

## European Solar and Energy Storage Solutions

# El Salvador microgrid digital twin



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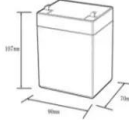

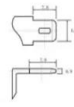


### AspenTech Selected by AES El Salvador

Bedford, Mass. - March 15, 2023 - Aspen Technology, Inc. (NASDAQ:AZPN), a global leader in industrial software, today announced that AES El Salvador has selected its digital grid management (DGM) solution to improve the secure and efficient delivery of electricity from local power plants to more than 1.5 million residential and commercial

### Microgrid Controller

ETAP mGrid(TM) (Microgrid) includes an advanced electrical digital twin model combined with intelligent automation and system protection to modules, and engineering device libraries that allow you to create, configure, customize, and manage your system model. Microgrid controller response can be verified and validated prior to connecting it

**12.8V6Ah**

- Nominal voltage (V):12.8
- Nominal capacity (Ah):6
- Rated energy (Wh):76.8
- Maximum charging voltage (V):14.6
- Maximum charging current (A):6
- Floating charge voltage (V):13.6-13.8
- Maximum continuous discharge current (A):10
- Maximum peak discharge current @10 seconds (A):20
- Maximum load power (W):100
- Discharge cut-off voltage (V):10.8
- Charging temperature (°C):-20~+60
- Discharge temperature (°C):-20~+60
- Working humidity: <95% RH (non condensing)
- Number of cycles (25 °C, 0.5C, 100%DoD): >2000
- Cell combination mode: 32700-4s1p
- Terminal specification: T2 (6.3mm)
- Protection grade: IP65
- Overall dimension (mm):90\*70\*107mm
- Reference weight (kg):0.7
- Certification: un38.3/msds



### Unleashing the Potential of Digital Twin Technology in Microgrid - ...

A digital replica of a microgrid is referred to as microgrid digital twin which can provide massive enhancement to microgrid design, planning, optimization, forecasting, system reliability ...

### Cognitive Digital Twin for

## Microgrid: A Real-World Study for

Abstract: Digital twin technology is a promising solution for achieving optimized microgrid control with enhanced efficiency, reliability, and sustainability. In this paper, we focus on a real-world microgrid in Singapore and develop a cognitive digital twin. Our digital twin consists of a client, located near the physical microgrid for real-time control, and a cloud-based server for ...



## Understanding Microgrid Digital Twins

Through real-time data, mathematical models, and analysis and response of the physical systems, digital twin technology in microgrids can be implemented to optimize energy, generation, storage, distribution, and control. ...

## AspenTech Microgrid Management System(TM) (MMS)

AspenTech Microgrid Management System ensures power reliability and helps optimize onsite energy systems. Leveraging decades of power utility industry experience and cybersecurity know-how, AspenTech MMS brings functionality, flexibility and scalability to the microgrid challenge, enabling you to: Enhance power reliability



## Microgrid Energy Management Solution

Use ETAP Digital Twin to design, analyze, and validate, and configure the microgrid system,



objectives, and logics. Validate controller logic with ETAP software-in-the-loop (SIL) or hardware-in-the-loop (HIL) systems then simply transfer the model to ETAP Microgrid Controller to deploy.

## ANGEL: An Intelligent Digital Twin Framework for Microgrid

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present a framework for adapting the Digital Twin to the application of microgrid security. The Digital Twin is a real-time, physics-based simulation that runs alongside the physical system ...



## Digital twin technology in microgrid systems

This chapter aims to provide a thorough analysis of the concept by offering a detailed framework for digital twin microgrids (DTMGs) and examining the potential benefits that arise from the implementation of software-based management systems in MGs.

## Digital Twin-Based Cooperative Control Techniques for Secure

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Ahmed A. Saad, S. Faddel, T. Youssef and O. Mohammed, "On the Implementation of IoT-Based Digital Twin for Networked Microgrids Resiliency Against Cyber Attacks," in IEEE Transactions on Smart Grid, doi:

10.1109/TSG.2020.3000958. C8. A. A. Saad Shetaya, R. El-Azab, A. Amin and O. H. Abdalla, "Flexibility Measurement of Power System



## Digital twin technology in microgrid systems

Software-based representations of intricate physical systems, known as DTs, connect to the actual system through a communication link. They continuously exchange data with the real environment and create a dynamic digital replica using a constantly operating modeling engine (Brosinsky et al., 2018). The initial concept of creating a twin for a system developed in NASA's

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## Is Digital Twin Technology a Game Changer for Community Microgrids?

Limited availability of capital: Creating a digital twin could allow microgrid designers to simulate the impacts of cost-cutting measures. By modeling different levels of distribution capacity with the microgrid in island or grid-connected mode, for example, designers could evaluate the trade-offs of various CapEx strategies.



## ANGEL: An Intelligent Digital Twin Framework for Microgrid

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present a framework for adapting the Digital Twin to the application of microgrid security. The Digital Twin is a real-time, physics-based simulation that runs alongside the physical system providing for its constant monitoring and control. The Automatic Network Guardian for ELectrical systems, or ANGEL, will model both the cyber and physical

## Digital Twins for Microgrids: Opening a New Dimension in the ...

Microgrids, as a flexible architecture capable of integrating local distributed energy resources (DERs), can satisfy wide-ranging demands via their variable solutions, from off-grid to on-grid applications.



## Digital Twins for Microgrids

Microgrids can satisfy wide-ranging demands via their variable solutions, from off-grid to on-grid applications. The digital twin (DT) concept opens a new dimension in the energy system to break down data silos and carry out seamless functional processes in data analysis, modeling, simulation, and artificial intelligence (AI)-driven decision

## Validating Before Operating: Digital Twins and ...

It's a digital representation of your entire microgrid that allows you to test the feasibility, safety, reliability and commercial viability of your microgrid. "Anything you want to do in the real world, you can simulate it ...



## Understanding Microgrid Digital Twins

Through real-time data, mathematical models, and analysis and response of the physical systems, digital twin technology in microgrids can be implemented to optimize energy, generation, storage, distribution, and control. In a DER microgrid digital twin model, key components form the structure of a functional digital twin for power optimization.



## Resilient microgrid modeling in Digital Twin considering demand

Among these transformative technologies, the Digital Twin has emerged as a game-changer in the realm of smart grid management. A Digital Twin of a Smart Grid serves as a virtual representation that mirrors the real-time functioning of the physical grid, offering a comprehensive and dynamic view of its components, operations, and interactions.



## Towards electric digital twin grid: Technology and framework ...



Digital twin grid provides the status of the whole electric grid in real-time and intelligent decision-making capability that predicts the future of the grid and saves the power systems from tiny to large-scale accidents by both manual ...

## The Applications and Challenges of Digital Twin Technology in ...

Digital Twin technology plays a crucial role in load balancing and optimization in smart grids. By creating a dynamic digital replica of the physical grid, operators can simulate various load scenarios in real time, allowing for the prediction and mitigation of potential imbalances before they occur.



## ETAP 20.6 Release , Continuous Intelligence Digital Twin Platform

Digital Twin Solution to Plan, Design, Operate, Optimize and Automate Electrical Power System. Watch Webinar / Request Quote . simulate, optimize, validate, and control microgrids. Optimal and rule-based dispatch ; Grid active and reactive power interchange control ; High speed intelligent adaptive load shedding for seamless islanding ;

## Microgrid Digital Twins: Concepts, Applications, and Future Trends

A microgrid digital twin (MGDT) refers to the digital representation of a microgrid (MG), which mirrors the behavior of its physical counterpart by using high-fidelity models and simulation platforms as well as real-time bi-directional data exchange with the real twin. Pasando de ISO 9001:2008 a ISO 9001:2015 El nuevo estándar



## Microgrid Digital Twins: Concepts, Applications, and Future Trends

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## island microgrids el salvador

Microgrid Technology: What Is It and How It Works? What Is A Microgrid And How Does It Work. Generally, a microgrid is a set of distributed energy systems (DES) operating dependently or independently of a larger utility grid, providing flexible local power to improve reliability while leveraging renewable energy.



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