



Smart Energy Profile 2.0 Test System



ZigBee®
Member

Features

- ▶ Validate application layer interoperability between ZigBee, Wi-Fi and HomePlug Smart Energy Profile 2.0 enabled devices
- ▶ Pre-certification conformance test cases
- ▶ Simulations of real devices and their behavioral characteristics

Benefits

- ▶ Utilities: Confirm device reliability and compliance to SEP 2.0
- ▶ Device Manufacturers: Speed time to market and increase customer confidence
- ▶ Confirm that SEP 2.0 devices deliver accurate, reliable information

ZigBee Smart Energy Profile is the leading standard for interoperable products that monitor, control, and automate the delivery and use of energy and water. The Smart Energy Profile standard supports the diverse needs of a global ecosystem of utilities, product manufacturers and government groups, and it gives consumers the information and automation needed to reduce their consumption and save money. The ZigBee Alliance is currently developing Smart Energy Profile (SEP) version 2.0, which will offer IP-based control for advanced metering infrastructure and home area networks.

The SEP 2.0 Test System

QualityLogic, an active participant in the development of the SEP 2.0 standard, is developing a test system to validate the interoperability and reliability of smart meters, business and residential energy management devices, and gateways that share energy information with business and residential users via the ZigBee SEP 2.0 standard. The SEP 2.0 Test System will benefit the entire SEP 2.0 ecosystem, including device manufacturers, utilities and system integrators.

The SEP 2.0 Test System will include conformance test cases designed to exercise the full breadth of the SEP 2.0 Application Layer Specification, synthetic simulations of SEP 2.0 devices, and simulations of real-world devices, allowing device manufacturers, utilities, and their partners to ensure deployed smart energy devices can interoperate. Test cases will be made available initially over a standard Ethernet IP link, then over various chip and stack combinations of ZigBee, Wi-Fi and HomePlug.

During the early stages of Smart Energy Profile 2.0 adoption, synthetic device simulations may be the only effective way to validate interoperability, as few other products will be on the market. As the market matures and large numbers of smart energy devices are released, actual simulations of real-world devices become the only practical way to test interoperability over a wide range of devices without the logistical nightmare of physically obtaining and setting up real devices.

SEP 2.0 Test System Architecture

- ▶ **SEP 2.0 Test Application** – runs on a Windows platform and exposes the simulator to the user for configuration, runtime status, and test or command executions.
- ▶ **SEP 2.0 Device Simulator** – runs on an embedded system and mimics the application layer behavior of the simulated SEP 2.0 device type. Multiple simulators can be run simultaneously to simulate a Home Area Network (HAN).
- ▶ **HAN Interface** – allows the simulator device to access the HAN via the IP stack and associated MAC/PHY layer. Initially will support ZigBee, Wi-Fi, and HomePlug.

SEP 2.0 Test System Test Suites

SEP 2.0 Functional Test Suite – test cases that validate the basic functionality of client and server function set implementations (available over a standard Ethernet IP link for early adopters).

SEP 2.0 Comprehensive Engineering Test Suite – test cases for all function sets that exercise the full breadth of the SEP 2.0 application layer specification, including tests that mirror the SEP 2.0 Certification Test Specification. Includes use case scenarios running over synthetic device simulations.

SEP 2.0 Device Simulation Interoperability Test Suite – application layer simulations of real-world SEP 2.0 devices (ZigBee, Wi-Fi and HomePlug) including use case scenarios to validate the DUT is interoperable with simulated device behaviors.

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