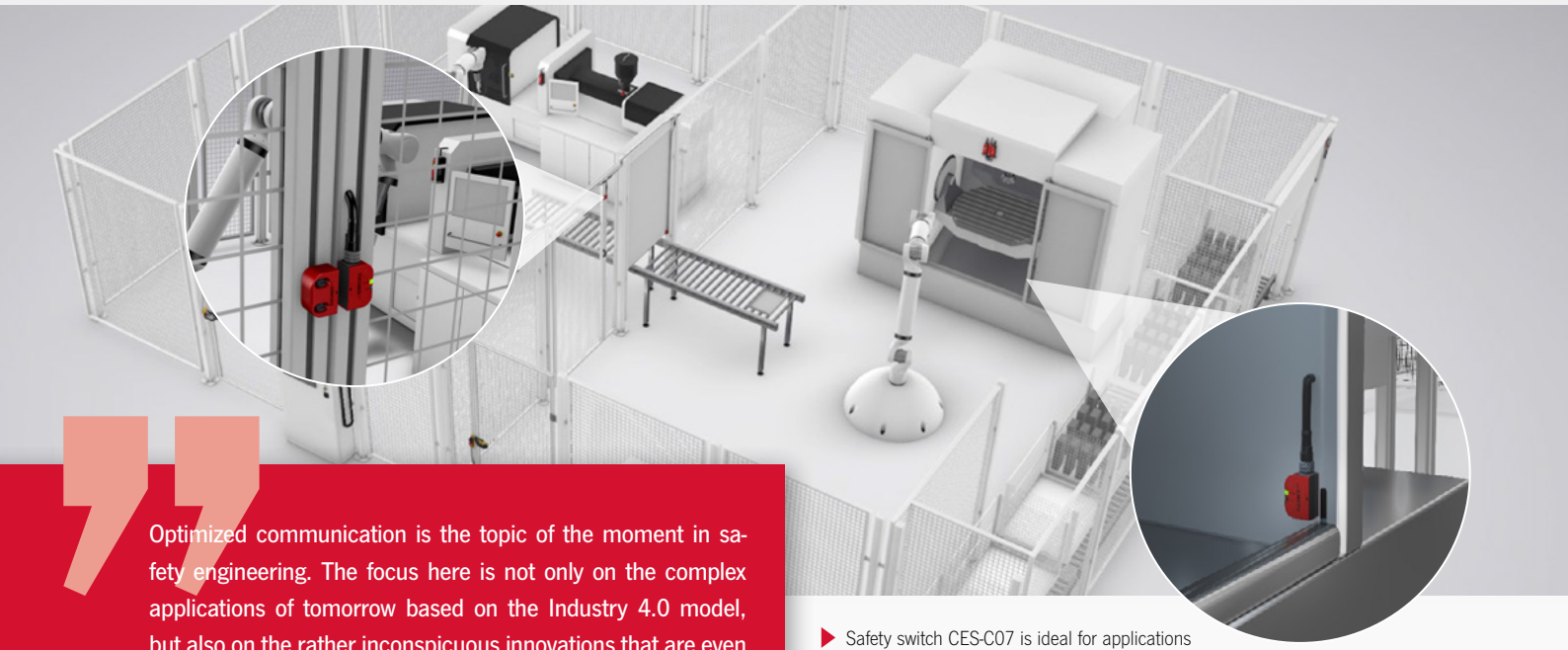
CES-C07

EUCHNER
More than safety.

Intelligent safety solution for smaller installations

The clever way to do things



Safety switch CES-C07 is ideal for applications such as securing packaging machines and installations incorporating numerous flaps, access points and doors. What's more, it provides valuable preventive-maintenance information.

Optimized communication is the topic of the moment in safety engineering. The focus here is not only on the complex applications of tomorrow based on the Industry 4.0 model, but also on the rather inconspicuous innovations that are even now proving to be true wonder products. For instance the new safety switch CES-C07 and the safety module ESM-CB from EUCHNER: these efficient team players promise a significant reduction in downtimes, above all in smaller installations.

Communication for high machine availability

„Everyone is talking about Industry 4.0", says Jens Rothenburg, product manager at the safety specialist EUCHNER. „Of course as a technology leader in the safety sector, we are also talking about it, however it is just as important for us that our innovations can leverage their improved communication capabilities not only in the completely networked factory of tomorrow, but right now – in the next machine that a machine tool manufacturer designs or a user puts into service or reconfigures."

This is exactly the case for the two newcomers from EUCHNER. As inconspicuous as the safety switch CES-C07 and the safety module ESM-CB may be at first glance: they are able to communicate at Industry 4.0 level and in this way open up – compared to conventional safety switches – completely new degrees of freedom during the design of highly efficient safety solutions for smaller installations up to category 4 / PLe.

When safety switches without communication were connected in series, a large amount of effort was required to locate the switch that had triggered a machine stop. The subsequent troubleshooting was often difficult and caused unnecessarily long downtimes. On the other hand, the CES-C07 now provides process-related parameters in real time. As such it is possible to identify not only urgent problems, but also to obtain a large amount of information for preventive maintenance. The sensors measure, for instance, relevant parameters in the surroundings to indicate in good time whether the installation is about to fail. The system even signals attempts at tampering.

Intelligent process data information hierarchy

The developers at EUCHNER came up with an intelligent information hierarchy to avoid excessively high data traffic on the bus. „In relation to the process data, we can rightly say that every single bit provides the user with essential information on what needs to be taken into account in a specific situation“, says Jens Rothenburg. „The user can then very conveniently obtain more detailed explanations by retrieving the acyclic data.“ And best of all: a single cable is sufficient for communication and only an already integrated eight-pin M12 plug is needed for the connection. This feature saves hardware and makes the entire system lean and transparent.

Each switch transmits 4 bits of process data to the control system. The OD signal, for instance, indicates whether the guard is open. The operator, therefore, knows exactly which door is responsible for stopping the installation. If the weak-range indication OW appears, an actuator is in the limit range of the transponder field. The cause is mostly doors dropping after extended use. Up to now the switches only flashed to alert the user, an indication that was easy to miss in everyday industrial use.

This situation can hardly arise now with the corresponding control system message on the Human-Machine Interface (HMI). The indication OI informs the operator that there is a pending message to be retrieved as soon as possible via the acyclic data.

These acyclic data also include the current diagnostic codes that describe exactly what is wrong with the related switch. There are more than 30 different messages defined. Every single wiring error is indicated providing a massive time saving during setup. At the same time, behind the code there are exact instructions for the operator on how to rectify the related error as quickly as possible.

Preventive maintenance

Valuable information for predictive maintenance is provided by the indication of the voltage currently applied to the CES-C07 and the temperature measured in the switch. If certain thresholds are exceeded or dropped below, preventive maintenance can be requested automatically by means of a corresponding setting. Further indications of a possible imminent fault are provided by acquiring the number of switching cycles. Although the CES-C07 itself is wear-free, the safety door mechanically is not; this aspect can be monitored very easily in this manner. The fact that the safety switches can be easily replaced while electrically live also provides a major contribution to avoiding downtimes.

Protected against tampering

A similarly important topic in modern production facilities is the protection of the installations against tampering. The acyclic data also provides useful information on this issue. By checking the number of switches in a row, the control system can check whether the circuit has changed since the last check, whether for instance the row of switches has been shortened. And with the function for polling unicode switches for the actuator code

Safety switch CES-C07 and safety module ESM-CB: Particularly in smaller installations, these efficient team players can significantly reduce downtimes. All the relevant sensor and device data are sent to the control system via IO-Link.

currently read, it is possible to determine whether this code is different to the code taught in. For multicode switches the system checks whether the current actuator code matches the code saved in the control system. „This feature provides a vital safety improvement, for instance, on machine tools on which the chip conveyors are only protected by the bins for the metal chips“, explains Jens Rothenburg. „Thanks to the verification of this code, it is ensured that the right bin is always standing in front of the related discharge opening, even if bins of varying sizes are in use.“

All this information – and much more – is polled automatically from each switch in the chain, in combination with the safety module ESM-CB, and provided to the control system via IO-Link. The device, only 18 millimeters wide, fulfills several functions at the same time: it is an evaluation unit, safety relay and IO-Link

Unbeatable duo: Safety switch CES-C07 and safety module ESM-CB offer a new level of freedom in designing safety solutions for smaller installations up to category 4 / PLe.

device in one – that is everything you need to protect a small machine. Two safety circuits can be connected to the input side. For example one with which the device can monitor an emergency stop chain or the switching contacts on mechanical safety switches – and another one for evaluating a chain of the new safety switches CES-C07. Two redundant, safe relay contacts make it possible to switch loads of up to 6 amperes directly. The safety module is in a constant dialog with the devices connected and acquires information from each sensor including the system state, the ambient conditions and the sensor's data.

Communication via IO-Link

Along with cost aspects, the excellent team player characteristics of the point-to-point wiring system played a key role on deciding for communication via IO-Link. Irrespective of whether PROFIBUS or PROFINET, whether AS-Interface, CC-Link or Ethernet/IP: all common automation systems have access to IO-Link. This means: the new safety switch CES-C07 and the safety module ESM-CB have a direct connection to the entire world of automation. This feature makes them interesting for all types of installations – from machine tools and packaging machines to fences in need of protection. And, among other aspects, it has the irresistible charm for the manufacturer that products with identical safety engineering can be delivered to all regions of the Earth. „Anyone who wants to market the same machine in the USA and in Europe generally needs to build different control systems", recognizes Jens Rothenburg. „However, here it is good to know that at least the safety switches can remain unchanged."

Features of the CES-C07 from Euchner

With the new safety switch CES-C07 and the new safety module ESM-CB, EUCHNER is therefore placing real all-rounders on the market that thanks to their communication capabilities are also real wonder products – and that not just in complex applications of tomorrow based on the Industry 4.0 model, but also already today in comparatively smaller installations.

EUCHNER safety engineering

EUCHNER industrial safety engineering for the protection of people, machines and products has already proven its worth in various sectors such as the automotive, logistics, tool and packaging machine construction, food and pharmaceutical industries. The product range comprises door detectors, door locking systems, hand-held pendant stations and limit switches in addition to guard locking devices and access management systems