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MESA Standards Alliance - Energy Storage Communications Standardization and Testing and Certification Process

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MESA Standards: Overview

The Modular Energy System Architecture (MESA) Standards Alliance is an industry association of electric utilities and technology suppliers. MESA's mission is to accelerate "standards based," open and non-proprietary interoperable communications for Distributed Energy Resources (DER), in particular utility-scale Energy Storage Systems (ESS). MESA has developed and published two Standard specifications: MESA-DER (formerly MESA-ESS) for the DNP3 protocol and MESA-Device for the SunSpec Modbus protocol. See Figure 1.

MESA-DER Testing and Certification Program

MESA is partnering with the Pacific Northwest National Labs (PNNL) to develop a testing and certification program for the MESA-DER specification. MESA's Testing and Certification Working Group, led by PNNL, is comprised of utilities, vendors, and other stakeholders with the goal of improving interoperability, reducing integration costs, and ensuring confidence that systems and components interact and perform as expected.

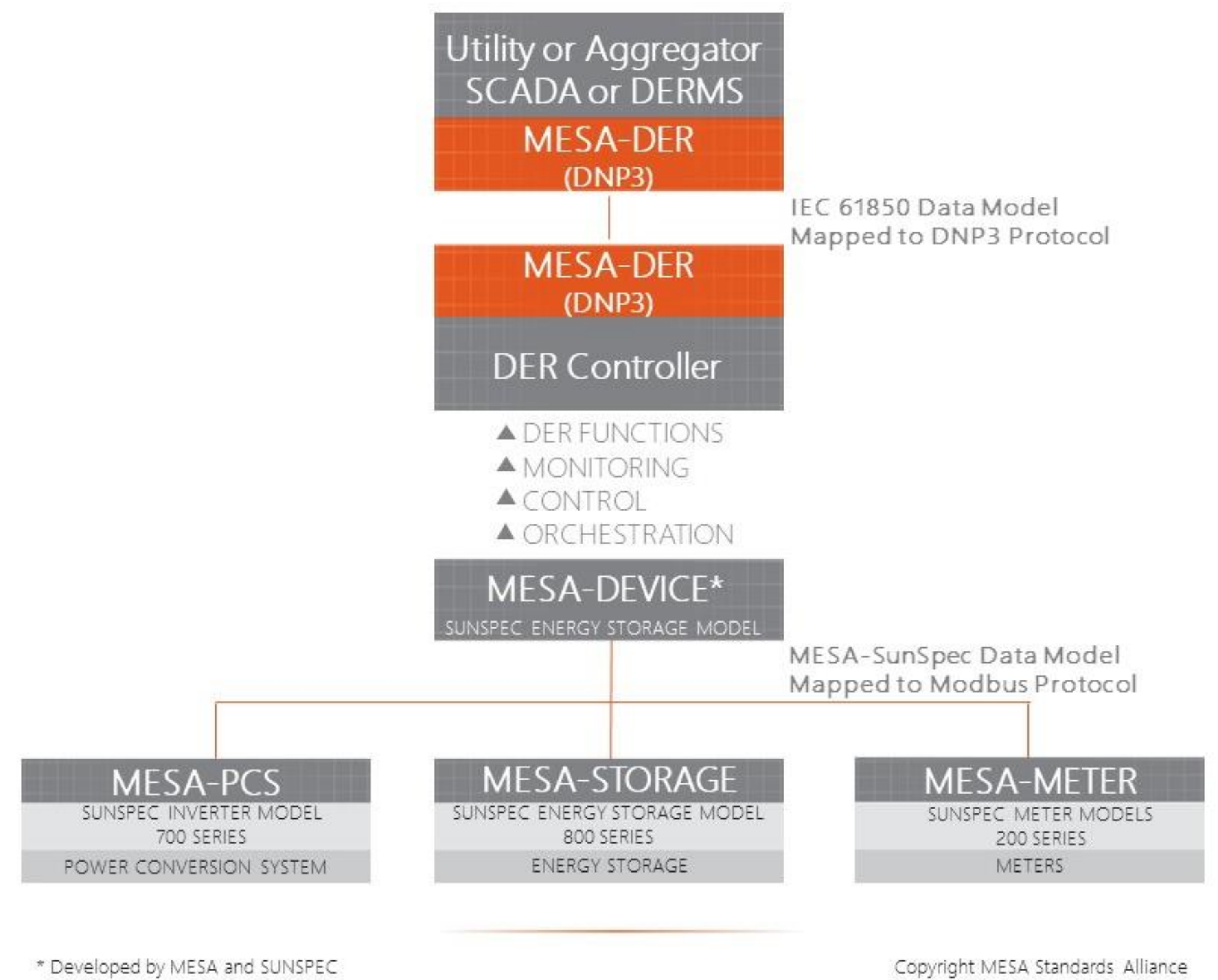


Figure 1: Overview of MESA Communications Specifications. MESA-DER is the information model for IEC 1547, Rule 21, and market-based functions.

MESA specifications support safe, affordable, and scalable storage and DER deployments

MESA-DER Testing

The MESA-DER testing process builds on existing IEEE & IEC testing programs and procedures and is organized in two phases. Phase One validates the mapping of the IEC 61850-7-420 data objects to IEEE 1815 (DNP3) and verifies that basic DNP3 conformance testing has been performed. Phase Two validates additional MESA-DER functions currently not covered in IEEE 1547 and verifies that DER has passed the IEEE 1547.1 and UL 1741 SB functional and interoperability tests. The Phase One test tool is nearly complete, and MESA will roll out the MESA-DER testing and certification program in Q3 2022. Phase Two testing and certification design began mid-2022 and will be completed in early 2024. MESA-DER standard will soon become an IEEE international standard (**IEEE P1815.2**).

Phase One (Complete)

The **MESA-DER Test Tool**, developed by **Triangle Microworks**, validates the mapping of the IEC 61850-7-420 data objects to DNP3 points as defined in the DNP3 Application Note (e.g., it validates that the DNP3 Analog Input point AI47 "System Available Active State of Charge" is mapped to the unique IEC 61850-7-420 data object "DSTO.SocPct"). In addition to mapping all points, the test tool verifies the maximum and minimum values, the multiplier, and the mandatory status

Phase Two

MESA-DER validates that functions in MESA-DER are operating correctly from utility server to client devices. Since some of those functions are included in IEEE 1547 with the associated testing requirements defined in IEEE 1547.1 and UL 1741 SB, Phase Two testing focuses on the additional functions defined in MESA-DER, such as Set Active Power, Coordinated Charge/Discharge, and Scheduling. Testing procedures to be submitted to UL for review at the end of Q4 2023.

QualityLogic has developed a test harness for testing the IEEE 1547 functions using the MESA-DER interoperability requirements as defined in IEEE 1547.1. Additional testing for MESA-DER functions is expected to be an "add-on" to the IEEE 1547.1/UL 1741 SB testing procedures at Nationally Recognized Testing Laboratories.

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TO LEARN MORE ABOUT HOW MESA IS ADVANCING THE ADOPTION OF ENERGY STORAGE TECHNOLOGIES, OR TO INQUIRE ABOUT BECOMING A MESA MEMBER, VISIT WWW.MESASTANDARDS.ORG OR EMAIL INFO@MESASTANDARDS.ORG.