence like automatic speech recognition and natural-language understanding.

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■ **Renesas completes RZ/N1 solution kit lineup**

Renesas Electronics announced its latest solution kit based on the RZ/N1L Group of microprocessors. In addition to the RZ/N1D Group for high-end processors for master devices including Programmable Logic Controller and the RZ/N1S Group for mid-range devices including Human Machine Interface, the RZ/N Series includes the RZ/N1L Group is optimized for slave devices including remote IO and communication modules, and networked drives. Solution kits for RZ/N1D and RZ/N1S are already available.

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■ **ON Semi: new set of low power, fully compliant USB-C 1.3 devices**

ON Semiconductor has announced the latest set of USB-C (Type-C) devices that are fully compliant with the latest revision 1.3 specification, enabling easy integration into USB-C systems. The new devices include two controllers and a switch, all of which are aimed at applications such as smartphones, tablets, and laptops, as well as industrial and automotive use cases.

[News ID 6033](#)

■ **MACOM expands 5G optical connectivity portfolio with 28Gbps TIAs**

MACOM announced the sampling and pre-production of the new 28Gbps transimpedance amplifiers (TIA), including the MATA-03003 and MATA-03006 devices. This high-performance TIA solution supports data rates from 8.5 Gbps to 28 Gbps for 25G CPRI, 25G Ethernet and 32G Fibre Channel applications while featuring low power, high sensitivity/overload, reduced die size and flexibility in optical sub-assembly (OSA) for SFP28 optical modules.

[News ID 6142](#)

■ **Cypress: support for Platform Security Architecture Trusted Firmware-M from Arm**

Cypress Semiconductor announced availability of the Platform Security Architecture Trusted Firmware-M reference example from Arm for its PSoC 6 microcontrollers, enabling a solution that adheres to the highest level of protection as defined by PSA. By leveraging PSA's holistic set of threat models, security analyses, hardware and firmware architecture specifications, and Trusted Firmware-M reference implementation, Internet of Things designers can quickly and easily implement secure designs with PSoC 6 MCUs.

[News ID 6057](#)

■ **Renesas: chip-to-cloud IoT connectivity with new Enterprise Cloud Toolbox**

Renesas Electronics announced the new Renesas Synergy Enterprise Cloud Toolbox v1.1 -- a software Application Project that together with the Synergy AE-CLOUD1 kit provides a reference design and starting point for users to connect in 10 minutes or less to enterprise clouds such as Microsoft Azure, Amazon Web Services, and Google Cloud Platform.

[News ID 6096](#)

■ **Silicon Labs: Wi-Fi devices for the IoT slash power consumption in half**

Silicon Labs has introduced a new Wi-Fi portfolio to simplify the design of power-sensitive, battery-operated Wi-Fi products including IP security cameras, point-of-sale terminals and consumer health care devices. Optimized for exceptional energy efficiency, the WF200 transceivers and WFM200 modules support 2.4 GHz 802.11 b/g/n Wi-Fi while delivering the high performance and reliable connectivity necessary as the number of connected devices increases in home and commercial networks.

[News ID 6084](#)

■ **Toshiba: photocoupler with UVLO for digitally controlled switching power supplies and IPM drives**

Toshiba Electronics Europe launched a new high-speed IC-Photocoupler for MOSFET gate signal insulation. The TLP2735 is Toshiba's first photocoupler to incorporate an under-voltage lockout (UVLO) function with hysteresis. UVLO reduces the photocouplers susceptibility to noise that is often generated in power supply cables, and can prevent malfunctions at switch on. With an isolation voltage of min.

[News ID 6145](#)

■ **iC-Haus: high-resolution absolute encoder iCs for nonius interpolation**

A minimal sensor area of only 1.9 x 3.3 mm is sufficient for the optical sensors in the iC-PNH series to scan encoder code discs and generate sine signals in top hi-fi quality. Evaluation is executed by interpolation ICs using a Nonius calculation, e.g. iC-MN and iC-MNF, permitting a very high angle resolution of more than 21 bits, even with code disc diameters of only 26 mm.

[News ID 6135](#)

■ **ROHM receives certification under ISO26262**

ROHM has received certification for the development process under the ISO 26262 functional safety standard for automotive products by third-party certification authority TÜV Rheinland in Germany. This certification allows ROHM to develop automotive-grade devices that achieve the highest level of safety (ASIL-D). ISO 26262 was formulated in 2011 as an international standard for functional safety in response to the rising demand for safety performance along with the increasing automation and functionality required in the worldwide automotive market.

[News ID 6161](#)

■ **Allegro MicroSystems: automotive sinusoidal sensorless BLDC fan driver IC**

Allegro MicroSystems Europe has announced a new sensorless BLDC controller. The A5932 three-phase BLDC motor controller solution is targeted at high-power automotive fan applications with very low vibration and audible noise requirements. MOSFET gate driver outputs permit motor currents that can be scaled to fit the applications requirements.

[News ID 6130](#)

■ **Maxim: small step-down converters Rohde & Schwarz: WLAN signaling tester to emulate all IEEE 802.11a/b/g/n/ac standards**

Before now, the RF properties of WLAN stations (STA) were mainly tested in an artificial remote control operation, the non-signaling mode. For IEEE 802.11ax, this is only possible to a certain extent. IEEE 802.11ax uses OFDMA technology to significantly increase the efficiency of WLAN networks. The available bandwidth is shared between multiple STAs that simultaneously transmit to the access point.

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