

EtherCAT: Redundancy

For a detailed understanding, please consult our online help and all settings at [Redundancy Settings](#) and subordinate articles.



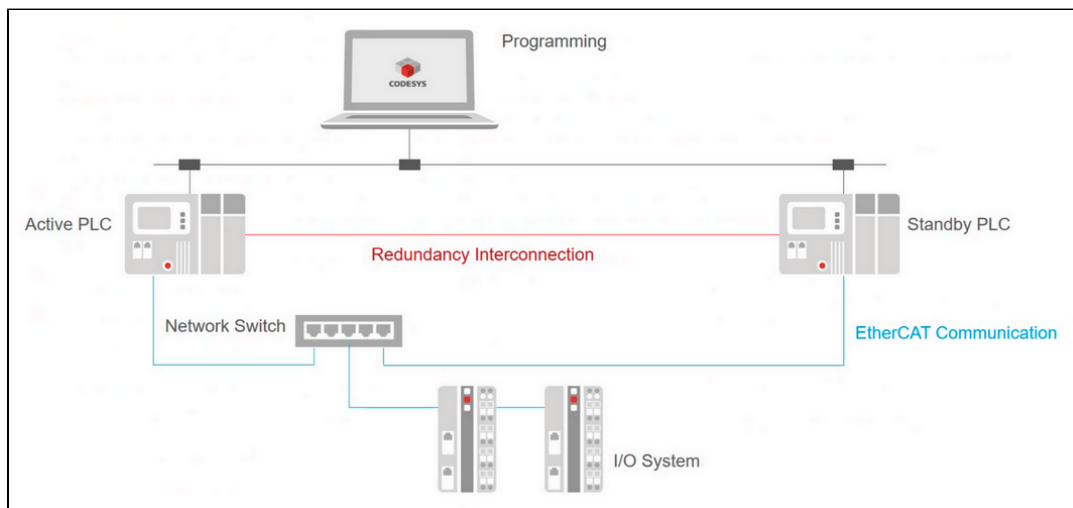
To note:

Redundancy is depending on the available runtime system components.
There are different types of redundancy:

- Controller Redundancy
- Cable Redundancy of EtherCAT
- Redundant I/O system
- Combinations

Example setup:

EtherCAT cabling with controller redundancy

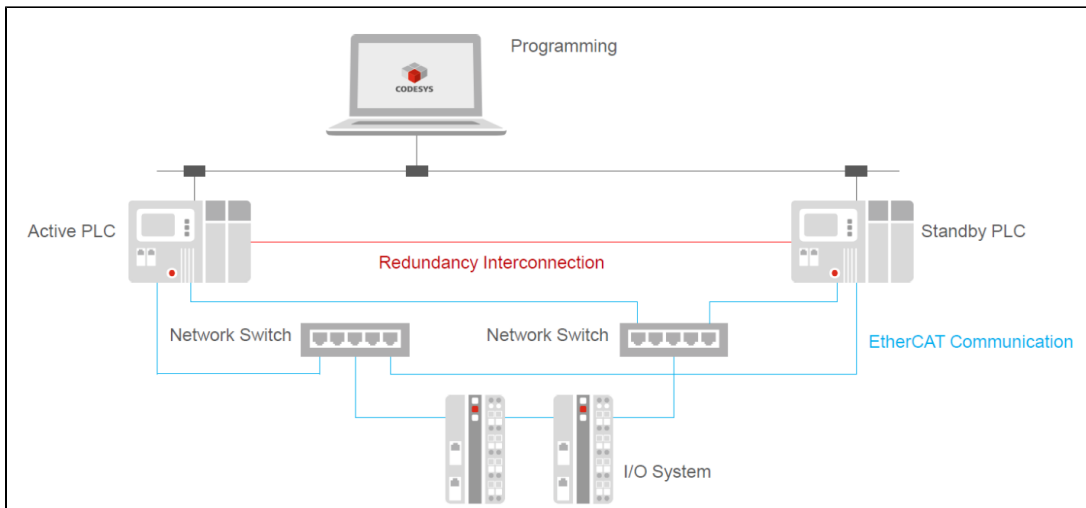


Customize the 'Synchronization timeout' setting

Synchronization timeout should not be 0.
Set a value (for example) to a 30 (ms) limit.

Otherwise, EtherCAT network fails when the connection is disconnected with the Primary cable and then reconnect.
Increasing the Distributed Clock Cycle Time seems to have solved this problem.

EtherCAT cabling with controller and cable redundancy



i With EtherCAT cabling redundancy, the **EtherCAT distributed clocks** are not supported!

For a EtherCAT Cable Redundancy, every PLC needs two ports:

- One switch for PLC1 Port1 and PLC2 Port1, and
- the second switch for PLC1 Port2 and PLC2 Port2.

[blocked URL](#)

FAQ:

In case of a such a sync fails, after f.e. an online change.

This can be solved by increasing the value of `BootupWaitTime` in the runtime configuration file.

The Default is 5000 [ms], and should be doubled for a redundancy setup, to 10000 [ms].

It is possible, when Power Cycling or simply switching of a switch, a communication gap can occur when it is switched back on.

As a rule, this can be about 1 sec.

Example:

[blocked URL](#)

The `xErrorCount` increases by about 50 when the switch is turned on again, and the `LostFrameCounter` increases by about 300.

To compensate for this, set a fixed bit rate (100MBIT) and full duplex on the controllers.

Then the network card does not have to search for the speed and thus the interruption time is shorter.

Please note, there will always be a small interruption, as this is caused by the hardware.

i Power cycling of the Primary Network Switch will always generate a failure of the EtherCAT network!

For example, if the power supply of the switch is broken.

Should powering off the network switch happen knowingly, unplug the Ethernet cable before restart the switch.

- This way, there will be no disconnection.
- When the switch is booted, plug in the cables and the connection will run without interruption.

