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Go wireless with Bluetooth control



Jeremy Cook, Engineering Consultant

If you've been experimenting with development boards like the Arduino Uno, turning on a light automatically can be useful, and there is a wide variety of other things you can do with these versatile devices. On the other hand, controlling them wirelessly may seem like a challenge. After all, you have to figure out how [...]

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Future industrial requirements being met by redefined mid-range FPGAs



Ted Marena, Microsemi Corp.

A sea change is underway in the industrial equipment and manufacturing sector. The renewed call for more jobs and several new mandates for minimum wage hikes are forcing vendors who build automation equipment to respond to a new reality and difficult technology hurdles. They must turn to suppliers that can help them create more efficient, smarter automation solutions that meet a variety of challenging requirements. Among the key new answers to these challenges is?

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	Requirements	Technology Impa
ands	Lower operating expenses	Lower cost, lower
	Smaller form factors	Optimized archite
	Portability	Lower power, sm
in demands	Cloud connectivity	Secure data comm
	M2M communication	Increased sensors communications
	Increased automation	Flexibility to supp protocols, edge p

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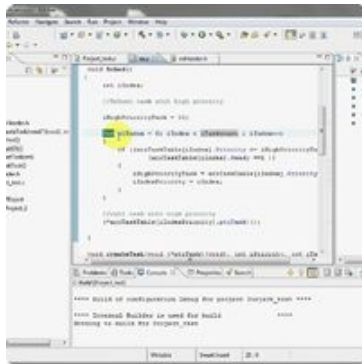
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RTOS source code, anyone?



Colin Walls Mentor Graphics Embedded Systems Division

When did you last purchase a software product in the form of source code? I am guessing that the answer may be either never or a long time ago. Of course, open source products are available in source code, but the average user never sets eyes on it. With software intellectual property (IP) ? libraries, [...]

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Mobility tech ?growing pains?



Shawn Andreassi, SAE International

This article is the third of a six-article series from SAE International providing a practical look into the feasibility of connected vehicles and autonomous driving.

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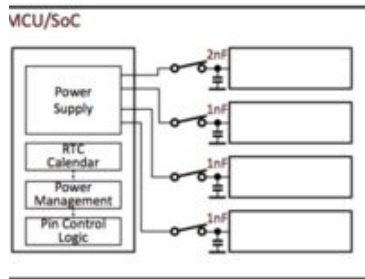
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[Figure 2] Basic power gating

Energy consumption in modern microcontroller systems



Horst Diewald, ProJoule GmbH

Is there a strategy that can be applied to both IP-based and standard semiconductor products that will allow device users to control energy consumption in a manner that is simple and reliable, that will give the user full visibility into operation, and that can maintain safe and secure conditions? Improved results can come with an increased degree of control of operating modes.

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How vulnerable is your code?



Jay Thomas, LDRA Technology

When writing code, most people understand what they are doing ? at least at the time ? but how clear will it be later, and how understandable is it to others? Is it overly complex? Does it follow prescribed coding standards? Are there subtle errors that could make it vulnerable to hacking? You don't know unless you check, and that means static analysis.

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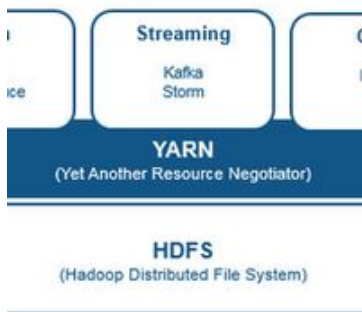
Intel's Mobileye deal marks an inflection point in automotive electronics



Majeed Ahmed, Automotive Contributor

In summer 2016, when BMW, Intel, and Mobileye joined hands to bring fully autonomous cars to roads by 2021, the collaboration raised a few questions. For instance, what is Intel doing in this alliance without an automotive chip? And why would Mobileye share its renowned machine-vision algorithm with a chipmaker?

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Big data for engineers and scientists, part 3: IT, enterprise applications, and big data



Dave Oswill, MathWorks

Many organizations have realized the value in data that is collected from their products, services, and operations. They have created new executive positions, such as Chief Information Officer (CIO), whose main focus is on the proper use and protection of [...]

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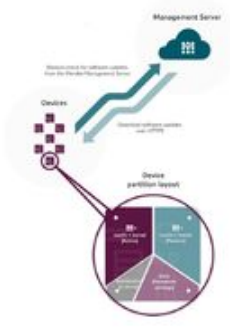
Self-healing mesh networks on the 8-bit Industrial Internet



Brandon Lewis, Technology Editor

One of the most interesting stories in the embedded processing market over the past decade has been not just the survival, but in many ways the triumph, of 8-bit microcontrollers (MCUs). Indeed, market projections from iSuppli (now part of IHS) have shown that not only is the 8-bit MCU market slated to grow through this year, but it will nearly kept pace with the 32-bit market and do so in spite of tapering 16-bit?

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Embedded developers need an open source over-the-air software updater without the lock-in



Ralph Nguyen, Mender

The topic of OTA software updates for embedded devices is gaining attention as embedded systems are increasingly being connected. Highly publicized breaches continue to demonstrate the lack of security in the design of embedded systems. The software update process itself is intricate with many security considerations and it plays an urgent role in the security [...]

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ing the memory in non-updatable portions



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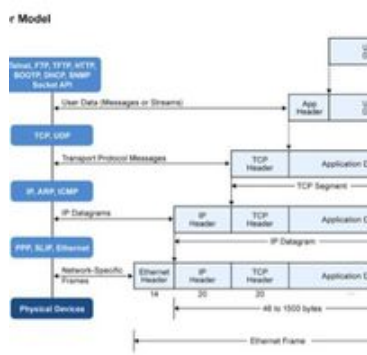
Flexibility to update firmware, a key to IoT devices



Hardik Patel, Microchip

Internet of Things (IoT) devices are being introduced into the market at a rapid pace ? from home appliances to medical devices to cars ? as manufacturers must stay ahead of their competitors with new innovations and the flexibility to adopt or integrate new technologies. Designers must build flexibility into their products to meet the evolving IoT ecosystem as new functionalities and regulations are adopted. Firmware updates not only allow customization during initial deployment?

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Which IoT protocol should I use for my system?



Christian Legare, Micrium

Embedded systems using sensors and connectivity are not new to developers. However, using these elements with multiple additional Internet technologies is. Internet protocols (IPs) are not new, but dedicated IPs for the Internet of Things (IoT) are, and they are used to help shape system capabilities. There are multiple IP application layer protocols above TCP/IP sockets. Each one has its advantages and constraints. Knowing them helps developers make the best design choices for a?

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A galactic collision in the IoT universe



Semir Haddad, Director of Product Marketing, Renesas Electronics America

According to the latest cosmological models, our galaxy, the Milky Way, is bound to collide in four billion years with the Andromeda galaxy, creating a super galaxy named Milkomeda. This long-predicted event will surely not happen without much chaos and disruption for the billion solar systems that inhabit the two galaxies. For those cognizant of [...]

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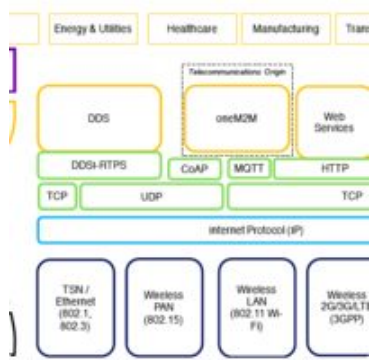
Virtualizing legacy control systems for an efficient, scalable, low-cost IIoT



Brandon Lewis, Technology Editor

The irony of the Industrial Internet of Things (IIoT) is that it requires architectures that enable quick, in some cases real-time iteration and change from markets that often rely on industrial control systems (ICSs) that aren't modified, upgraded, or replaced for years; in some cases, decades.

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IIC Connectivity Framework defines IIoT network architecture for scalable interoperability



Brandon Lewis, Technology Editor

Without question, the biggest obstacle facing widespread adoption of the Industrial Internet of Things (IIoT) is interoperability. From a high level, one impediment is the very loose classification of "industrial," which spans a wide range of vertical markets, including energy and utilities, manufacturing, transportation, and healthcare, to name a few. At a more granular level, many of these industrial sub-segments have evolved domain-specific connectivity transports and service standards, which help optimize networks for the?

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Understanding IoT requirements 101, part 1



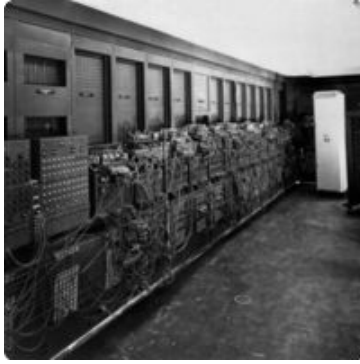
Jaya Kathuria, Cypress and



Anbarasu Samiappan, Cypress

To play in the Internet of Things (IoT) market, original equipment manufacturers (OEMs) need to be able to embrace a faster rate of innovation. The possible spectrum of IoT applications is endless, and successful companies enable their developers to continuously identify and implement new and more useful ways to harness the capabilities of sensors, monitor different types of data, and control ecosystems of devices.

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Make your device unattractive to hackers: Design in security early on



Kristopher Ardis, Maxim Integrated

Stuxnet. Black Hat insulin pump hack. Jeeps driving off the side of the road. Mirai botnet malware. It used to be difficult to argue that embedded devices need security, and even more difficult to convince designers to factor it into their designs. After these attacks, the argument hardly needs to be made: connected, embedded devices need security.

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Embedded Insiders Podcast: Analog and Smart Alix



Brandon Lewis, Technology Editor,



Rich Nass, Embedded Computing Brand Director, *and*



Alix Paultre, Contributing Editor

The Embedded Insiders welcome in the newest member of the Embedded Computing Design editorial team, Alix Paultre. Alex will be covering analog and power topics from his home base outside of Frankfurt, Germany, and in this episode he discusses highlights from the recent Applied Power Electronics Conference (APEC), including Gallium Nitride (GaN), silicon carbide, packaging, and digitally enhanced analog.

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Safety-critical software development surprisingly short on standards, analysis, and review



Brandon Lewis, Technology Editor

Recent survey data indicates that static code analysis, peer review, and basic coding standards are being neglected in the development of safety-critical connected embedded devices. In our monthly safety and security interview with Andrew Girson, Co-Founder and CEO of embedded consulting firm Barr Group, he picks apart the recent findings.

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SISTER PUBLICATION ARTICLE

Departing from proprietary Ethernet and exploiting Industrial IoT value with Time-Sensitive Networking



Todd Walter, National Instruments *and*



Tom Weingartner, Analog Devices

Industrial networks have long been plagued by interoperability issues stemming from a mix of proprietary communications technologies, even within single families of standards such as Ethernet. If not rectified, this incompatibility will slow the adoption of Industrial Internet of Things (IIoT) rollouts that must be able to communicate across layers of network infrastructure to be effective.

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