



DER Gateway

EPRI's Reference Implementation

INTRODUCTION

With rising DER levels, utilities across the U.S. are beginning to design their communication and control systems that will be used to manage and monitor inverter-based resources. DER management systems (DERMS) are currently being evaluated and deployed by several utilities to connect with DER, making them an integral part of system operations. A major gap exists in the process of integrating such DERs with critical utility operational control systems (e.g., DERMS and ADMS). DER Gateways address the gap and are increasingly becoming critical for the integration of DERs into utility control systems. These are local onsite platforms at DER sites that houses logics and functions that are valuable to the utility.

BACKGROUND

In 2020, EPRI led a working group which identified and documented a list of specifications and applications for a DER Gateway. The applications and use cases were documented in EPRI report Applications of the Local Distributed Energy Resource (DER) Gateway: Low Cost, Secure DER Network Gateways for Integration of Smart Inverters¹. The detailed requirements for these applications were documented in EPRI report Distributed Energy Resources Utility Gateway Requirements: First Edition²

¹ [Applications of the Local Distributed Energy Resource \(DER\) Gateway: Low Cost, Secure DER Network Gateways for Integration of Smart Inverters](#)
² [Distributed Energy Resources Utility Gateway Requirements: First Edition](#)

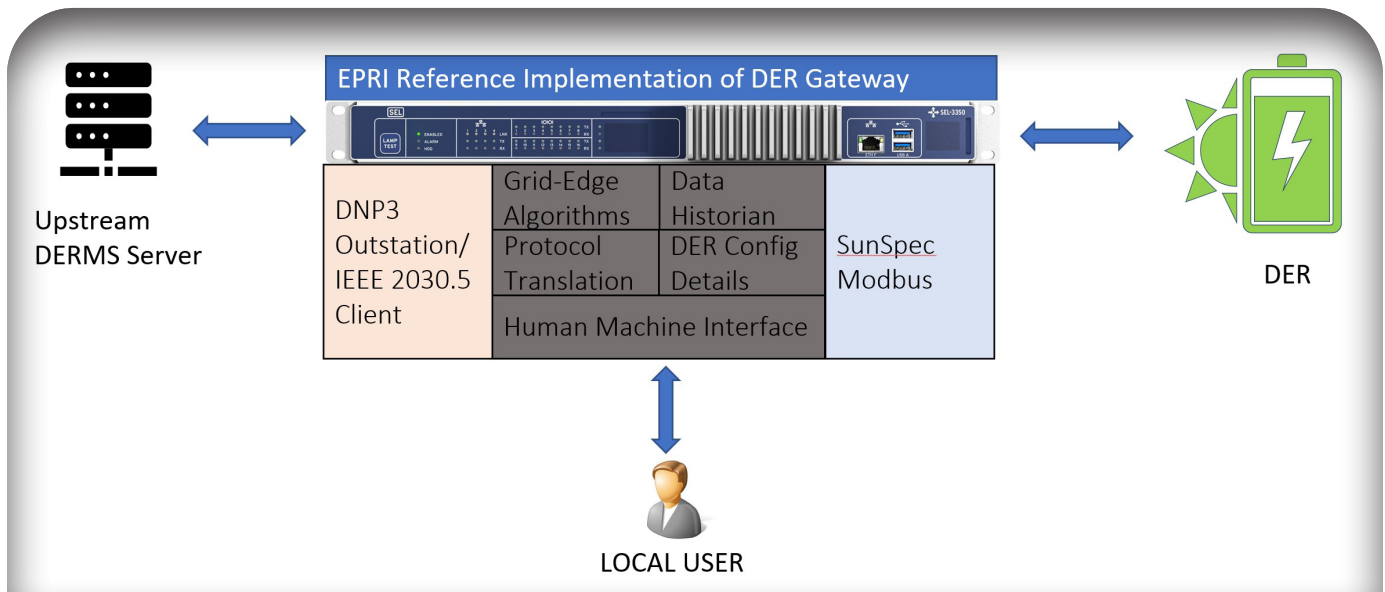


Figure 1. EPRI's reference implementation of DER Gateway

As a logical next step, EPRI has developed a reference implementation of a DER Gateway based on these requirements and intends to keep updating it with new features and functionalities based on recent developments and new IEEE Recommended Practice. Utilities can use the EPRI's reference implementation for any pilot projects demonstrating the benefits and values of the DER Gateway in their networks. EPRI can also work with utility partners and vendors to accelerate the commercial adoption of DER Gateways by sharing the prototype design, implementation details and the source code.

FEATURES

- Linux-based open-source solution implemented on SEL 3350
- Deployable on ruggedized hardware, smaller footprint single board computers, or as a software application
- DNP3/ IEEE 2030.5 support for utility integration
- DER integration supported over SunSpec Modbus 700 series
- Custom logic programming supported
- Data logging for DER operation
- HMI for visualization

APPLICATIONS

- Protocol translation
- Reversion to default for loss of upstream communication
- DER monitoring
- DER dispatch
- Schedule handling
- Transparent IEEE 1547-2018 smart inverter function handling

BENEFITS

- Available to utilities for pilot projects, benchmarking and comparison
- Flexibility to use the open-source features (including design logic and source code) from the reference implementation in commercial platforms to support utility-specific needs

EPRI TECHNICAL CONTACTS

ABREZ MONDAL, *Technical Leader III DER Integration*
414.861.8417, amondal@epri.com

JACKIE BAUM, *Sr. Team Lead DER Integration*
801.750.4854, jbaum@epri.com

BEN EALEY, *Principal Team Lead, ICCS*
865.218.5938, bealey@epri.com

For more information, contact:

EPRI Customer Assistance Center
800.313.3774 • askepri@epri.com



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EPRI

3420 Hillview Avenue, Palo Alto, California 94304-1338 USA • 650.855.2121 • www.epri.com

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