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## PA-infoSYS by IEF-Werner: Unit for Data Surveillance as well as Communication for Machines and Components

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## Box Shaped Intelligence

It started as research project and is now going into series production: in the time of Internet of Things, IEF-Werner developed an intelligent unit for data surveillance and communication for machines and components, the PA-infoSYS. These are able to describe themselves and make statements concerning all relevant statistical and dynamic data. With this integrated intelligence, a toothed belt axis monitors its own condition and performance permanently and is able to analyse its own wear, amongst others. The user receives statements concerning the lifetime and a proposal for the next maintenance date. The user can plan the maintenance procedures in time and therefore increase his plant availability.

Furtwangen, 07.03.2019 – If a machine fails unexpectedly, it often gets expensive very quickly for the companies. The longer it takes to resolve the malfunction, the bigger the danger that delivery dates cannot be met. A resource saving and reliable production gains more and more importance for long-term customer loyalty and competitiveness. "Sudden failures are actually not necessary", Matthias Fehrenbach, who works for IEF-Werner in the research and development department, says. Actually? "Mostly the failures involve relatively small defects or signs of wear, which were not recognized in time. The degree of wear increases, the machine or component does not work precisely anymore and completely fails after some time." What if it could monitor its own status, recognize problems and weaknesses and inform the responsible staff member?

### PA-infoSYS: From research to series production

"That's possible for us!", Fehrenbach promises. For IEF-Werner, this has been an exciting topic for quite some time, in order to support clients even better. Within the scope of a joint project supported by the European commission, the automation specialist developed and realised an intelligent toothed belt axis. "The intelligence concerns the ability to describe itself and make statements about all relevant statistical and dynamical data available to the responsible staff members early on", the IEF specialist, who dealt with that topic intensively throughout his technical thesis, describes. "This is now going into series production." The engineers from the Black Forest presented the autonomic working unit with the name PA-infoSYS for the first time to an expert audience at the MOTTEK last fall.

Up to 16 plants or components can be connected with this new product. The application-specific and user-oriented processed information help the user of the plant to react quickly, in order to keep the production

running economically at all times. The involved components do not perform isolated tasks in the production lines. They are rather a dynamical, versatile and specialized part of an entity of intelligent work cells.

Example toothed belt axis: this linear unit is driven with a servo motor; it works efficiently and economically. The integrated guiding can also be used in slightly soiled environments; the guiding elements run up to 10,000 kilometres almost maintenance free. The toothed belt makes high accelerations and speeds with short cycle times possible. However, the data concerning the life cycle of a machine part given by the producers are often only guidelines, which vary strongly within the course of its service life. Through different workloads, for example fast starting and stopping, abrasive, adhesive wear or fatigue may occur on the contact surfaces of the slides and guide surfaces or the actuator bearings.

## A Promising Connection

If the toothed belt axis is connected to PA-infoSYS, it recognizes raw data as well as different statistical data before starting to work, through configuration of the linear unit, for example the serial number. "Via the motor current as well as the average speed and acceleration of the so-far run path, the PA-infoSYS calculates, by means of filed models, various dynamic key figures of the axis", Fehrenbach explains.

PA-infoSYS collects time-dependent data such as the present motor current every 100 milliseconds. These are offset with time-independent data, for example, the produced parts that are calculated once a minute, and stored on a XML-based database. "By means of the XML-format, the user is able to read the information without any graphical processing needed. However, in order to read and graphically process the stored data of the data acquisition system, we developed PA-infoSYS, an efficient application", Fehrenbach says. The data sets, stored per minute, are deleted, their content offset and put into a day log file with the next change in date in order to keep the size of the data low and still make frequent upgrades possible. This way, the user receives a simple and slim protocol that can be transmitted.

## All Data available

The client has access to his data at any time via PA-infoSYS. "If he wants to use our service, we get access as well on his request", Fehrenbach explains. "Our staff is then able to deliver a spare part on time, for example. Therefore we increase the availability and security of the processes."

The Internet of Things is not only about secure processes, but also about safe data. Therefore, the IEF developers equipped the PA-infoSYS with two network connections, in order to separate the machine network from the public network. A direct access to the machine control via the internet is rendered impossible this way. Therefore, the danger of computer viruses or hacker attacks is banned.

The user may install the IEF control PA-CONTROL but also solutions by other producers are possible. The client has the choice where exactly in the company the PA-infoSYS is situated. He can integrate the solution directly into a machine but it may also be placed for example into a control room.

“Our intelligent unit helps companies to produce more sustainably, environmentally friendly and resource saving; they work more economically and are more competitively”, Fehrenbach promises. The production can continue without expensive machine standstills and service technicians are able to plan maintenance procedures in advance. Wear can be reduced and therefore the availability as well as the service life of the entire system can be extended significantly.

The special feature of this solution is that it can be retrofitted into existing client-plants and components even though the solution is completely new on the market.

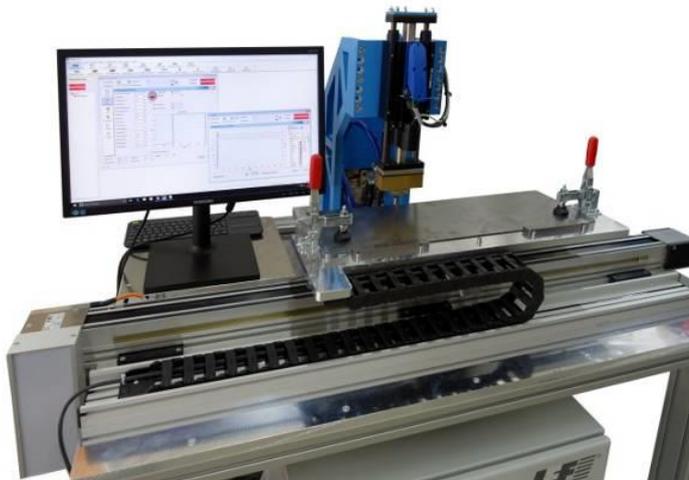
**Meta-Title:** PA-infoSYS by IEF-Werner: Unit for data surveillance as well as communication for machines and components

**Meta-Description:** It began as research project is now going into series production: in the time of Internet of Things PA-infoSYS of IEF-Werner connects machines and components; hence, they are able to describe themselves and make statements about all relevant statistical and dynamical data.

**Keywords:** IEF-Werner; toothed belt axis; EU research project; machine stand still; automation; industry 4.0; Internet of Things; PA-infoSYS

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Captions:



Picture 1: The result of a research project supported by the EU: a linear axis is connected with a welding unit via PA-infoSYS. They communicate with each other via a cloud solution.

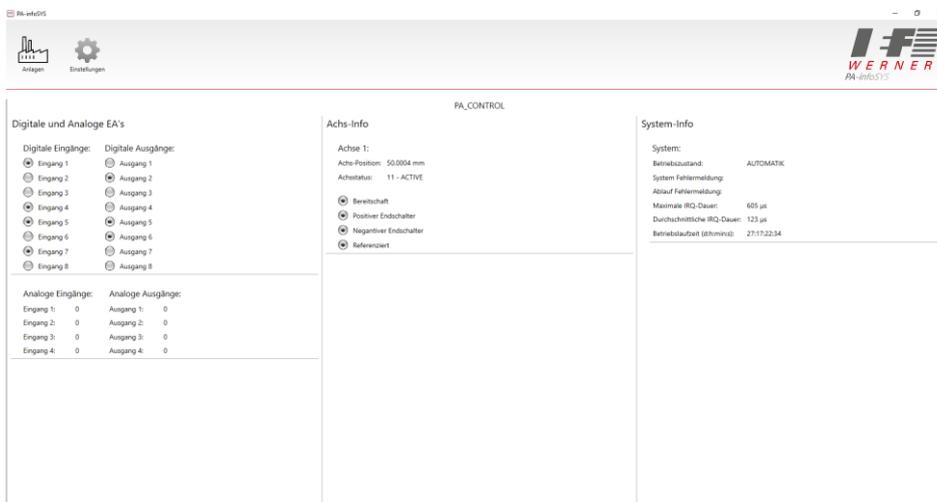
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Picture 2: The aggregated information are presented to the user application specifically and user oriented via PA-infoSYS.



Picture 3: Up to 16 plants or components can be connected via PA-infoSYS.

Pictures: IEF-Werner GmbH