PROFESSIONAL ARTICLE

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nexofox - part of an open ecosystem

Industry 4.0 and the "Industrial Internet of Things" represent the next evolutionary stage of automation. While the third industrial revolution was about automating individual machines - which was still easily solved by individual manufacturers - the current development is about networking and automating complete factories or even global corporations. In contrast to classic automation, this can no longer be achieved by individual manufacturers. For this reason, open cross-manufacturer ecosystems are becoming increasingly important. Dunkermotoren | nexofox, a brand of AMETEK Advanced Motion Solutions, recognized this early on and has been developing its IIoT solutions together with strong partners within industrial ecosystems from the very beginning. Be curious to see in which form Dunkermotoren | nexofox gets involved in the different ecosystems and alliances.

OI 4

The Open Industry 4.0 Alliance is an open ecosystem of a wide variety of manufacturers that has set itself the goal of applying existing standards in the field of automation and demonstrating common approaches to solutions on their basis. The spectrum within the alliance ranges from sensor and actuator manufacturers to machine and plant builders, integration companies, and large software houses, all of which are pulling together to make the vision of Industry 4.0 a reality. The OI 4 sees itself as an implementation alliance and not as a standardization body. Dunkermotoren has already been a member since 2019 and is active in a wide variety of areas within OI 4. To sharpen the image for the interests of its target markets and to get in close contact with them, Dunkermotoren | nexofox is represented in the industry-oriented workgroups Intralogistics and Mechanical Engineering, among others. These workgroups are concerned with the elaboration and presentation of the various use cases in

practice and how these can be realized along the entire value chain. In addition to its participation in the two mentioned workgroups, the drive technology manufacturer is proud to have been able to lead its own workgroup the "Component Supplier" since January 2022. In addition to the industry-oriented workgroups, which, to put it simply, develop the requirements for technical implementations, there are various technical workgroups within the OI 4 that, on the one hand, take up the developed requirements and implement them technically and, on the other hand, fill the various layers of the OI 4 architecture with life. In this area, Dunkermotoren | nexofox is actively involved in the design of the Open Operator Cloud and Open EDGE Computing. But more information will follow later.

OI 4 - Workgroup Components Supplier

The workgroup led by Dunkermotoren | nexofox is specifically concerned with the role of smart components such as the motors of the drive technology manufacturer within an ecosystem. The aim of the group is to develop generally applicable approaches and use cases for the integration of smart components across the value chain. Among other things, this involves looking for the best design of digital services for easy integration into existing systems, or evaluating which developments can deliver the greatest added value along the value chain. Interesting approaches include reducing the carbon footprint, predictive maintenance, and the digital twin.

OI 4 - Open EDGE Computing (OEC) Workgroup

This workgroup identifies ways in which assets from different vendors can be connected and interact with each other at the edge level. In addition, the group is concerned with building an ecosystem at the edge level and providing information from the edge to the various sub-models of the OI4 administration shell, also called AAS (Asset Administraion Shell).

OI 4 - Open Operator Cloud (OOC) Workgroup

In the Open Operator Cloud workgroup, the use cases originating from the industry-oriented workgroups (e.g., Components Supplier) are transferred into technical concepts. The implementation is always based on the AAS and is made available to members as a reference implementation. In addition to supporting members in entering a new subject area and helping them to adapt the use case to their own plants, the reference implementation provides a basic framework for specific implementations. In addition to these technical concepts, work is being done in close collaboration with the above-mentioned OEC workgroup on an end-to-end data provision process.

Administration Shell / Asset Administration Shell (AAS)

The administration shell enables cross-vendor interoperability for non-intelligent and intelligent products, thus achieving an end-to-end value chain. On the one hand, the management shell supports the mapping of the entire lifecycle of an asset. On the other hand, the administration shell integrates each asset into the communication world of Industry 4.0 and makes it uniquely addressable and identifiable within this network.

IDTA

With increasing maturity, the digital twin is becoming more and more tangible and thus also more decisive for the industry and for Dunkermotoren | nexofox. For this reason, Dunkermotoren has been a member of the "Industrial Digital Twin Association" since this year. The IDTA makes an important contribution to the construction, modeling, and standardization of the digital twin and relies, just like the OI 4, on the administration shell or AAS defined by the platform of the Industry 4.0 and the Fraunhofer Institute. The IDTA thus perfectly complements the work of Dunkermotoren | nexofox in the OI 4. Here, the technological foundations for the construct digital twin are laid and standardized, so that it can be reverted to this in realization projects in the OI4. For Dunkermotoren | nexofox, the step

towards joining and participating in the IDTA was a logical consequence of the integration of the AAS administration shell in its developments. In this way, Dunkermotoren | nexofox can contribute to the development of standardized sub-models for drives, for example.

Digital Twin

The digital twin of Dunkermotoren | nexofox is based on the principle of the administration shell (AAS) and goes far beyond the pure digital image of a motor. The drive technology specialist sees the digital twin as a universally applicable tool, which is particularly characterized by its manufacturer independence. This results in the following advantages for its customers:

- Standardized interfaces make it very easy to integrate the digital twin into existing ecosystems in addition to the stand-alone solution.
- Through models and submodels, even the most diverse assets can be easily integrated with each other.
- The central access structure allows customers easy access to motor-relevant information and/or data anytime and anywhere.
- The possibility to integrate further nexofox services also expands the scope of information and data provided.
- Sustainable and resource-saving use of Dunkermotoren motors and the materials used through optimizations with the digital twin.

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