

Compact safety controller with preconfigured application programmes

Compact and flexible

If you hesitate between a safety-monitoring module and a complex safety controller, you might as well steer a middle course and reach out for the flexibility of a safety controller without having to accept the programming effort by choosing the PROTECT SELECT compact safety controller. With four preconfigured application programmes, this system covers the majority of applications.

The individual safety areas of a machine or plant (image 1) are often monitored by multiple safety switchgear. In these cases, multiple safety-monitoring modules are required for the signal evaluation as well. As soon as four of five of these modules are needed, the builder starts wondering whether it would not be more likely to use a safety controller. The "step" towards this high-order solution however is huge and moreover involves additional programming efforts (image 2).



Image 1
 No matter how different the individual safety fields are: PROTECT SELECT can be adjusted to the specific requirements without programming effort.

In order to close the gap between the safety-monitoring modules and the full-grade programmable safety-related control systems, the Schmersal Group has developed the new PROTECT SELECT compact safety controller (image 3). At SPS/ IPC/ DRIVES, this system will be launched in combination with four

application programmes, which already have been preconfigured for the most frequently used configurations of safety areas. In this way, the parameter setting and set-up time is considerably reduced and the entrance into the world of safety controllers offering a higher flexibility and adaptability is simplified to the user.

For safety fields with up to eight switchgear

PROTECT SELECT replaces up to eight safety-monitoring modules (up to PL e and SIL 3); considering its compact overall width of only 52.5 mm, it saves place in the control cabinet. All established safety switchgear such as emergency-stop pushbuttons, safety switches and solenoid interlocks, safety mats and optoelectronic safety devices can be queried through the 18 safe inputs. At output level, four safe semiconductor outputs, two safe relay outputs and four optional signalling outputs provides for flexible wiring possibilities.

Smooth adjustment to the individual circumstances

Features especially worth mentioning are the additional safe analogous inputs, enabling the integration of critical process parameters (temperature, pressure, flow, etc.) in the safety concept. The parameters of the corresponding threshold limit values can be individually set.

In actual practice, no safety field is identical to another one; this means that the user must change the individual parameters and determine, for instance, whether an emergency stop to Stop 0 or Stop 1 is required or if a power-to-lock or power-to-unlock solenoid interlock

is integrated into the safety circuit. With PROTECT SELECT, these issues are simply defined by navigating through the menus of the plain-text colour display. Here, all parameters can be set in the form of a dialogue with the control system.

Four application programmes

To simplify this job to the greatest extent for the user, Schmersal offers the new compact safety controller with four basic configurations or application programmes covering approximately 80% of all applications, for which only the parameters of a few functions need to be set individually (e.g. Stop 0 and Stop 1 category, cross-wire short monitoring, de-bounding times, drop-out delay times etc.). In addition to that, functions such as the free allocation of feedback loops (EDM), start-up test, cyclic



Image 2
 The new compact safety controller closes the gap between individual, permanently wired safety-monitoring modules and complex programmable safety control systems.



Image 3
With an overall width of only 52.5 mm, the new compact safety controller saves place in the control cabinet. It replaces up to eight safety-monitoring modules.

test, automatic start, manual start etc., can be smoothly activated and deactivated. The available programmes are clearly described in the operating manual; by means of these programmes, PROTECT SELECT can be smoothly wired similar to a safety-monitoring module.

**Programme 1:
for additional operating modes**

Application programme 1 offers the possibility to connect up to four dual-channel safety switchgear, which can be by-passed using operating mode selectors and enabling switches. The programme is also suitable for hazardous areas, where additional operating modes such as “set-up mode” and “process observation” facilitate the processes during set-up or fault elimination. These operating modes are frequently used on many machine-tools as well as on packaging machinery. The Machinery Directive explicitly allows these operating modes and describes the applicable conditions for a machine operation with the safety guard open.

**Programme 2:
one workstation with two safety fields**

Application programme 2 was developed for machines featuring one workstation with two separate safety fields (image 4). In the upper part of the machine for instance, the workstation where the parts are processed, fitted or wrapped, is located. The bottom part, where the material feed and the drive units are situated, must only be opened for maintenance operations; however, it needs to be monitored by a safety switchgear as well. Here, PROTECT SELECT offers the possibility to monitor all

safety functions for both safety fields through a single module – with up to three safety switchgear per safety field. For each field, an individual start/reset function as well as a separate feedback loop (EDM) is provided. The additional superordinated emergency stop has its own reset function.

Programme 3: complex safety fields with up to six switchgear

By means of application programme 3, the signals of up to six safety switchgear can be evaluated. The programme also offers the possibility to allocate a separate reset function to one of these safety switchgear. This provides for a comfortable configuration of complex safety fields, which are monitored through multiple safety switchgear.

Programme 4 for muting applications

Application programme 4 was configured especially for optoelectronic safety guards with muting function (image 5). In this case, the material can be transported into (or out of) the hazardous area without the machine being stopped. The safety guard is automatically by-passed for a limited duration and the machine runs safely and with a higher productivity.

PROTECT SELECT with programme 4 offers in all situations the additional advantage that no separate muting sensors are needed anymore. The muting function is monitored directly through standard safety light curtains and sensors. In addition to that, the signals of two other safety switchgear are evaluated. In this way, the user can realise a complete muting application for instance with an additional safety guard and an emergency stop.

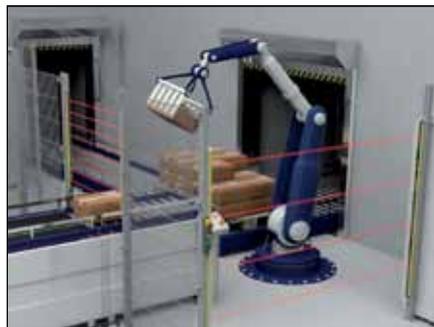


Image 4
If two safety fields must be protected on one workstation, PROTECT SELECT can evaluate the signals of up to three safety switchgear for each field.

One compact controller, many functions

The four application programmes cover the majority of practical applications and provide for a quick programming-free implementation of the modules. Hence, the machine builder can optimally adjust the safety functions to the specific process operations of the machine. He moreover saves space in the control cabinet and - what is even more important - money considering that one PROTECT SELECT module replaces up to eight safety-monitoring modules.

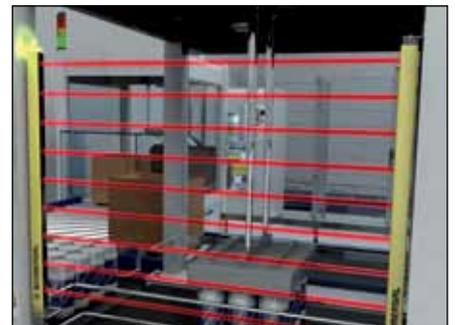


Image 5
Application programme 4 with muting function was developed for safety fields with material conveyance.

Photo credits:
K.A.Schmersal GmbH

Author:
Christian Runge, Product Manager
Safety Controls,
K.A.Schmersal GmbH, 42279 Wuppertal

K. A. Schmersal GmbH
Möddinghofe 30
42279 Wuppertal
Telefon: +49 202 6474-100
info@schmersal.com
www.schmersal.com