April 4, 2024
University of Michigan
Dearborn, Michigan

Register

Harnessing the Power of Hardware-in-the-Loop (HIL) Simulation Seminar

Accelerating Digital Power Innovation in e-Mobility and Grid Modernization

What you will experience and learn?

- Essentials of integrated model-based engineering solution for intelligent digital power. From simulation and design to testing and validation.
- Advanced modeling and simulation techniques for ultra-high fidelity real-time HIL simulation encompassing power electronics converters, electric machines, drives, batteries, photovoltaics, gensets, communications (CAN, Modbus, IEC 61850, etc.).
- Learn about the signal interface requirements between controllers under test (ECU) and real-time HIL simulation.
- How to build a complete HIL simulation testbed with actual digital controllers in the loop and fault insertion to meet ISO26262 and other standards.
- Write automated tests in Python to verify performance and operation in both nominal and fault conditions.

Agenda

9:45-10:00 — Welcome / Check-In

10:00-12:00 — General Introduction

- Introduction to University of Michigan-Dearborn
- Introduction to Typhoon HIL
- Keynote Speaker

12:00-13:00 — Lunch

13:00-15:00

Track 1: e-Mobility

- Overview: Typhoon HIL Solution for e-Mobility
  - Modeling challenges for real-time HIL simulation of electric powertrains
  - Power electronics converters and electric motors modeling and library components
  - HIL Testbench for electric drive unit testing (e-Drive, and e-Axle)
- e-Mobility Use Case Presentation
  - Electric drive unit for e-Mobility applications: design, testing, and verification

Track 2: Grid Modernization

- Overview: Typhoon HIL Solution for Grid Modernization
  - Modeling of inverter based distributed energy resources (DER) for utility scale applications
  - Modeling and simulation of digital protection and control
  - Interoperability testing for integration of inverter based DERs
- DTE Energy Use Case Presentation
  - Large scale HIL Testbed for integration of BESS, renewables, and digital protection

15:00-15:15 — Coffee Break

15:15-17:00

Track 1: e-Mobility

- Typhoon HIL Solution Examples
  - Electric drive unit
  - Onboard and stationary chargers
  - Battery modelling and HIL for BMS interface
- Q&A Session

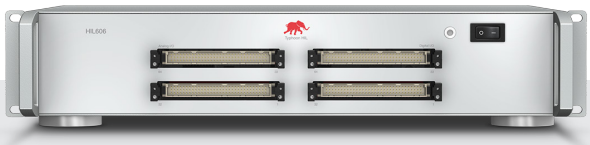
Track 2: Grid Modernization

- LS Electric Presentation
  - Microgrid demo
  - SCADA training
- Q&A Session

17:00-18:00 — Networking Happy Hour

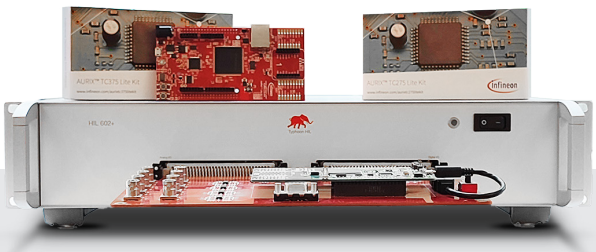
Typhoon HIL testing solution highlights

- Ultra-high fidelity, down to 25ns simulation time step
- Streamlined IO interface signal conditioning for ease of integration between ECU and signal HIL
- Emulation of all feedback sensors: (resolver, encoder, current, voltage, temperature)
- Plug and play fault insertion unit
- Vertically integrated software and hardware solution - no third party software/hardware tools needed



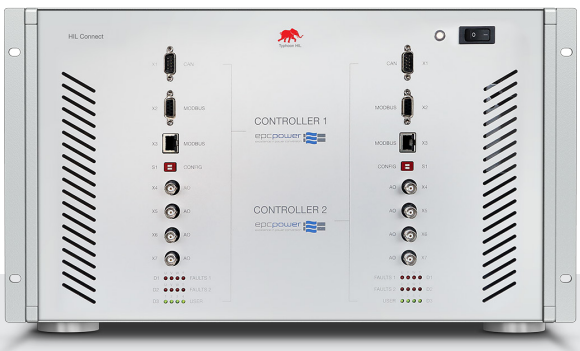
HIL setup for prototyping and ECU software development and testing

- Real-time HIL simulator HIL606 for ultra-high fidelity motor drive and power electronics emulation
- TriBoard AURIX TC3x and TC4x development boards
- Off-the-shelf HIL interface boards for plug and play experience with TriBoard and AURIX LiteKit solutions
- Infineon and Vector debugging, tracing, and simulation tools (optional)



Streamline your testing process with HIL Compatible

- De-risk projects at all stages: from vendor component validation, to operational support
- Seamless integration and component interoperability providing a more competitive offering to the market
- Trust in overall system performance through increased test coverage, including faults.
- Shorter project delivery time
- Rapid response time
- Lower your overall cost of testing



Register **Register for the seminar on April 4, 2024, with Typhoon HIL and University of Michigan-Dearborn.**