

Title : Controller Hardware-in-the-Loop (CHIL) Design for Evaluating
A Smart Inverter Controller

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Abstract:

The interconnection of Distributed Energy Resources (DER) to the utility grid has raised concerns about communication and interoperability requirements between DER and the system operator.

To help the operator meet these requirements, this paper Controller Hardware-in-the-Loop (CHIL) is designed to assist evaluating a smart controller.

The CHILS consists of a Real Time Digital Simulator (RTDS), a System Validation Platform (SVP), and a smart inverter controllers. The DER, grid simulator, PV and ESS simulator, as well as the smart inverter, are modeled in RTDS. The SVP is a versatile automated certification platform that allows the test sequences to be scripted through abstraction layers, to test Equipment Under Test (EUT) using the Python programming language. The proposed CHILS method can be effectively utilized to validate and test of smart controller with SVP under the practical environment without a real system.

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