

# Honeywell's New PLC Brings Digital Transformation to the ControlEdge

By Craig Resnick

## Keywords

IIoT, PLC, DCS, Digital Transformation, Mobility, OPC UA, Cybersecurity

## Summary

IIoT is changing the way industrial organizations generate, collect, and analyze data. Data will be generated faster and in greater volume than ever before. This will require the current plant information infrastructure to evolve. One key part of this new infrastructure will be edge devices, which will include the latest generation of controllers, such as DCSs, PLCs and

To address these market trends, Honeywell Process Systems introduced its ControlEdge PLC, a new controller that is IIoT-enabled and can act as an edge device.

PACs. Besides providing control, these edge devices will securely collect, aggregate, filter, and relay data, leveraging their close proximity to industrial processes or production assets. They will also be capable of collaborating with powerful analytics tools, detecting anomalies in real time, and raising alarms so that operators can take

appropriate actions. But the question is, what about the technology that is embedded into these new controllers that is enabling IIoT and pushing these new devices to the edge? And will this be a trend for future controllers? To address these market trends, Honeywell Process Systems introduced its new ControlEdge PLC, an IIoT-enabled controller that can act as an edge device.





## The Edge and IIoT

The growth of IIoT extends the edge to industrial devices, machines, controllers and sensors. Edge computing and analytics are increasingly being located close to the machines and data sources. As the digitization of industrial systems proceeds, so does analysis, decision-making, and control being physically distributed among edge devices, the network, the cloud, and connected systems, as appropriate. These functions will end up where



it makes most sense for them to be. This makes it essential that today’s automation assets, such as PLCs, be designed to leverage IIoT and the edge.

With edge computing and analytics, data is processed near the source, in sensors, controllers, machines, gateways, etc. These systems may not send all data back to the cloud, but the data can be used to inform local machine behaviors as it is filtered and integrated. The edge systems may decide

	Customer Issues	Impacts	Desired solution
1	<b>Multiple PLCs across plants</b>	<ul style="list-style-type: none"> <li>• Unsupported and obsolete systems</li> <li>• Complex / Loose integration of systems</li> <li>• No single owner - EPC, OEM, PLC Vendors</li> <li>• High maintenance costs</li> </ul>	<b>Standardization of solution</b> 
2	<b>Last minute changes impacts schedule</b>	<ul style="list-style-type: none"> <li>• Production losses due to late plant startup</li> <li>• Project cost overrun</li> </ul>	<b>Engineering Flexibility</b> 
3	<b>Poor connectivity – difficult to pull data from proprietary protocol</b>	<ul style="list-style-type: none"> <li>• Lack centralized asset performance data</li> <li>• Delayed service leads to risk of downtime</li> <li>• Low quality visualization – Information silos</li> </ul>	<b>Connectivity</b> 
4	<b>Cyber security risks</b>	<ul style="list-style-type: none"> <li>• Higher insurance cost</li> <li>• Risk to plant safety and availability</li> </ul>	<b>Cyber security</b> 

**Top Customer Challenges for Any Plant**

what gets sent, where it gets sent and when it gets sent.

Placing intelligence at the edge helps address problems often encountered in industrial settings, such as oil rigs, mines, chemical plants, and factories. These include low bandwidth, low latency, and the perceived need to keep mission critical data on site to protect IP.

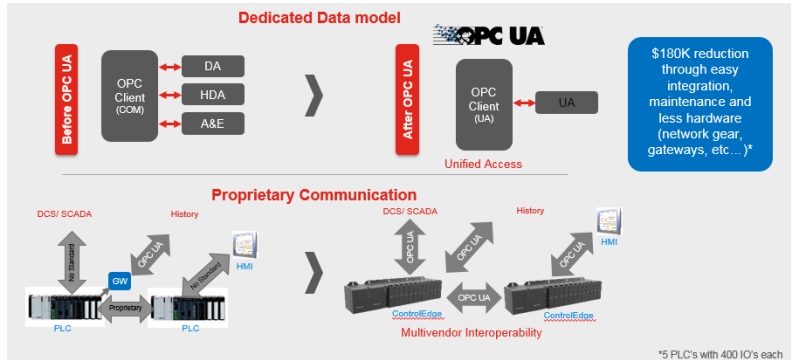
### Automation Investments Must Maximize ROA

Plants seek to maximize their return on assets (ROA) by making sure that their automation investments are scalable, future-proof, adhere to open standards, and can seamlessly integrate to existing assets, avoiding having to “rip and replace” current infrastructure. Industrial automation suppliers can address these issues and help maximize its customers’ ROA by providing new scalable IIoT-enabled edge device controllers that future-proof their platforms to be IIoT solution-ready, embed their platforms with open communication standards, and design their platforms to integrate with existing assets for either process or discrete applications ranging from other DCS, PLC or PAC systems to variable speed drives, which is the reality found in most plants.

The emergence of the IIoT represents a digital transformation for manufacturers and processors that shifts the source of competitive advantage away from physical machinery and toward information. Controllers designed to be IIoT-enabled edge devices provide an IIoT-ready open platform that enable its users to better utilize data across their assets to help reduce unplanned downtime and off-spec products by building IIoT ecosystems that leverage data, advanced analytics and domain knowledge.

## OPC UA Embedded into Controllers

OPC Unified Architecture (UA) is a family of technologies intended to exchange information between different industrial control systems on different control layers in a standardized fashion. OPC UA provides technologies to connect field control devices with higher control layers.



### OPC UA Open Communications Standards versus Proprietary Communications

OPC UA has certainly been gaining traction as a standard for connecting the plant floor to the enterprise, but it appears that IIoT is being threaded in as common denominator. The OPC Foundation pursues interoperability in industrial automation by creating and maintaining open specifications that standardize communication of acquired process data, alarm and event records, historical data, and batch data to multi-vendor enterprise systems and between production devices. The goal for OPC is for it to be a standard for interoperability for moving information vertically from the factory floor through the enterprise of multi-vendor systems, as well as providing interoperability between devices on different industrial networks from different suppliers. Controllers that utilize embedded OPC UA will certainly leverage these benefits.

Most factories and plants want to deploy IIoT applications, but are often seeking guidance as where to start. Those controllers that are embedded with OPC UA are better able to leverage plant floor to enterprise communications as well as participate in IIoT applications. OPC UA will find its way to being embedded into additional devices to make this IIoT-enabling process easier for industrial automation suppliers, end users, OEMs and software developers to begin their IIoT journey. OPC UA will still be used to maintain interoperability of manufacturing and automation assets, providing specifications, technology, processes and certifications to help achieve multi-supplier, multiplatform interoperability for moving data and information from the embedded world to the enterprise cloud.

## ControlEdge PLC Living at the Edge

To address the market demands for digital transformation, IIoT, and the edge, Honeywell Process Systems launched its ControlEdge PLC. This new addition to Honeywell's next generation family of controllers leverages and

### ControlEdge PLC Key Features

- Redundant control option
  - Redundant power supply option 60W (110/240 VAC, 24VDC)
  - Redundant communication
  - **IO Racks (4, 8, 12 Slots)**
  - **Universal IO module (16 Ch)** with HART support
  - Digital Input Modules – 24VDC (32 Ch), 110/240VAC (16 Ch)
  - Digital Output Modules – 24VDC (32 Ch), 110/220VAC (16 Ch)
  - Universal Analog Input – TC, RTD, V
  - 16-Bit resolution (AI), DI/DO – line monitoring (Open/Short circuit)
  - **2304 IOs per PLC**
- 
- [ControlEdge](#) Builder tool (common tool with RTU)
  - **Five IEC 61131-3** programming languages
  - **Cyber Security** – Secure Boot, Built-in firewall, IPSEC, ISA-99 ready
  - **Embedded OPC UA** (server and client)
  - HMI and 3rd party device integration via Modbus
  - [Experion HS and PPC integration using OPC UA](#)
  - FDM and FDM Express Integration

- Operating temperature - 0 to 60°C

Certifications – CE, UL, ATEX, CSA FM, CSA, ABS\*

### ControlEdge IIoT and ISASecure Embedded Device Security Assurance Program Version 2.0.0 for Level 2 Certified by Exida

supports IIoT. Its focus is to provide connectivity through all levels of process and business operations.

The ControlEdge PLC, combined with Honeywell's Experion Process Knowledge System (PKS), leverages embedded OPC UA protocol and built-in cybersecurity for connecting and integrating to a range of devices, instruments, equipment, and software from multiple vendors. The new PLC offers Universal I/O technology, providing remote configuration and late-design I/O change flexibility and is designed for use with any process or SCADA system. The ControlEdge PLC delivers a unique integration capability when combined with Experion PKS through

Honeywell's LEAP project execution methodology. With one company providing both the DCS and PLC, it can support a common lifecycle and "plug and play" integration, requiring no custom interface.

As its name implies, the ControlEdge PLC is focused on being a controller as well as an edge device that enables connectivity to IIoT. The ControlEdge PLC achieves this by leveraging its embedded OPC UA protocol for connectivity and integration to a range of devices, instruments, equipment and software from multiple industrial automation suppliers. The PLC is used in a variety of balance of plant applications, such as equipment and device level control. It is part of the ControlEdge next-generation family of controllers offering secure connectivity through all levels of process and business operations. The PLC is being offered to end users, OEMs, and EPCs, especially those in global refining, oil & gas, power, chemical, water management industries, and for infrastructure applications.

The ControlEdge PLC, combined with Honeywell's Experion DCS, provides a reduction in integration efforts and project costs as well as increased security and availability through enhanced cybersecurity for industrial facilities. Both Experion and ControlEdge PLC leverage a common HMI platform, which enables faster field device commissioning, and improved device diagnostics.

Since the ControlEdge PLC provides an IIoT-ready open platform that uses OPC UA as a communication protocol, users are better able to leverage data across their assets. The company's IIoT portfolio of technologies is bundled in Honeywell Connected Plant, which combines Honeywell's industrial

1	<b>Unified control with ControlEdge PLC and Experion</b>	<ul style="list-style-type: none"> <li>• Reduce project delivery time</li> <li>• One vendor for controls support</li> <li>• Reduce obsolescence risks and future migration costs</li> <li>• Reduce maintenance costs</li> </ul>	
2	<b>Flexible and Efficient Engineering</b>	<ul style="list-style-type: none"> <li>• Universal IO supports last minute changes with minimal rework</li> <li>• Reduce panel sizes and engineering time</li> </ul>	
3	<b>Open Connectivity and Security</b>	<ul style="list-style-type: none"> <li>• OPC UA simplifies communication integration</li> <li>• Ring and Star Network Support</li> <li>• Internet friendly communication capabilities for IIoT</li> <li>• Secure boot and integrated firewall reduces vulnerability to cyber security threats</li> </ul>	

### Honeywell ControlEdge PLC Value Proposition

expertise, software and cloud technologies to help make customers' operations more reliable, profitable and secure.

The ControlEdge PLC is focused on process industries requiring discrete control for specific PLC applications. These include water treatment, balance of plant modular equipment, terminal automa-

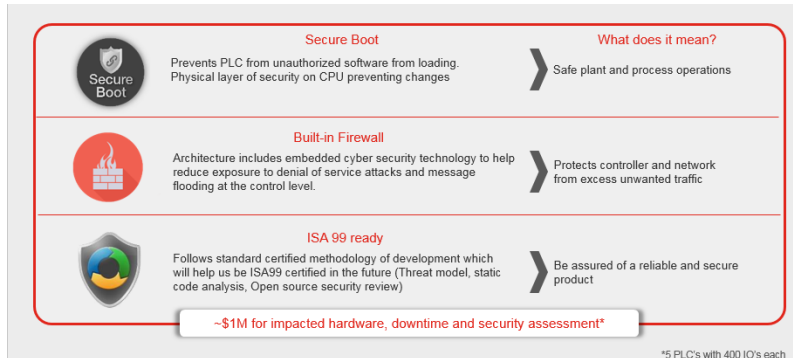
tion, and coal/ash handling. Honeywell is currently working on migration utilities to convert legacy PLC code to ControlEdge PLC code as well as performing hardware conversion for equivalent CE PLC hardware.

### I/O and Cybersecurity Differentiators

The ControlEdge PLC offers users a number of differentiators. Universal I/O is one, which makes it easier for users to adapt to project changes, helping mitigate delays due to late design inputs and changes at various stages in a project. It also helps reduce hardware requirements; eliminating marshalling with direct landing from the field, and reducing and simplifying marshalling with no cross-wiring. Universal I/O also requires fewer spares, as one universal I/O module replaces four standard modules, and helps lower cabinet, infrastructure and labor costs.

Security is a major concern of every manufacturer, as security breaches in control systems can lead to significant damages and harm to both plant

personnel and the public. Security breaches can also damage plant assets and equipment, causing lost production as a result of unplanned downtime. Security breaches can also cause companies to receive fines due to



### Honeywell ControlEdge PLC Cybersecurity Features

Assurance Program Version 2.0.0 for Level 2. Honeywell addresses these cybersecurity concerns with the ControlEdge PLC by a design that has been certified ISASecure L2 by Exida. It also features a secure boot, a physical layer of security on the CPU that prevents changes and loading unauthorized software. A built-in firewall includes embedded cybersecurity technology to help reduce exposure to denial of service attacks and message flooding at the control level. This protects the controller and network from excess unwanted traffic.

### Conclusion

The emergence of the IIoT represents a digital transformation of manufacturing that shifts the source of competitive advantage away from physical machinery toward information. ARC is glad to see that Honeywell is positioning its ControlEdge PLC as a solution to help users leverage IIoT capabilities. The solution, which can serve as an edge device, embraces open standards such as OPC UA and offers both universal I/O and embedded cybersecurity technologies. Most factories and plants want to deploy IIoT applications, but often need guidance as where to start. By deploying the ControlEdge PLC, its users will be well-positioned to leverage the edge as a gateway to the IIoT.

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