

Experion I/O Families



The Experion® Process Knowledge System (PKS) is an innovative process automation system that unifies knowledge with process and provides unmatched process connection capabilities through a comprehensive selection of I/O families and modules.

Flexibility and Reliability

Experion provides or enables these key I/O and process connected functions, features, and benefits:

- Five fully integrated I/O families in a wide range of form factors, mounting styles, and with a comprehensive set of functions, features, environmental ratings, certifications, and module types.
- All I/O families are fully integrated with the Experion control processors and user interface.
- Support for legacy I/O allows the users to protect their investment and evolve to Experion at a pace that makes most sense for their plant and people.
- Integrates with the leading field level networks and smart digital device protocols (like HART, FOUNDATION Fieldbus, ProfiBus, Modbus, DeviceNet, and DE).
- Optionally, networks and I/O modules can be implemented in a redundant configuration providing no single point of failure.
- Effective and efficient engineering enabled by a user friendly, time saving graphical environment, Control Builder.
- Comprehensive set of standard detail displays for I/O modules, smart devices, and I/O related components to facilitate faster commissioning and startup and provide more value out of the box.
- Comprehensive and effective asset management and troubleshooting solutions and tools.

Experion I/O Families

Five I/O families are available for use with the C200 and C300 control processor.

- Rail I/O Series-A (RIOM-A)
- Rail I/O Series-H (RIOM-H)
- Chassis Series-A I/O (CIOM-A)
- Process Manager I/O (PMIO)
- Series C

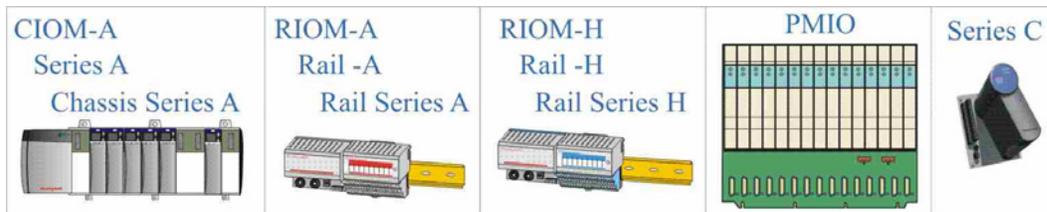
These flexible choices allow the user to pick the solution that makes the most sense for their specific process application.

In many cases, I/O families can be mixed and implemented within the same control processor to provide maximum flexibility while minimizing installed cost.

Redundancy

All I/O modules and components are industrial grade and robust, but when the I/O and process signals are essential to the safe and optimal operation of the process Honeywell provides redundancy.

Modules and communication media can be configured to create a solution with no single point of failure, from I/O, through control processor, to the user interface.



Chassis I/O Series-A

The CIOM-A family provides a large selection of I/O modules and field level network gateways in a compact chassis-based design. CIOM-A modules can be placed local or remote to the control processor. CIOM-A provides a flexible and robust solution where module redundancy is not an essential requirement.

The CIOM-A family offers:

- Large selection of traditional I/O module types
- Comprehensive coverage for field networks and smart device protocols (HART, FF, ProfiBus, DeviceNet)
- I/O modules can be located at the process and remote to the control processor
- Field wiring can be landed on a removable terminal block that mounts at the front of the module or through factory wired remote terminal assemblies
- Comprehensive set of chassis types (4, 7, 10, 13, and 17 module slot types)
- Modules are powered through an integrated power supply (optionally redundant)
- I/O communicates over hi-speed ControlNet (optionally redundant) using a deterministic publish/subscribe methodology

Rail I/O Series-A

Rail-A I/O is a compact, cost-effective modular I/O system for distributed applications. It is Din-rail mountable and provides flexible and space saving mounting options.

The RIOM-A family offers::

- Modularity of network adapter, I/O, and the backplane simplifies mounting and installation
- Compact design of hardware results in smaller cabinets
- I/O modules can be located at the process and remote to the control processor
- Separate terminal bases make it possible to replace I/O modules without rewiring, saving labor costs

Rail I/O Series H

Rail-H I/O has the same compact, cost-effective modular design as the Rail-A I/O. Modules are Din-rail mountable and can be placed local or remote to the control processor.

The essential difference between Rail-A is that Rail-H modules can be mounted directly in hazardous locations (Div 1/Zone 1). This can provide significant design, installation, and wiring savings for intrinsically safe applications.

Mixed CIOM-A, RIOM-A and RIOM-H Topologies

For maximum flexibility, these three I/O families can be mixed on the same I/O ControlNet network and connected to the same control processor.

Process Manager

Process Manager I/O it is a well proven, highly available and extremely robust chassis based I/O solution. All components can be implemented in a redundant fashion providing a solution with no single point of failure.

When introduced, PMIO set industry standards for I/O and continues to be one of Honeywell's' flagship offerings.

PMIO integration is also making it easy and cost effective for users to migrate existing legacy systems to the Experion paradigm.

The PMIO family offers:

- Extensive fault checking and reporting
- Robust, automatic, and bumpless redundancy
- Fully integrated power system (optionally redundant) with easy to wire 24 volt field power
- PMIO modules can be placed local or remote to the control processor
- Highly secure and deterministic I/O data transfer
- Can be used with the Process Manager, C200 or C300 controller providing "plug and play" migration

Series C I/O

Series C is Honeywell's newest I/O family. It leverages the success, experience, and innovative technology of the PMIO to produce a unique, patented form factor. It provides a robust and highly available platform in a sleek styling that results in reduced footprint, easier installation and maintenance, and longer life. Components can be implemented in a redundant fashion providing a solution with no single point of failure. Series C modules can be placed local or remote to the control processor.

Series C provides all of the benefits of PMIO plus these key additional benefits:

- Patented designed vertical technology allows for greater I/O channel density and more efficient cabinet heat dissipation and management
- Chassis-less module mounting and effective cable management provides for lower installed cost
- The design allows for easier maintenance
- Enhanced robustness and security functions

FOUNDATION Fieldbus

FOUNDATION Fieldbus technology is a field level serial network and a popular choice to connect smart field devices to the automation system.

It provides process connected tasks (flow, temperature, pressure, level, valve positioners, drive units, solenoids, etc.) through a comprehensive set of devices from wide range of suppliers. In addition to typical functions, **FOUNDATION** Fieldbus devices also provide a valuable status, event, and diagnostic information.

Honeywell provides a comprehensive and highly integrated solution for **FOUNDATION** Fieldbus devices.

Honeywell offers two Fieldbus Interface Modules (FIMs):

- **FIM2:** This module is provided in the Chassis Series-A form factor and it supports up to two Foundation Fieldbus H1 links per module
- **FIM4:** This module is provided in the Series C form factor and it supports up to four H1 links per module

Fieldbus Redundancy

As an option, both the FIM2 and the FIM4 provide a robust, automatic, and bumpless redundancy solution.

A Common Engineering Environment

All **FOUNDATION** Fieldbus network and device configuration is completed in Control Builder. This is the same tool used to configure all I/O components and C200/C300 control processors and control strategies.

Using a common tool enables easy configuration and management of the control strategy and all related hardware.

All related information, status, events, and diagnostics are automatically displayed by the Experion user interface along with standard detail displays for all FIMs and devices.

Control in the field

The **FOUNDATION** Fieldbus protocol also allows the supplier to embed automatic control algorithms and calculation functions into their Fieldbus devices. This provides for the concept of "control in the field" where two or more Fieldbus devices on the same Fieldbus link can be configured to perform automatic control tasks.

This concept allows entire control schemes to be implemented using multiple devices connected on the same Fieldbus network.

FIMs and Control Processors

The FIM (and its connected devices) can be implemented in an architecture that is independent of the C200/C300 processors or can include any combination of FIMs and control processors. This provides a very flexible platform where the user is free to interconnect intelligent **FOUNDATION** Fieldbus devices and any of the control processors (C200/C300) in any combination or mix that makes the most sense for the process and plant.

This allows the user to implement complex supervisory and cascade control schemes using Experion processors and **FOUNDATION** Fieldbus devices.

The table below provides a summary of each I/O family, distinguishing characteristics, and what control processor (C200 and/or C300) the family can be interfaced to.

I/O Family (Source)	Mounting type/style	Major Features and Distinguishing Characteristics	Usable with C200?	Usable with C300?
CIOM-A (AB-1756)	Chassis	<ul style="list-style-type: none"> Wide variety of I/O types and chassis sizes Good Backplane robustness (but non-redundant) Good quality I/O when redundancy is not required 	Yes	Note-1
RIOM-A (AB-1794)	Din Rail	<ul style="list-style-type: none"> Inexpensive installation and wiring Flexible mounting configurations 	Yes	No
RIOM-H (P+F Haz)	Din Rail	<ul style="list-style-type: none"> Hazardous area use (no need for IS barriers) Direct mounting in Zone-1/Div-1 Field device mounting in Zone-0 	Yes	No
PM I/O (Honeywell)	Chassis	<ul style="list-style-type: none"> High integrity, robust, redundant I/O High integrity, robust, redundant backplane High integrity, robust, redundant module and field power Comprehensive error checking/reporting 	Yes	Yes
Series C I/O (Honeywell)	Chassis-less	<ul style="list-style-type: none"> High integrity, robust, redundant I/O Has no Backplane, no single point of failure High integrity, robust, redundant module and field power Comprehensive error checking/reporting 	No	Yes

Note-1: Only four module types (DeviceNet, ProfiBus, Serial Interface, and Pulse Input) are tested and validated for use with the C300.

The table below provides additional information and selection details about each I/O family.

Function or Feature	CIOM-A	PM IO	RIOM-A	RIOM-H	Series C
Chassis sizes (# of slots)	4, 7, 10, 13, 17	7 or 15	N/A	N/A	N/A
AI, AO, DI, DO modules	Yes	Yes	Yes	Yes	Yes
Serial Interface Module	Yes	No	No	No	No Note-1
High speed pulse counter	Yes	No	No	No	No Note-1
Environment rating	G1, G3	G1, G3, Gx	TBD	G1, G3	G3
Corrosion Protection (Conformal Coating)	Optional	Optional	No	Standard	Standard
Operating temperature	0-60 DEGC	0-60 DEGC	0-55 DEGC	0-70 DEGC	0-60 DEGC
Location Certification (See Specification Doc)	Div 2 Haz Loc.	Div 2 Haz Loc.	Div 2 Haz Loc.	Zn 1/0 Haz Loc.	Div 2/Zn 2 Haz Loc.
24Vdc Field Power	External	Internal	External	External	Internal

Function or Feature	CIOM-A	PM IO	RIOM-A	RIOM-H	Series C
RIUP (removal & insertion under power)	Yes	Yes	Yes	Yes	Yes
Profibus Interface	Yes	No	No	No	No Note-1
HART Integration	Yes	Yes	No	No	Yes
Honeywell DE	No	Yes	No	No	No Note-2
DeviceNet	Yes	No	No	No	No Note-1
FF Integration	Yes	No	No	No	Yes
Engineered Cabinet	No	Yes	No	No	Yes
I/O Redundancy?	No	Yes	No	No	Yes
Field wiring method	Front of module or RTP	FTA	Below module on carrier	Below module on carrier	Carrier IOTA
Media used to connect Cx00 processor to I/O	ControlNet	Honeywell IO Link	ControlNet	ControlNet	Honeywell IO Link (2x speed)
Maximum distance Cx00 ctrl processor to I/O	Note-3	8 K-meters	Note-3	Note-3	4 K-meters
<p>Note-1: These I/O types are provided by using CIOM-A I/O modules interfaced to the C300 using FTE and FTE bridge modules.</p> <p>Note-2: DE (Honeywell Digital Enhanced) protocol can be interfaced to the C300 using PMIO modules.</p> <p>Note-3: Overall segment length is a factor of the number of drop taps used. With 2 taps the segment length could be 1000M (3280 ft.). With 48 taps the length could be 250M (820 feet). Repeaters and fiber-optics can be used to increase overall cable length.</p> <p>Legend: RTP= Remote Terminal Panel IOTA = Input Output Terminal Assembly FTA = Field Termination Assembly.</p>					

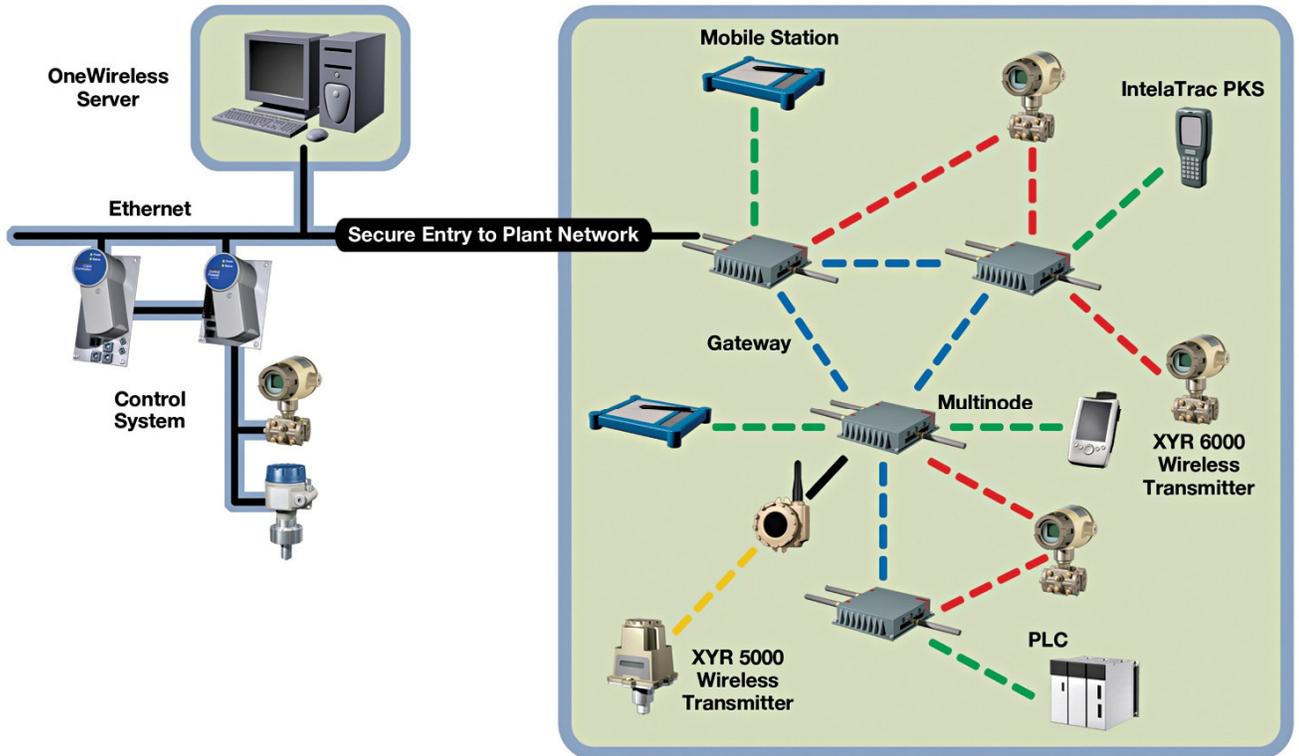
SCADA Interfaces

In addition to the five fully integrated I/O families and the C200/C300 control processors, Experion also provides access to a wide range of other Honeywell and 3rd party I/O, processors, and devices through comprehensive SCADA capabilities built into the Experion Server.

OneWireless

In addition to the traditional wired solutions, Honeywell's OneWireless™ Network is a universal and multi-functional wireless mesh network that supports field I/O, actuators and wireless-enabled applications within a single network

to optimize plant productivity and reliability, improve safety, and ensure regulatory compliance. This network delivers a global solution with robust security, predictable power management, and multi-speed monitoring that also supports Honeywell's XYR™ 5000 and XYR 6000 wireless transmitters, along with 802.11-based applications.



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The following table provides a listing of the specification documents associated with the various I/O families and solutions. These documents provide details, capacities, implementation rules and specifications.

See Specification (note-1)	Description
EP03-300-rrr	CEE-based Experion Controllers and Network Capacities and Specifications
EP03-400-rrr	CIOM-A (Chassis Series-A I/O and platform)
EP03-410-rrr	RIOM-A (Rail I/O Series-A I/O)
EP03-420-rrr	RIOM-H (Rail I/O Series-H I/O) (GI/IS)
EP03-430-rrr	PMIO
EP03-490-rrr	Series C I/O
EP03-440-rrr	DeviceNet Integration
EP03-450-rrr	Profibus Integration
EP03-460-rrr	HART Integration
EP03-470-rrr	FOUNDATION Fieldbus Integration
EP03-480-rrr	Field Device Manager (FDM)
EP03-610-rrr	Honeywell OneWireless
EP03-200-rrr	Experion Server
Note-1: rrr in the specification document number is the Experion release number. Example, 301 would indicate a specification document that covers functionality for Experion R301	

For More Information

For more information on Experion I/O visit our website www.honeywell.com/ps, or contact your Honeywell account manager.

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