

Hot Standby

Quantum option processor

High availability solutions



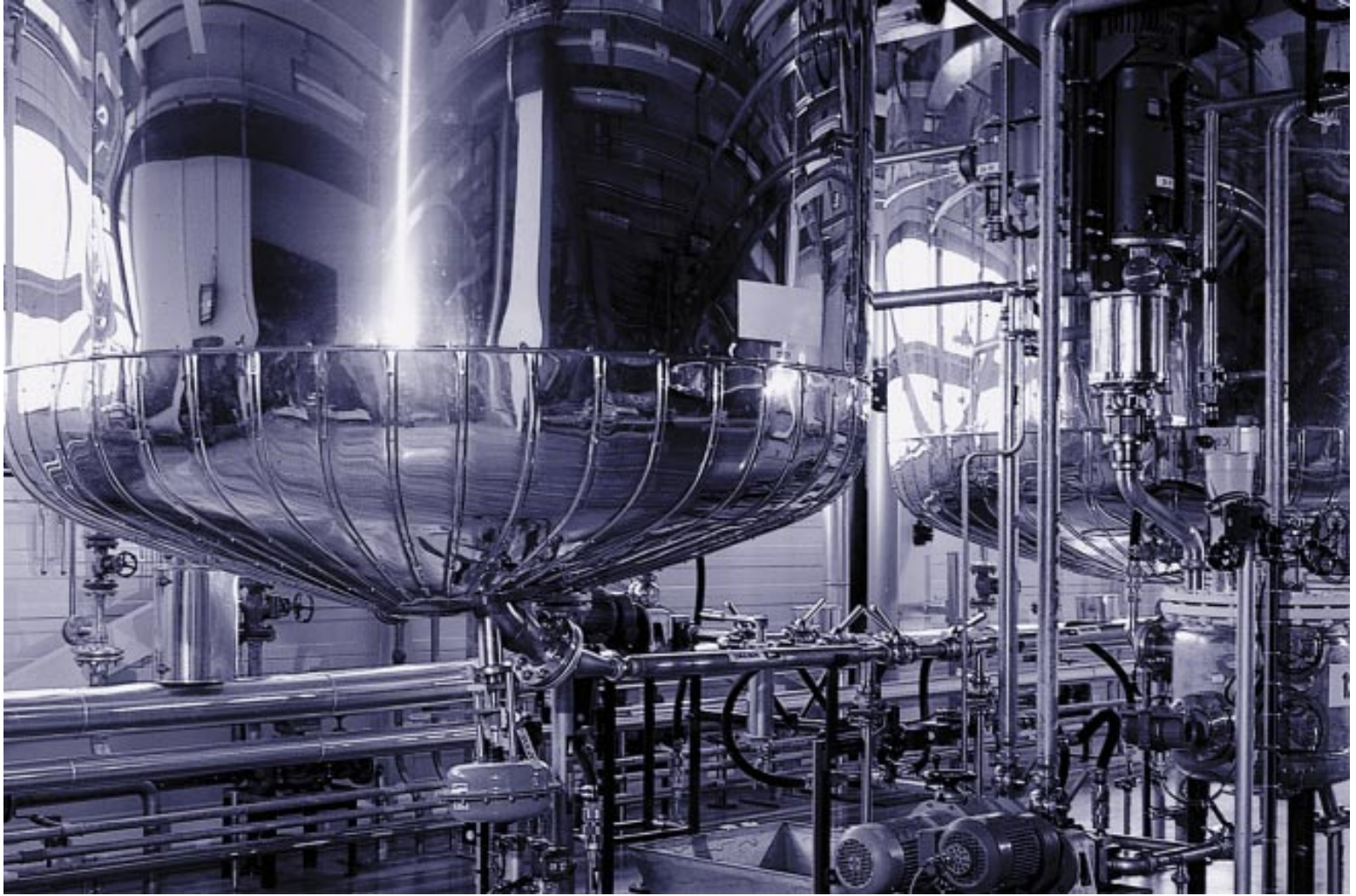
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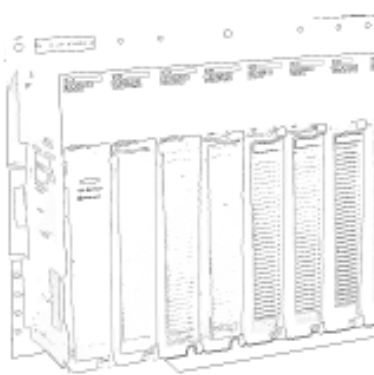
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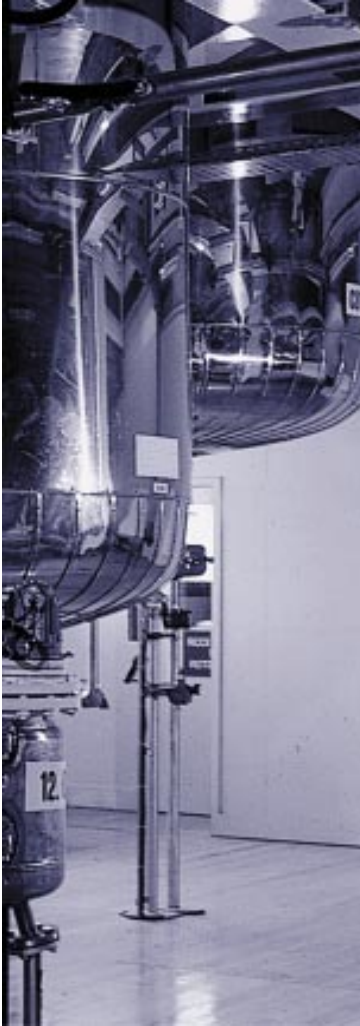
We do more with electricity



Delivering high availability solutions...



The Modicon Quantum Hot Standby option processor provides Quantum Series controllers with the high availability and security that critical process applications demand. Central to the system is the standby controller with current system status for automatic switch-over in the event of a primary controller failure. This means critical processes are not affected by control system hardware failures. The result, productivity goes up while downtime is minimized.



...for process applications

Reduced downtime

Hot Standby provides the Quantum control system with a standby processor with up-to-date system status. Should the primary controller system fail, the Hot Standby processor takes control of the system to ensure maximum productivity and product quality.

Fast response time

The Hot Standby option processor configuration extension allows the transfer of as much as 64k of State RAM information, in one or multiple scans across the high speed fiber optic link. In addition, the fiber optic link is used to pass status messages between processors to verify the fiber optic link and processor health. Similar messages are simultaneously transmitted between the Quantum remote I/O processors. Both messages are verified to ensure accurate failure detection and fast control transfers. Two available paths of communication ensure that no single point of failure can isolate the primary and standby control systems.

For added security, the Hot Standby system is compatible with the dual cable version of the Quantum Remote I/O system. Dual remote I/O cabling provides protection against simple I/O cable breaks and provides higher system integrity. Should one I/O link be damaged or broken, the other link continues to operate and control the process.

Secure and reliable

User logic comparisons are performed to verify the integrity of the application programs. These comparisons are performed at start-up and runtime. Mismatches in user logic force the standby processor off-line to ensure proper control actions in the event of a control transfer. The user can select to allow logic mismatches for higher availability during maintenance periods. If minor process changes are required, the user can make these changes without disturbing the hot standby operation. Status information provides the user with an indication of a mismatch.

Simplified diagnostic and debugging

Primary and standby LEDs on the front lens indicate the status of each controller. The keyswitch allows qualified operators to take manual control of the system while protecting the system's integrity from inadvertent actions. In addition, command and status registers allow the hot standby system to be controlled via programming panels or human-machine interfaces for greater flexibility and ease of use.

Hot Standby

Product Benefits

Ethernet connectivity

The Quantum standby adopts open and universally available Ethernet, TCP/IP and related technologies. Ethernet and TCP/IP are the technologies of the Internet – the fastest growing communication medium of all time. Ethernet is fast, cost effective, and reliable. Currently there are more Ethernet nodes installed daily than any other proprietary fieldbus networks annually! This broad-based support, together with its use as the media for the information revolution, ensures continual improvements in speed, security, and reliability attributes, which are critical to the industrial environment.

On-line program download and transfer

The Hot Standby option processor can copy the user program from the primary to the standby controller in a simple two-step procedure using the keyswitch and update button. After the program download is complete and the controller performs all powerup diagnostics and sets the controller based on the position of the the run/off-line/transfer switch, the system then assumes the state selected by the keyswitch (run or off-line.) This is easily done at the location of the replaced controller without a programming panel.

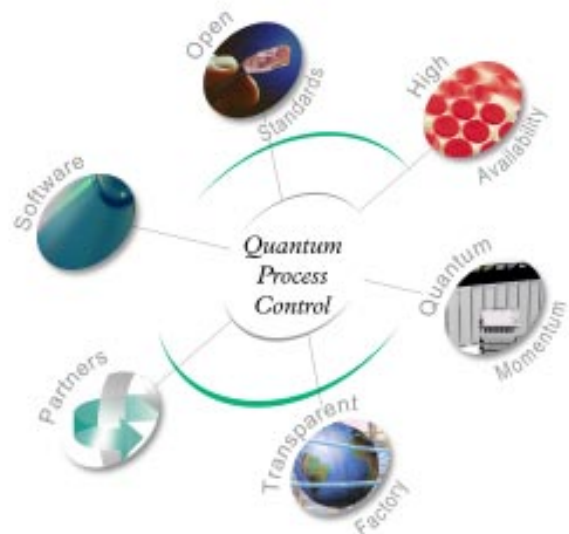
Uninterrupted communications

The Hot Standby system controls addressing of the Modbus TCP/IP, Modbus Plus, and Modbus communication ports so control transfers are transparent to client computer communications. Client computers simply poll the primary controller's address for process data. In the event of a control transfer, the station address follows the primary controller function, not the physical unit. The client computer can also access the standby controller directly for maintenance requirements such as upload/download or diagnostic information.

The communication (NOE 771 00, NOE 771 10) modules coordinate the swapping of IP address. If the primary controller goes off line, the IP address is automatically swapped to the secondary communication module, thereby providing uninterrupted and seamless communications.

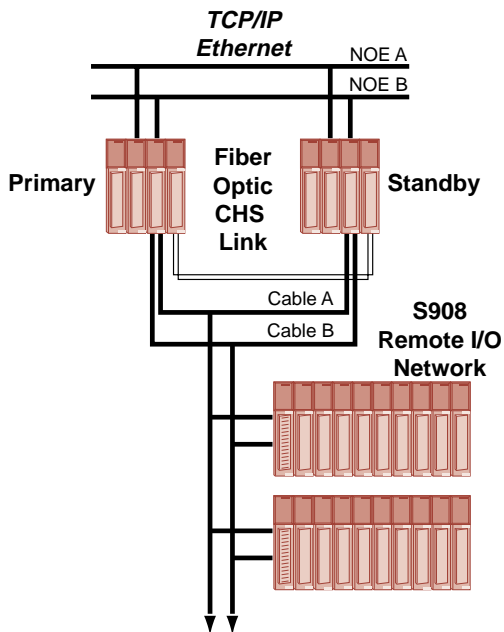
Critical for process control

Due to high performance and scalability, the Quantum Automation Series has always been a key element in the Process Control solutions. For Schneider's QPC offer – Quantum Process Control – Quantum Hot Standby is an integral part of a total process control solution, providing powerful, scalable high availability for the



At the beginning of every primary controller scan, the current register and I/O state table is transferred to the Hot Standby controller across a high-speed, secure fiber optic communication link. In the event of a primary controller failure, the standby option processor takes control of the system with up-to-date I/O and register status information for a bumpless, controlled transfer with minimal process impact. Critical processes which cannot tolerate any disruption of control are assured a fast, smooth switchover.

Features of Quantum Hot Standby



- A single-board Modicon Hot Standby option processor in each controller system improves reliability by eliminating the need for an intermediate supervisor controller.
- System control transfers occur in either direction increasing system uptime by eliminating the master-slave relationship.
- Integrity of the user programs are verified and compared in both controllers to ensure high security.
- High-speed fiber optic communication link between processors minimizes scan impact and improves productivity.
- Configurable Primary State Table transfers to the standby controller provides up-to-date system integrity.
- Online primary-to-standby program transfer minimizes the amount of time that the standby controller is out of service.
- Software control of Modbus and Modbus Plus ports allows client computer communications to either controller with no custom communication drivers.
- New configuration extension mode provides greater flexibility in state RAM transfer.
- An optional ladder logic function block delivers an easy migration path for 984/800 Series Hot Standby users.
- The Hot Standby system is compatible with all Quantum controllers and S908 remote I/O systems for cost-effective system design.
- IEC 61131-3 Programming language Support for high availability Hot Standby system.

Hot Standby

Applications

Batch and continuous process control

- No loss of process data in the event of hardware or software failures.
- Higher availability of Controller Hot Standby system ensures higher productivity of process.
- Secure, bumpless transfer provides uninterrupted control process for better product quality.
- Client computer access is easily implemented by Modbus TCP/IP Modbus Plus, or Modbus communication networks.
- Available dual cable remote I/O, Modbus Plus, and Modbus TCP/IP systems provide additional system security for critical communications.

Interlocking systems

- User logic comparisons are performed every scan to verify the integrity of the interlock sequence.
- Bumpless control transfers eliminate false tripping.
- Modbus TCP/IP, Modbus Plus, and Modbus access provides necessary system status to client computers of distributed control systems.
- Dual cable remote I/O and Modbus Plus systems provide an additional system security for critical I/O and communications.

Material handling

- Higher availability of the Hot Standby system ensures continuity of service.
- Fast data transfers minimize scan impact to ensure high productivity.
- High security of the Quantum Hot Standby system ensures availability of critical parts tracking data.

| Components | Hot Standby Kit for open configuration 140 CHS 210 00 | CPU11302 Hot Standby Kit 140 CHS 410 10 | CPU11303 Hot Standby Kit 140 CHS 410 20 |
|-----------------------------------|---|---|---|
| Kit for CHS Hot Standby includes: | Two CHS Hot Standby processors One fiber optic (3m) Hot Standby cable One CHS loadable software package One S908 terminator kit CHS Installation manual | Two CHS Hot Standby processors One fiber optic (3m) Hot Standby cable One CHS loadable software package One S908 terminator kit CHS Installation manual Two back planes Two power supplies Two remote I/O processors Two processors | |
| CHS Model Part Number | 140 CHS 110 00 | | |
| CHS Installation Manual | 840 USE 106 00, Version 2.0 | | |
| Back Plane Part Number | | 140 XBP 006 00 | |
| Power Supply Part Number | | 140 CPS 111 00 | |
| Remote I/O Processor Part Number | | 140 CRP 931 01 | |
| Processor Part Number | | 140 CPU 113 02 | 140 CPU 113 03 |

Product Specifications

| Description | |
|---|--|
| CHS Hot Standby Processor | Option Processor for Standby Quantum Controller Family |
| Controllers Supported | |
| 984 Ladder Software | 140 CPU 113 0X, 434 12A, 534 14A (plugs into any slot in Quantum backplane) |
| IEC 61131-3 Software | 140 CPU 434 12A, 534 14A (plugs into any slot in Quantum backplane) |
| CHS Hot Standby Topology | |
| Two modules required per Hot Standby system | |
| Performance | |
| Switchover Time | 13-48 ms for Hot Standby to assume control after primary fault detected |
| Scan Impact | 3 ms + 6ms/k of configured State RAM |
| Communications | |
| CHS Comm Rate | 10 megabaud |
| Cable Between Quantum Systems | 3m Fiber Optic cable supplied (1 km capability w/o repeaters) |
| Indicators and Switches | |
| LED Indicators Switches Push Buttons | READY, PRIMARY, STANDBY, COMACT RUN/XFER/OFFLINE, Controller A, Controller B Program Update |
| Software Requirements | |
| Loadable Function Block | CHS block (Included with kit) |
| Power Supply Requirements | |
| Operating Voltages: Current Requirements: | Supplied by CPS Power Supply 700MA |
| Environmental | |
| Temperature Operating: Storage: Humidity: Shock: Free Fall: Vibration: | 0-60°C -40 ± 85°C 0-95% RH non-condensing 15Gs for 11 msec 1m unpacked 0-57 H Z @ 0.075mm d.A., 57-150 HZ@ 1 G. |
| Physical | |
| Dimensions: (HxWxD) | 9.84" x 4.09" x 1.59" (250mm x103.85mm x 40.34mm) (requires one slot in Quantum backplane) |
| Approximate Weight: | 0.453kg (1 lb.) |

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