VENDOR-NEUTRAL NETWORKING OF HETEROGENEOUS MACHINES

Application for the manufacturing industry - Cutting machine networking

SUMMARY

Construction of a reference system to demonstrate the use of an administration shell with heterogeneous systems, equipment and components, and to show the benefits of vendor-neutral standardized networking. The reference system is equivalent to SME production with heterogeneous machines.

CURRENT SITUATION

For SMEs, island solutions for networking result in data silos without interoperable interfaces, and only offer limited benefits. The challenge is to provide a vendor-neutral networking solution for SMEs. The cost of implementation and the complexity must be minimized to create a solution that has real benefits and is attractive to SMEs.

PROJECT DESCRIPTION

Based on specific benefits such as greater system transparency of in-house production, greater utilization of machines, or cost savings from the efficient use of resources, a solution was developed for an open, vendor-neutral ecosystem for SMEs – IndustryFusion – and implemented in a reference system. In the reference system, machines and systems including plasma power sources, CNC cutting systems, filter technologies, welding technologies, gas supply, deburring and measuring systems for room air monitoring, were networked with each other independently of the manufacturer on an interoperable basis.

REFERENCES

https://www.youtube.com/watch?v=_a23UG7Es2U

SOLUTION

When the reference system was created, it addressed both the machine level and the factory level. At machine level, the data is obtained from the controller or directly from the sensors (e.g. in retrofit solutions) and processed using a semantic model to generate information. Methods compare the current readings of the machine with the specified parameters so that any deviations can be identified at this stage. At factory level, the information from the individual assets is combined, creating a transparent smart factory for SMEs. It is the interaction between different assets that delivers cost and production benefits for manufacturers, for example energy efficiency, component monitoring or consumption analysis of technical gases. As an option, different cloud platforms can also be attached to the software architecture of the reference system to achieve redundant data storage or more complex data analysis.

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INDUSTRY 4.0 FEATURES

Structured in accordance with the Reference Architecture Model for Industry 4.0 (RAMI 4.0) in DIN SPEC 91345. Implementation of the administration shell concept at machine and factory level.

STANDARDIZATION APPROACHES

Creation of a vendor-neutral semantic model to describe assets in sheet metal working. Transfer planned to relevant standards, e.g. OPC UA companion specifications. Use of existing standards (e.g. VDI 3423: Technical availability of machines) to describe the data.