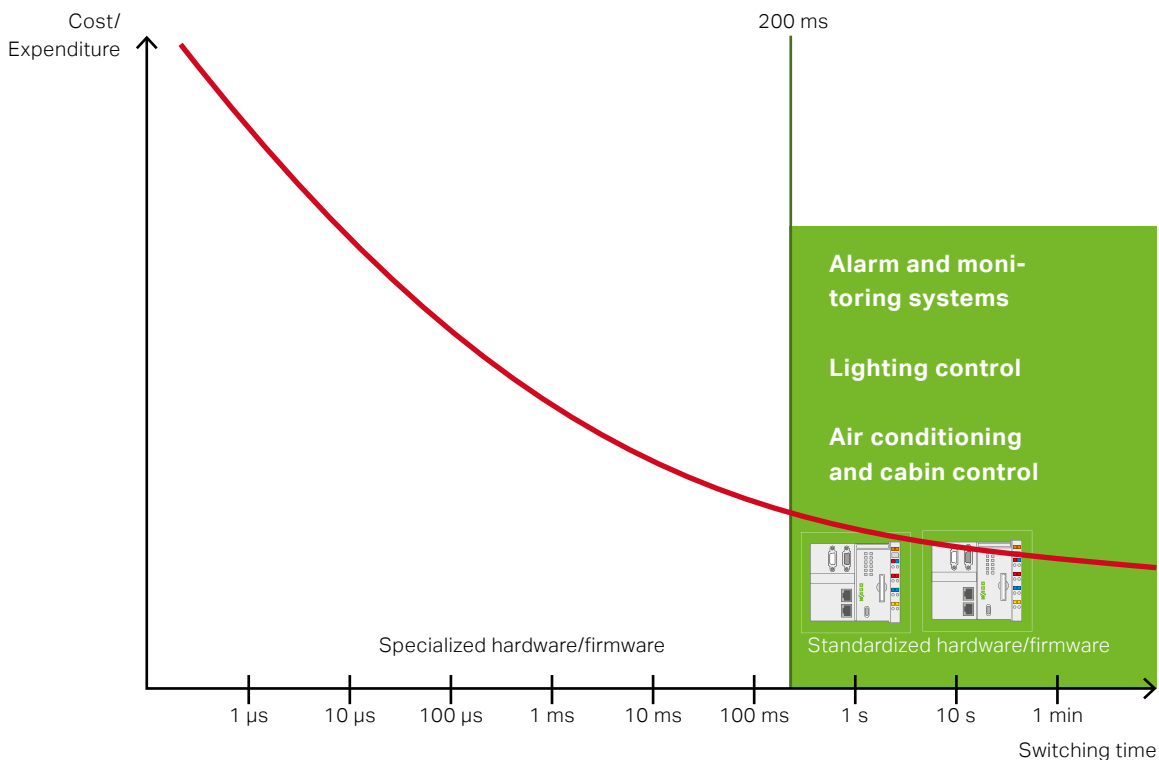# Application-Based Controller Redundancy

Increased Availability in Alarm and Monitoring System

High Availability
on Standard Components

→ Increase availability (lengthen service life, reduce fault effects)
→ Collect and bundle data
→ Simple/slow control loops

Application-Based Controller Redundancy

WAGO's *e!COCKPIT* engineering software tool is the intuitive programming environment for the controller. The multi-node programming environment can easily transmit the PLC program to both PLCs. For the application-based controller redundancy to be used, a software library with the necessary synchronization functions must be linked to the master PLC. The library offers the possibility of redundantly linking subnodes using a dual LAN . The subnodes, also known as smart couplers, do not have to be programmed; they can be simply booted from an SD card and then configured using an integrated webserver. A large number of the available analog/digital and complex 750 Series I/O Modules are automatically detected.

Process mapping is also automatically made available to both higher-level Master PLCs. These Master PLCs can communicate with higher-level SCADA systems via the Modbus-TCP protocol. The redundant connection is performed over two separate networks.

The solution's design corresponds to an SPOF-tolerant system, which means that any occurring fault – like a voltage supply failure, a poor LAN connection, switches, or controller – can always be compensated for. Doubling the ETHERNET topology and the redundant message transmissions enable instantaneous switching during a network fault.
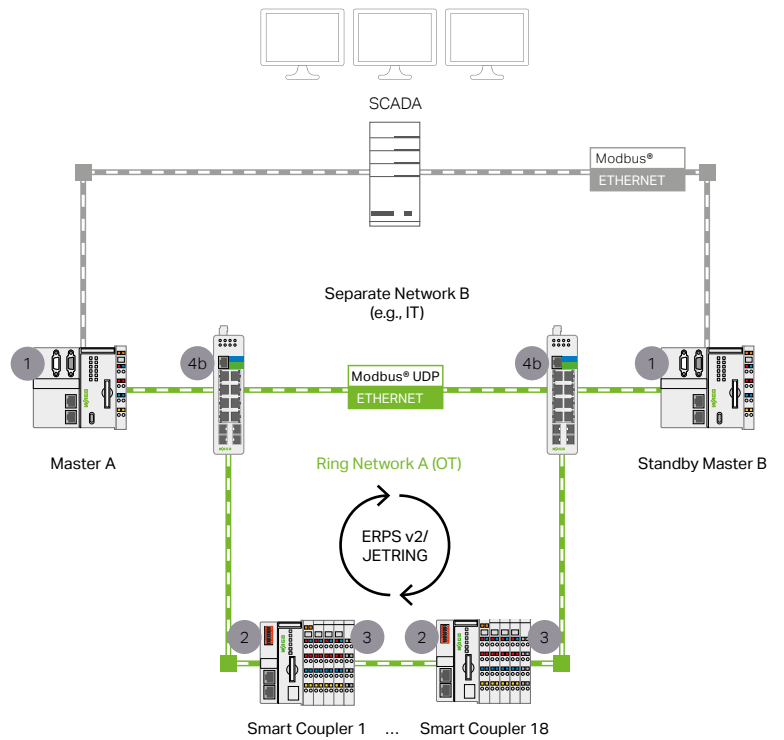Typical switching times after a PLC failure are within DNV GL requirements when used in typical alarm and monitoring systems.

Openness in the Network Topology

Controller Redundancy in a DUAL LAN
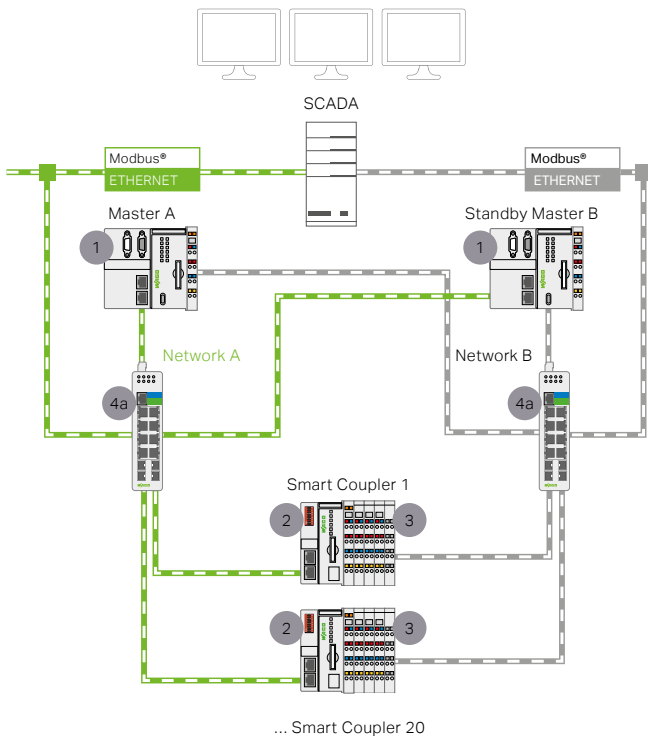
Controller Redundancy in a SINGLE LAN

Parts List

| DUAL LAN			
Position	**Item**	**Description**	**Quantity**
1	750-8212 or PFC 200 G2	Master/Standby Master	2
2	750-8101	Controller/Smart Coupler	1-20
3		Intrinsically Safe and Standard I/O Modules (incl. Complex Mailbox Modules)	1-24
4a	852-111	Industrial ECO Switch	2

SINGLE LAN			
Position	**Item**	**Description**	**Quantity**
1	750-8212 or PFC 200 G2	Master/Standby Master	2
2	750-8101	Controller/Smart Coupler	1-18
3		Intrinsically Safe and Standard I/O Modules (incl. Complex Mailbox Modules)	1-24
4b	852-1305 or 852-303	Industrial Managed Switch	2

Switching Time

	DUAL LAN	SINGLE LAN
Network	Uninterruptible	300 ms
PLC	200 ms	200 ms
System	200 ms	300 ms

Easy System Commissioning

Master
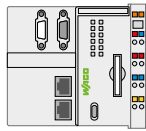
750-8212 or
PFC 200 G2

Library for
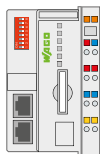**e!COCKPIT**

+

DRM License
2759-0245/0211-1000

Redundant data space: max. 1468 bytes

1. Load library into e!COCKPIT

↓

2. Load framework project

↓

3. Add DRM license

↓

4. Program and start application

Smart Coupler

750-8101

+

758-879/0000-3102

+

Image Files (DUAL or SINGLE)

1. Copy image onto SD card
- Use supplied application note
- Generate system image on the SD card
- Set IP address via DIP switch

↓

2. Start smart coupler

↓

3. Copy SD card onto controller
- Use Web-Based Management