



SOLUTIONS FOR THE GLASS INDUSTRY

SIL2 CONTROL SYSTEM FOR GLASS INDUSTRY





Abstract

The European standard EN746-2 and correlated specifies the safety required for industrial combustion system and burner applications for industrial thermoprocessing equipment including the glass furnace and glass forehearth.

The standard EN746-2 includes in the safety related control system:

- The safety valves and relative equipment for gas/air control
- Fuel pipework downstream of and including manual insulating valve
- The burners safety system and ignition device
- The electrical (hardwired) and electronic (PLC) safety device SIL2 standard

In the present article **Glass Service** in cooperation with Honeywell present the solution of HC900 safety control device.

Challenge

Whatever the process and application, the process industry faces a number of major challenges. These include the need to keep processes up and running with maximum uptime. At the same time, the performance and profitability of processes need to be maximized. And ultimately, processes need to produce products that are of a higher quality than those of their competitors.

Plant reliability, employee safety and environmental compliance are also crucial to a smoothly operating process. Accidents must be reduced to as few as possible, with zero being the goal. Emissions need to be controlled. And should an emergency scenario occur, the plant or specific process needs to be shut down in a timely and safe manner.



THE SIL2 CONTROL SYSTEM



SOLUTION

To keep your assets safe, **Glass Service** presents the SIL2 control board based on Honeywell HC900 Process and Safety System. HC900 is fully compliant with the performance-based standards IEC 61508 and IEC 61511 as well as the prescriptive-based standards NFPA 85 and NFPA 86. The system also complies with other standards and regulations such as CSA/FM CL1/DV2, ATEX, ABS, UL, and CE Conformity. Moreover, the Honeywell HC900 Process and Safety System is certi-

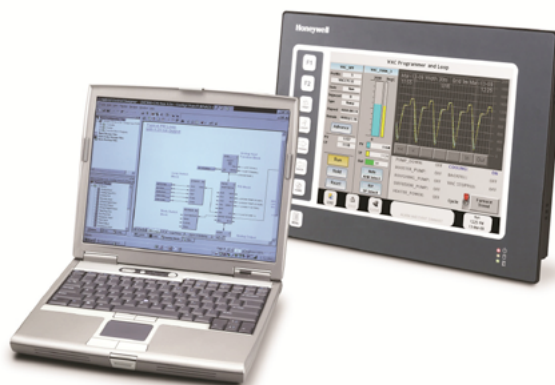
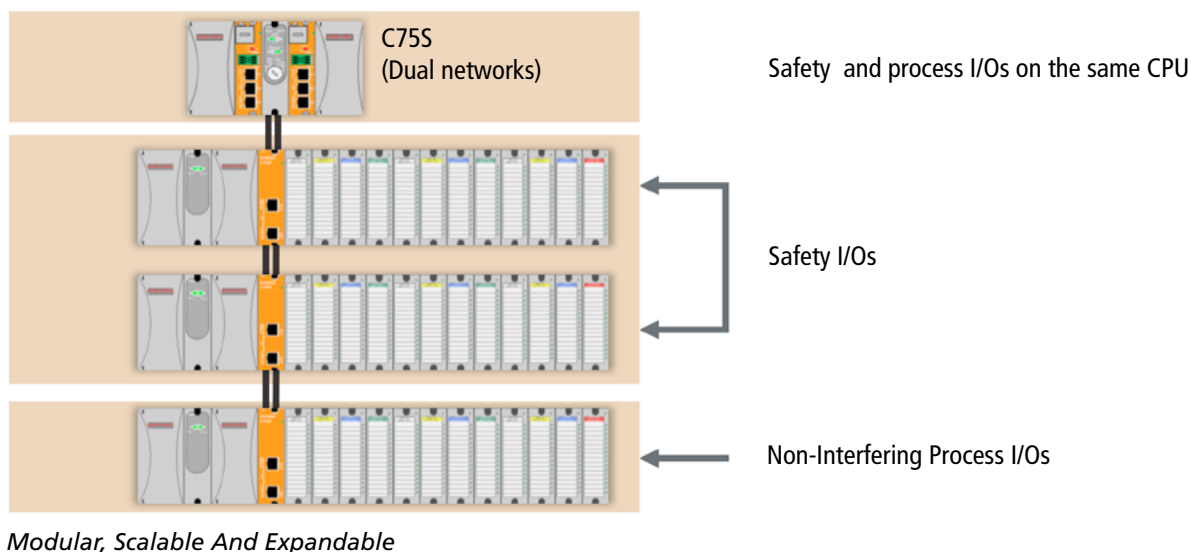
fied by TÜV for use in a SIL-2 environment. Process industries currently using the SIL2 certified HC900 system include glass industry thermal applications.

The HC900 SIL2 certified controller can include safety application and process controller in one single device.

The full electrical control board design is optimized for the SIL2 by **Glass Service** engineers.



THE GLASS SERVICE ADVANTAGE



The Glass Service SIL2 certified HC900 system offers unique benefits:

PROVEN RELIABILITY MAXIMIZES UPTIME

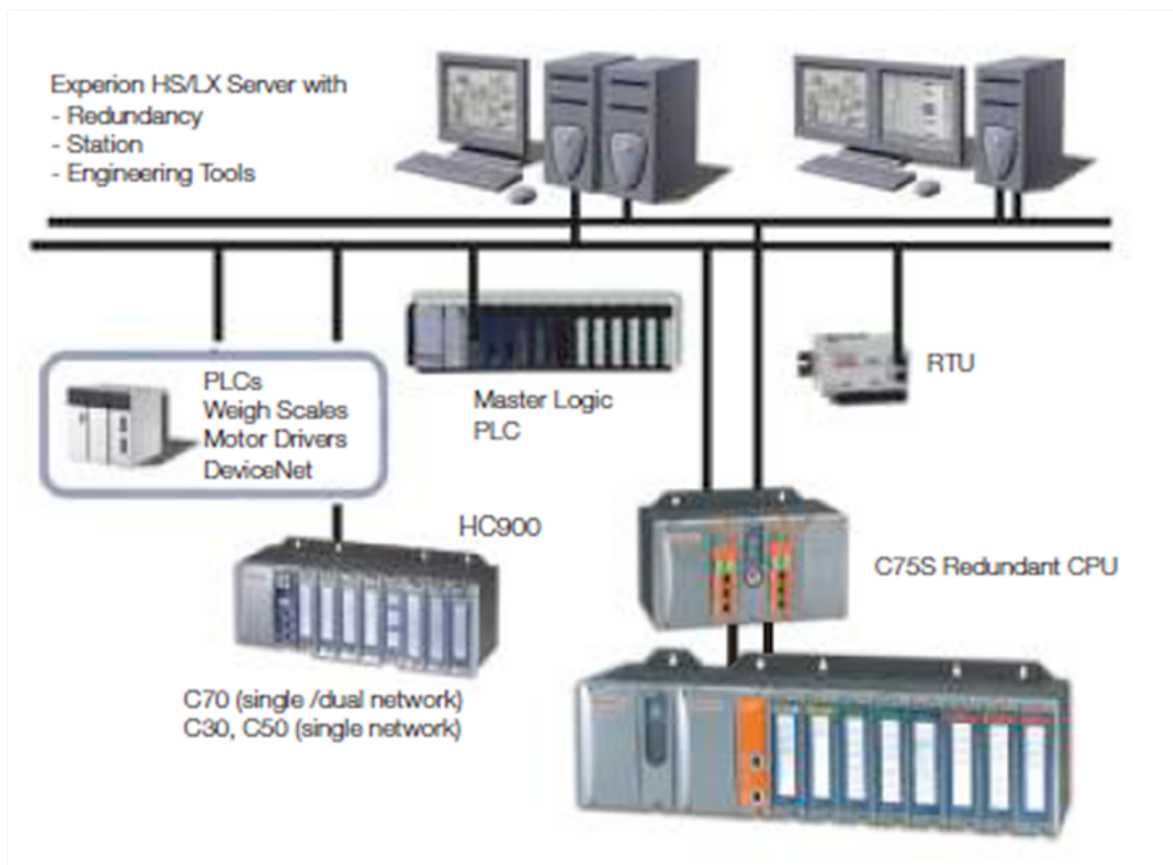
HC900 SIL2 is proven in the field with over 13,000 installations globally across process control and critical applications. The system is ideal for a process/safety software environment. Its non-interfering software environment means that the HC900 system is capable of hosting process control and safety applications, providing control, monitoring, password protection for configuration, alarm processing and data acquisition for process applications.

High reliability and availability is ensured by redundant CPU, rack power supply, communications and networking, as well as by features such as removal and insertion under power, online monitoring, edits and hardware maintenance during running operation. Its hardware, communications and sensor level diagnostics are robust, and the system provides early warning notification of pending sensor failure.

EASY TO USE AND ENGINEER LOWERS OPERATING COSTS

Process specific function blocks including I/O validation safety function blocks suited to individual application needs reduce configuration time. The system is quick to start up thanks to its HC Designer intuitive software. Powerful Accutune III auto-tuning algorithms enable control loops to be quickly and easily tuned to reduce start-up time as well as the impact of process upsets.

Advanced monitoring and debugging tools are easy to use and engineer, and the system provides an integrated operator interface and open Ethernet communications as well as central and remote I/O capability. The system is also fully scalable, allowing a customer to purchase only what the process currently needs, while enabling future expansion as the process expands.



HIGH PERFORMANCE INCREASES EFFICIENCY AND PROFITABILITY

HC900 enables accurate process control which translates into benefits such as increased throughput, reduced scrap, reduces energy utilization, and minimized energy costs. The SIL2 certified CPU displays a digital throughput of only 10 ms. Its External Watchdog Timer with independent clock helps detect failures and bring process to safe state. The system provides RAM and Flash memory enhancements, while its ECC memory circuitry corrects single faults and detects double faults, thus correcting memory corruption conditions. This ensures robustness, performance and reliability of data transmission.

ENHANCED SAFETY WITH SIL2 CERTIFICATION

HC900 provides similar hardware/software for process control and safety related applications. An option is to have a separate or a common logic solver for process control and safety applications. The system integrates easily and smoothly with the HMI (HC900 Control Station), or SCADA solution.



A LOW TOTAL COST OF OWNERSHIP IS CENSURED BY:

- Universal analog inputs, which minimize hardware to buy and reduce spare parts
- No annual software license fee
- Free software web-based downloads for product enhancements
- Worldwide product support with a toll-free support team
- Reduced training costs with common tools for process and safety applications
- Several CPU are available for many configuration, single or redundancy

HC900 CONNECTIVITY

HC900 can communicate with Honeywell device or third parties.

Open Ethernet Connectivity

- Enables HC900 controllers to communicate with their host interfaces and each other
- Open Modbus / TCP protocol allows interfacing to most popular HMI, data acquisition
- 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

- 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

CPU CAPACITY

Function	Point per module	Max for C30 CPU	Max for C50 CPU	Max for C70/C75 CPU
Analog IN	Universal 8, High level 16	Universal 96, High level 192	Universal 480, High level 960	Universal 480, High level 960
Analog OUT	4, 8, 16	40	200	200
Analog OUT (external power)	8, 16	192	960	960
Digital IN	16 or 32	384	1920	1920
Digital OUT	8 AC or 16 DC, 32	384	1920	1920
Function blocks	n/a	400	2000	5000
Configuration	n/a	Single CPU	Single CPU	Single CPU redundancy CPU
Power supply	n/a	Single or redundancy	Single or redundancy	Single or redundancy
Communication	n/a	Single or redundancy	Single or redundancy	Single or redundancy



The SIL2 certified HC900 is a single flexible system for process control and safety with faster start-up time, common engineering tools, reduced training, simplified maintenance and lowest cost of owner ship. Its engineering tools and hardware can easily integrate with Honeywell system and other third party application. This leads to increased throughput, less rework,

secure accurate process record, improved safety, and reliability, reduced human error, and loss prevention through a TUV certified SIL2 system.

Glass Service can supply to the final customer the complete control solution using the SIL-2 safety application in combustion system for furnace and forehearth.





CUSTOMERS WORLD WIDE

CBS-17-01-E



turn key project

batch plants

furnaces:

recuperative

regenerative

gas fired

oil fired

oxy-fuel fired

mixed fuel

electric

forehearth:

colouring forehearth

combustion systems

day tanks

mini melters

boosters

bubblers

metallic recuperators

batch chargers

stirring machines

glass level controls

frit dosing and transport

control cabinets

SCADA and DCS

cooling systems

robotics

gathering - 4 or 5 axis

services:

installation and supervision

commissioning

training

preheating

technology transfer

assistance

laboratory and analysis

refractory consulting

project financing



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