APPLICATION STORY

# ECTRON CORPORATION

## Taking the Express route to building industrial IoT edge computers

POSSIBILITIES START HERE

kontron
S&T Group

# CONTENTS

Kontron COM Express modules help Ectron reap the rewards from its new range of Industrial IoT Edge Computers.

// Power plant control center

Ectron Corporation, founded in 1964, is based in San Diego California, USA. Ectron manufacturers rugged signal conditioners, amplifiers and calibrators for industrial, automotive and defense markets. Ectron also provides rugged line of computers, gateways for use as control computers, gateways or HMI computers. Ectron's SmartEYE™ PaaS (Platform as a service) provides companies 360 degree view on operations with KPIs for predictive maintenance, energy usage, energy productivity and operational efficiencies. Ectron is a Microsoft partner, Azure CSP and works with Kontron, Arrow Electronics, its sensor and networking partners to provide robust IIoT solutions.

Ectron's products have been used for decades in government test facilities and in the field by various segments of the Military, including on cruise missiles, rocket launches and aboard the Space Shuttle. Ectron technology is utilized on test tracks in the auto industry and in numerous other commercial, industrial, aerospace and military settings.

Recently the company expanded its portfolio to include SmartEYE™, an end-to-end Industrial IoT capability and, as a key part of this initiative, commenced the design and manufacture of a range of ruggedized edge industrial computers. At the heart of SmartEYE™ systems are Kontron COM Express® industry standard form factor Computer-On-Modules (COMs).

## RESPONDING TO NEW EDGE INDUSTRIAL IOT OPPORTUNITIES

In 2017, Ectron commenced operation under new ownership and management. With this, the company adopted a new strategy of delivering a more comprehensive solutions capability for Industrial IoT applications - from the first sensor touch point to the cloud, including analytics and Artificial Intelligence enabled Machine Learning at the edge.

This decision followed extensive market research among existing and potential customers by Ectron's CEO Kary Dodd and its COO/VP of Engineering Gautam Kavipurapu. The market feedback was clear: There was a significant gap in the market for harnessing Ectron's expertise and complete computer solutions; purpose built for key edge-based industrial applications, especially engine/machine condition monitoring, but also HMI computers and IoT Gateways.

Furthermore, Ectron realized that being able to offer complete end-to-end IoT solutions - consisting of sensors, networking, instrumentation amplifiers, gateways and industrial computers - would be in increasing demand for transforming factories into Smart factories.

// Power plant

## DESIGN AND PERFORMANCE REQUIREMENTS

Having identified the market opportunity, the company set about designing and specifying a range of ruggedized industrial computer solutions including custom Artificial Intelligence/Machine Learning (AI/ML) co-processors. It was decided to use x86 CPUs for running Windows 10-based machines and ARM for Linux-based solutions. However, as the computers would ultimately be deployed in varied and often harsh industrial environments - from factory floors to wind turbines - several important design and performance factors had to be taken into consideration:

- All computers would undergo HALT and HASS stress testing to comply with stringent reliability and safety demands
- All of the components, including the COM Express® module, had to be suitably robust to withstand extreme operating temperatures and vibration, while being resistant to rain and dust
- The modules had to be passively cooled and sufficiently compact to help minimize the footprint of the final edge computer products
- The new systems had to guarantee customers a long lifecycle of typically 10 to 15 years

## MARKET EVALUATION

To ensure a rapid and low risk approach to bringing its industrial computer range to market, Ectron recognized partnering with a trusted long-term supplier for x86 Computer-On-Modules (COMs) was essential. The chosen supplier would have to already offer an extensive range of leading edge industrial-grade embedded computer products and be highly experienced in the specialized requirements of the sector. In addition, it had to have a global logistics and support capability in line with Ectron's strategy to streamline the supply chain.
All the above were prerequisites for allowing Ectron to keep pace with the current and future demands of its customers.

Following an extensive market evaluation of potential embedded systems suppliers, Ectron selected Kontron, one of the world's leading embedded computer technology manufacturers. In Kontron, Ectron was confident it had found the ideal partner:

"*Kontron has a stellar reputation in the embedded computing industry and a very impressive pedigree in the industrial space,*" *asserts Gautam Kavipurapu, COO and VP of engineering at Ectron. "We were totally confident their COMe product range would offer us the ability to produce high quality, scalable x86 industrial solutions very cost-effectively and give us the essential time-to-market and time-to-revenue competitive edge we desired.*"

Joe Nicosia, Sales Manager for Industrial Automation at Kontron, adds: "*Ectron's IP and deep knowledge in the area of embedded edge Artificial Intelligence/Machine Learning programmable logic devices was another major positive for Kontron when discussing a long-term strategic supplier relationship with Ectron. So too was our considerable expertise in embedded hardware and software security. These attributes bring considerable added value and provide major benefits to customers.*"

## THE SOLUTION: KONTRON COM EXPRESS® MODULES

At the heart of Ectron's new range of industrial IoT edge computers are Kontron off-the-shelf fully pre-tested and ruggedized COMs. Compared to full custom designs, they offered a faster, more flexible and highly scalable solution with the benefit of making future processor upgrades much easier. And compared to commodity PC motherboard alternatives they ensured maximum reliability and durability, backed by extended product lifetime guarantees.

For its new industrial computer range Ectron chose Kontron's COM Express® industry standard form factor COMs. The AI/ML capable Ectron ECT-ECI edge computer, for example, uses Kontron's COMe-bKL6 module (125 x 95mm) running Intel® 7th Generation Core™ / Xeon® E3 v6 Family processors.

This application-ready COM offers industrial grade features, making it an ideal platform for deployment in harsh environments. It features powerful CPU and graphics performance to enable excellent user experiences while still ensuring low power consumption. In addition, the broad scalability of CPU performance grades allows full flexibility to choose the optimal performance solution for matching user operational requirements. Furthermore, the COMe-bKL6 includes Kontron's embedded hardware Approtect security system.

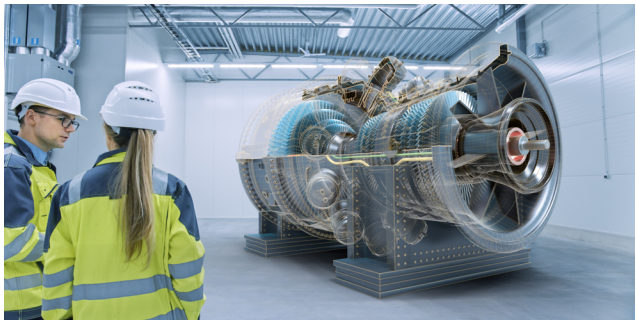
// Wind turbines

## TARGET APPLICATIONS

The Ectron ECT-ECI ruggedized computer is particularly suited to System controller, HMI computer (headless) and IoT Gateway applications. It is also ideal as a gateway for edge aggregation and the bridging of OT to IT networks for connection to Microsoft Azure Cloud. Typical applications include:

- Turbine condition monitoring and control
- Factory network sensor aggregation and processing
- Network gateways bridging IT and OT network
- Factory machine monitoring and control systems
- Edge monitoring and control for smart city and energy usage

Ectron's ECT-GCI BOX PC computer and ECT-MAN server also use Kontron COMe modules. The ECT-GCI computer is being offered as a control computer with Artificial Intelligence/Machine Learning capability on the edge to implement a Gateway to bridge OT and IT networks and cloud connectivity, or as a control computer for various applications. The ECT-MAN server class computer has the capability to bridge OT-IT networks and, in addition to Artificial Intelligence & Machine Learning capabilities, offers a large storage capacity. These computers can run multiple frameworks for implementing the SmartEYE™ IIoT factory monitoring solution: Ectron's Hybrid Edge/Cloud solution for providing a 360 degree view of factory operations, with services for predictive maintenance, energy efficiency, energy productivity, and overall operational efficiency.



// Steam turbines

## BUSINESS BENEFITS

With the help of Kontron COMe modules and embedded computing expertise, Ectron has been able to build and launch its first range of industrial-grade edge computers - quickly and cost-effectively. These are now enabling the company to exploit major new and varied market opportunities in the industrial sector. Most recently, for example, Ectron has been selected for several US Department of Energy funded contracts and will be deploying these AI/ML enabled computers with several industrial customers. With this, Ectron has been piloting the Kontron COMe based computers with Turbine makers and Machine builders for various applications. At the same time, the company has a rapidly growing pipeline of new customers looking to take advantage of Ectron's expanded IIoT solutions capability. Their requirements include various IIoT applications, from edge computing and gateways to building automation and visibility across industrial operations.

## FUTURE DEVELOPMENTS

Building on its growing success in developing and manufacturing fit-for-purpose edge IIoT computers, Ectron is now planning on introducing a line of 'market-ready' industrial computer solutions. Once again, these will utilize Kontron COMe products and target specific industrial sectors and applications.

Concludes Gautam Kavipurapu, COO and VP of engineering at Ectron:

*"Kontron's portfolio of COMe solutions based on Intel processors allowed us to rapidly prototype and build solutions for industrial computing solutions. We are very excited in working with Kontron to deliver our AI/ML enabled ECT-ECI, ECT-GCI and ECT-MAN computers for the industrial market that also form components of our hybrid Edge plus Cloud SmartEYE™ solution for IIoT."*

*"The support provided by Kontron's sales and technical teams has been outstanding, helping us throughout our journey to the new business and strategy."*

### ECTRON IOT EDGE COMPUTERS – HIGHLIGHTS:

- Ruggedized enclosures (based on applications)
- Operating System: MS Windows 10 IoT LTSC
- 802.11 WiFi interface
- Optional Radios: 4G/LTE
- Connectivity: 2 USB, 2 Ethernet, HDMI
- Processor: Intel Core i3/i5
- Co-processor: Artificial Intelligence/Machine Learning (AI/ML) capability
- Memory: 64 GB or 128 GB SSD
- Operating Voltage : 20 to 30V
- Uncooled
- Operating Temperature: - 40 to +85 C
- 95% non-condensing humidity

### KONTRON COMe-bKL6

- Intel® 7th Generation Core™ series/Xeon® E3 v6 family with CM238/QM175 PCH
- Up to 32 GByte DDR4 non-ECC/ECC memory
- Three independent displays with up to 4k@60Hz resolution
- TPM2.0 and built in Hardware Security Device
- Support of Intel® Optane™ memory technology via PCIe

▶ For more information about Kontron's COM Express® product family please visit Kontron:
**https://www.kontron.com/products/boards-and-standard-form-factors/com-express**

## About Kontron – Member of the S&T Group

Kontron is a global leader in IoT/Embedded Computing Technology (ECT). As a part of technology group S&T, Kontron offers a combined portfolio of secure hardware, middleware and services for Internet of Things (IoT) and Industry 4.0 applications. With its standard products and tailor-made solutions based on highly reliable state-of-the-art embedded technologies, Kontron provides secure and innovative applications for a variety of industries. As a result, customers benefit from accelerated time-to-market, reduced total cost of ownership, product longevity and the best fully integrated applications overall.

For more information, please visit: **www.kontron.com**

## About the Intel® Partner Alliance

From modular components to market-ready systems, Intel and the over 1,000 global member companies of the Intel® Partner Alliance provide scalable, interoperable solutions that accelerate deployment of intelligent devices and end-to-end analytics. Close collaboration with Intel and each other enables Alliance members to innovate with the latest IoT technologies, helping developers deliver first-in-market solutions.




## GLOBAL HEADQUARTERS

**Kontron Europe GmbH**

Gutenbergstraße 2
85737 Ismaning, Germany
Tel.: + 49 821 4086-0
Fax: + 49 821 4086-111
info@kontron.com

**www.kontron.com**