

# Reset the trajectory

Electrification in the automotive industry is fundamentally changing the way components are tested on the plant floor

Intelligent control, security, safety and diagnostics are now embedded in virtually every electromechanical system. Production test machines must be adapted to this new technology with new communication and security protocols, new signal processing techniques, and designs that are adaptable, accurate and fast. The tester must be as smart as the component it is testing.

Almost a decade ago, the team at Signal.X realized that the traditional way of deploying end-of-line (EOL) test machines for these new components was inefficient. A machine builder would build and control the machine with a PLC, and a data acquisition vendor would use a separate device to acquire and process sensor data. Then, another device would be added to control the part over CAN, and thus a gateway was needed to ensure that the PLC could communicate with the part during the test sequence. The result was a disparate set of computing devices managed by different stakeholders – a counterintuitive process for any plant.

Signal.X's answer to that challenge was Stax, created to fully integrate all aspects of production testing into one system. The key was to make a single platform that could contain the sophistication of part communication, high-speed acquisition and signal processing, and traditional machine control,

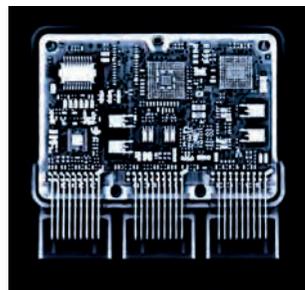
RIGHT: Embedded deployment hardware option for Stax

BELOW: Stax interfaces with ECUs and other elements and is customizable to each setup

BELOW RIGHT: Two examples of NVH data from a production test stand, visualized in the Shield analysis software



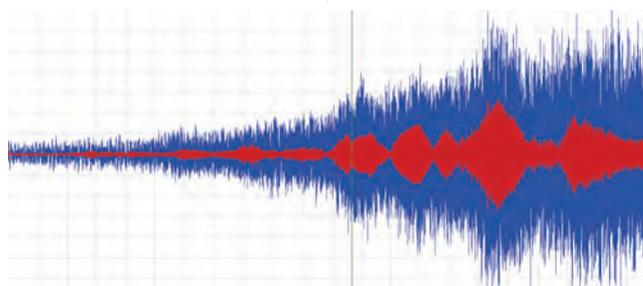
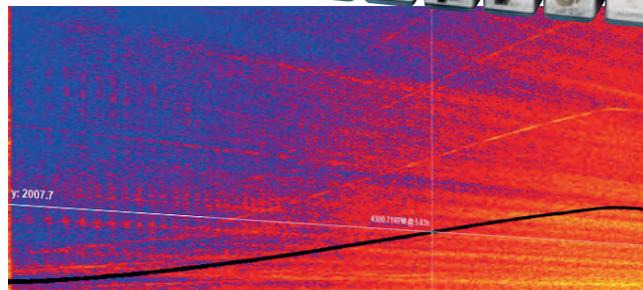
Image: National Instruments



all in an environment familiar to plant personnel. Leveraging the power of NI LabVIEW, Stax is a unified platform that brings together those technologies into a single embedded computing device.

Stax can be customized to include elements unique to a particular test stand. Such elements can include standard plug-ins, such as EtherNet/IP or EtherCAT communication to an assembly line; customized NVH metrics, waveform analysis, calibration, and diagnostics to an ECU, including automotive cybersecurity; and custom displays and database interactions to an MES or SCADA platform.

When combined with the company's long heritage of high-speed data acquisition and signal processing using its Shield analysis software, a complete EOL test system



for the most sophisticated automotive components comes to life.

A Stax control and acquisition system is an embedded platform that can be realized on a range of NI hardware, including CompactRIO and PXI, with a wide range of globally available signal-conditioning and acquisition modules. Users configure Stax behavior through an interactive portal application that synchronizes with the embedded target.

Reliability is achieved through simplified architecture, a single unified user interface, and a real-time operating system that is ideally suited for a machine that operates 24/7 on the plant floor.

As the electrification revolution continues to push the boundaries of EOL component testing for function, NVH and more, Stax is designed to evolve with the needs of the industry, and deliver the cutting-edge solutions developers need. ◀