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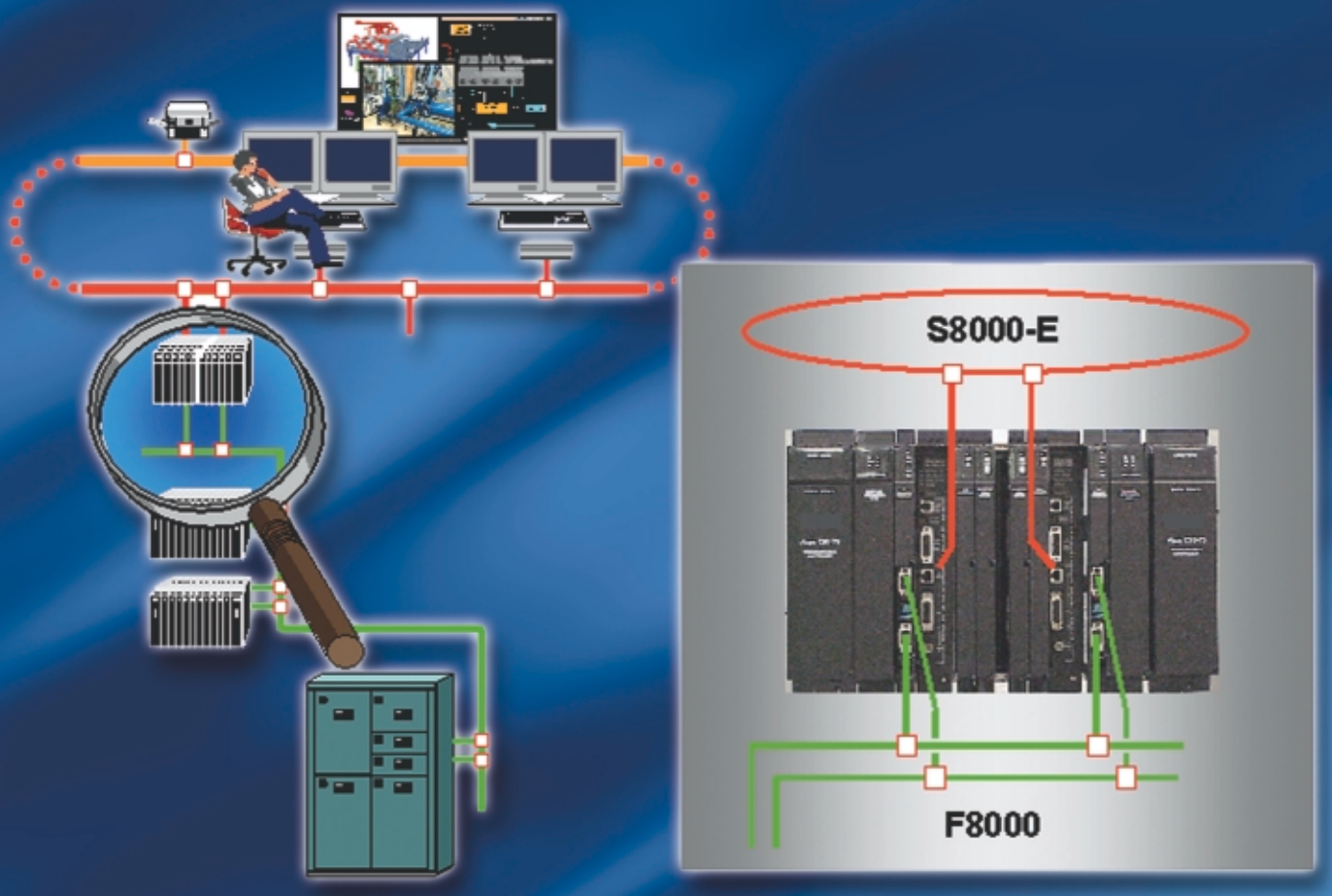


P320 - C80-75 Enhanced Safety multi-function controller

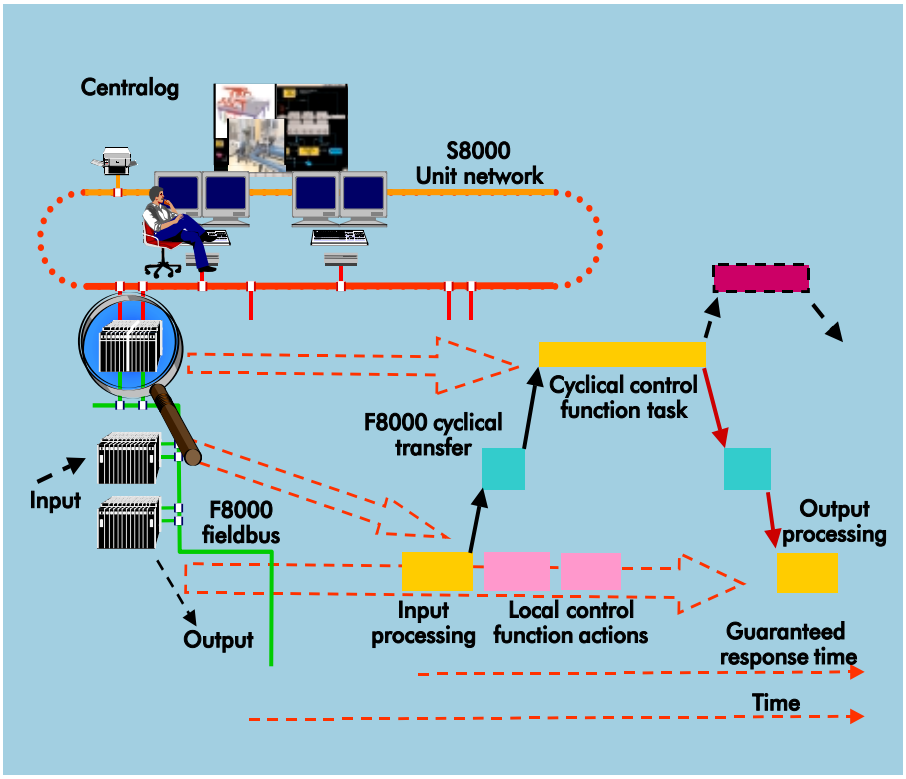
ALSTOM Power

C80-75 - An enhanced safety and powerful product

The C80-75 multi-function controller acts as the automation cell controller.

An automation cell is composed of a set of electronic blocks comprising independent control function units that can be installed in one or more physical enclosures or decentralised.
These blocks are linked to the multi-function controller by an enhanced safety F8000 fieldbus (based on WorldFip).

The C80-75 transmits the time to the field devices via the F8000 network and thus ensures that events are timetagged at source.

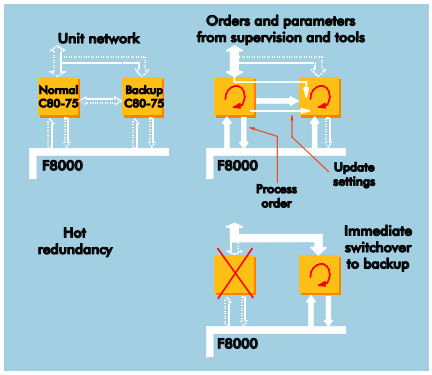


"Hot standby" redundancy

The multi-function controller implements hot standby redundancy. Each unit receives information from the network and executes control function processing.
However, only the active unit transfers orders to the F8000 network.

On the occurrence of a malfunction, switchover to the backup unit executes immediately and smoothly.

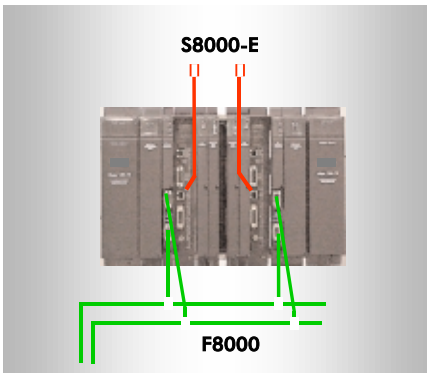
Power supplies and network connections are redundant.



Galvanic isolation

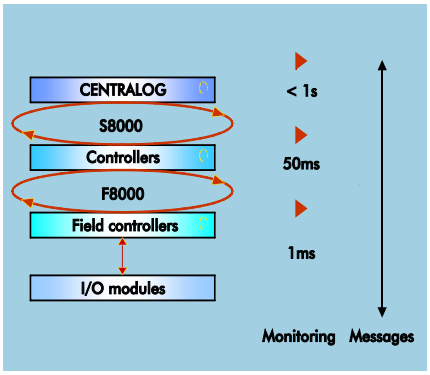
The multi-function controller is fully isolated :
- in regard of the power supplies,
- in regard of the fieldbus,
- in regard of the unit network (industry standard fast Ethernet technology).

On-line monitoring checks controller integrity :
- watch-dog,
- periodic memory tests,
- communication line tests (CRC, promptness, message sequencing tests).



Predictable processing

The application processing is cyclical at the same rate as the data acquisition/restitution cycle on the F8000 network.
Variables transmitted on the networks are sampled at the end of the cycle to reduce risks.



Simplified multi-task OS

Application processing is multi-task and managed on the basis of 2 task types :
- a rapid task at the fieldbus rate, used for logic control functions,
- a slow task, at a rate that is a multiple of the above, used for the control loops and slow functions.

System variable sampling tasks for communications purposes and for processing Controcad queries are inserted into the resulting cycle.

Operation in asynchronous synchronised mode

The multi-function controllers operate in asynchronous mode (no clock in common mode) among themselves and with the field controllers.
Processing runs at the periodic sync point determined by the determinist F8000 network.

Controcad loading and observation

Variables are observed on-line in Controcad.
Setting parameters also are modified on-line.
Programs included in reserve resources are modified on-line using redundant structures.

Dependability qualification

- Control functions are qualified for critical applications (nuclear plant control, high pressure boilers),
- The dependability life cycle meets IEC 61508 specifications.

Developments and applications conform to ISO 9000 quality standards.

Standards and environment

The multi-function controller meets IEC series 61000 standards, which are the strictest in respect of electromagnetic environment.
The controller is designed to function at high temperatures (up to 50 °C, 40 °C nominal) without requiring ventilators.

The device meets impact and vibration requirements and can be provided in earthquake resistant enclosures.

Field network dependability

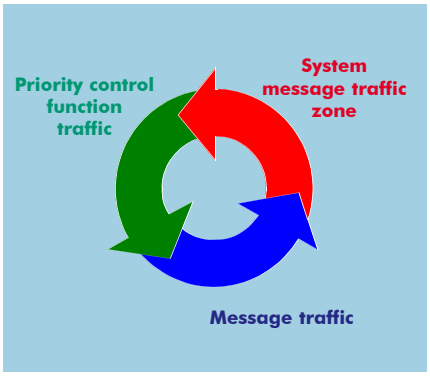
The F8000 fieldbus is determinist, redundant, galvanically isolated and resistant to electromagnetic aggression.

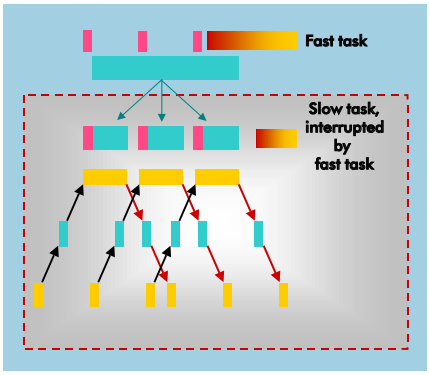
The S8000 network uses determinist 10/100 Mbs Ethernet technology, implementing switches.

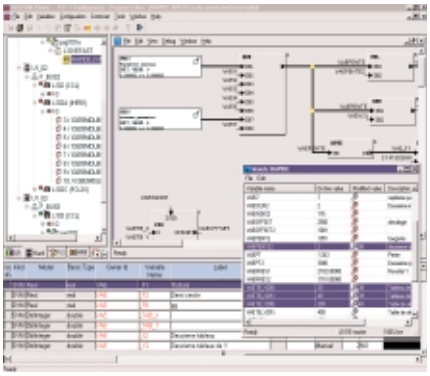
The networks are used to route observation messages, setting messages and F8000 network subscriber configuration messages without impeding control function traffic.
The multi-function controller uses the unit network for routing purposes.

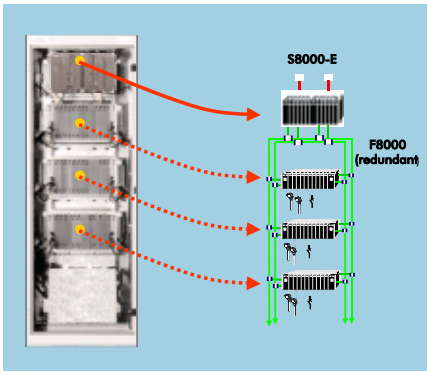
Lifetime

Like all strategic components, the multi-function controller benefits from guaranteed ALSTOM support for a minimum period of 10 years following entry into service (supply of parts and maintenance); this service can be extended to 25 years with a special lifetime contract.









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