

Reliable protection for 24 VDC circuits with  
integrated connectivity: PXS24 – electronic  
protection module from Eaton

## Higher up-time by electronic overload protection

**Location:**

Schrems, Austria

**Challenge:**

- Reliable protection for control circuits with long cables.
- The circuit breakers need to be connected to the control unit to simplify troubleshooting and to have remote access, if necessary.

**Solution:**

PXS24 Standard - Eaton's electronic circuit breaker with integrated connectivity

**Outcome:**

By using the electronic protection module PXS24 in the production plant in Schrems it was possible to:

- Avoid nuisance tripping
- Speed up troubleshooting also with remote access if required
- Speed up "Switch ON" process

This leads to an explicit reduction of the downtime in case of an error.

System errors do happen. No operator is 100% immune to this type of malfunction. But the big question is: What happens next? Does the downtime affect the entire system, or is it limited to the faulty part? Are hours and hours of troubleshooting required to identify the fault, or can it be corrected within a short period of time? Dieter Beyer, head of the control engineering department at Schrems, takes no risks at the technology used by his engineers: He trusts in the special capabilities of the PXS24 electronic protection module from Eaton.

**Challenge**

Globally, the trend is clear: The use of electronic circuit breakers is on the rise. Especially in the case of modern power supplies and large machines with long cables, conventional electromechanical solutions can no longer keep up with the high safety level and functionality of electronic protection modules. In addition, in the age of Industry 4.0, customers increasingly demand protection devices with enhanced functionality. For example, connectivity options are becoming increasingly important. "One look at the machine's operation terminal is all it takes for the staff on site to know what needs to be done," says Alexander Peutl, Electrical Designer

in the control engineering department, who is very happy with the degree of transparency that "his" system now offers. "We are now able to identify exactly which function groups are affected by a fault, down to channel level," he notes.

As both the switching input and the error message output of the PXS24 comply with IEC-EN 61131-2, smooth communication with the PLC is guaranteed. The input can be addressed by sensors and can even control functions that previously required a separate PLC output. In the event of a fault, a PXS24 can, among other things, switch off further PXS24 modules in the system within a few milliseconds.

**Tried and tested**

Although Alexander Peutl works for Eaton's automation business, he regards the Power Distribution Division in Vienna as an external supplier. "Of course, our first choice is always to use Eaton products, but this doesn't mean that they get preferential treatment. We will only install Eaton components if they meet our requirements and offer the right functionality for the application at hand."



Powering Business Worldwide

At Schrems, the PXS24 also had to pass this test before it was installed in a machine that produces yoke assemblies with low amperage for miniature circuit breakers.

The average output of the machine is approximately 5,500 units per shift. It runs around the clock, mostly, but not always. Due to downtimes generated by incidents in the 24 VDC circuit it was time for an electronic protection solution.

“Our system contains numerous parts that are constantly in motion. Their task is to integrate a wide variety of individual components into one assembly. And although we use particularly stress-resistant cables to provide the best possible protection against broken cables, in the past this type of incident would nevertheless occur from time to time. If this happened, the machines would then be down until the fault was corrected, after which an authorized staff member had to turn the tripped miniature circuit breaker (at the time still an electromechanical model) ON again,” according to Alexander Peutl. This had to do with the fact that only authorized and trained personnel has access to the locked machine control cabinets.

It was possible to address two problems: On the one hand safe & reliable protection is ensured and on the other hand it is possible that the normal operator can do a reset at any time it is requested via the operating terminal and even remotely, if necessary. This feature is particularly useful for the Eaton automation team, since many machines at other production sites are

also serviced from Schrems via remote maintenance. “If, for example, a PXS24 has tripped at our facility in Sarbi, Romania, a technician could provide troubleshooting assistance from Schrems remotely. In addition, this information is also transmitted to a higher-level machine data acquisition system and is therefore not only available via an Eaton touch panel on site, but also from any other evaluation point, as required,” notes Dieter Beyer. For him, this is another reason why the PXS24 electronic protection module for 24 VDC circuits is the obvious choice for all new machines, alongside digital RCDs and Eaton’s NZM circuit breakers and switch-disconnectors. In addition, as Beyer emphasizes, the PXS24 even comes with UL approval and is thus suitable for the North American market.

### Selectivity is key

There are a number of other features that make the PXS24 devices especially suitable for the selective protection of individual, 24 VDC function groups. The electronic protection module features a modular design, can be directly connected to up to three loads, and supports precise control, switching and signaling down to channel level. As already mentioned, it comes with a remote reset function and is easy and quick to install thanks to the push-in terminals and busbars. In addition, the device also issues separate error messages for each channel, rather than a simple sum error message, which enables the implementation of professional system monitoring and visualization. What makes the PXS24 particularly

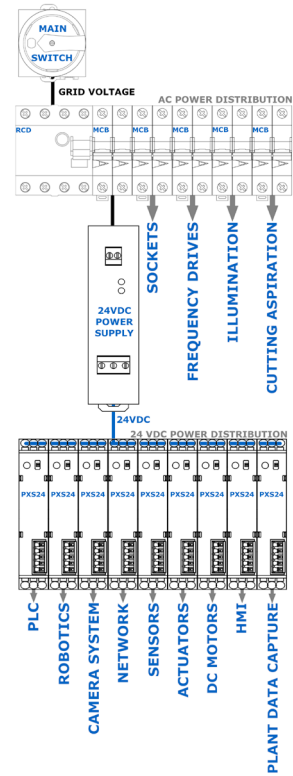
interesting for manufacturers of standardized machinery is the fact that it significantly reduces the need for coupling relays during operational switching.

A total of 10 PXS24s are currently installed in the yoke assembly system at the Eaton facility in Schrems, ensuring that in the event of a fault only the affected circuit is switched off, rather than the entire production line. In contrast, thermal-magnetic circuit breakers often do not detect faults in 24 VDC circuits quickly enough, so that the higher-level power supply would switch off the entire system in the event of a fault. Naturally, this should be avoided, as it complicates troubleshooting and reduces machine availability.

In addition, this may also result in dangerous machine states. “The entire periphery should be protected separately,” notes Alexander Peutl. “Targeted and well-thought-out selectivity is therefore the most important factor for maintaining high machine and system availability.”

By using the electronic protection module PXS24 in the production plant in Schrems it was possible to avoid nuisance tripping, speed up troubleshooting with remote access if required as well as the “Switch On” process after a fault.

This helped explicitly to reduce the downtime in case of an error.



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