KPA Master Redundancy (patented technology)

Network protection from control system failure

Inbuilt EtherCAT functionality of cable redundancy cannot protect the control system, where control application with EtherCAT master is launched, from restart, disconnection or failure.

KPA Master Redundancy is koenig-pa GmbH patented technology, which resolves mentioned problems and allows to stay operational even in synchronized environment.

Benefits and key features

- **Unique technology for network protection from control system failure**
  koenig-pa GmbH patented technology – Master Redundancy – provides unique fault tolerance to resist possible control system failures.

- **Support of any network topology**
  Master Redundancy supports a network of any topology, such as a ring, a star, and a daisy chain.

- **Unlimited number of control system units**
  Master Redundancy can be used for unlimited number of control system units. It is possible to enable multiple redundant masters without collision when two or more passive masters attempt to start the failover protocol.

- **Cost-effective solution**
  For stable system operation, there is no need to use expensive equipment such as a real-time Ethernet switch.

- **Prompt response to system failures**
  Redundant master can take the control immediately without any dedicated control device, additional signal lines or manual control.

- **Adaptation to any fieldbus system**
  Any fieldbus system using hop-to-hop serial master-to-slave communication principle.

Workflow

EtherCAT configuration with enabled Master Redundancy consists of an active master device and one or several passive masters.

Master is an agent, which cyclically creates a data telegram, fills it with requests, and sends it to the bus in strict time intervals. A data telegram is common to all slave devices connected to the bus, and it passes from one device to another.
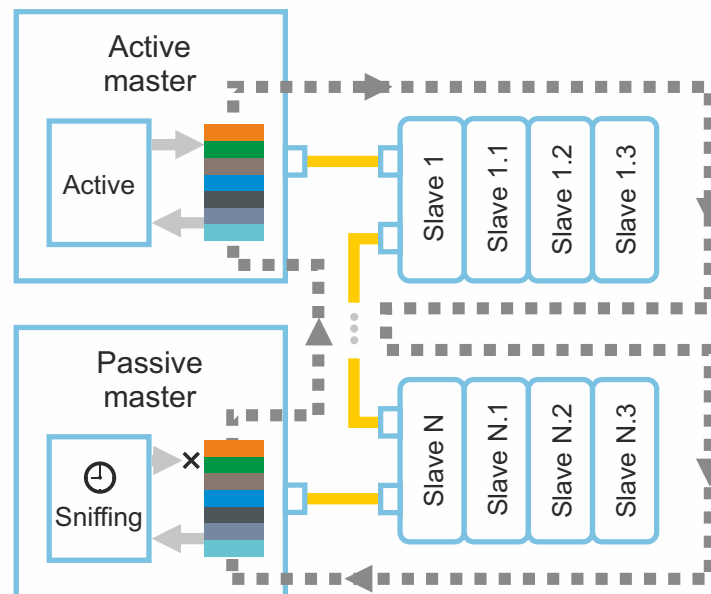
This feature is extremely useful for fault tolerance: any device connected to the bus is fully aware of slave's activity and can transparently acquire, or sniff, the data, which is transferred between master and slaves. There is no need to modify any slave devices, to add any additional signals, or to change the transfer protocol.

During a normal operation, redundant master is passive, sniffs data, and doesn't enter its own telegrams. As all passive masters are consistent with the bus activity, they are ready to take place of active master anytime, when it fails.

When passive master is not getting a telegram he expects, he knows that the bus has no master anymore. There is no need to wait until the current cycle is over – redundant master can take control immediately, posting his own telegram. And this telegram will be correct and meaningful, because passive master was tracking the same changes with failed active master.

Custom Development
koenig-pa GmbH offers specific software development for customers who require additional support for integrating EtherCAT capabilities into their applications or solutions.