CASE STUDY

How InBolt would improve the reliability and traceability of torquing processes at Thales Alenia Space - A Proof of Concept

Thales Alenia Space (TAS) is a franco-italian aerospace manufacturer. In France, it is based in Toulouse and Cannes and has over 15 facilities in 9 countries. Thales Alenia Space is one of the world's premier satellite manufacturer with Airbus Defense & Space and Lockheed Martin. Crucial to Thales Alenia Space's success is the digitization of its manufacturing processes for a faster and better production. Because manual operations such as torquing are at the heart of these processes, guaranteeing the quality of these operations is thus a key component of its success.

Challenge

The robustness of torquing's reliability and traceability could be improved through:
- smart tool able to adapt torquing to screw
- screw's torquing and localization data connected to MES and digital twin
- real-time assembly progress report
- automatic control ensuring torque applied and completion of tasks
- improving operator's confidence during operation
- removing any possible mistake as task interruption

The solution

InBolt is developing a tool tracking technology based on 3D computer vision. The first prototype is a module/device that can be attached onto the handle of all torquing wrenches / screwdrivers. This module can track constantly the tool's position when in use.

By constantly knowing the position of the tool, the module can control the settings of an electric torque wrench, monitor the tasks completion (i.e. whether the torquing sequence has been respected or whether a screw was forgotten) and send a real-time assembly progress report with the torquing and localisation data to the client MES. This is thus improving operators’ confidence and avoiding mistakes during assembly completion.

InBolt's solution would mean for TAS an improved reliability and traceability of torquing processes.

“The InBolt solution is a way to improve confidence both of operators and customer on payload assembly completion” Stéphane Forestier, AIT payload innovation, competitiveness & bid manager, Thales Alenia Space
The results

The proof of concept has shown that the InBolt module was able to track the position of the tool with a **millimeter accuracy**. Indeed, the interface showed that the module could identify the screw which was being torqued and differentiate it from another screw 3 millimeters apart. Thus validating the proper torquing of a given screw.

In conclusion, this proof of concept has validated the 3D based computer vision technology for accurate tool position tracking and release detection developed by InBolt. However there is still plenty to do and this was just the first step. The next steps will be the definition of a use case on assembly line and testing of the InBolt solution, the integration with the TAS MES and then the full deployment. ***Thales Alenia Space and the InBolt team are confident regarding the value proposition and success of the solution.***