EIU
ELECTRONICS INFORMATION UPDATE
A Mouser Magazine
EUROPE | OCTOBER 2026

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ELECTRONICS ON SHOW

See Us at electronica 2026
Booth C3.578, Messe Muenchen, Munich, 10th - 13th Nov

FEATURES

Keeping data centres cool
Vector control for BLDC motors using advanced MCUs
Unified wireless platform delivers range, noise & power benefits with massive scalability
Digital tools simplify connector specification
New skills behind smart sensor innovation

PLUS

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- Navitas to acquire Claros
- Open-standard display connectivity for SDVs
- Winbond gets Infineon's NOR flash and F-RAM businesses
- Automating sustainable aviation fuel production

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Tech Ideas
Dev Kit pick
NPI

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Is it really two years since we were last off to Munich for Electronica? It can't be – yet it is and we are excited as ever to see all the new tech and meet friends old and new.

By way of a celebration, we present five articles covering topics you will likely see during your visit: Keeping data centres cool; Vector control for BLDC motors using advanced MCUs; Unified wireless platform delivers range, noise & power benefits with massive scalability; Digital tools simplify connector specification; New skills behind smart sensor innovation. Stuart Cording puts on his comfy shoes as he prepares for his visit to Electronica while David 'Connector Geek' Pike argues the case for defining requirements before you spec a connector..or nuclear vessel! Tech Ideas keeps it real by explaining how desktop PCB fabrication accelerates hardware development. Plus Mark Patrick's Dev Kit Pick, the news round-up, and, of course, a review of the most innovative products now in stock at Mouser. Now, have you booked your tickets to Germany and your hotel in Munich? If so, then read on! Cheers! Nick Foot, Editor, Mouser's EIU.

EIU – Electronics Information Update

Publisher: Mouser Electronics Inc., Georg-Brauchle-Ring 53, 80992 Munich, Germany, represented by Mark Patrick, Director Technical Content EMEA, eu.mouser.com

EIU Editorial Management and Production: Nick Foot, BWW Communications, 1 Bailbrook Lane, Bath, BA1 7AH, United Kingdom, nick.foot@bwwcomms.com, bwwcomms.com

Sales & Marketing: Claudia Bertaccini, Director Marketing Communications EMEA, claudia.bertaccini@mouser.com

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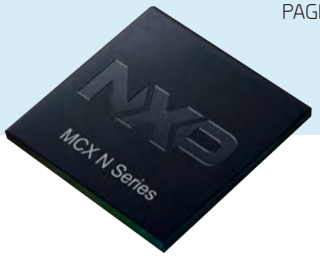

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Vector Control for BLDC Motors Using Advanced MCUs

Smaller-scale applications can now use this advanced motor-control tech

By Bill Schweber, contributing writer for Mouser

The ubiquitous use of DC motors is a testament to ongoing technological advances and developments in specialties such as magnetics, materials science, processors, software, and power semiconductors.

These motors are embedded in countless household products, from power tools to automobiles. In fact, the average car—whether ICE, hybrid, or electric—contains dozens of DC motors, not including the traction motors in hybrids and electric vehicles (EVs).

Figure 1. Small and medium motors surround us and are embedded in our daily lives. (Source: anantachat/stock.adobe.com)

DC motors come in three basic types: brushed, brushless (BLDC), and stepper. Brushed motors, powered directly from a DC rail, have been used since the late 1800s, and remain popular for their low cost and unique performance characteristics. BLDC motors offer higher efficiency, improved reliability, and greater control than brushed motors and are well-suited for continuous rotation, but they require more complex drive circuitry.

The brushless DC motor offers many operational advantages, but fully realizing these capabilities requires much more than the simple drive circuitry of the brushed motor. As a result, its use has traditionally been limited to applications using smaller fractional-horsepower motors, such as power tools and small appliances.

Among the various methods for controlling BLDC motors, one of the most advanced and widely used techniques is vector control, also known as field-oriented control (FOC).

Vector control enables highly precise, efficient, and responsive motor operation, but requires complex algorithms to act on real-time current and voltage information. Now, advances in processors, combined with appropriate support functions, have made vector control a practical approach for BLDC motors in lower-power applications, including power tools, small appliances, and similar compact systems.

This blog examines the fundamentals of BLDC motor operation, breaks down the principles behind FOC, and highlights how modern, integrated motor-control MCUs enable designers to implement high-efficiency, high-precision solutions in compact, smaller-scale applications such as power tools.

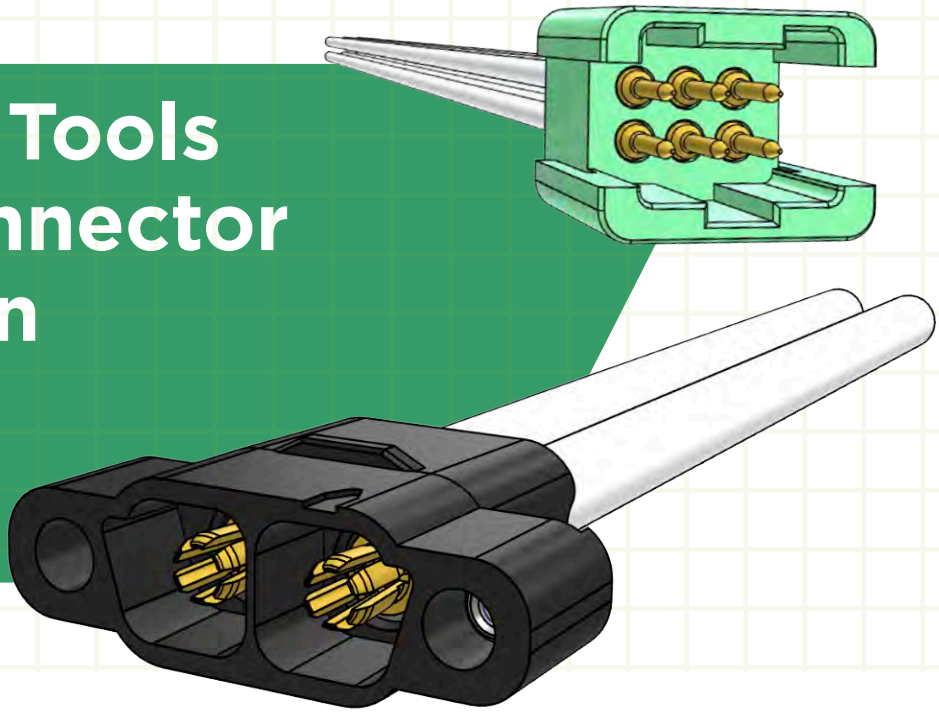
Motor Control Basics

The objective of motor control is to determine a motor's position, speed, and acceleration under fixed (static) and varying (dynamic) load conditions in real time and then adjust the drive currents to maintain the desired setpoints of these performance parameters.

These setpoints are not constant but shift during motor operation. It's the system's higher-level controller task to determine the desired setpoint and the changes to the setpoint. For example, a motor may be instructed to smoothly accelerate from zero revolutions per minute (rpm) to a predefined rpm, run for a period, then stop and hold its position.

The motor driver takes the desired setpoint signal and drives the motor to reach and track it. The parameter to be controlled—position, velocity, or acceleration—depends on the application. The three parameters are related: velocity represents the rate of change of position, while acceleration represents the rate of change of velocity. Therefore, if the system continually knows the rotor position, it can determine the other two factors.

How Digital Tools Simplify Connector Specification for Design Engineers



By Peter Schneid, VP of Marketing at Harwin

Introduction

Poor contact integrity can lead to intermittent power loss or data errors. Mismatched mechanical tolerances can lead to wear or outright failure when subjected to shock or vibration. Environmental factors, including heat, humidity and corrosive atmospheres, can stress and degrade materials over time. In short, poor connector choice can compromise reliability or safety, and has serious consequences when parts fail.

Once a design is finalized, such problems are rarely easy to rectify. Hence, optimal connector specification should be considered critical.

But connectors come in many shapes and sizes. They additionally integrate a huge variety of features to ensure mating integrity, and materials to ensure exceptional performance in harsh environments.

Connector design is, however, often peripheral to many engineers' core competencies and their selection can be overlooked by design teams during the prototyping phase.

As a result, there is an increased need for external support and resources to help identify, evaluate, source and deploy the best connectors for a given application.

Increasing Complexity

Harwin's annual Connector Specifier & Buyer Survey seeks to create a better understanding of those for whom connector specification and purchasing has become a key role. The 2026 survey (for the first time) also asked European specifiers and buyers concurrently alongside their North American counterparts, and provides insight into not only how connector design, specification and procurement choices align across a broad spectrum of users, but also how engineering mindsets differ by geography.

Among the trends identified, is that the majority of both US and European engineers (59% and 55%) believe their job is set to get harder, with just 13.6% and 23.6% believing it will get easier. A key reason cited for this, especially in the US, was specification challenges related to increased operation in harsh conditions and a greater need for miniaturization.

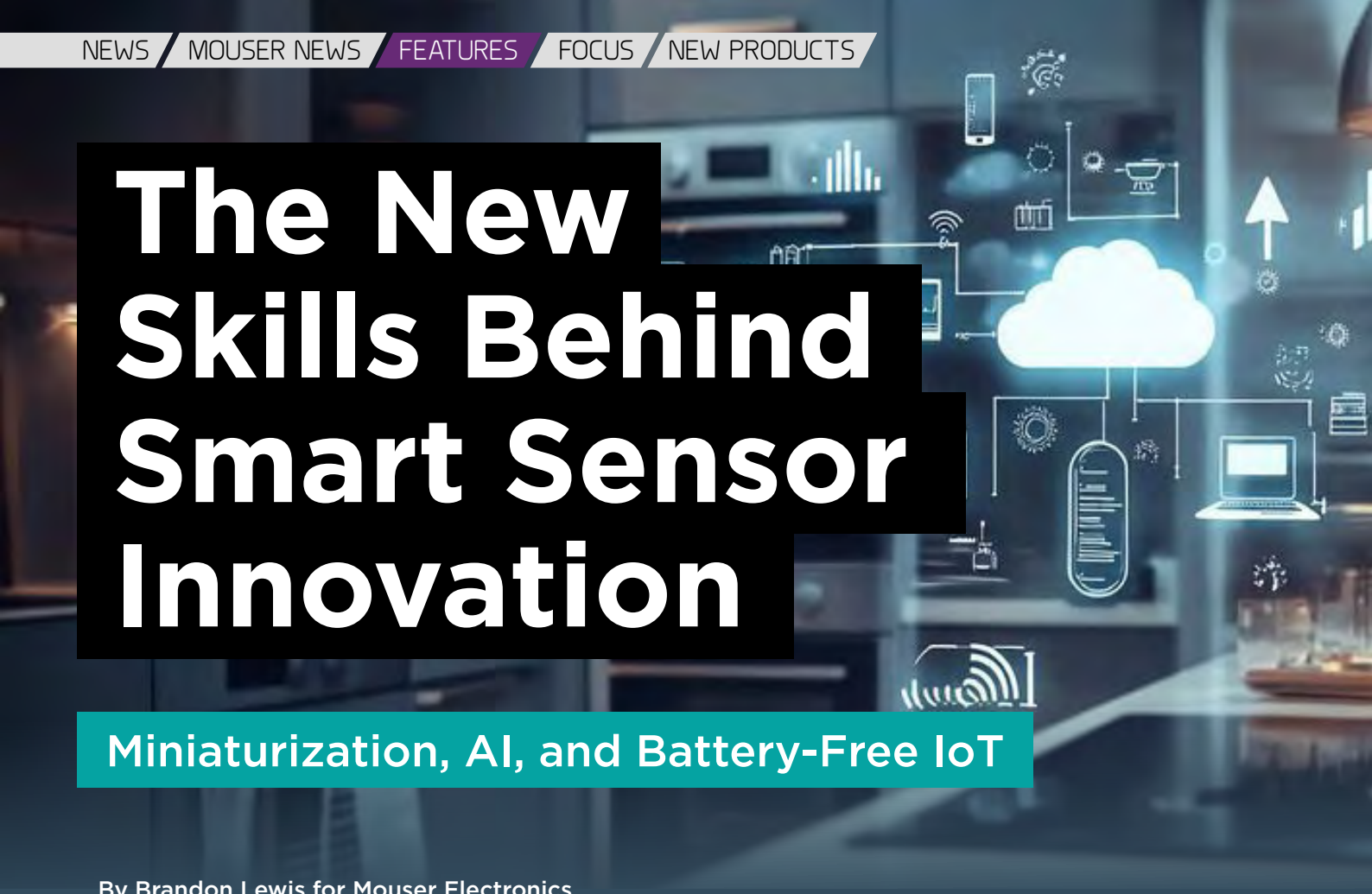
To meet this need, some developers are turning to AI and digital twins to help them prototype systems more effectively and rapidly. More than half of North American, and 37% of European respondents said they plan to, or already use these tools to speed design and verification. Connector selection can, however, remain a challenge.

The Paradox of Choice

Popularised by psychologist, Barry Schwartz, the 'paradox of choice' concept argues that while choice is ostensibly good, too many options can drain our mental resources, causing overload, anxiety, decision fatigue and paralysis.

For design engineers, connector specification represents a classic case: too much choice, not enough clarity, and too little time. With hundreds of connector manufacturers, there are thousands of product families to choose from, each with multiple variants, ratings, mounting options and contact configurations. And to compound things further, supplier documentation can often be fragmented, inconsistent and difficult to parse.

This complexity slows the process down. Engineers spend valuable hours searching for datasheets, verifying specifications, and cross-referencing part numbers, only to discover that a specific component is out of stock, or no CAD file is available for it. And even when CAD files are available, they can be incompatible with a preferred tools, forcing additional rework or manual modelling. It's a frustrating experience, and one that is exacerbated as project timelines shorten.



The New Skills Behind Smart Sensor Innovation

Miniaturization, AI, and Battery-Free IoT

By Brandon Lewis for Mouser Electronics

Smart sensing is radically changing how organizations collect and analyze data to better understand environments, processes, and even patterns of human behavior. Building intelligence into sensor systems enables more accurate and automated data collection, minimizing the need for 24/7 human monitoring. It allows routine processes to be automated more effectively, lowering operational costs and improving building systems, industrial safety, and farming workflows.

A typical smart sensor system uses an optimized combination of sensing components, signal chain circuitry like amplifiers, and computing elements such as microcontroller units (MCUs). However, recent progress in sensor miniaturization, integrated functions, and edge artificial intelligence (edge AI) has changed how engineers approach smart sensor system design. This article examines the impact of sensor component evolution on design processes. It explores primary smart sensor industry trends, including ambient Internet of Things (IoT)- and AI-enabled MCUs and the changing expertise required to address new design challenges.

Modern Sensors as Integrated Subsystems

Two breakthroughs have resulted in a move away from bulky and fragile sensors to today's compact, intelligent devices.

- Micro-electromechanical systems (MEMS) technology has made it possible to shrink sensors to microscopic sizes, and improvements in MEMS manufacturing have increased their reliability and precision.
- Digitization removes the many challenges of analog sensing by reducing the external signal chains required to obtain reliable, accurate data.

As a result, many modern sensors are ready-to-go solutions that require less component-level design expertise. This enables faster product development while reducing design costs, the number of signal chain components, and calibration requirements.

Improvements in semiconductor manufacturing have enabled sensors to integrate features like power-saving modes, wake-up triggers, and built-in AI, which improve efficiency or pre-process data.

With these capabilities, sensors can act more like modular subsystems with logic and autonomy, instead of simply being digital data sources. Even with these added functions, modern sensors remain highly compact, promoting smaller smart devices that consume less power than earlier designs.

As sensors gain more built-in functions, design is shifting away from component-level work toward application- and data-level design. The new challenge is ensuring that software and firmware remain compatible as these devices become more complex.

Low-Power Sensing and the Rise of Ambient IoT

The decreasing size, power consumption, and cost of sensors are key factors in the widespread adoption of IoT across factories, supply chains, buildings, and infrastructure. Wireless sensing modules can monitor many physical variables such as temperature, vibration, pressure, gases, and motion in previously unworkable locations.

View From the lab

By Stuart Cording, Consulting Engineer

Stuart Cording is a Deep Tech B2B Influencer, Journalist and Presenter with almost 30 years of experience in the electronics and embedded systems industry. His aim is to help engineers, innovators, and decision-makers stay updated, so we've widened the scope of his column and changed its name to reflect his new brief.

What to Expect at electronica 2026

Every two years, the electronics industry descends on Munich for electronica, one of the world's largest electronics trade fairs. With nearly 3,500 exhibitors spread across 18 halls, it's almost impossible to see everything in four days. Of course, every event needs a theme, and this year there are three focus areas: artificial intelligence, cyber resilience, and energy efficiency.

But this isn't all that's on show, and visitors will explore the halls to find the technologies most relevant to their own designs. On top of that, it is a brilliant networking opportunity to catch up with old friends and make new ones with application engineers who know the answers the datasheet failed to provide! Strangely, it's challenging to find out in advance precisely what technologies each exhibitor will have on display, so what follows is my best guess at what you'll find.

Edge and Physical AI

With humanoid robots waiting in the wings to take over those dull, repetitive jobs, the interest in technologies that will do the thinking continues to grow. While cloud AI is incredibly powerful and clever, applications like robots need local decision-making capabilities.

Almost everyone with a processing platform will be demonstrating Edge AI, AI and machine learning (ML) that can run close to the sensors and actuators in an application.

You should also expect plenty of discussion about Physical AI systems, such as robots and autonomous vehicles that can make human-like decisions when undertaking tasks. This means new AI chips that are powerful enough to run application-specific large language models (LLMs) but not designed to compete for space in an AI data centre.

Worth a look is NXP's Ara240 Discrete Neural Processing Unit (DNPU), targeting real-time generative AI, such as LLMs and vision-language models (VLMs). Traditional CNN-based accelerators excel at image classification and object detection. This device can run Transformer-based models capable of identifying relationships between objects, language and context, enabling capabilities such as LLMs and VLMs.

Powering it are eight neural network processors and two vector processing units, kept in check by a management and control processor (Figure 1).

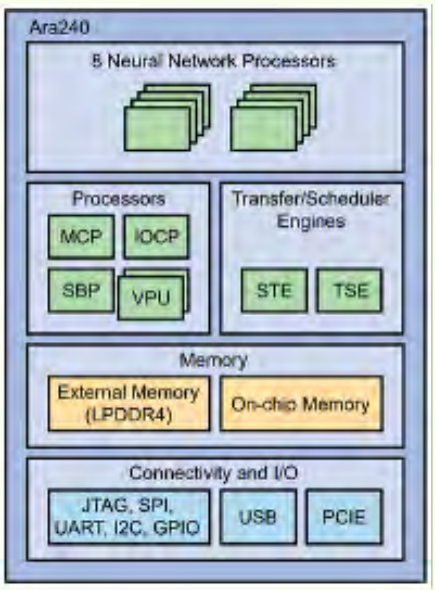


Figure 1. With eight neural network processors, the Ara240 places generative AI capabilities in systems like robotics, drones, and vision systems. (Source: NXP)

When paired with up to 16 GB of LPDDR4 memory, the accelerator offers up to 40 equivalent tera-operations per second (eTOPS), accessed by a host processor through its PCIe Gen4 x4 interface. It's not clear precisely what application experience you can expect, but it's probably along the lines of a good local chat LLM focused on a specific task, such as a factory-floor assistant or equipment troubleshooter.

The development tools you need

Top 5 Development Tools

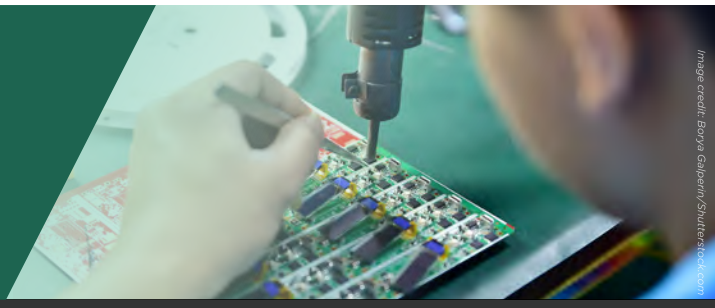
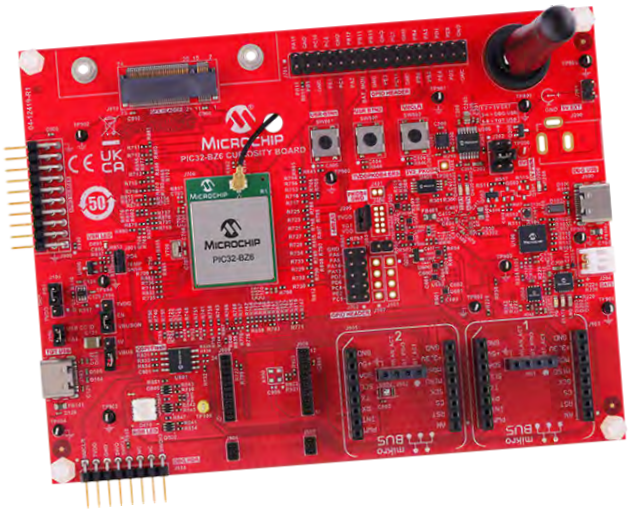


Image credit: Borya Galperin/Shutterstock.com

Mouser offers one of the widest ranges of development kits immediately available off-the-shelf to help designers get started. Here, Mouser's Director, Technical Content, EMEA, Mark Patrick, presents his 'Top 5 Pick' of recently-released dev kits.

www.mouser.com/Development-Tools-Centre



Versatile development platform

Microchip Technology PIC32-BZ6 Curiosity Board

The Microchip PIC32-BZ6 Curiosity Board is a versatile development platform developed to enable quick prototyping while developing the characteristics of the PIC32WM-BZ6204UE module. It includes Microchip's PIC32WM-BZ6204UE module. All signals from the module are connected to onboard features for flexibility and rapid prototyping. The PIC32WM-BZ6204UE module is a high-performance, low-power, integrated wireless microcontroller unit (MCU) powered by a 128MHz Arm® Cortex®-M4F processor. The PIC32WM-BZ6204UE module supports BLUETOOTH® Low Energy (BLE) and IEEE® 802.15.4 wireless communication

Learn more about the Microchip Technology PIC32-BZ6 Curiosity Board

Powerful motherboards

Kontron K3836-Q/R mITX

Kontron K3836-Q/R mITX motherboards feature a compact Mini-ITX format with the latest 12th, 13th, and 14th generation Intel® Core™ processors. These high-performance motherboards include a comprehensive set of modern interfaces and provide a future-proof solution for various applications. The K3836-Q/R series is the successor to the D3633-S mini-ITX motherboard and comes in two configurations, both developed and produced in Germany. The K3836-R offers the high-performance Intel R680E chipset with error correction code (ECC) support for mission-critical applications, while the K3836-Q is equipped with an equally powerful Q670 chipset. Both types feature an array of connections: two Intel LANs (one 2.5 GbE), PCIe x16 Gen5, multiple USB ports, M.2 or DisplayPort™ that supports graphics up to 8K resolution, and more.

Kontron K3836-Q/R mITX Motherboards are reliable and provide 24/7 continuous operation at temperatures up to +60°C. Ideal applications include industrial, robotics, medical, digital signage, infotainment, and point-of-sale (POS) and point-of-interaction (POI) systems.

Learn more about the Kontron K3836-Q/R mITX

Integrated system for energy monitoring and control

Carlo Gavazzi's all-in-one energy management system (EMS) is highly versatile, serving as a fast and reliable Industrial Internet of Things (IIoT) energy meter or operating as a complete energy management system.

Now in stock at Mouser, the EMS enables accurate acquisition of energy and electrical variables, secure data storage, and seamless data exchange with local and remote systems, including building management systems (BMS), cloud-based energy services, and industrial ERP/MES platforms.

The EMS combines measurement, data logging, communication, and analysis, providing a complete energy management solution in a compact 5-DIN module. The EMS features a built-in web user interface that allows multiple users to access dashboards, generate reports, and analyze data in real time from any device. MAIA cloud integration enables the centralized management of devices, users, and organizations with secure remote access and fleet-wide updates.

The EMS energy management system includes a range of security protocols, including third-party certifications and safe over-the-air (OTA) firmware updates. For streamlined integration into IIoT environments, the EMS supports ACnet® and Modbus®, as well as internet protocols such as SMTP, MQTT, and REST APIs.

With an integrated web server and Wi-Fi, the EMS is quick and easy to set up, including from a smartphone. The EMS Energy Management System is easily expandable via ESY plug-and-play modules or with the full range of Carlo Gavazzi meters and analyzers.

Learn more about the EMS energy management system from Carlo Gavazzi

Vision devkit for AI, Edge, HMI, and camera applications

Now shipping from Mouser is the new ESP32-P4X-EYE vision development kit from Espressif Systems.

The ESP32-P4X-EYE is a compact, camera-focused development kit designed for smart surveillance cameras, vision model detection, and edge computing in IoT applications.

The ESP32-P4X-EYE kit offers developers a mini digital camera form factor that includes a compact, camera-style enclosure housing the camera, a rear display with a 1.54-inch SPI LCD screen, a digital microphone, a rotary encoder and a push-switch for real-time image processing for AI, edge, human machine interface (HMI) and camera applications. Based on the ESP32-P4 chip, which features a dual-core 400 MHz RISC-V processor and supports up to 32MB of PSRAM, the ESP32-P4X-EYE also supports USB 2.0, MIPI-CSI/DSI, an H.264 encoder, and various other peripherals. Rich onboard features include a camera, display, microphone, and MicroSD card, enabling real-time environment monitoring and the collection of images and audio data.

With its outstanding connected audio and video capabilities, the ESP32-P4X-EYE board also integrates the Espressif System ESP32-C6-MINI-1 module for Wi-Fi®, IEEE 802.15.4, and Bluetooth® LE communication. The Espressif Systems ESP32-C6-MINI-1 is ready to power a wide range of applications, including smart homes, industrial automation, health care, and consumer electronics.

The ESP32-C6-MINI-1 features a convenient PCB antenna, or developers can also connect peripherals to the ESP32-P4X-EYE with jumper wires.

Learn more about Espressif's ESP32-P4X-EYE vision development kit