

Safe control technology – modular and flexible

With additional speed monitoring module

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Safety-related functions are increasingly migrated from the hardware to the software level. This migration is, amongst other things, due to the fact that the requirements placed on the safety functions become ever more versatile, flexible and user-friendly.

The PROTECT PSC safety controller for instance feature a high degree of flexibility: because of its modular structure, the manufacturer can combine different modules as required by the application, which can be smoothly fitted onto standard DIN rails and connected through a Backplane bus. This flexibility is reflected in the programming software: the combination of functional blocks with the programming language KOP enables realizing almost any desired function. The possibility to create user-specific functional blocks allows for a comfortable programming of similar projects.

The set-up and start-up procedure becomes a piece of cake as a result of the comprehensive visualization features. Elan, a subsidiary of the Schmersal Group, now offers the PROTECT PSC users an extension of the programme: the PDMS drive monitoring with modular structure for standstill monitoring, which is also suitable for frequently used special operating modes such as "set-up mode" and "process monitoring" as well.

Modern electronics essentially contributes to the optimal integration of safety switchgear in the work processes, for instance the "integrated intelligence" of the new generations of safety switchgear such as the safety sensors of the CSS series from Schmersal. This also applies at least to the same extent to the evaluation of safety-related signals – and to the new generation of programmable modular safety systems, which Elan, the Centre of Competence for pro-

grammable electronic safety systems from the Schmersal Group has developed to meet the requirements of modern production systems and complex individual machinery.

Completely modular structure

The modular structure of the so-called PROTECT PSC system (from "Programmable Safety Controller"; image 1) offers the user numerous possibilities to combine the most various input and output expanders. Besides the central CPU unit (image 2), the system includes input and output modules in various combinations. The power supply module for the Backplane bus integrates a programming interface as well as a connecting interface for gateways. PROTECT PSC is suitable to realize all conventional safety functions and meets the safety requirements of Performance Level (PL) "e" to DIN EN ISO 13849-1.

The CPU can control up to 15 modules, which means that – if necessary – additional input and output expanders can be added to and smoothly integrated in the entire system later on. In this way,



Image 1: The safety controller with modular structure can be used with up to 15 I/O modules and over 250 inputs and outputs.

Safety in system. Protection for man and machine.

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Image 4: The safe speed monitoring is suitable for use in many process steps of mechanical processing – especially where hazardous inertial movements are to be expected.

can use a certified wiring example for certain applications. If necessary, his own programme module can be added to and retrieved from the above-mentioned library.

In this way, the user can be sure that he is not using a ready-made overdimensioned control system. Instead of that, he has a safety controller at his disposal, which exactly meets his specific requirements and which allows for an optimal adaptation to the individual application. As a result of the possibility to integrate operational functions, the mechanical engineer can save additional costs.

Extension: modular system for safe speed monitoring

As an extension to this universally applicable system, the Schmersal Group presents the "Protect Drive Monitoring Systems" PDMS (image 3), a solution with modular structure for safe speed monitoring, e.g. of spindle or axle drives (image 4).

As generator for the movement detection with PDMS, encoders, resolvers or two proximity switches can be used. The system evaluates signals from rotating and linear movements. The speed of the drive system to be monitored thereby can be programmed individually.

Perfectly fit for special operating modes as well

In this way, the maximum speeds, e.g. for special operating modes on CNC machining centres to DIN EN 13128 for operating mode 1 ("automatic mode"), operating mode 2 ("set-up mode"), operating mode 3 ("process monitoring with enabling device") and operating mode 4 ("process monitoring without enabling device") can be individually set and monitored in a safe manner.

The PDMS monitoring electronics, which is connected to the generator signal through a drive-specific cable adapter, is located on an input card. Every axle to be monitored is monitored by means of its own pluggable input card. Inside the system rack, multiple and even different input cards can be defined. Safe output cards then transmit the signals for further processing to PROTECT PSC. For a number of drive systems, appropriate cable adapters are available.

Target: high productivity with a high safety level

With these features, PDMS completes and concludes the monitoring functions from PROTECT PSC on machinery and plants, thus contributing both to the machine safety and to a higher productivity of the machinery regarded. The system for instance only give the enabling signal for a guard door, when the hazardous movement has come to standstill or has slowed down to such extent that no risk is involved anymore. For time-controlled monitoring however, a certain time-frame must be taken into account, so that the enabling signal for this guard door is given at a later time.

For the increasingly used possibilities offered by the use of special operating modes, PDMS also represents an efficient technological solution: the observance of the maximum speeds required for these "new" operating modes is safely monitored, so that the user can perfectly monitor the process or set up the machine with slow-running machine and opened safety guard, i.e. with a clear view onto the work piece and the tool.

Photo material:

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Note:

This article was first published in the specialised magazine "SPS Magazin". With the kind authorisation of the editorial staff and the authors.

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