

Application report Electronic-Key-System EKS

Electronic-Key-System for selection of safe operating mode

Eberspächer Exhaust Technology GmbH & Co. KG has defined the Electronic-Key-System EKS from EUCHNER as the company standard for secure access control to processes and software applications and for selection of safe operating mode.

The automotive industry places the highest demands on production efficiency and product quality. It is therefore crucial to avoid disruptions in process sequences. Neunkirchen-based Eberspächer Exhaust Technology GmbH & Co. KG took a special measure to reduce the fault susceptibility of production processes and thereby to enhance product quality: The manufacturer of pioneering automotive exhaust systems has already equipped around 100 of its machines and production systems around the world with an Electronic-Key-System permitting secure access control to processes and software applications – and is adding more each day.

“Before we implemented EUCHNER’s Electronic-Key-System EKS Light in our production facilities in early 2015, our security system for entering quality-relevant data consisted of passwords,” explains Achim Noll-Hussong, CoC Controls at Eberspächer and responsible for implementing the new system. The password administration system had a major drawback, however: every employee came to know the passwords after a while, because they were either written down on the respective machine or in its control cabinet or were passed along in person. Noll-Hussong also added that the passwords were often simple enough for anybody to crack. The resulting lack of protection against unauthorized machine access eventually led to higher

fault susceptibility of the processes and consequently to decreasing productivity and quality losses in production.



Illustration 1: Only specially trained personnel may perform sensitive setup and servicing on the testing installation for the exhaust tract – this is ensured by the Electronic-Key-System EKS

Access protection to critical processes

Eberspächer was already using other EUCHNER safety systems – including the Multifunctional Gate Box MGB to secure safety doors – so a product from the Swabian safety engineering expert was also the obvious choice when it came to access restriction. The first choice was the Electronic-Key-System EKS Light for electronic access management. The system consists of the actual Electronic-Key with writable RFID transponder for user logon to the machine, as well as the Electronic-Key adapter into which the Electronic-Key is placed during machine operation. It finds widespread use at automobile manufacturers and suppliers, and is also recommended for all applications involving process-oriented production of food, pharmaceutical products or

chemicals for which protecting access to critical processes is crucial.

Selection of safe operating mode with EKS FSA

Like many other companies, Eberspächer employed the EKS Light as the entry-level access protection technology. “Susceptibility of the processes to faults decreased dramatically when the Electronic-Key-System was implemented. Productivity and product quality increased at the same time,” confirms Achim Noll-Hussong. He convinced his colleagues around the world that expanding from pure access management to an EKS application in combination with selection of safe operating mode is expedient. Eberspächer still uses a special key switch to bypass safety functions.



Illustration 2: The Electronic-Key is inserted in the Electronic-Key adapter of the EKS Light (right)

The key to it is given only to specially trained persons. To streamline this process and make it safer, Eberspächer is currently testing the use of EKS FSA (For Safety Applications) with PROFINET data interface, the

bus system Eberspächer defined as the standard, in a pilot phase in Germany. Combined with a procedure developed and tested by EUCHNER and a touch panel as the HMI, this Electronic-Key-System meets all requirements in standards and laws applicable to an access system for selection of safe operating mode. Eberspächer was particularly interested in this function of the Electronic-Key-System, because the exhaust system specialist uses exclusively touch panels as the man-machine interface.

Unlike the EKS Light, the EKS FSA with data interface allows each Electronic-Key to be personalized and provided with custom authorizations. Responsibilities can be made transparent this way. In addition to providing a high level of protection against copying, the system offers functions like controlling access to parameters and access by individual persons and other installations, etc. For example, the Electronic-Key gives specially trained personnel clear authority to perform sensitive setup and servicing in a special operating mode, which could be hazardous for inexperienced operators.

“The pilot phase involving the EKS FSA with data interface forms part of our future-oriented ‘Lean Machine Control’ project with the goal of streamlining our machines,” explains Achim Noll-Hussong. He elaborates: “The EKS and selection of operating mode on the touchscreen eliminate all controls that used to be required for changing the operating mode. This can shrink the housing in which the HMI and controls are installed.” Furthermore, it is no longer necessary to organize and distribute special keys that were required to

activate the special operating modes. The respective employee now simply inserts his Electronic-Key into the Electronic-Key adapter on the machine and additionally logs on with his personalized password.



Illustration 3: The modular and compact EKS Light version in use for access management at Eberspächer

The Electronic-Key content is then checked automatically. This includes a check of the unique and unalterable serial number plus checksum (Key CRC), the valid date, the valid operating mode level and the valid HMI user level. Only when this check clearly identifies the employee as an authorized machine user, he will be able to exit the logon screen and select and confirm the operating mode depending on his valid selection of operating mode level. One of four operating modes – “Manual,” “Automatic,” “Setup” and “Media Permanent” (to bypass safety functions in Setup mode) – can be selected on machines equipped with the EKS FSA at Eberspächer.

More than just an access right

Other data can be stored in addition to the access right on the Electronic-Keys. It is this option in particular that Noll-Hussong utilized to the fullest with regard to global use of the system in all Eberspächer production facilities. For example, each Electronic-Key contains the number of the plant in which it is used, as well as information about the respective plant/production unit/field and specifications relating to the various production technologies at Eberspächer Exhaust Technology. This ensures that access rights to the various technologies or machines are assigned only depending on the respective level of education or training of the personnel. This could result in some employees being allowed to operate only one machine while others can operate several installations. Each Electronic-Key is additionally protected with a personalized password, so nobody but the Electronic-Key holder can do anything with it. If it is lost, the Electronic-Key is blocked virtually instantaneously to ensure the safety of the installation.

Programming support

In addition to providing the hardware, EUCHNER also offers comprehensive documentation for implementing selection of operating mode with EKS FSA. Based on the application description, the customer can independently perform programming or setup. Technical Support simultaneously assists the user in setting up and implementing the Electronic-Key-System.

Achim Noll-Hussong can confirm this: “Technical Support was always available to me during programming of selection of safe operating mode and was of great assistance to me.”



Illustration 4: The modular and compact EKS FSA version with PROFINET interface – the Electronic-Key-System for safe access control to processes and software applications and for selection of safe operating mode