

# Focus on IFA's work

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## Programming standard for safe machine controls

### Problem

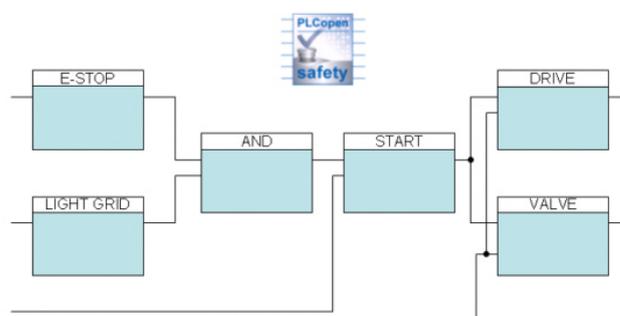
Modern, competitive machinery and production systems require integral safety solutions with comprehensive, flexible functionality employing programmable safety components such as safety PLCs (programmable logic controllers), safety bus systems, optical sensors or safe drive systems. The trend is growing for safety functions to be programmed by machine manufacturers themselves.

The parties validating the software (such as the test bodies), like the program authors themselves, must already deal with a large number of programming language variants. Conversely, an established international PLC language standard has existed for a long time for the standard software of machine controls (IEC 61131-3).

Several new standards (such as ISO 13849, IEC 61508/IEC 62061) are now available for programmed safety functions. They impose the same, very general requirements: separation of safety-related and non-safety functions, suitable programming languages, validated software modules and recognized programming guidelines. In order to satisfy these requirements, the machinery manufacturers require products with suitable safety solutions.

### Activities

At the request of manufacturers and Expert committees of the DGUV, the IFA is a member of



Example of a programmed safety function employing function modules

the "TC 5 – Safety" working group of PLCopen, an international user organization for automation systems. The objective of TC 5 is the establishment for the first time of an international market standard governing safety-related software modules for machine controls. Almost all leading suppliers of safety controls and all leading manufacturers of the programming tools employed are represented in the working group. The Institute advises the working group on safety standards and on arrangements for programming guidelines governing safety software, and contributes its experience to the specification of software modules.

Advice is simultaneously provided to manufacturers, and design and type examinations conducted. This activity will increase following approval of the specifications for additional function modules by the working group.

## Results and Application

The result for occupational health and safety is that the leading manufacturers will implement the new market standard for software modules. A babylonian plethora of programming languages for safety controls can thus be avoided.

Manufacturers of programming tools and PLCs will use the specification for new products and incorporate it into the type examination. A recognized specification provides all parties involved with security in planning. The pace of development and test activities (including those conducted at the IFA) will be stepped up as a result, and the introduction of a universal standard for safety-related machine control software will accelerate approval procedures. Testers will not require training in several different software standards.

The specifications for the safety-related software modules and a guide to application are available for download at PLCopen. General findings of the working group and the experience of the IFA have also been considered during international standardization activity. For ISO 13849-1, the institute had contributed normative requirements and an informative annex dealing with software development. This assists users in applying the new programming standard.

## Area of Application

Manufacturers of automation devices and programming tools; machinery manufacturers and users; test bodies

## Additional Information

- The web pages of PLCopen: [www.plcopen.org](http://www.plcopen.org), TC5 – Safety

## Expert Assistance

IFA, Division 5: Accident prevention – Product safety

## Literature Requests

IFA, Central Division