



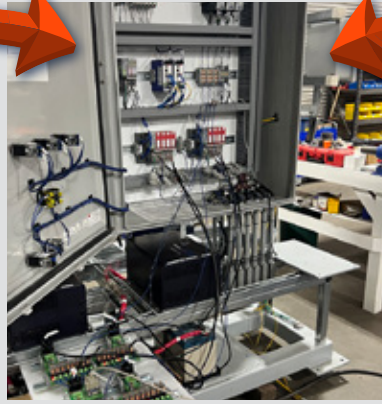
# Typical Real World Control System

Network

Network/Field Wiring



Typical Human Machine Interface (HMI) displaying field conditions



Typical Programmable Logic Controller (PLC) or Distributed Control System (DCS)



Typical field instrumentation, control wiring, and elements

## Limitations and disadvantages of current methods of testing:

**PRE-FAT  
DEVELOPMENT  
TESTING**

**FACTORY  
ACCEPTANCE  
TEST (FAT)**

**CONSTRUCTION  
ACCEPTANCE  
TEST (CAT)**

**OPERATIONAL  
ACCEPTANCE  
TESTING (OAT)**

**MAINTENANCE,  
REGRESSION TESTING  
AND TRAINING**

- ▶ **Semi-automated testing whose approach seems adequate but rather is brute-force, and an approach that is not efficient for project costs or schedules.**
  - PLC software-only simulators can only perform a fraction of the testing phases.
  - Multiple technicians, engineers and support personnel supplement these methods with hand held tools and process meters to perform field and start-up testing, sometimes to the detriment of expensive process equipment.
  - Limited to only perform a sample of logical combinations instead of a fully automated method with a robust selection of test ranges.
  - At test completion with current methods, you may have an operational system. However, latent errors will reveal themselves later!
  - Costly re-performance of failed tests with limited regression testing options.
- ▶ **Testing that relies on manual methods are not easily documented or repeatable, and not efficient for project costs or schedules.**
  - Almost all organizations rely on pen and paper recording of tests with multiple personnel for all testing phases.
  - Creation of tests are typically done in word processing documents that are not part of an information management strategy for reproduction, retrieval, searching, sharing, etc. as it does not have the power of a database-created test.
  - Human errors in performing I/O testing happen when performing signal generator/DMM connections to verify alarms, logic, interlocks, and lifting/landing leads, or during generation of signals for test (flipped the wrong switch, applied incorrect signal, etc.).
  - Manual testing methods, even on small I/O count systems, requires personnel to gather, track and later, correct data input on test results, including missing initials, dates, signatures, transposed data, etc. that can cost weeks of project time and schedule to correct these issues at best and potentially reperform tests at worst.
  - Reporting and organizing manual test results for a formal results report for each test phase is tedious and searching manual test results for specific issues or results is impossible.
  - Options for testing on modified systems including regression testing are severely limited, often requiring testing on production systems that are in-field.

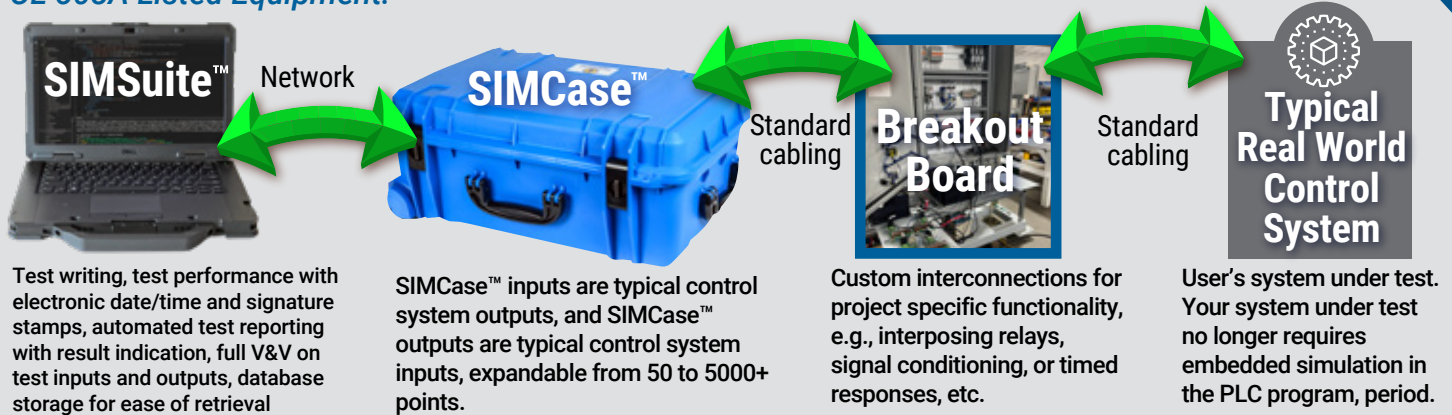
**There have also been documented instances where semi-automated testing utilizing PLC software-only simulators have failed as acceptance tests were run with the simulated code in place and engaged and this later required a full re-performance of the test.**

**We don't live in a simulated world, we live in a *real* world.  
*Keep your testing real!***



# Introducing Automated Testing Technologies

Fully NQA-1/Subpart 2.7 Qualified System. Compliant with DOE O 414.1D for Safety Software. UL 508A Listed Equipment.



## Use Cases and Advantages

### Pre-FAT Development Testing

- ▶ Avoid the pitfalls of not having the actual system in your facility by using a PLC and a SIMCase™. Now, you can fully emulate the field, pretest your logic, interlocks, alarms and the HMI, and save your project cost and schedule.
- ▶ Tests developed in advance for all phases using the SIMSuite™ test writing tools including a spreadsheet import option.
- ▶ Testing can involve fully automated I/O mapping, logic testing, and semi-automated system, interlocks, and HMI alarms, sequences, scaling, and human factors testing where it is a synchronized mix of human actions and SIMCase™ test logic, including requirements and design and component CGD testing.
- ▶ Problems are flagged and logged immediately as trouble tickets and visually in reports.

### FAT Testing (Factory testing phase)

- ▶ 100% emulation of the field and test/retest your logic, interlocks, alarms and HMI.
- ▶ 100% testing of each I/O component, including range and scaling to validate but also find defective components.
- ▶ 100% testing of specialized bit logic and patterns, including PID loops, instead of a small fraction.
- ▶ 100% automated repeatable testing that reduces time for retest and regression testing using the fully automated and semi-automated test modes.
- ▶ A side-by-side comparison reveals that even in small systems an order of magnitude reduction in testing time was achieved.
- ▶ No lifting and landing of wires during ring-out testing eliminates human interaction and likely errors.

### CAT/OAT/Commissioning (Construction and Operational testing phases)

- ▶ No lifting and landing of wires during testing of field devices and wiring by utilizing the same test equipment used in the FAT to minimize human interaction and likely errors.
- ▶ With our patent pending design, the same SIMCase™ can now be integrated to communicate directly with the actual field devices for field I/O ring-out and commissioning.
- ▶ Allows for re-performance of select FAT tests to perform fully automated and semi-automated testing when installed onsite.
- ▶ Allows use of lightweight PC tablet or notebook to gather and sign field test data and results, no pen and paper required at field.

### Maintenance, Automated Regression Testing and Training

- ▶ Allows for use of Critical Spares, similar to pre-FAT development test system, for full testing of code changes prior to deployment including automated regression testing.
- ▶ Allows for training, procedure development, etc. with simulation modules built for your facility.

**Call today to schedule an online demo or for more information.**

**Keep your testing real!**

**833.538.8880**

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