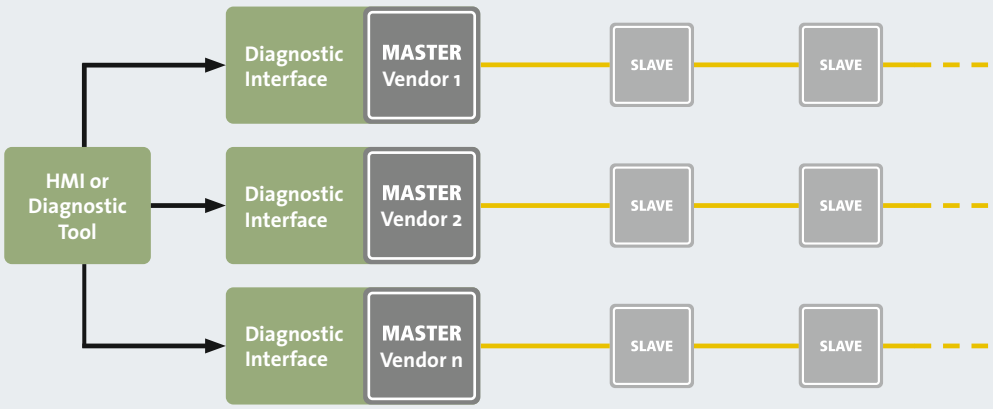
Master-independent diagnostic interface

Enhanced diagnosis with EtherCAT

Machine availability is a key factor in modern production and EtherCAT supports that by a proven technology with a very robust communication. Environmental issues can stress or break the elements of a system. Thus, the detection of errors is one of the most important aspects in modern fieldbus systems. EtherCAT provides extensive diagnostic information along the communication path. An outstanding feature of EtherCAT is the capability not only to detect errors but also to locate them. This includes bit corruption with frame integrity checks as well as link losses. Corresponding error counters are supported by all devices. This helps users, machine builders and system integrators to detect network problems easily and helps to avoid or reduce machine downtime. The signal quality is permanently checked and combined with the checksum monitoring. This allows to evaluate the quality of communication and helps to easily detect damaged electronic components, broken cables or EMC disturbances. Some errors, like a loss of power supply or a failed communication interaction between master and the device, lead to similar interruption pattern. Monitoring the application state helps to detect these errors and to report them to the diagnosis.

The diagnostic interface enables master-independent access to EtherCAT diagnostic data



What are the benefits?

The information about the status of the EtherCAT network is there, yet it must be put into the hands of the service technician. It shall be available for all machines in one device, and unique for all systems.

ETG has specified a user-friendly, vendor-independent diagnostic interface in the master that enables external tools to access diagnostic data. **No changes** in EtherCAT slave devices are necessary and the collection of the required data are done by a simple extension on top of the existing master software. It requires a limited amount of resources, which makes it **feasible for embedded systems**.

The standardized interface enables access to EtherCAT network diagnostic information to all machines with EtherCAT. Through this interface, diagnostic tools or human-machine interfaces can scan the networks, **detect cabling errors, locate communication interruptions and disturbances**, or **identify unexpected state changes**.

It's ready to implement and use!

The ETG.1510 Profile for Master Diagnostic Interface enhances the ETG.1500 EtherCAT Master Classes specification, and extends the EtherCAT Master Object Dictionary defined in ETG.5001.3 Annex A. The diagnostic objects can be read by CAN application protocol over EtherCAT (CoE) mailbox protocol using the already specified mailbox gateway functionality. As it is fully based on existing standards, the new profile requires just a few elements in the object dictionary of the master.

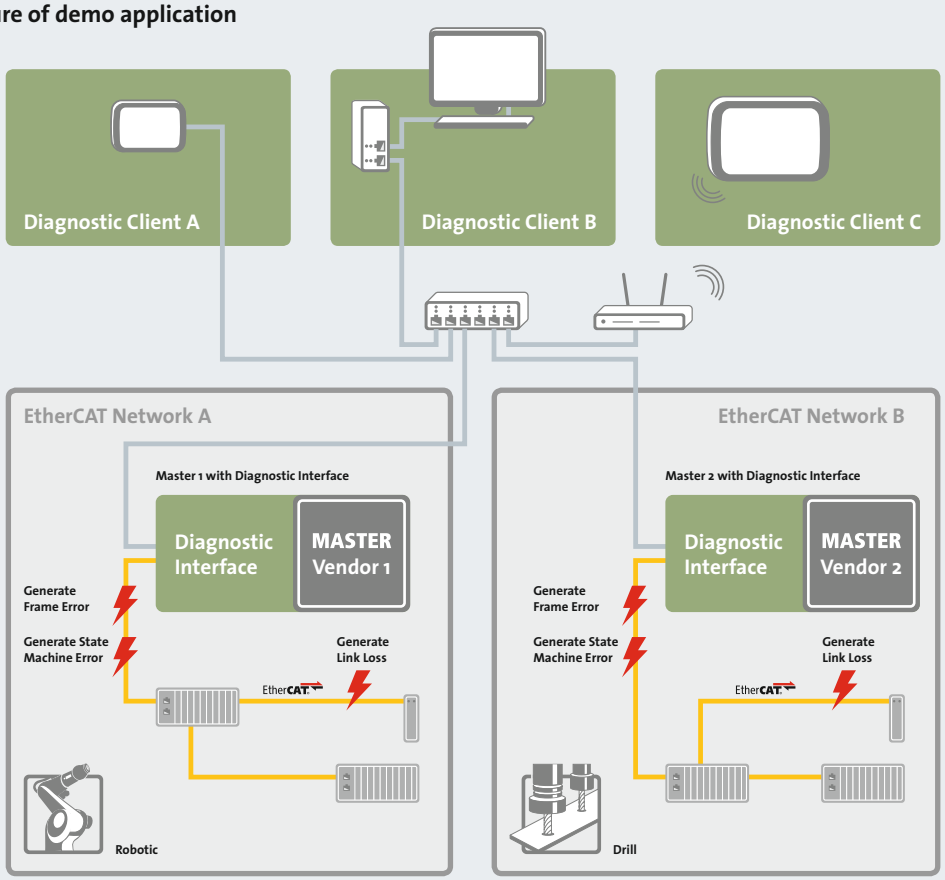
Find the respective specifications as follows:
www.ethercat.org/ETG1500
www.ethercat.org/ETG1510
www.ethercat.org/ETG5001

How does the demo work?

Vendor-independent access to EtherCAT diagnostic information from different client tools

- Two EtherCAT master devices (Master 1 from Beckhoff and Master 2 from Acontis), both supporting the ETG.1510 profile for master diagnostic interface
- Three diagnostic tools from two different vendors (Diagnostic Client A and B from PROCENTEC, Diagnostic Client C from Acontis)
- Different types of errors like link loss, frame corruption or unexpected state transitions can be generated by unplugging cables or pressing buttons
- Each diagnostic tool can access the corresponding error information reported by the masters within their object dictionaries according to the ETG.1510 profile, and display this information

Structure of demo application



What is EtherCAT?
EtherCAT (Ethernet for Control Automation Technology) is an open Industrial-Ethernet solution. EtherCAT sets new standards with respect to real-time performance, low costs, flexible topology and ease of use.

www.ethercat.org

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