HC900 Process and Safety System
A Solution for Process Control and Safety Related Applications
Wide-ranging applications

The HC900 Process and Safety System reduces hardware, software, training and support requirements, and is ideal for diverse industries such as:

- Chemicals, including specialty and fine chemicals, plastics & rubber
- Pharmaceuticals & Cosmetics
- Power (excluding nuclear)
- Cement & Glass
- Pulp & Paper
- Mining & Metals
- Water & Waste Water
- Food & Beverage
- Heat Treatment

Applications in which HC900 is proving invaluable include the following:

Safety:
- Burner Management Systems (e.g. furnaces, boilers, pre-heaters, kilns, ovens, reactors, calciners, dryers, thermal oxidizers, melters, incinerators, process heaters, vaporizers).
- Combustion control
- Pipeline monitoring
- Spill prevention
- Road transportation
- Waste water treatment
- Terminal automation
- Emergency shutdown
- Fire & Gas monitoring

Critical control:
- Electronics and semiconductors
- Cement
- Glass
- Textiles
User-friendly process control

A touch-screen operator interface (the 900 Control Station) provides user-friendly pre-built or custom displays, along with trending, data archiving and a host of other capabilities. The 900 Control Station provides a global integrated database with HC900. A selection of controller CPU modules, multiple I/O rack sizes and multiple local or remote I/O process racks per system provide a flexible architecture that can accommodate the most demanding application.

Modularity, built-in redundancy, versatile I/O configuration and connectivity, plus the ability to configure complete process solutions and archive their program parameters for easy retrieval and implementation, permits customized pinpoint control.

HC900 Designer is the common software used to configure process and safety applications. The working environment is split using process and safety worksheets which are completely non-interfering with one another.

The HC900 Designer software used for controller configuration is a Windows-based application that uses graphic objects to represent function blocks. This greatly simplifies control strategy development and improves configuration record-keeping.

The Station Designer software used for configuration of the operator interface is conjoined with HC900 Designer software through database import functions that greatly simplify user interface display development.

Safe and reliable process control

The Honeywell HC900 Process and Safety System has a modular, scalable design that meets the control and safety requirements of a wide range of applications ranging from process PLC’s to DCS.
A solid and secure investment for the future

Proven—Ensures a safe and continuously operating environment

- Honeywell has a wealth of experience with FSC (Fail Safe Controller) & Safety Manager thus validating our capability to support safe and continuous operating applications. The HC900 system is fully field-proven with over 13,000 installations globally across process control and critical applications. The system complies with most major standards and regulations such as CSA/FM CL1/DV2, ATEX, ABS, UL, and CE Conformity.
- The system is also certified by TÜV for use in a SIL-2 environment. The system is ideal for a process/safety software environment. Its non-interfering software environment means that the HC900 system is capable of hosting process control and safety applications, providing control, monitoring, password protection for configuration, alarm processing and data acquisition for process applications thus adding to reliable data and information being stored and protected.
- High reliability and availability is ensured by redundant CPU, rack power supply, communications and networking. Redundancy at CPU, Racks, Power Supply, and Communications allows customers to keep their system running continuously.
- Online Configuration, Monitoring, Removal & Insertion under power—During startup a lot of time can be spent “tweaking” the design or correcting design mistakes. The HC900 allows configuration changes and online replacements to be made without shutting down the process.
- Advanced hardware, sensor diagnostics allow operators detect unforeseen incidents thus maintaining a safe and continuous operating environment.

Accurate and optimal performance—Increases throughput and efficiency

- Tighter process control—The standard fuzzy logic of the HC900 prevents process overshoot and provides tighter control thus increasing throughput, efficiency and minimizes energy costs.
- Digital Response Time Improvements—New SIL2 certified CPU with improved digital throughput of 10ms* will help capture process changes quicker thus increasing process efficiency.
- External Watchdog Timer with independent clock*—Provides a safeguard for detecting and correcting spurious CPU lock-ups using independent clock. External watchdog timer is advantageous over internal watchdog timers as internal watchdog can be damaged if CPU is damaged. Internal faults are monitored and add to efficiency and performance of system.

Low cost of ownership

- Universal Analog Inputs, which minimize hardware to buy and reduce inventory.
- No annual software license fee.
- Free software web-based downloads for product enhancements.
- Worldwide product support with a toll-free GTS.
- Reduced training costs with common tools for process and safety applications.
- One vendor for Burner Management Solutions—integration with a portfolio of Honeywell products thus reducing total solution cost.
So easy, in all aspects

**Easy to own**
- Purchase only what you need initially, then expand as desired, thanks to modular/scalable platform design.
- Take advantage of the control design to cut hardware and software costs and reduce training and support requirements.
- Reduce spares requirements, with universal analog inputs (TC, RTD, V, mV, mA) on the same I/O card.
- Use a graphic operator interface for extensive controller status views and integrating database contents with the controller.
- Maximize run times and reduce support costs, with built-in alarm e-mails.

**Easy to operate**
- Streamline intuitive operation, eliminate errors, speed data access, and improve process supervision with a touch screen interface featuring custom graphic displays.
- Upgrade throughput, while reducing energy and scrap costs, thanks to tighter process control.
- Monitor process performance, and enhance data security with local data archiving.
- Facilitate fast, accurate process changes with recipe selections chosen from secure controller storage.

**Easy to engineer and start up**
- Integrate a total solution with process control logic and sequences, communications, archived settings, and process recipes.
- Reduce start-up time with run-mode configuration monitoring and edits.
- Simplify record keeping and eliminate filing errors with configuration back-build.
- Ensure confidence and compatibility with a customized user-friendly dedicated operator interface.
- Shorten design cycles and enhance design flexibility with conjoined controller and interface configuration tools.
- New I/O voting and validation Function Blocks—New AI & DI input blocks include 1oo2 and 2oo3 voting capabilities. Additional safety function blocks makes data more reliable as output can be validated with new function blocks, thus reducing engineering efforts.

**Easy to maintain**
- Manage and access historical process data quickly and easily, through electronic records and logs.
- Eliminate PC or network dependency, reduce downtime, and enable portable configurations with a controller-centric database.
- Avoid process shutdowns with hot-swappable I/O removal/insertion while system is powered.
- Simplify version management and minimize software maintenance with a backward-compatible configuration tool.
- Eliminate compiled databases and uncertainty; reduce service support requirements, with back-built configuration.
Modular design for process and safety applications with similar hardware and software tools

The modular, scalable HC900 Controller is available in three rack sizes and three CPU performance levels to handle a wide range of automation requirements. Analog and digital modules support up to 1,920 I/O points. Universal analog inputs that accept both direct and indirect inputs from sensors minimize the number of input cards and spare parts required. Configuration time is reduced through the availability of process-specific function blocks, including I/O validation safety function blocks suited to individual application needs.

**Common hardware and software for process and safety**

HC900 offers the capability and flexibility of hosting both safety and process control applications on a single hardware platform or separate platforms depending on the need of the application or the end user although proper design procedures must be followed to ensure there is no common cause of failure between BPCS and SIS when shared components are used between the safety and process control system. A common hardware platform allows separation between the process control and safety environments within the designer software which is totally non-interfering and easy to configure using function block methodology.

Similar hardware for process control and safety allows for easy training of engineering and safety personnel. This leads to development and training cost savings because the same function block software is used for safety and process. Training costs are reduced because training on using the tools need to be conducted only once.

The operators can have the same HMI or operator interface with enhanced diagnostics to view the process and safety control operations. The use of a similar kind of system for process control and safety reduces the system complexity and number of systems from different manufacturers used.

**Function blocks simplify execution of complex control strategies**

HC900 process and safety systems are configurable from a menu of more than 125 different types of software function blocks, each representing a unique algorithm for a specific control function. Available CPU options support up to 400, 2000, or 5000 function blocks. Function block types are not limited.

**HC900 control loops** provide tighter, more accurate process control to increase throughput, reduce scrap, and minimize energy costs. They include applications ranging from single loop control to interactive cascade, ratio, duplex, feed forward, three-position-step, or custom control strategies. The quantity of loops per controller is not limited. Accutune III auto tuning is standard on every control loop to reduce startup time and ensure on-spec product.

**Integrated logic capability** can execute all logic functions approximately every 10 milliseconds and/or be synchronized with analog processing at 500 milliseconds.

**Sequencers** control the output states of multiple digital parameters to control the sequence of process operation based on time or process events.

**Setpoint programmers** automatically manipulate a setpoint value for use by PID loops to create a time/value profile for process batch control.

A **setpoint scheduler** provides up to eight ramp/soak setpoints along with eight soak only setpoints that operate on a common time base.
Implementation options support diverse configuration and I/O needs

Recipes stored in the controller memory make it easy to ensure error-free product/process changeovers. These recipes include variables, setpoint profiles, setpoint schedules, and/or logic sequences that can be loaded by operator action or included as an integral part of the HC900 controller configuration for automatic loading.

Redundancy features maximize process availability by providing backup controllers, power supplies and communications for seamless failover under fault conditions.

Ethernet network ports are continuously active on the lead controller, each on a different subnet. Transfer of communications from one port to another port on the same CPU is handled by the host application. A secondary power supply can also be added to each HC900 I/O rack for standby redundancy.

Remote I/O capabilities maximize installation flexibility and reduce wiring and installation costs, with up to four remote I/O racks able to connect to a single controller.
Flexible connectivity to suit your process environment

Open Ethernet connectivity enables HC900 controllers to communicate with their host interfaces and each other. The open Modbus/TCP protocol allows interfacing to most popular HMI, data acquisition and OPC software. Up to 10 device connections are supported on the host Ethernet port. An HC900 network of controllers and operator interfaces are partitioned into segments on the network to maximize communication performance.

Serial Modbus connectivity, using selectable Modbus RTU capability, allows two RS485 ports to be configured as Modbus slaves, while one of the ports is selected as a Modbus master. A wide variety of devices (touch panel operator interfaces, I/O devices, etc.) can be connected to the controller to provide greater flexibility in system design.

Peer-to-peer communications allows any HC900 to interface with up to 32 other units for process equipment applications that require sharing data between controllers.

Wireless connectivity, using dedicated communication function blocks in the HC900 Controller, simplifies setup and operation of the controller with Honeywell wireless transmitters, via an RS485 network to multiple base stations. Connectivity to the OneWireless™ LAN is via an Ethernet connection to a wireless gateway.

E-mailed alarm/event reporting communicates process upsets over a plant LAN or via the Internet using the HC900’s e-mail capability. Alarms and events may be programmed to send messages to up three different e-mail addresses.

Building-block configuration simplifies control implementation

HC900 Designer software enables system configuration with a Windows XP, Vista or 7 based PC. It uses drag-and-drop placement techniques for graphic icons and soft-wiring connections between function blocks to create application-specific control strategies, automatically calculating memory usage and processor scan time as the function blocks are configured. The user-friendly graphic development allows partitioning of the control strategy into multiple worksheets for ease of recordkeeping, faster access to functional areas during programming and better support for user-specified process function identifications.

Diverse HC900 connectivity and communications options adapt to existing process-line infrastructure, satisfy specific control requirements, and accommodate specialty applications.
The 900 Control Station operator interface provides a large assortment of standard preformatted displays for controller monitoring and servicing. Their use shortens design time, reduces engineering costs, and facilitates standardization of operator interaction with the process—all while enhancing the ability to customize easy-to-understand graphic displays that look like the process the operator is monitoring.

Station Designer software is a robust yet user-friendly PC tool that integrates with the HC900 Controller's Designer software to streamline the task of configuring a custom operator interface. It is an intuitive development environment that offers more than 4,000 pre-built process graphic symbols (for pumps, valves, tanks, buttons, switches), widgets, animation, hide object, if-then-else scripting, and more.
Operator interface features:

- Multilingual: English, French, Italian, German, Spanish.
- Setpoint Programmer Pre-plot Display: Pre-plot display is a Widget that gets bound to a Setpoint Programmer function block.
- Concurrent Batch Reports: Schedules multiple batch reports to run concurrently.
- Bar Code/Keyboard Input: Use touch screen, remote keyboard or barcode reader to enter data.
- GSM/GPRS, SMS Available: The GSM/GPRS modem may be used via a Cellular Network Provider’s wireless network.
- Emulation: Launch the emulator to see data as it would appear on the operator interface.
- NEMA Type 4X operator interface screen withstands harsh operating environments.
- Easy-to-operate 10"-display includes both a touch screen and dedicated buttons.
- Standard and custom graphic elements can be assembled into specific displays, for fast and easy startup.
- Custom graphics tools let you select from 4,000+ pre-built objects for animation support, math, formulas, scripting.
- Function block widgets accelerate configuration development.
- Controller status displays verify system integrity, with no configuration required.
- Recipe selection makes product/process changeovers simple and accurate.
- Trending and data logging is provided via non-volatile flash card storage, with USB memory support and no artificial limits.
- Multi-level log-on security feature prevents unauthorized access.
- Alarm/event logging with e-mail notification of impending problems tracks process upsets and validates performance.
- Ethernet or serial connectivity enhances installation flexibility, includes Modbus and Modbus/TCP protocol support.
- Embedded web server feature allows access to your application from anywhere.
- Multiple interfaces on each controller enable process management from up to three locations.
The HC900 process and safety system integrates easily and smoothly with the Honeywell Experion HS (SCADA) solution, and with Matrikon OPC third-party solutions.

Integrate with Experion HS and Matrikon OPC

Experion HS

Experion HS is a powerful software platform that incorporates innovative applications for human machine interface (HMI) applications and supervisory control and data acquisition (SCADA). Built upon the proven technologies of the Experion platform, Experion HS is an integrated and affordable solution for smaller unit operations. Experion HS enables seamless integration, configuration and data exchange with the HC900 system.

HC900 OPC Server from MatrikonOPC

The HC900 OPC Server from MatrikonOPC provides secure and reliable real-time data access between all HC900 Controller series and any OPC-enabled applications such as Historians, HMIs, SCADA etc. It enables 3rd party connectivity—which is key to successful phased migration and integration. It enables the easy and cost-efficient management of openly connected systems—crucial in today’s highly competitive industrial environment. And by using standardized MatrikonOPC components you can build stronger, more secure architectures.

Furthermore, the Honeywell HC900 OPC Server is OPC certified. OPC certification is the process of ensuring that applications meet the standards specified by the OPC Foundation. OPC certification requires extensive testing to ensure true interoperability. OPC certification means multi-vendor system interoperability is guaranteed.
Controller

**Function Blocks:** C70, C75 CPU–5000, C50 CPU–2000, C30 CPU–400.

**Analog Inputs:** Up to 480 universal analog inputs, 960 high level.

**Accuracy:** 0.1% of span (field calibration to ± 0.05% of span).

**Analog Outputs:** Up to 200 with internal power, 960 with external power 0 to 20 mA maximum, 12 bits, 0.1% accuracy.

**Digital Inputs/Outputs:** Up to 1920, contact DI, 24Vdc DI/DO, 120Vac DI/DO, 240Vac DI/DO.

**Total I/O:** Up to 1920.

**I/O Racks per System:** One controller and up to four remote I/O racks.

**Control Loops:** PID, on/off, cascade, ratio, %C, three-position step.

**Control Output Types:** Current, time-proportioning, position-proportioning, three-position steps.

**Setpoint Programmers:** 50 segments each, 16 event outputs, multiple stored profiles.

**Setpoint Scheduler:** 50 segments, 8 ramp/soak outputs, eight auxiliary outputs, 16 events, multiple schedules.

**Comm:** Ethernet 10/100 base T, Modbus/TCP protocol, up to 10 Ethernet hosts on C50, C70, C75 up to 32 peer-to-peer controllers, Serial Modbus RTU, RS485 or, slave or master operation (up to 32 slaves).

**Operating Temp:** Rated 0° to 140°F (0° to 60°C).

**Humidity:** Rated 10% to 90%, non-condensing.

Control Station Operator Interface

**Display:** 10.4in (264mm), TFT active matrix color LCD.

**Touch Screen:** Resistive analog.

**Distance from Controller:** Ethernet—328ft (100m), RS485—2000ft (600m).

**Power Supply:** 24Vdc, 1.4A.

**Size (WxHxD):** 12.83in x 9.5in x 2.2in (325.8m x 241.3m x 55m).

**Operating Temperature:** 32° to 122°F, (0° to 50°C).

**Humidity:** Rated 10 to 90%, non-condensing.

**Panel Rating:** Type 4X.

**Memory:** 16MB onboard non-volatile flash, optional memory card (compact flash 2GB).

**Comm. Ports:** Ethernet 10/100 base T, 1xRS-485, 2xRS232 Serial.

**USB Ports:** 2 x USB specification 2.0 host port, type A, 1 x USB specification 2.0 device port type B.

**900 Station Designer Software**

**Configuration:** 900 control station CS interface—offline.

**Operating Environment:** Windows 2000, XP, Vista.

**PC:** Pentium class processor and RAM as required by the chosen operating system plus 50MB for software installation. 800 by 600 pixels minimum, 256 or more colors. RS-232 or USB port.

**Cable:** USB Host, RS232 Serial, Ethernet 10/100 base T.

**HG900 Designer Software**

**Configuration:** HG900 Controller—offline with run-mode editing.

**Operating Environment:** Windows XP, Vista, 7.

**PC:** Pentium, 2GHz with 256 MB RAM minimum, SVGA or greater screen resolution.

**Cable:** RS485—three-wire, Ethernet 10/100 base T.

**Modem Support:** Monitor, upload, download configuration.

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For More Information

To learn more about Honeywell’s HC900, visit www.honeywellprocess.com or contact your Honeywell account manager.

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