

Embedded PC hardware platform supports data acquisition and analysis solution for Airbus

Condition-based maintenance increases production reliability for engine mounts





The engine mounts (pylons) manufactured by Airbus at its Saint-Eloi plant in Toulouse are used to attach the engine to the aircraft wing and to accommodate the necessary electrical and hydraulic systems. They are characterized by their robust design as well as their complexity. Given the very high costs involved, Airbus attaches great importance to highly precise production tool control to minimize the risk of faulty machining and the duration of any machine downtime. This is precisely where condition-based maintenance comes into play, which uses a solution from the specialists at Dizisoft based on the CX5140 Embedded PC from Beckhoff.

Airbus formation flight to celebrate the company's 50th anniversary

Back in June 2018, two Dizisoft representatives in the form of commercial director Vianney Lepers and senior manager Christophe Rosiaux met with Airbus representatives to demonstrate the benefits of their technology. The start-up was founded in 2014 and was originally operating in the automotive sector before being awarded the Innovation Trophy in the Industry category in 2016. As part of their presentation, the representatives showcased a data acquisition and analysis system based on production resources that can be used to accurately understand the behavior of machine tools and contextualize the faulty parts that can occur in production. This makes it possible to speed up the entire process of machine tool diagnostics and troubleshooting.

An open, plug-and-play system

The main advantage of this digital maintenance tool is its open design, which means it is not tied to any particular manufacturer or technology. Stored on a USB stick or Industrial PC, the Diziscop interface has all the drivers necessary for the acquisition of production data, regardless of the component manufacturer – from PLC to numerical control (NC) and including the sensor and vibration analysis box. Another bonus feature is that this is a plug-and-play solution with no software installation requirements. Suitably impressed with the solution, Airbus placed an order in September 2018. The framework for this was provided by the MOS (Maintenance Operating System) project, which the aircraft manufacturer has implemented across all production sites to avoid equipment failures, reduce unplanned downtime, increase production rates and optimize product quality through more reliable production resources.

The monitoring project created with Diziscop notably includes specifying the machine tools and defining the features to be monitored in the NC during their idle cycles (such as instructions, programs, axis currents and backlash). The project is then transferred to the Dizispy acquisition kernel on the customized CX5140 Embedded PC equipped with Intel Atom® quad-core processor (1.91 GHz) and 4 GB of main memory. Over at the Saint-Eloi plant, around 50 of these Embedded PCs monitor just as many machining centers' handling tasks including drilling, cutting and pressing, and the CX5140 has proven itself in this demanding industrial environment according to Dizisoft.

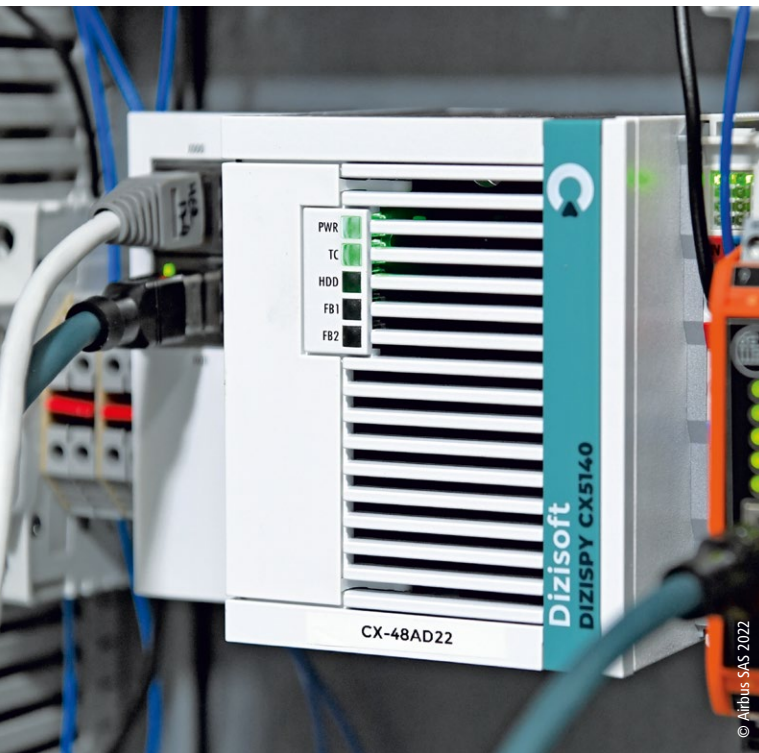
Data acquisition via edge computing

Diziscop and Dizispy form an edge computing unit, which allows the raw data collected within the production line to be processed, filtered and made available to industrial customers. To centralize and visualize this data from their information system, Dizisoft offers its own applications such as Dizilake (central data collector and business dashboards), and the entire solution is integrated into the Airbus AMI architecture. The data from the Embedded PC with Dizispy can be accessed via standard protocols such as MQTT, OPC UA or Modbus TCP. Dizisoft is also planning on predictive maintenance services and working on the development of corresponding algorithms.

According to Dizisoft, the Embedded PCs from Beckhoff were selected because of their 24 V power supply, which is indispensable in an industrial control cabinet, and the integrated UPS. What's more, the dual Ethernet ports on the CX5140 make it the ideal gateway between the operational network (OT) as



Engine mount for an Airbus A320neo



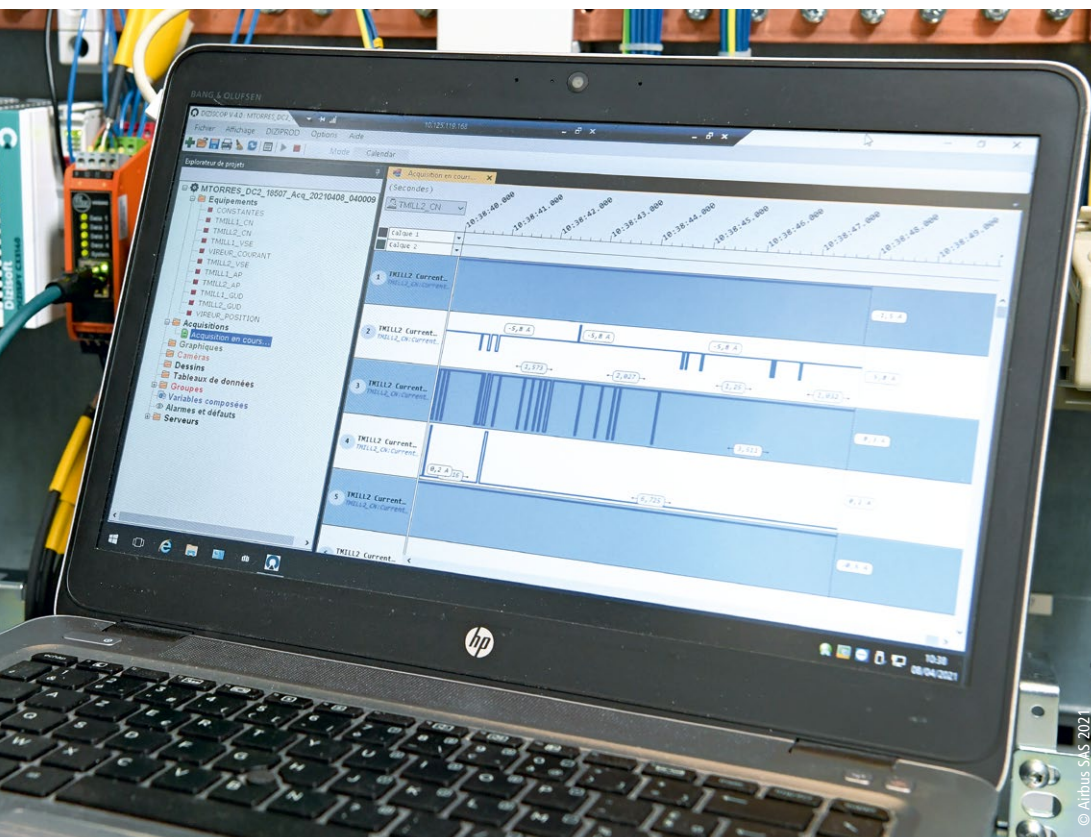
Dizisoft uses a customized CX5140 Embedded PC from Beckhoff for its data acquisition and analysis solution.

the raw data source and the IT network, which forwards the processed data to the Airbus information system. The Industrial PCs from Beckhoff are a PC and PLC in one, offering maximum flexibility. Another important selection criterion was the long-term availability of the Embedded PC to ensure the future security and maintainability of the production technology.

Dizisoft has also been impressed by the wide range of EtherCAT I/O components, which can be used to easily integrate production sensor technology that may be required subsequently. The drivers included in Diziscop mean that this I/O data can even be correlated with process data for further analysis and declared directly in TwinCAT PLC software. This type of retrofitting exercise does not require any complex reprogramming of the controllers.

Significantly improved reliability

Ultimately, the Dizisoft solution has significantly improved the reliability of production resources at the Saint-Eloi plant by cutting down on both downtime and the costs associated with quality defects. The system allows Airbus data experts to continuously optimize their analysis work based on the information collected every millisecond. Having been impressed by the benefits experienced so far, Airbus is currently looking into rolling this solution out across its other production sites.



The Dizisoft solution significantly increased production efficiency at Airbus.

More information:

www.airbus.com

www.dizisoft.fr

www.beckhoff.com/cx5140