

Seize control of safety and productivity

It is about time the people responsible for machine safety and operation – engineers, electricians and integrators – quite literally took control.

Because plant safety is most effective when it is incorporated into the very design of the plant, it makes sense for the plant's designers and managers to design and manage its safety and control functions too.

Unfortunately, this is rare. The rise of safe field bus and the safety PLC shredded the red tape associated with time consuming lockout tag-out procedures and promised to make safety every bit as efficient as the production line they safeguarded but with one serious limitation: the language of code made them inaccessible to many of their users. The design of safety systems instead became the domain of specialist programmers.



Pilz believes another paradigm shift is overdue. Plant designers should be able to choose to deal with code or configure the logic themselves without any need to delve into the mysteries of computer languages.

Speaking in code costs

Engineers can of course train to write their own code but the question is: which code? The IEC 61131-3 standard encompasses five common process control languages that can be complex by necessity. Many technical people understandably leave it to the specialists.

The next hurdle is time. Programming in code is tedious, time consuming and small keying errors can cripple projects.

Safety suppliers like Pilz have long made it possible to "drop in" the most common functions but production lines don't come in one-size-fits-all. Instead, we argue that plant designers should be able to create their own function blocks tailored perfectly to their own operations, which can be applied over and over again. They should also be adaptable for different types of hardware.

Why must we hold out for hardware?

It's common practice for software development to wait until the machine specifications are complete for no reason other than the software demands details of the hardware upfront. Engineers are faced with three serious implications of this process:

1. Project timelines are extended because design work has to be done in sequence rather than in parallel;
2. Changes to the production line are difficult and often call for more programming; and
3. Safety tends to be designed as an afterthought.

Imagine an alternative scenario where the plant designers can create their own function blocks perfectly tailored to the overall structure of the machine with the most basic information. The detailed functions of components are simply added in when they become available. The hardware and programming can be done in parallel, compressing project time lines and putting designers firmly back in control.

Safety and production in synch

There is something even more important at stake: the incorporation of safety into plant design. Research by the National Occupational Health and Safety Commission (NOHSC), highlighted the role of design in safety. Analysing the cause of fatalities from 2000 to 2002, the study found 95% of deaths involving machinery and fixed plant were due, at least in part, to design issues. Poor design was slated as the primary cause of 42% of workplace fatalities.

Similarly, an analysis of injuries sustained during the 1997 to 2002 period showed design issues were once again involved in at least 42% of cases. The top three identifiable design problems were inadequate guarding, poorly situated control devices and inadequate interlock safety systems.

Rather than adding controls – which are often cumbersome and detrimental to productivity – configuring the safety system and the production system together allows engineers to design out hazards during the machinery's early development phases.

Central control over decentralised plant: the best of both worlds

The trend towards modular plant cells controlled by networked PLCs has brought response speeds measured in microseconds and the ability to isolate zones (whether for safety, breakdowns or planned downtime) without affecting the entire production line.

It has, however, brought other challenges. Each PLC must be programmed with all the associated time and costs. Pilz instead recommends considering individual PLCs as nodes of control within the larger system. This provides plant engineers with a comprehensive overview of their operations and the ability to adjust its functioning from one central point. In other words, simplicity, without sacrificing any of the benefits of modularity.

Seamless control, well, almost

Recently, automation suppliers have been promoting greater integration between safety and operations control. With the proliferation of incredibly fast Ethernet technology, Pilz believes that now makes sense; there is enough capacity to deliver the almost instantaneous responses needed to guarantee both safety and productivity. In fact, we advocate the integration of machine control, safety and even motion control but with one qualification: safety and operations functions must be logically separated.

This ease of use and functionality has long been enjoyed in the information technology world with all types of what-you-see-is-what-you-get (WYSIWYG) platforms. Pilz believes the future holds similar accessibility for engineers, electricians and integrators. The payoffs for these technical people will translate to greater safety and productivity for the entire workforce.

Contact: Pilz Safe Automation
Phone: 03 9544 6300
Email: safety@pilz.com.au
Web: www.pilz.com.au