



New IEEE 1547.1 Test Tool Announcement



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QualityLogic's Role in the Smart Energy Industry

- **QualityLogic focused on Smart Energy Testing**
 - IEEE 2030.5 and OpenADR (Approved Certification Test Tools)
 - Standards Training & Consulting
- **QualityLogic is a Contributor to IEEE 1547 and UL 1741**
 - Member of IEEE 1547-2018 Work Group
 - Member of IEEE 1547.1 WG and 1547.1 Interop WG
 - Member of IEEE 1547.2 and 1547.2 Interop WG
 - Member of UL 1741 STP
 - First vendor to offer a 1547.1 Interop Test Tool
- **QualityLogic Has Been involved With 2030.5 Since 2010**
 - Only SunSpec approved test harness for 2030.5/CSIP
 - Used by NRTLs and End Users to perform 2030.5 Testing/Certification
- **Active in Standards Development**
 - IEEE 2030.5, UL 3001, CSIP, 1547/1547.1, SAE, OpenADR

Current IEEE 2030.5 Testing Solutions



- **IEEE 2030.5 for CA Rule 21/CSIP Certification Testing**
 - Used by 5 NRTLs/Labs and many vendors for SunSpec Certification
- **Published CALSSA Application Guide**
 - CALSSA Testing Pathway allows non 2030.5 inverters to be verified and listed on CEC
 - Explains how to use QualityLogic Test Tool to verify CALSSA Testing Pathway
- **Published Phase 3 Functions 2 & 3 Testing Application Guide**
 - Explains how to use QualityLogic Test Tool to verify UL 1741 SA17 and UL 1741 SA18 tests
 - SA17 – Enter Service (Energize/Connect). Includes use of Enter Service settings
 - SA18 – Limit Max Active Power Mode. Includes use of FreqDroop/FreqW

IEEE 1547.1 Background - Approved March 2020



- **IEEE 1547.1 defines the test procedures for verifying inverter's functionality**
 - Includes interoperability section (Section 6) that leverages 2030.5, DNP3 and SunSpec
- **UL 1741 SB updated to reflect latest 1547.1 test requirements**
- **Testing by NRTLs and vendors require various test equipment that interacts with the target inverter**
 - Grid simulators, power analyzer, DC/PV simulator, Oscilloscope and others
- **1547.1 Interoperability test section requires use of the protocols to trigger/monitor the inverter**
 - 47 individual tests defined in 1547.1 for interop section
 - Leverages “Type” functional tests in 1547.1 Section 5
- **A NRTL has stated that total 1547 tests may take months to conduct**

1547.1 Interoperability Test Section

- Four different test categories that includes 47 test areas
- Nameplate data – verify nameplate data can be read from the DER
- Configuration Information – verify that DER settings can be read/written and take effect
- Monitoring Information – verify that DER reports set of metered data
- Management Information – verify that DER can act upon set of grid functions as requested thru protocol

Table 44—Management Information Test List

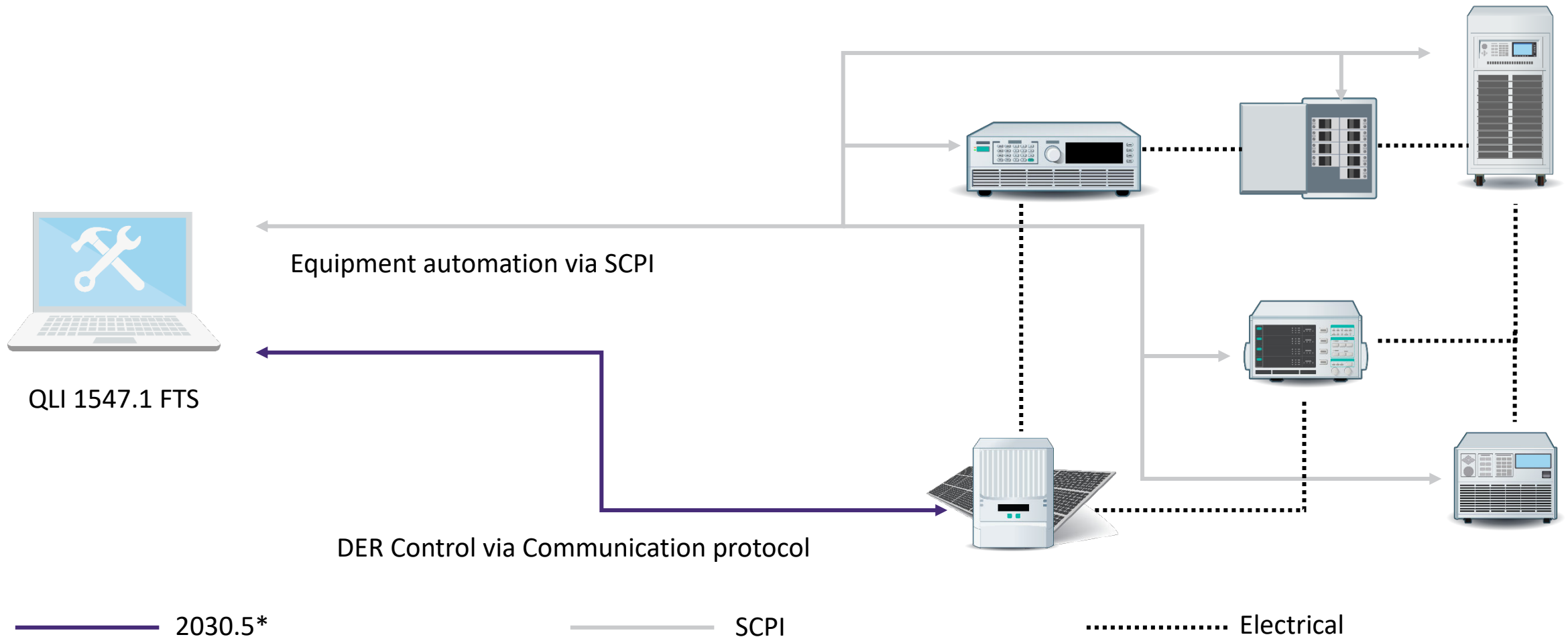
Test	Management Function	Adjustable Settings (References to IEEE Std 1547-2018)	Criteria (References to functional test criteria within this document)	Notes
1	Constant Power Factor Mode	10.6.2, Table 30	5.14.3.3	
2	Voltage-reactive power mode	10.6.3, Table 31	5.14.4.3 and 5.14.5.3	
3	Active power-reactive power mode	10.6.4, Table 32	5.14.7.3	
4	Constant reactive power mode	10.6.5, Table 33	5.14.8.3	
5	Voltage-active power mode	10.6.6, Table 34	5.14.9.3	
6	Voltage trip test	10.6.7, Table 35	5.4.2.4 (over voltage trip settings) and 5.4.3.4 (undervoltage trip settings)	
8	Frequency trip test	10.6.8, Table 37	5.5.1.4 (over frequency trip) and 5.5.2.4 (under frequency trip)	
9	Frequency droop (frequency/power or frequency-watt) test	10.6.9, Table 38	5.15.2.3 (above nominal frequency) and 5.15.3.3 (below nominal frequency)	
10	Enter service and Cease to energize and trip tests	10.6.10, Table 39, 10.6.11	5.6.4	NOTE—This management function relates to permit service.
11	Limit maximum active power test	10.6.12, Table 40	5.13	

The New QualityLogic IEEE 1547.1 Conformance Test Tool



- New 1547.1 FTS tests to cover the 1547.1 interoperability tests and functional Type tests
- End to end testing to verify DER communication and power level functionality
- Automate management and monitoring of power test equipment
- Reporting of monitored data from data collection devices such as power analyzers and oscilloscopes
- Supports use of Python scripts to modify test behavior and further customization by user
- Customizable test values to handle regional grid code differences
- To the extent feasible, support analysis of the test results to determine pass/fail or provide decision support to the test engineer

1547.1 Product Design



**DNP3/SunSpec protocol optional*

Summary



- **Industry's only 2030.5/CSIP Certification Test Tool expanded to support 1547.1 interoperability testing**
- **Leading NRTLs committed as Accelerator customers**
 - Helping to shape the product direction and requirements
- **Same version that NRTLs receive available to the public**
 - Help mitigate certification testing risks and issues
- **For more information, please contact QualityLogic at info@qualitylogic.com**