ControlEdge™ PLC
Easy Integration and Flexible Deployment
Product Information Note

The ControlEdge™ PLC, when combined with Experion, dramatically reduces integration costs for balance of plant operations, minimizes downtime through unified support, decreases risk with embedded cyber security, and lowers total cost of ownership through Experion-level extended system lifecycle.

Our new PLC is part of the ControlEdge™ family, a next generation family of controllers providing unprecedented connectivity through all levels of process and business operations. The result is optimized operations and maintenance efficiencies that release personnel from manual processes. ControlEdge PLC is one of the first controllers supporting Honeywell's IIoT-ready initiative.

The ControlEdge Programmable Logic Controllers (PLCs), designed and developed by Honeywell is based on the proven platform of racks and power supplies, currently used by HC900. This advanced line of controllers, compliant with the IEC 61131-3 standard, offers impressive scalability for different environments and provides robust control in a wide range of discrete applications.

ControlEdge PLCs can be deployed as part of Honeywell's unique LEAP™ project execution approach, enabling optimum solutions to be found for automation projects while eliminating complexity, saving time and lowering costs.

With the ControlEdge solution, industrial facilities are assured of utmost cost and performance benefits over the life of the asset. They will also realize significant value from simplified configuration and integration across their control architecture.

Figure 1. ControlEdge PLC

FEATURES & BENEFITS

- Tightly integrated with Experion, Honeywell's best-in-class Distributed Control System (DCS), Supervisory Control and Data Acquisition (SCADA) system, safety system and Honeywell's Field Device Manager (FDM) for smart field device management

- Integration with third-party systems and devices such as motors, drivers, and compressors
- Leveraging Honeywell's LEAP™ project methodology, it is the first PLC with HART enabled Universal I/O for greater configuration flexibility

- Optionally redundant power supplies and communication links
- Digital Input, Digital Output, Universal Analog Input module variants
- I/O racks of various sizes and AC/ DC Power supply option
- Connects to Human-Machine Interface (HMI) through Modbus and OPC UA protocols

- Compatible with leading open network standards such as Modbus and OPC UA
- Powerful IEC 61131-3 programming environment
- Best-in-class cyber security ensuring the safety of the system, personnel and critical information

- Native controller redundancy
- OPC UA protocol offers smooth integration to a broad range of instruments
- Single vendor service and support across PLC, DCS, Safety System, Panel PC and Field Device Manager
- Supports remote firmware updates

Designed to work with any SCADA system, ControlEdge PLC becomes a superior solution using Experion, leveraging common station hardware and HMI, LEAP project execution, faster field device commissioning, and improved device diagnostics. OPC UA protocol and built-in cyber security provide smooth integration to a range of instruments from multiple vendors. HART-enabled Universal I/O offers remote configuration and late design change flexibility for improved project implementation.

Superior Integration Capability

With Honeywell technology, industrial sites have a flexible way to efficiently access data in a seamless manner, ensuring easy configuration and maintenance. Honeywell can serve as a single vendor for all automation needs, including the DCS, PLC, SCADA, asset management with Field Device Manager, and an HMI panel.

ControlEdge PLCs are tightly integrated with the Experion control system architecture. By partnering with an automation vendor offering both DCS and PLC solutions, users have a single point of contact from project inception to support, substantially reducing CAPEX and OPEX.

Integration with Experion

Through use of open protocols, ControlEdge PLC is designed to work with any SCADA system. When combined with Experion PKS, Experion SCADA or Experion HS, it becomes a superior solution. Enhanced ControlEdge PLC and Experion integration over an OPC UA interface offers pre-built PLC diagnostics in the Experion system, an Integrated alarm summary for C300 controller and PLC, and integrated history, trend and reporting - resulting in fast and easy integration with significant cost savings and ease of plant operations.

Auto-configuration of PLC data points in Experion HS and PKS provides a significant reduction in the cost of integration, easy updates on the Experion Server, and faster project deployment. In addition, OPC UA named variable based mapping eliminates address mapping efforts.

When you match an Experion Equipment template with a ControlEdge PLC, the cost of configuring the full solution is simplified even further. Experion and ControlEdge PLC have been designed to solve automation requirements in the oil and gas, mining, water and other industries.

For more information, refer to the *Experion SCADA, Experion PKS, Experion HS and Field Device Manager PINs.*
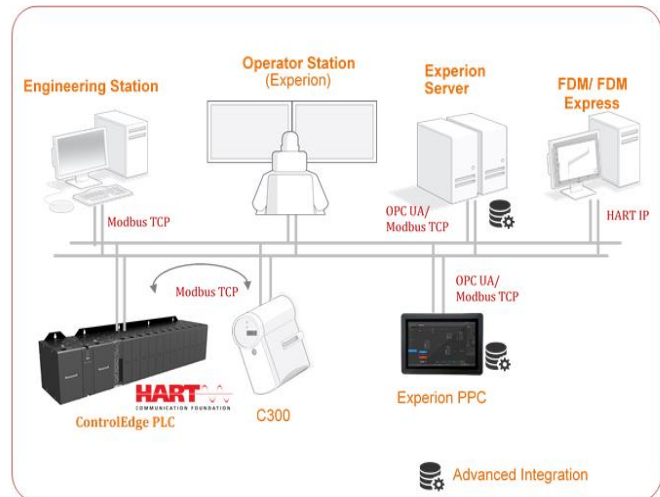

Figure 2. ControlEdge PLC, Experion and Experion PPC Integration

Experion HMIWeb Display Builder is the object orientated tool for building and maintaining PLC HMI displays. It includes an object browser to easily navigate and make changes, a property window to enter and view parameters and a structured list of shapes. Shapes can be dragged and dropped to quickly engineer new displays and modify existing ones.

The Experion HMI incorporates features developed from extensive consideration of human factors by the Abnormal Situation Management consortium. Operators' situational awareness is optimized, fatigue minimized and quick identification and response to abnormal situations promoted. These features are available both in standard system displays and user built displays where the HMIWeb Solution Pack library is used. For more information, refer to the Experion HMI PIN.

Experion Panel PC

The Experion Panel PC, or Experion PPC, provides a single HMI across PLC diagnostics and Experion system displays. The touch user interface allows you to operate from the equipment or from the control room easily without learning different systems. It also allows connection of the PLC to the Experion system with less effort. It also allows improved integration with Experion over a secured (encrypted and authenticated) connection using node to node IPSec-based security for all protocols. Experion PPC also supports Automatic Point Configuration for PLC.

In all, the Experion PPC configured with Experion HS provides the following benefits:

- Better operator emergency response

- Seamless, quick start-up and commissioning

- Transparent process view

- Easy, lean and secure integration

- Lower training, maintenance overheads

- Improved total cost of ownership

Universal I/O HART and Field Device Manager Integration

ControlEdge PLC offers onboard HART support on any of 16 Universal IO channels and HART-IP protocol support. Field Device Manager (FDM) provides fast and accurate commissioning of HART field devices. Rapid maintenance decisions are afforded through simplified diagnostics and fewer site trips. The combination of FDM and HART-IP protocol offers design flexibility using the HART-IP open standard and investment protection through the use of existing plant network infrastructure. Finally, FDM conveniently co-exists on the ControlEdge Builder workstation and is scalable to large sized projects.
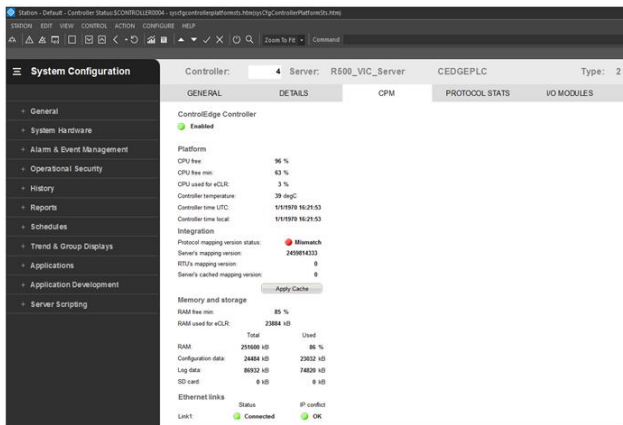

Figure 3. Simplified diagnostics

Universal I/O for Project Flexibility

Honeywell's automation experience and innovative LEAP methodology are the key to increased flexibility – allowing industrial firms to optimize project execution. With LEAP, companies can realize significant capital savings on the total installed automation costs of a project, reduce rework costs, and minimize schedule delays.

Essential to the LEAP approach is the implementation of 16- channel Universal I/O modules (UIO) supporting HART signals, which offer flexibility in I/O type, eliminating the need for custom PLC hardware alignment with different I/O configurations and enabling simplified field device configuration and maintenance. Any field signal can be connected to any I/O channel. Deployment of UIO provides greater flexibility for late stage

changes, such as configuration and design changes on a typical automation project.

The UIO module reduces equipment needs by reducing or eliminating marshalling, and because there is no need for hardware with different I/O configurations. The result is significant savings in spares inventory and associated costs.

The Value of HART

Distributed operations can require crews of field operators that travel each day over long distances and dangerous terrain. ControlEdge PLC can help bring that requirement to an end. It is not only a large operating expense, but is also unsafe —and that is just the trip to site. The traditional PLC strengths of logic control and good sub-system communications with local devices, alongside smart device integration with HART, is enabling better fault modeling at central locations. This means that each field operator is much more productive and can manage more remote sites than without the implementation of ControlEdge PLC.

In figure 3, we show the FDM accessing both the HART device's digitally accurate secondary variable and its diagnostic data. The operator can use Honeywell's Field Device Manager to connect through to the HART device using HART IP.

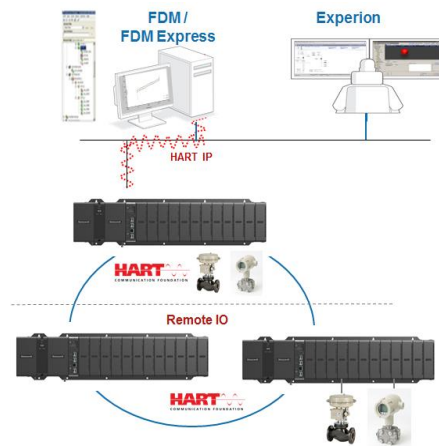For more information on smart device management, refer to the *Field Device Manager (FDM) PIN.*

Figure 4. HART data accessed by FDM remotely

I/O Module Choices

More I/O module options below provide flexibility in system design and reduce system cost:

 a. 32 Channel Digital Input (24VDC)

 b. 16 Channel Digital Input (120/240VAC)

 c. 32 Channel Digital Output (24VDC)

 d. 8 Channel Digital Output (120/240VAC)

 e. 8 Channel Universal Analog Input (TC, RTD, other)

Remote Terminal Panels

Optional DIN rail mounted Remote Terminal Panels (RTPs) are available for use with pre-wired cables to reduce installation time and labor expense. Three cable lengths are available: 1.0m, 2.5m and 5m. RTPs switch field power to allow module removal and installation under controller power.

Controller Redundancy

Honeywell's redundancy is ready to go. There is no need to program any differently from a non-redundant controller. ControlEdge PLC takes away the complexity. No additional infrastructure is required to synchronize the data between CPMs.

Figure 5. Redundant Controller and Power Supply

Enhanced Hardware Design

A security cover prevents unauthorized access to physical mode switch, SD card and the RJ45 connectors from being accidentally unplugged. It is also transparent for viewing the diagnostic information from LEDs on the CPM. A wide-access I/O door opens out, providing clear access and visibility to the labels and terminal blocks for easy wiring.

Robust Cyber Security

Our embedded cyber security supports compliance, reduced risk, and availability. Features include secure boot to prevent uploading of unauthorized software, a built-in firewall to reduce exposure to denial-of-service attacks and message flooding.

In addition, PLC communication is secured using IPSec. This prevents man-in-the-middle attacks and protects ControlEdge PLC from unauthorized access. Encryption for critical data employs NSA Suite B recommended algorithms. Supports easy configuration and provides certificate-based authentication.
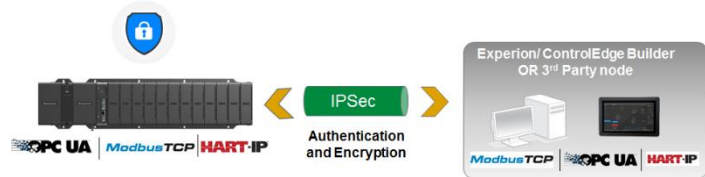

Figure 6. PLC Communication Secured with IPSec

At the forefront of industrial safety and security, Honeywell offers Industrial Cyber Security Solutions and Managed Services that help protect the availability, safety and reliability of industrial control systems and site operations. Honeywell improves business performance by reducing the risk of incidents, faults and failures that disrupt normal operations. This means customers can have greater confidence in the security of their PLC installation.

Embedded OPC UA Protocol

As the protocol of choice for IIoT, OPC Unified Architecture (UA) provides secure, reliable and vendor-neutral transport of raw data and pre-processed information from the sensor and field level up to the manufacturing level. Utilizing this open protocol – embedded directly in the controller itself as a client and a server – Honeywell's ControlEdge PLC provides users with the flexibility to choose between interfaces while simplifying integration with a wide range of third-party systems and devices. Interoperable multi-level and multiplatform open communication provides flexible and scalable design, enabling standardization with less hardware.

ControlEdge Builder — An Integrated Configuration Environment

ControlEdge Builder is ControlEdge PLC's integrated configuration tool to design, configure, program and maintain your PLC investment. ControlEdge Builder is fully compliant to IEC 61131-3, supporting all five programming languages.

- Ladder Diagram (LD)

- Function Block Diagram (FBD)

- Structured Text (ST)

- Instruction List (IL)

- Sequential Function Chart (SFC)

In addition to the basic function blocks that come with an IEC 61131-3 environment, ControlEdge Builder includes Honeywell designed function blocks derived from our extensive industry experience and family of market leading automation controllers. Function blocks include PID, Device Control, Auto Manual, Fan Out, and Ratio Control, just to name just a few.

ControlEdge Builder is designed to work locally or remotely to the controller using TCP/IP. Personnel can program on site or from a remote central location to save time and mitigate the need for site work. In addition, a common builder between ControlEdge PLC and ControlEdge RTU reduces training and maintenance cost.

Remote Firmware Upgrades

Being able to remotely upgrade controller firmware is very important when there are several controllers geographically distributed. To account for low bandwidth, unreliable networks, remote firmware upgrading from ControlEdge Builder is a two-step process ensuring uptime of the controller and reliability of the result.

Remote Diagnostics

Just as important as being able to remotely program and upgrade ControlEdge PLC is being able to remotely diagnose the health of the PLC. ControlEdge Builder provides a high definition analysis of the health scenario, leading to fewer site visits.

Scalable to a Broad Range of Applications

Honeywell's PLC solution enables you to configure a control system with functionality to suit your specific needs. The controllers are scalable not only in their speed of processing, but also in their performance characteristics. In addition, they offer networking options across different communication standards.

ControlEdge PLC is designed to optimize small unit applications ranging from motor control and HVAC systems, to pumps, generators and more. It is also ideal for process industry applications such as waste water treatment, instrument air handling, coal and ash handling, chiller controls, and drying equipment.

Expert Service & Support

Honeywell has been recognized as an automation industry leader for more than four decades. Our technology is installed in some of the largest refineries, plants, mills and mines in the world. Honeywell automation systems are easy to install and use, and are the most reliable and scalable systems available.

Honeywell understands that knowledgeable support and implementation services— delivered when and where they're needed—are critical to the success of any automation project.

For More Information

Learn more about ControlEdge PLC – Easy Integration and Flexible Deployment at our website www.honeywellprocess.com/PLC or contact your Honeywell account manager.

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