Machine safety strategies aimed at protecting people, property and ecosystems can benefit from innovations in drive technology with safety functions being built directly into the drive. This can offer significant benefits to machine builders, designers, engineers and end-users, who want to meet all relevant safety requirements with less hassle while saving time and money.

Integrated safety
Integrated safety has revolutionised the way we achieve machine protection. New electronic safety solutions integrated into the drive are capable of replacing safety systems based on external electro-mechanical add-on devices. In ABB’s drives, for example, integrated safety consists of the safe torque off (STO) function. Additional safety functions can also be integrated into the all-compatible ACS880 industrial drives, using the optional safety functions module.

Implementing a machine safety system from start to finish can be seen as a daunting and complicated undertaking. But it is now made much easier thanks to drive-based functional safety technology, and standardisation that unifies requirements and terminology used across the market. So, we can move away from the separate electro-mechanical machine safety measures that involve hard-wired logic add-ons like relays and contactors. Instead, electronic safety functions are built directly into the drive’s safety logic.

Some of the most important benefits that can be obtained with integrated safety in drives include reduced design time and effort as well as easy commissioning of one or several built-in pre-programmed safety functions in one common safety module. Other advantages include reduced number of devices, cabling, and costs, as well as no wearing parts, when compared to the use of electro-mechanical safety devices.

Design tools
The safety designer’s job starts with a risk analysis aimed at defining if and where risk reducing safety functionality is needed on the machine and then deciding which safety levels and functions are required. To make this
Expanded safety at work range

With a new generation of programmable safety controls and an expanded line of safety relays, Leuze electronic believes it is able to offer safe solutions for all applications in machine and system construction.

Its new safety relays allow many smaller safety tasks to be solved – from the monitoring of simple components, such as E-STOP or safety switches, to the integration of optoelectronic sensors or standstill monitoring of motors with its 22.5 mm housings – the relays have a compact design taking up little room in the switch cabinet.

The safe controls of the MSI 400 product family offers both 24 inputs/outputs as well as an Ethernet interface and integrated industrial Ethernet protocol such as Profinbus and Ethernet IP in a compact design.

The safety controls are said to be suitable for the safe monitoring of simple safety functions as well as for performing more complex safety tasks.

Direct benefits for the machine

With STO as the foundation of modern integrated safety to the way it has traditionally been done – by connecting discrete devices together in a certain wiring and logic sequence – this benefit becomes obvious.

Functionality at the drive

Using the safety module provides straightforward functionality right in the drive. There is no need to figure out how to hook up and wire the logic with relays, resets and contactors. Instead users can work in harmony with the drive’s functionality. All that is needed is to commission the required built-in functions based on the safety design, and this eliminates the electromechanical logic design task.

The safety functions module provides pre-programmed safety logic functions that can easily be implemented in the drive according to the ‘connect-configure-reconfigure’ principle. The main benefit is the integrated safety functions that work seamlessly together alongside the drive control system. In addition, diagnostic features aid troubleshooting to keep the system continuously safe, with critical safety-related status and event-system messages part of the standard drive operation, accessible through the drives control panel.

Direct benefits for the machine

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