

Embedding a High-Performance Ultrasonic Testing Instrument in a Robot or Drone

ALAN CAULDER¹, Sylvain Deutsch²

¹VP OF SALES, ASNT UT LEVEL III, ADVANCED OEM SOLUTIONS, LLC, USA, ¹Applications, TPAC (The Phased Array Company), France

The utilization of robotic and drone-based platforms for NDT (non-destructive testing) is increasing rapidly across all industry verticals. These approaches provide a multitude of benefits, including faster aggregate inspection speeds, safer access to potentially dangerous environments, eliminating or reducing confined space entries, and more comprehensive evaluations with a greater density of data. When integrating a payload, specifically electronics for UT (Ultrasonic Testing), there are many factors to be considered. Some of these are the size of the electronics, power output, thermal signature, and sensor capacity. Compact electronics with a high sensor capacity are ideal, as payload form factor and weight can be a limiting factor in system integration and deployment capabilities. Power requirements must be considered, specifically in systems requiring batteries as the power source. Additionally, a lower power output and thermal signature can reduce the overall mechanical complexity. This presentation will address some of the common complexities in integration of UT systems into these platforms and provide experience-based ideas for approaching each. Specific examples of optimized robotic system integration will be detailed and discussed. Also discussed will be the benefits and possible complexities in employing different UT inspection approaches, including MC (Multi-Channel conventional UT), PAUT (Phased Array UT), as well as FMC/TFM (Full Matrix Capture/Total Focusing Method) and its derivative techniques. Various related details are also explored, including data management.