CONTROLEDGE™
HC900
Process Control and Safety Made Easy
The Honeywell ControlEdge™ HC900 Process and Safety System is a fully field-proven system for process control and safety applications, with over 15,000 installations throughout the world. Its SIL-2 certification means it can be used in a variety of safety application such as burner management systems (BMS), emergency shutdown systems (ESD), fire & gas monitoring, pipeline monitoring, spill prevention, tunnel ventilation, etc.

**TUV Compliance**

The ControlEdge HC900 is fully validated to perform its safety tasks, and is certified by TUV for use in a SIL-2 environment. The system is ideal for a process/safety environment. Its non-interfering software means that the ControlEdge 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.

**TYPICAL INDUSTRIES**

- Chemicals (including specialty and fine chemicals, plastics and rubber)
- Life sciences and Cosmetics
- Power (excluding nuclear)
- Cement and Glass
- Mining and Metals
- Water and Wastewater
- Food and Beverage
- Heat Treatment
- Buildings / Infrastructure - Metro Rail, HVAC etc.

**CUSTOMER BENEFITS**

- Proven & Reliable
  - Maximizes uptime
- High Performance
  - Tighter control
  - Reduced scrap
  - Higher throughput
- Easy to Use & Engineer
  - Lowers operational costs
- Enhanced Safety
  - with SIL 2 certification
- Critical Control
  - Electronics & SemiConductor
  - Cement and Glass
  - Textiles
- Certifications
  - TUV SIL2
  - CSA-Canada and USA (HazLoc) / FM CL1 / Div2
  - ATEX
  - ABS
  - UL
  - CE
  - RoHS

**TYPICAL APPLICATIONS**

- Safety
  - Burner Management Systems (e.g. furnaces, boilers, ovens, pre-heaters, reactors, calciners, dryers, thermal oxidizers, kilns, melters, incinerators, process heaters, vaporizers)
  - Combustion Control
  - Pipeline Monitoring
  - Spill Prevention
  - Metro / Road Transportation - Tunnel Safety, Ventilation
  - Wastewater Treatment
  - Terminal Automation
  - Emergency Shutdown
  - Fire & Gas Monitoring
  - Pressure and Flow Control

**DIVERSE APPLICATIONS RANGING FROM PROCESS PLCs TO DCS**

- Proven track record
- Redundancy
- G3 conformal coating for harsh environment
- RoHS compliant
- Actionable information

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MULTIPLE SYSTEMS, MULTIPLE I/O RACKS
ControlEdge HC900 Hot Stand-by Architecture

CPU Capacity

<table>
<thead>
<tr>
<th>Function</th>
<th>Point per module</th>
<th>Max. for C30 CPU</th>
<th>Max. for C50 CPU</th>
<th>Max. for C70 / C75 CPU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog in</td>
<td>Universal: 8, High Level: 16</td>
<td>Universal: 1153, High Level: 2304</td>
<td>Universal: 1153, High Level: 2304</td>
<td></td>
</tr>
<tr>
<td>Analog out</td>
<td>R: 16, L: 16</td>
<td>480</td>
<td>480</td>
<td>480</td>
</tr>
<tr>
<td>Analog out (external Power)</td>
<td>R: 16, L: 16</td>
<td>192</td>
<td>2304</td>
<td>2304</td>
</tr>
<tr>
<td>Digital in</td>
<td>16 or 32</td>
<td>384</td>
<td>4608</td>
<td>4608</td>
</tr>
<tr>
<td>Digital out</td>
<td>8 AC or 16 DC, 32</td>
<td>384</td>
<td>4608</td>
<td>4608</td>
</tr>
<tr>
<td>Function blocks</td>
<td>n/a</td>
<td>480</td>
<td>2000</td>
<td>15000</td>
</tr>
</tbody>
</table>

Controller
- Function Blocks: C70, C75 CPU–15000, C50 CPU–2000, C30 CPU–400
- Controller C75 CPU supports redundancy (in common and separate rack). Redundant CPU racks can be placed at least 1km apart.
- Analog Inputs: Up to 1152 universal analog inputs, 2304 high level, A/D Resolution is ±15 Bits
- Accuracy: ±0.3% of span (Field calibration to ±0.05% of span)
- Universal SIL IO Module (UIO)–16 channel, with Live SOE, HART, Line Monitoring, Voting & Validation and I/O redundancy
- HART/IP support for improved device diagnostics and easy maintenance
- Digital Inputs/Outputs: Up to 4608, contact DI, 24 VAC/DC, 120 VAC/DC, 240 VAC/DC
- Total I/O: Up to 4608
- I/O Racks per System: One controller and up to 11 remote I/O racks
- ControlLoops: PID, on/off, cascade, ratio, N/C, three-position step
- Control Output Types: Current, time-proportional, position-proportional, three-position steps
- New Input Voting (1002 and 2003) and output validation function blocks (with feedback verification)
- Setpoint Programmers: 50 segments each, 16 event outputs, multiple stored profiles
- Setpoint Scheduler: 50 segments, ramp / soak outputs, eight auxiliary outputs, 16 events, multiple schedules
- Communications: 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, slave or master operation (up to 32 slaves), HART/IP for analog signals
- Operating Temp: Rated 32° to 140°F (0° to 60°C)
- Humidity: Rated 10% RH to 90% RH, non-condensing

Designer Software
- Configuration: ControlEdge HC900
- Controller – offline with run-mode editing
- Operating environment: Windows 7 Pro (32 or 64-Bit), Win 8 and Win 10
- PC: Pentium, 1.5 GHz with 1 GB RAM minimum, SVGA or greater screen resolution
- English and Mandarin languages supported (switchable after installation)
- Cable: RS 485 – three-wire, Ethernet 10/100 base T

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MODULAR AND SCALABLE

• Available in three rack sizes and three CPU performance levels
• Handles a wide range of automation requirements
• Analog and digital modules support up to 4608 I/O points
• Scalable and expandable
• Easy to own, engineer, operate and maintain
• Upto 12 racks and 4608 IO’s

FUNCTION BLOCKS
• Simplify execution of complex control strategies
• Over 125 different types of software function blocks available
• Each function block represents a unique algorithm for a specific control function
• Available CPU options support up to 400, 2,000 or 15,000 function blocks
• Simply drag and drop, and soft-wire
• 1oo2 and 2oo3 Voting Function Blocks, DO-V and AO-V (Digital Output and Analog Output Validation Function blocks).

SEPARATE PROCESS SAFETY WORKSHEETS
• Same type of controller can be used for process and safety applications thus reducing total cost of ownership
• Provisions are provided within programming environment to program using safety/process worksheets

UNIVERSAL ANALOG INPUTS
• Accept both direct and indirect inputs from sensors
• Minimize the number of input cards and spare parts required
• Inputs may be mixed on a module and may include multiple thermocouple types, RTDs, ohms, voltage or millivoltage types.

SIL UNIVERSAL IO MODULE
• 16 channel user configurable to DI, DO, AI or AO
• High resolution SOE with 1 ms time stamp
• Line Monitoring (Open Wire, Short Circuit Detection)
• HART support for Analog signals
• In-built Voting & Validation
CONTROL LOOPS

- Provide tighter, more accurate process control
- Include applications ranging from single loop control to interactive cascade, ratio, duplex, feed-forward, three-position-step, or custom controlled strategies
- Increase throughput, reduce scrap, and minimize energy costs
- Quantity of loops per controller is not limited

Cascade control
- The Cascade Loop uses 2 PID blocks with the back calculation pin of the secondary (BCD) connected to the primary loop (BCI). This transfer is reverse; i.e., the primary loop to adjust the PID for changes in mode of the secondary loop
- The RSP input for the secondary loop can be selected to be in engineering units or %, eliminating the need to scale the output of the primary loop

FUZZY OVERSHOOT SUPPRESSION
- Fuzzy Overshoot Suppression minimizes the Process Variable (PV) overshoot following a Setpoint (SP) change or a process disturbance. This is especially useful in processes that experience load changes or where even a small overshoot beyond the setpoint may result in damage or product loss.
- The Fuzzy Logic in the controller observes the speed and direction of the PV signal as it approaches the setpoint and temporarily modifies the internal controller response action as necessary to avoid an overshoot. There is no change to the PID algorithm, and the Fuzzy Logic does not alter the PID tuning parameters.

Accutune III
- Standard auto tuning on every control loop
- Reduces start-up time
- Ensures on-spec product

CARBON POTENTIAL
- The carbon potential of the furnace atmosphere can be controlled by monitoring the furnace temperature and the probe output because oxygen potential directly relates to the carbon potential. A combined carbon probe, temperature probe, and PID algorithm determine carbon potential of furnace atmospheres based on a zirconium probe input.
- Activates anti-sooting feature that limits the working setpoint of the carbon control loop to a value that prevents sooting in the furnace.
FREE-FORMAT LOGIC
- Optimizes design by combining multiple logic functions into one
- Simplifies operation and troubleshooting

SEQUENCERS
- Control the output states of multiple digital parameters
- Control the sequence of process operation based on time or process events
- Each sequencer supports up to 16 digital outputs and may have up to 50 process states
- Multiple sequences can be selected on demand from the operator interface or as part of a recipe

RECIPES
- Stored in the controller memory
- Ensure error-free product/process changeovers
- Write values into analog and digital variables
- Load via Control Station
- Load via RCP block
- Can be used to:
  - Write a value to any variable
  - Load setpoints
  - Select setpoint programs
  - Set alarm limits
  - Activate control valves

SETPOINT PROGRAMMER
- Automatically manipulates a setpoint value for use by PID loops
- Creates a time/value profile for process batch control
- Multiple setpoint programmers, with profiles of up to 50 segments each, may be configured and stored
- Any programmer may run any profile separately or simultaneously
- Each also has an auxiliary soak output and up to 16 event outputs for integration with sequence control functions
DEW POINT CONTROL
- Dew point analysis measures the amount of water vapor present which in turn helps determine the carbon potential of a furnace atmosphere
- This application uses the dew point function block to calculate dew point based on using a carbon probe where the input is an O2 sensor
- A typical example is control of an endothermic atmosphere generator when the user requires dew point for PV

SETPOINT SCHEDULER
- Provides up to eight ramp/soak setpoints that operate on a common time base
- Supports up to 16 event digital outputs 50 segments per schedule; the number of stored schedules is configurable
- Auxiliary Scheduler provides an additional 8 Soak Setpoints
- Multiple independent setpoint schedulers are available in a configuration

REDUNDANCY
- Maximize process availability by providing backup controllers, power supplies and communications for seamless failover under fault conditions
- Redundant Switch Module (RSM) is located in the rack between two CPUs and visually indicates which CPU is the lead and which is the reserve
- Key switch on the RSM allows the user to change the operating mode of the lead and reserve CPUs
- 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 ControlEdge 900 Platform I/O rack for standby redundancy
- Supports redundant I/O configuration in Universal Module

AMS COMPLIANCE
- The ControlEdge HC900 meets AMS 2750E, the key requirement for controlling, monitoring and recording instruments, which is a calibrated accuracy (±2°F/1.1°C)
FLEXIBLE CONNECTIVITY SUITS YOUR PROCESS ENVIRONMENT

OPEN ETHERNET CONNECTIVITY
- Enables ControlEdge HC900 controllers to communicate with their host interfaces and each other
- 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
- ControlEdge HC900 network of controllers and operator interfaces are partitioned into segments on the network to maximize communication performance

SERIAL ETHERNET CONNECTIVITY
- Allows two RS485 ports to be configured as Modbus slaves, while one of the ports is selected as a Modbus master
- Wide variety of devices (touch panel operator interfaces, I/O devices, etc.) can be connected to the controller
- Provides greater flexibility in system design

CONNECTIVITY AND COMMUNICATIONS
- Adapts to existing process-line infrastructure
- Satisfies specific control requirements
- Accommodates specialty applications

PEER-TO-PEER COMMUNICATIONS
- The improved ControlEdge HC900 controllers provide peer-to-peer interface between a maximum of 32 units for process/safety equipment applications that require sharing data between controllers.
- Up to 2,240 parameters per controller may be exchanged
- Standard Ethernet communication port supports concurrent peer-to-peer communications and connectivity to supervisory systems
- Peer-peer between safety systems is done using the new Safety-peer protocol that can exchange safety critical data between peers
INTEGRATION WITH EXPERION
• ControlEdge HC900 controllers can be integrated with the Honeywell Experion DCS system for supervisory control and data acquisition
• Can be integrated with Experion PKS, LX and HS systems
• Uses Universal Modbus Driver for communication
• Redundant controllers can also be integrated with Experion

CONTROLLEDGE HC900 OPC SERVER FROM MATRIKONOPC
• Provides secure and reliable real-time data access between the ControlEdge HC900 Controller and any OPC-enabled applications such as Historians, HMIs, SCADA etc.
• Enables 3rd party connectivity for successful phased migration and integration
• Enables easy and cost-efficient management of openly connected systems

BUILDING-BLOCK CONFIGURATION SIMPLIFIES CONTROL IMPLEMENTATION

CONTROLEEDGE HC900 DESIGNER SOFTWARE
• Enables system configuration with a Windows 7 (32 or 64-bit), Win 8 and Win 10 based PC
• English and Mandarin languages supported (switchable after installation)
• Uses drag-and-drop placement techniques for graphic icons and soft-wiring connections between function blocks
• Automatically calculates memory usage and processor scan time as function blocks are configured
• User-friendly graphic development allows partitioning of the control strategy into multiple worksheets

CONFIGURATION DEBUG TOOLS
• Simplify troubleshooting, include online monitoring of multiple function blocks on a single display, on/off identification of digital signal flow connections, and output forcing capability for most block outputs
• Selectable user-defined Watch Windows and Signal Trace-back provide a clear view of the configuration operation and quick identification of potential errors

PRINTABLE PRESENTATION FORMATS
• Simplify configuration documentation
• Include a summary of controller I/O, the graphic configuration diagram, function block properties, recipe groups, setpoint profile groups, operator display and point selection

RUN-MODE CONFIGURATION EDITING
• Standard feature that can significantly reduce start-up time and avoid costly process shutdowns
System Configuration and Operation Adapt to Your Needs

The 900 Control Station

• NEMA Type 4X operator interface screen withstands harsh operating environments
• Easy-to-operate 10" and 15" touch screen display
• Standard and custom graphic elements can be assembled into specific displays, for fast and easy start-up
• 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

Operator Interface Features

• Recipe selection makes product/process changeovers simple and accurate
• Trending and data logging is provided via SD card storage
• 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
• Multilingual: English, French, Italian, German, Spanish. Other languages may be added by expanding its lexicon library
• The software also supports accessing the translation libraries of Microsoft® and/or Google® for any untranslatable text strings used in the product during configuration
• 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

900 Station Designer Software

• Configuration: 900 control station CR interface – offline
• Operating environment: Windows 7 (32, 64-bit), Windows 8, Windows 10
• 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

Control Station Operator Interface

• The 900 Control Station is available with either a 10.4 inch (254 mm) or 15 inch (381mm) display size
• LCD Display: 10" (800 x 600), 15" (1024 x 768) pixels, color active matrix thin film transistor (TFT), 16M colors
• Touch Screen: Resistive analog
• Backlight: 50,000 hr typical lifetime at room temperature (field replaceable in non-hazardous locations)
• Distance from Controller: Ethernet-328 ft (100 m), RS485 - 2000ft (600 m) RS232 - 50ft (15.24 m)
• Power Supply 10 inch: 24 Vdc, 16 Watts maximum
• Operating Temperature: 14 to 122 °F, (-10 to 50 °C)
• Humidity: Rated 0 to 85%, non-condensing from 14 to 122 °F, (-10 to 50 °C)
• Panel Rating: Type 4X/IP66
• Memory: 512MB onboard non-volatile flash, optional SD card
• Communication Ports: 10 inch (254 mm) 1 x Ethernet RJ45 10/100 base T, 15 inch (381mm) 2 x Ethernet 10/100 base T, 2 x RS-485, 2 x RS232 Serial
• USB Ports: 2 x USB specification 2.0 host port, type A, 1 x USB specification 2.0 device port type B

Graphic symbols provided in Station Designer software to simplify configuration. Hundreds of icons available, including pumps, valves, and tanks icons shown.
EASY ENGINEERING AND FLEXIBILITY THROUGH USER FRIENDLY TOOLS

CONFIGURATION COMPARISON
- Change management
- Save engineering hours in finding previous changes

BULK EDIT
- Reduces engineering hours
VERSION CONTROL
- Easy tracking, de-bugging
- Revert to earlier versions
- Save dollars for a separate version control offering

PASTE SPECIAL
- Saves 15-20% of engineering efforts

CHANGE MANAGEMENT
- Manage versions, track and compare configurations
- Easier troubleshooting thereby reducing maintenance costs

RE-USABLE CUSTOM LIBRARIES
- Save engineering time, create logic once and avoid errors

PASSWORD PROTECTION
- Controllers are password protected and thus prevents any intrusion through the network
- Any changes to the controller are monitored and validated with credentials
For more information
To learn more about Honeywell’s ControlEdge HC900, visit www.honeywellprocess.com or contact your Honeywell account manager.

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