

EtherCAT Technology Group develops new Safety Drive Profile

Because current Drive Profiles do not cover functional safety, the EtherCAT Technology Group (ETG) is developing a new Safety Drive Profile to close this gap. With this new drive profile, the Safety Functionality of EtherCAT drives with CiA402 (CANopen) or SERCOS Drive Profile can be used and configured in a “manufacturer-independent” way.

The IEC 61800-5-2 standard defines safety-relevant functions for drives. With these functions, safe stopping of the drive, e.g. Safe Torque Off (STO) or Safe Stop 2 (SS2), or safe monitoring of motion, e.g. Safe Limited Speed (SLS), can be achieved. With these features, dangerous movements at startup or during manual interaction with a machine can be avoided or limited in a safe manner.

In order to configure and control these internal drive safety functions in an open fashion, the ETG is now enhancing the Safety over EtherCAT protocol with a safety-related device profile for drives (Safety Drive Profile).

Based on the functions defined by IEC 61800-5-2, a control word is specified which enables the separate activation of these functions within the drive. Each function is represented by a bit in the control word. If a safety function is selected and operates within its boundaries, it is reported back to the supervision safety logic with a status word. All communication makes use of the underlying safety protocol.

The definition of a uniform control and status word allows the user to operate safety drives from different vendors in the same way with their safety controller. The variety of function blocks inside the controller is reduced and the operation is simplified.

The configuration of the safety-relevant drive functions is also standardized within the profile. Typical implementations of the safety functions, which are defined by the IEC standard only in a very generic way, are considered and the corresponding parameters are described. Thus, an object dictionary is established, and the user receives a uniform

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implementation and a vendor-independent understanding of the embedded functions within the drive.

The EtherCAT Technology Group also intends to make the Safety DriveProfile available to other interested organizations and technologies since, by design, the profile is independent from the safety bus system being utilized.

EtherCAT sets new standards for real-time performance and topology flexibility, while meeting or undercutting fieldbus cost levels. An IEC and SEMI standard, EtherCAT features include high precision device synchronization, a cable redundancy option, and a functional safety protocol (SIL3).

The **EtherCAT Technology Group** (ETG) is an organization in which key user companies from various industries and leading automation suppliers join forces to support, promote and advance EtherCAT technology. With over 850 members from 44 countries, the EtherCAT Technology Group has become the largest organization in the world that is exclusively focused on Industrial Ethernet technologies. Founded in November 2003, it is also currently the fastest growing fieldbus organization.

The **Safety-over-EtherCAT (FSoE)** protocol is an open technology that was specified to transmit safety relevant information over EtherCAT networks. It is utilized to communicate input data from various safety sensors, such as light curtains and E-stops, to a safety logic controller. Based on this input information, the logic controller generates commands for the safe outputs, such as safety breakers or safety relevant drives and controls the safety functions of the application.

For further information please see www.ethercat.org