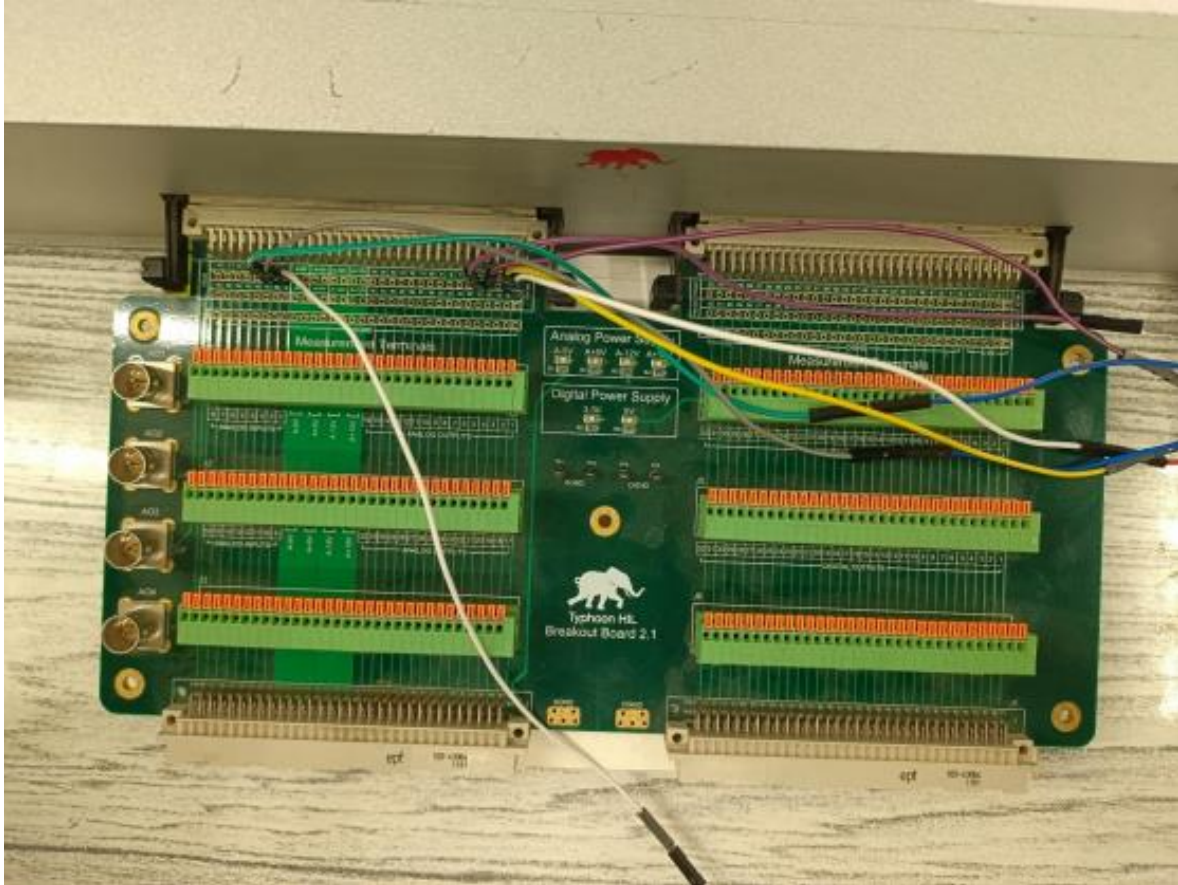


Breakout Board Typhoon 2.1



The Typhoon HIL Breakout Board 2.1 is an interface tool designed to expand the I/O capabilities of Typhoon HIL real-time simulators, such as the HIL602 and HIL404. It allows users to easily connect external devices like controllers, sensors, and actuators to the simulator's I/O ports.

The board provides access to digital and analog inputs and outputs, PWM signals, and encoder interfaces, enabling detailed hardware-in-the-loop (HIL) testing for power electronics, control systems, and motor drives. The Breakout Board 2.1 supports rapid prototyping and accurate real-time simulations in power and energy systems.



- **Applications**

Typhoon HIL602+ is an ideal all-around tool for development, automated testing, optimization, and automated standardized pre-certification of grid connected converters, automotive converters, electric propulsion drives for terrestrial and marine vehicles, and smaller microgrids.

- **Why upgrade?**

Although the HIL602+ looks similar to its predecessor, it boasts significant upgrades under the hood which allow even easier interfacing with controllers under test and high fidelity real-time emulation of more complex models.

For example, the bit-depth of analog inputs has jumped from 12 to 16 bits and their voltage ranges has doubled from ± 5 V to ± 10 V. Connectivity has also been expanded with RS-232, CAN and two Ethernet connectors on the back. Combine this with a new CPU and what you get is a fast, high-fidelity, versatile HIL simulator whose capabilities fit the model-based methodology for virtually any power electronics applications, ranging from grid-tied converters to mid-sized microgrids.

- **Features and Benefits**

1. Emulate of up to 6 converters with the new 6-core processor at a timestep of 500 ns.
2. Emulate your power stage with up to 2 MHz update rate

3. Give your controller an ultra-high-fidelity testing with 20 ns PWM resolution.
4. Parallel up to 4 HIL602+ units for testing of smaller microgrids
5. Interface to any controller by means of 32 analog outputs, 16 analog inputs, 32 digital inputs, and 32 digital outputs, all featuring over-voltage and short-circuit protection.
6. Build your power-stage models with a constantly expanding library of power electronics components and prepackaged examples.
7. Automate testing with Typhoon HIL API and Python scripts
8. Integrate HIL into your existing test scenarios with support for language agnostic RCP API based on JSON-RCP 2.0
9. Let your emulation communicate with external units and systems with standardized protocols, such as IEC 61850, Modbus, DNP3 and OPC UA.