IQC Advanced Inspection Solutions pvt Ltd.

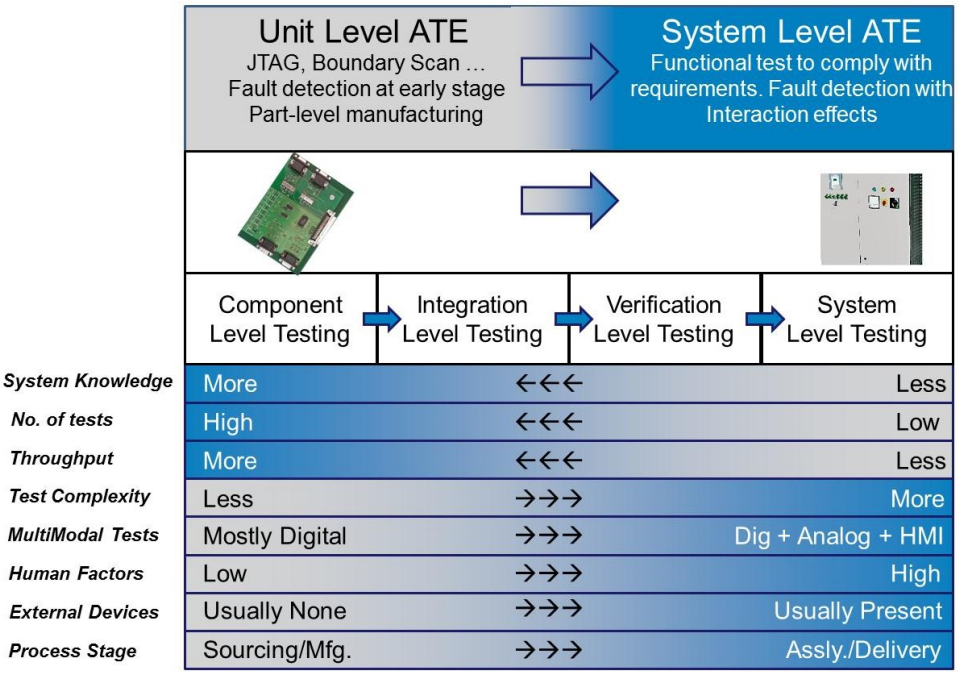
SLATE

SLATE: System Level Automatic Test Equipment

System Level Testing on complete systems is used to verify their *functional specification and performance requirements*. Such testing will find errors in the assemblies that make up the system or in the system as a whole. The test specification incorporates the expected customer usage pattern. System level testing gives best results when the individual components have also been tested at unit level. The testing identifies any issues due to the interaction of the multitude of components with each other as well with the *environment and the user*. *This* human factor aspect i.e. the effect of the envisaged user behaviour forms an important part of any system level test system.

Conventionally, custom built test jigs or manual processes are used for system testing with detailed manual work instructions for performing the system level testing. Some disadvantages of this approach are the strong dependence on operator skill, high time to test, & lower reliability. A System Level ATE (**SLATE**) will automate, supervise and augment the test process to boost the operator accuracy and speed of testing by replacing the test jig and manual controls by a computer controlled system with simplified easy to use interface with the DUT.

System level testing involves complex test sequences (based on use cases) that usually do not presuppose detailed knowledge of every component in the **Device Under Test** (DUT). The number of tests is smaller (few tens to about a hundred) than component/PCB in-circuit ATE specifications which may have thousands of tests. Additionally, external sensors and/ or other equipment/ devices/ instruments (including simulation of Hardware in the Loop) may form part of the test system requiring their responses to be part of the test sequence. Tests can involve multiple types of data including digital, analog and interface to other devices via Ethernet, RS-232, USB, I2C, SPI, CAN etc. and also HMIs. **SLATE** provides the best solution for your system level testing needs.



SLATE Benefits

- Verify functional specification & performance requirements of DUT
- Reduce time to test
- Improve QA productivity
- Archive data for analysis and production feedback
- Embed organizational knowledge in test process
- Fault history and analysis to integrate with process control methods
- Scalable architecture allows the test system to grow with your needs

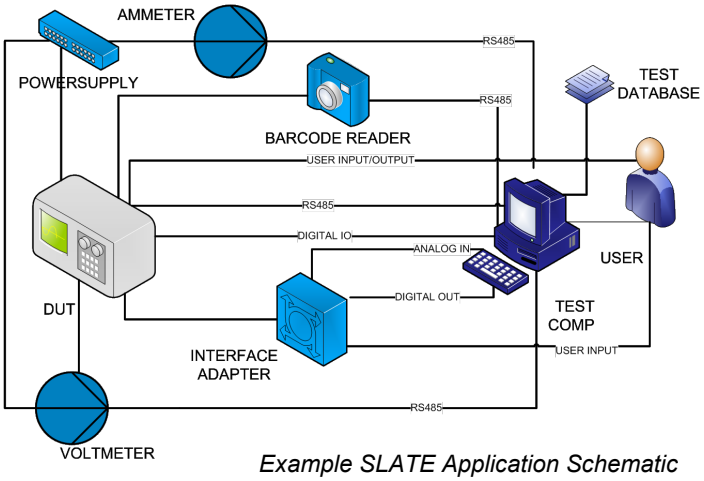
SLATE is the ideal tool for inspection of :

- Audio Hardware
- Automotive Electronic Control Units
- Avionics
- Consumer Appliances Controllers
- Control Panels
- Defence Electronics
- Energy Storage Equipment
- Eco-Monitoring Equipment
- HVAC Controller Units
- Machine Process Monitoring
- Medical Devices
- Multiple Hardware Integration Test
- Oil and Gas Control Systems
- Power Measurement and Monitoring units
- Solar ,Thermal and Power Plant Control
- Static and Fatigue Test Machine
- Structural Conditional Monitoring
- Switchgear
- Test Cell Measurement and Control
- Textile Machinery
- Wind Turbines

SLATE PLATFORM

Components

- A PC or embedded system providing an user interface and storage mechanism for configuration and result data.
- Test hardware which may of different types including PXI, PCI, USB, HMI, Specific interfaces like I2C, SPI, RS-232, Modbus etc.
- Interface Adapter which will provide the interface between the DUT and the test hardware. Frequently, this interface will have signal conditioning and isolation circuitry to prevent damage to the DUT as well to the test hardware
- Peripheral hardware like power supply, isolators etc.
- Finally, the DUT itself is the final part of the system. A handling system for pick-and-place of the DUT into the interface adapter may be an optional part of the system.

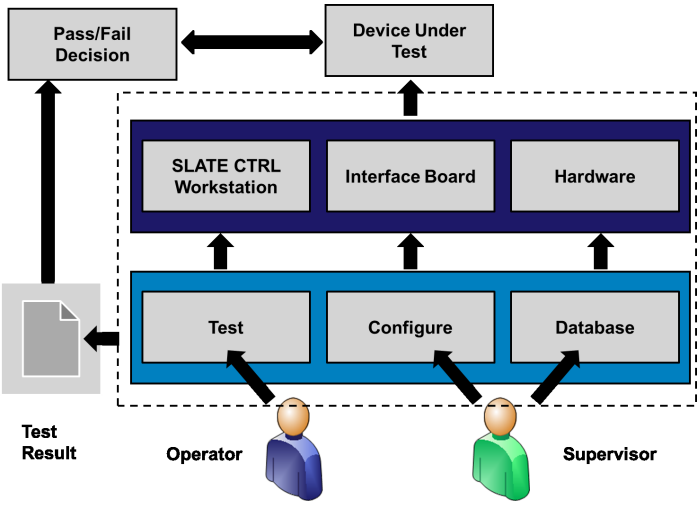


Example SLATE Application Schematic

Front panel and software

The test process will be controlled by software resident on the PC/Embedded system and contains the following primary modules with controlled access:

- Configuration: Test sequences are configured and interface conditions specified for various system to be tested.
- Test: The test sequence as specified in the configuration is carried out via the various routes including digital, analog, HMI, sensor interfaces etc. The test module is typically used by an operator simulating expected customer behaviour or action.
- Storage and Analysis: The test results are stored and analysed for a pass/fail result as well as for later analysis.



SLATE Architecture

Specifications

- PC or Portable PC or PXI chassis
- 96 high speed digital IO's for use as digital lines, counters, timers, switches scalable to 288 Channels ranges with 4mA -24 mA current drive per channel at DAQ layer
- 8 Channel (+/-10V) Analog Input (Scalable upto 80 Channels) with recommended 47 Ohm load.
- 8 Channel (+/-10V) Analog Output (Scalable as per requirement) with typical 47 Ohm source load
- Encoder quadrature interface for motor/pump speed and other measurements
- Isolation circuitry with voltage level translation to drive voltages upto 30V (or higher on request)
- Current Booster for digital/ analog lines as required at DUT side of interface circuitry
- Signal conditioning modules customized as required by the DUT signal specifications
- Serial based communication interface with HMI
- Powered by LabVIEW (© National Instruments) to create flexible powerful user interfaces
- Intuitive interface with modular approach including secure access
- Easy to use test sequencing function
- Fault tree diagnostics in case of test failure
- Report generation with statistical analysis of data history
- Database module to manage stored data with options to analyze data for trends
- Easy transition for existing operators
- Ergonomic benefit via the reduced need for repeated physical movement

Our Channel Partner

PDAC Microsystems (P) Limited
Moula-ali, Hyderabad, India – 500 040
Mail ID: Info@pdac.in
Phone: +91 8008295670
Website: www.pdac.in