

How to get the most out of Open Phased Array, FMC and UT Instrument platforms?

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The increase of robotics for automating Phased Array, TFM and conventional Ultrasonic Testing (UT) in manufacturing and maintenance of critical structures has created new and diverse requirements in the way in which this method is integrated, beyond what portable and laboratory instrumentation has been designed for. As a result, hardware and/or software must be customized or adapted to some extent in a variety of industries (e.g., aerospace, petrochemical and nuclear), environments (e.g., factories, energy production plants, maintenance workshops and offshore facilities), mechanical systems (e.g., industrial robots, pipe scanners, crawlers, and submarines) and applications (e.g., weld inspection, corrosion mapping, disbond detection, wall thickness measurement, and composite inspection). This work describes how an “open platform” approach can solve most of these applications based on standard hardware and software components, sometimes complemented by custom end-user software tools. In the hardware side, features like compactness, robustness, UT signal integrity, synchronization, connectivity, and data transmission speed are discussed. On the software side, multi-language support, multi-layered architecture, open data format, and compatibility are the main topics considered. Based on an open platform concept, integrators can design and build customized solutions taking the most convenient elements from different providers (robots, control system, probes, electronics, software), making them work in a modular way and assuring maintenance and evolution across the entire product’s life cycle at an optimum cost. Some implementation examples from different industries are shown as well.