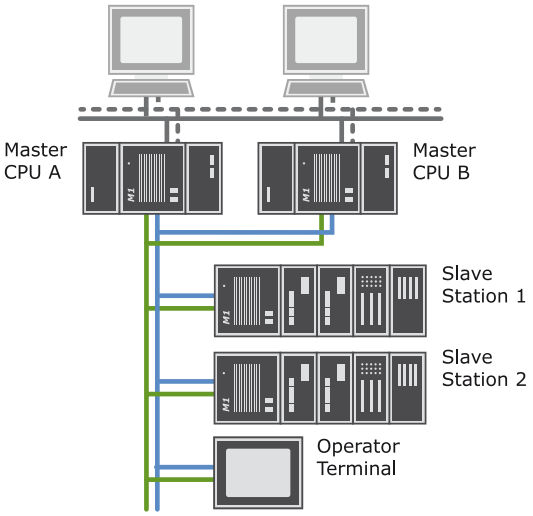


Redundancy

Part type designation	Part number
M-NW-REDU RT	00019828-63

Warm-Standby Redundancy

For applications where reliable recording of critical data has priority, Warm-Standby Redundancy is the preferred solution. Good support when configuring and monitoring the actual CPU redundancies helps during the rapid development of application programs for which bumpless switchover is not required. Continuous operation during maintenance, system update and application changes is also possible in this version.

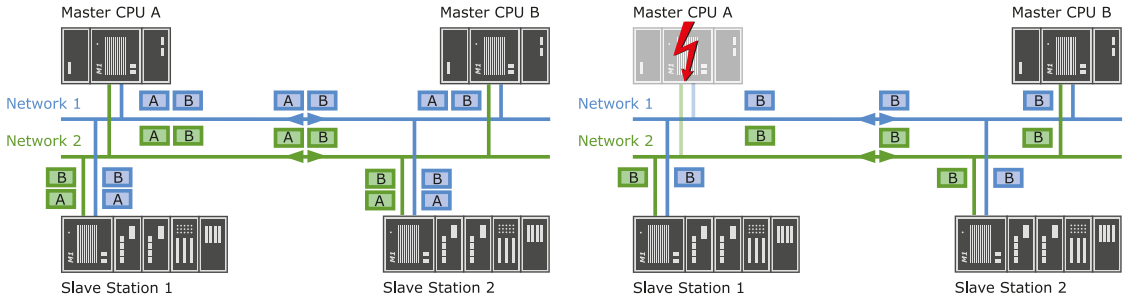
If a master CPU for maintenance work is disconnected from the network, real time processing is only affected to a minimum. The data transmission continues seamlessly and from the perspective of the receiving stations no packets are lost.

The matching of process variables in the master CPU has to be resolved on the application level, which means extra effort and increased complexity compared to Hot-Standby Redundancy (see *Figure*).

Warm-Standby Redundancy provides the qualities of network redundancy and beyond that the following advantages:

Features

- CPU redundancy
- Switching time freely configurable (0 to 10 PLC cycles)
- Selection of the data master integrated in end points (voter), resulting in the fastest possible switching times
- Diagnostic interface for monitoring and analyzing the redundancy status in the SolutionCenter
- Automatic matching of the master CPUs not integrated → switchover not bumpless



Switchover of the active CPU within a PLC cycle, e.g. cycle time 1 ms – switchover ≤1 ms

Warm-Standby Redundancy

Rationale/Type	
High availability system type	Warm-Standby Redundancy with local I/O (1oo2 voting integrated)
CPU redundancy	Yes (no automatic synchronization and self-monitoring)
Network Redundancy	Included
I/O redundancy	Possible
Sensor redundancy	Possible
Switchover	Not bumpless
Continuous dual-channel ability	Yes
Communication redundancy	Yes
Processing units (recommendation)	MainDevice: M200 standard CPUs from the families MPC, MC, MH or better SubDevice: M200 standard CPUs from the families MX, MPC, MC, MH or better
I/O periphery	Via MX CPU all from M200 standard module portfolio
Use of special hardware	No (straight software solution and standard Ethernet)
Topology/Networking	
Protocol basis	Ethernet IEEE 802.3q, Ethertype 0x892D
Communication protocol	bluecom with redundancy enhancement (100 % IEEE 802.3q compatible)
Media redundancy	Yes (continuous 2-channel, galvanically isolated Ethernet networks)
Switches	Industrial standard managed switch (unmanaged switch with appropriate configuration)
Topologies	Star, bus, ring, mesh
Ring redundancy	Possible through parallel use of MRP, STP and RSTP
Dimension	In compliance with IEEE 802.3 - ≥2000 m per network section with fiber optic connection
CPUs spatially separable	Yes (see dimension)
Time synchronization	Integrated in network protocol
Number of I/O stations	More than 100
Smart SubDevices	Yes, I/O stations can execute local application programs for: Emergency operation or load separation or local logging
Parallel data traffic	Yes, possible (Ethernet-based protocols and services, e.g. HTTP, FTP, video stream, Modbus, OPC, MMS)

Interfaces	
I/O periphery	M200 standard module portfolio
Redundancy network	bluecom network variables
Fieldbuses	Gateway function for CAN, PROFIBUS DP, PROFINET, Modbus, EtherCAT via application program possible
SCADA / supervisory control & PDA	Standard protocols: IEC 61850, IEC 61400-25, IEC 60870-5-104, OPC DA, Modbus TCP/UDP Application program development: Communication library M1Com and M1Com.NET
IT protocols	See M200 software (FTP, HTTP, SNTP, SMTP, etc. and security versions)
Configuration/Programming	
Configuration	SolutionCenter (support via wizards)
Remote configuration	Yes (Ethernet LAN, Internet)
Network configuration	SolutionCenter (support via wizards)
Programming	M-PLC: IEC 61131-3 (IL, LD, FBD, ST, SFC)
Editor	CoDeSys
Redundancy download	Automatic
Redundancy debugging	Yes
Redundancy synchronization	Manual
Manual switchover	To be integrated by user
Multitasking	To be integrated by user
Mixed operation	Yes (non-redundant, non-synchronized application programs can run parallel to redundancy application programs)
Diagnostics/Monitoring	
I/O live display	SolutionCenter
Redundancy status	Yes (restricted to network redundancy)
Error state	Yes
Diagnostic user interface (API)	Yes, integrated
Statistic user interface (API)	Yes, integrated
Network monitor	SolutionCenter
Network analysis	Yes (by Wireshark plugin, Wireshark data are generated automatically on the controller)
Performance data	
Master cycle time	1 to 1000 ms [1)]
I/O cycle time	Minimum 200 µs for non-redundant application programs 1 ms to 1000 ms for redundant application programs [1)]
I/O quantity structure	More than 100 stations [1)] Number of channels unrestricted ([1)], [2)]) – typically 400 to 600 channels per station (1/3 analog, 2/3 digital)
Switching time	Adjustable from 0 to 10 cycles

[1)] *Limit value is subject to CPU type, memory available, application size, number of exchangeable variables, network bandwidth available and network and CPU load via non-redundant applications*

[2)] *No program-technical restriction*

Installation	
Installation medium	CD ROM or network
Installation tool	SolutionCenter
Upgrading existing systems	Possible via software / new CF card required
License protection	Data CF of the master CPUs is integrated dongle
System requirements	
Automation devices	M200 CPUs of the MX200 family or better (minimum 2 Ethernet interfaces onboard)
Network	2x Ethernet 100 MBit/s or Gbit/s, managed switch
Software	MSys / MxCCore / M-Base V3.80 or higher

Order data

Part type designation	Part number	Description
M-NW-REDU RT	00019828-63	License to operate a network redundancy communication master on one controller CPU. Allows any number of I/O stations (SubDevices) to connect redundantly over the network. Two network redundancy licenses are necessary for Warm-Standby operation (one license per Master CPU).