

Paladin® Power Digital Twin™ is a real-time simulation tool with advanced analytics to securely monitor and manage advanced power systems for mission critical facilities.

The power model deployed in real-time is a *digital twin*. Power Analytics takes the *digital twin* beyond its typical applications limited to just critical components of the power system such as generation devices to include a power model of the entire power network or grid in **Power Digital Twin™**. Power Analytics leverages the power model created from DesignBase™ software (an integrated power modeling and single line application) that represents the entire power infrastructure or power network. With more than 5 years of deployed systems and experience integrating real-time data with the power model, the Power Digital Twin™ compares and contrasts actual performance of the physical power network with the *digital twin* of the power network.

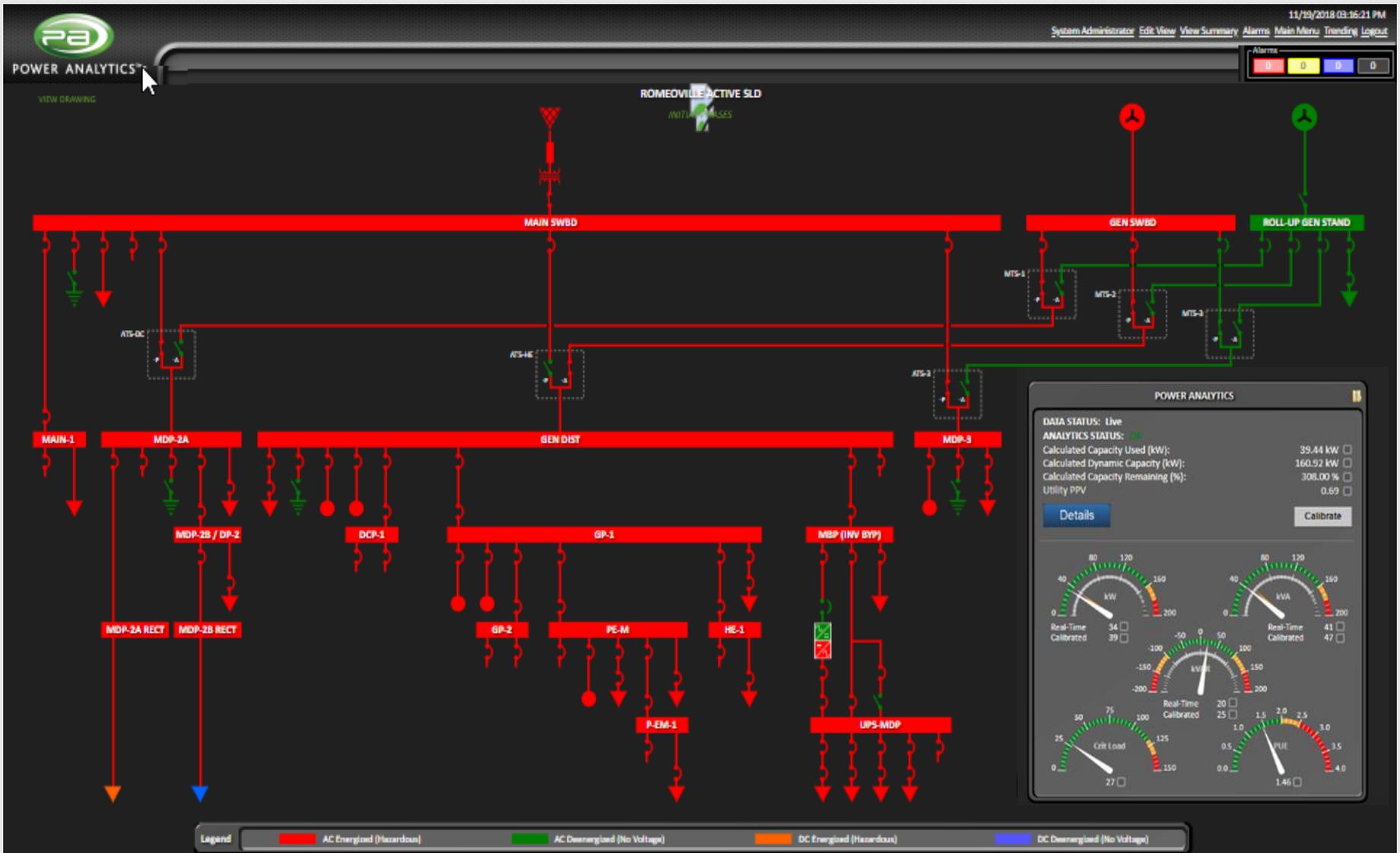
Power Digital Twin™ (PDT) is unique in the spectrum of modeling software because of the requirements for high fidelity driven by the substantial safety standards of power engineering. The PDT platform can be further incorporated into other tools in such as artificial intelligence tools and machine learning because of the architecture of the underlying Gateway™ software. The power model itself accelerates the learning of a *digital twin* by providing complex electrical rules based on industry standards and verified by safety standards.

This next generation software developed by Power Analytics is a cloud-based Software-as-a-Service (SaaS) that can be deployed securely on the public cloud or on secure private clouds depending on the requirements of the client. Power Digital Twin™ incorporates advanced power concepts for real-time power flow, device coordination, state estimation, arc flash, and many more.

Power Digital Twin™ is a tool for end users to simply monitor how the power network is performing and any variation to expected performance. The same tool visually includes actual versus expected system performance and predicts the impact of changes in energy, power, availability, cost, and maintenance. With role-based options to present high-level information or dashboards, the entire mathematical model is instantly available as the native detailed model to electric power engineering professionals including consulting and planning engineers.

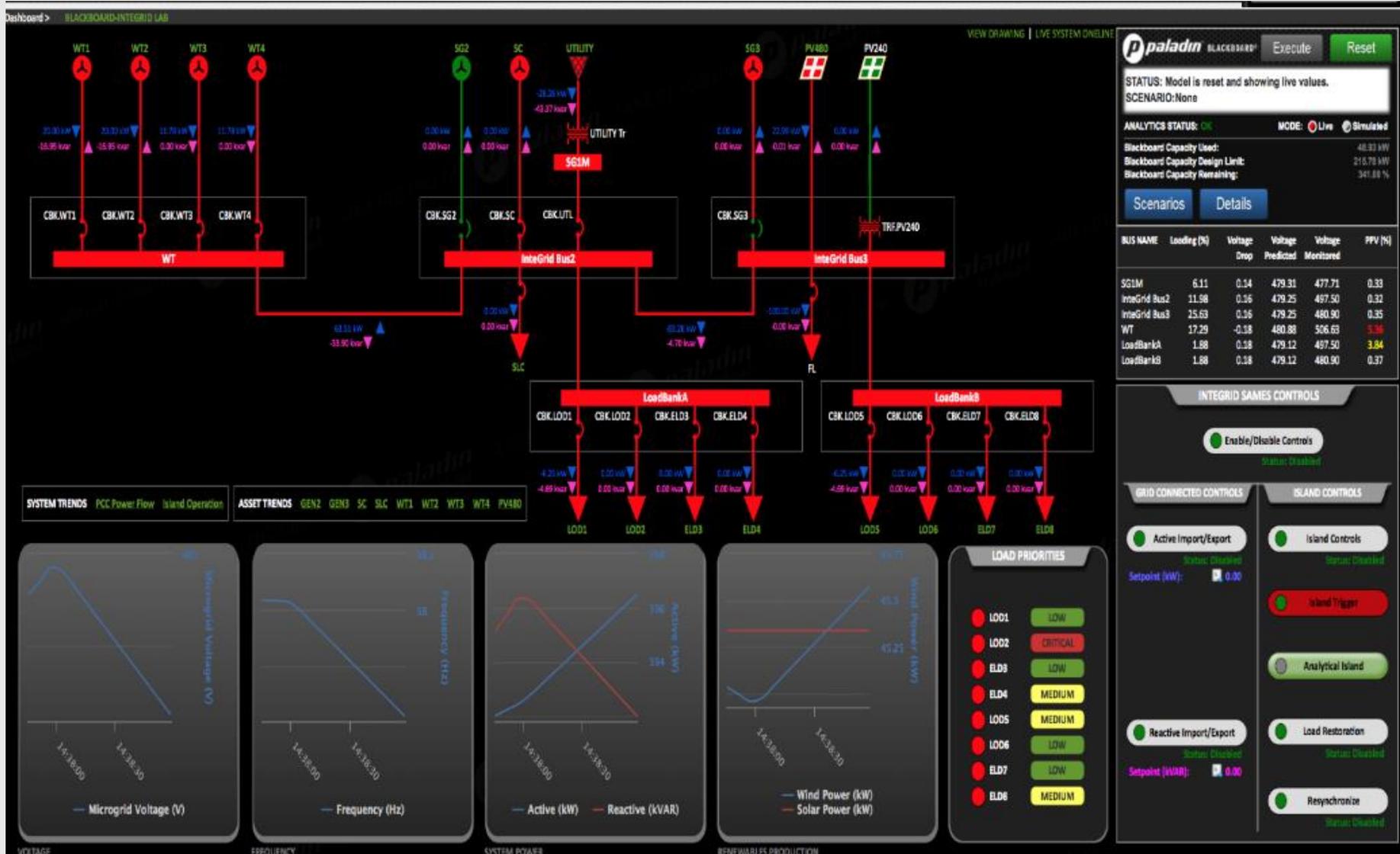
Active Single Lines (ASL or active one lines):

An ASL is the most basic of value dashboards showing in any browser or device the current state of the power network. ASL links specific real-time data to the power model to animate the browser-based display based on the actual conditions.



Blackboard™ Real-Time Simulation Environment:

Provides an online, mirror image of operations in a virtual environment; allows any changes to processes, procedures, hardware, or maintenance activities to be simulated before they are implemented and saved as cases. PDT includes the ability for users to evaluate maintenance procedures, evaluate options, and train users to simulate virtually any “what-if” scenario.



Real Time Arc Flash:

Derived from the DesignBase™ power model is the ability to integrate arc flash analysis in real-time. This patented approach is the most important element of power studies. RTAF™ enables organizations to run a real-time arc flash study each time an engineer prepares to work in an energized area, and make up-to-date assessments of changing threats as they emerge. RTAF™ maintains an uninterrupted, 360 degree view of the facility and its potential arc flash hazards, continually checking all components, equipment, and systems. It provides detailed, updated advisories for site personnel regarding the appropriate safety procedures and protective gear recommended to work in a given vicinity, and makes intelligent recommendations about where potential arc flash hazards could emerge and gauges their potential severity. RTAF™ is based upon IEEE 1584 and NFPA 70E standards, and is the only such software of its kind.

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POWER ANALYTICS™

ENTERPRISE | RTAF | REPORTS

RTAF | Arc-Flash Report | E401 RTAF | E402-1 RTAF | E403-1 RTAF | E403-2 RTAF

Alarms: 0 2 0 0

Dashboard > RTAF

SAFETY

Personal Protective Equipment Requirements

Flash Hazard Risk Category	Range of Calculated Incident Energy Levels	Minimum PPE Rating	Clothing Required
0	0 to 1.2 cal/cm ²	N/A	4.5 to 14 oz/yd ² untreated cotton
1	1.2+ to 4 cal/cm ²	4 cal/cm ²	FR shirt and pants or overalls
2	4+ to 8 cal/cm ²	8 cal/cm ²	Cotton underclothing plus FR shirt and pants
3	8+ to 25 cal/cm ²	25 cal/cm ²	Cotton underclothing plus FR shirt, pants, overalls or equivalent
4	25+ to 40 cal/cm ²	40 cal/cm ²	Cotton underclothing plus FR shirt, pants, plus multilayer flash suit

Arc Flash Boundaries

The diagram illustrates the Arc Flash Boundaries around an energized electrical conductor or circuit part. It shows concentric zones of increasing hazard severity from the center outwards:

- Prohibited Space:** The innermost zone, closest to the energized part.
- Restricted Space:** The next zone outwards.
- Limited Space:** The outermost zone.
- Approach Boundaries:** Three distinct boundaries are shown: PROHIBITED Approach Boundary, RESTRICTED Approach Boundary, and LIMITED Approach Boundary.
- PPE Work Distance:** Indicated by a dashed line.
- Flash Protection Boundary:** The outermost boundary shown.

Any point on an energized electrical conductor or circuit part is shown at the center of these boundaries.

IEEE 1584 Arc Flash Standard-2002 Amendment 1-2004 Amendment 2-2011

NFPA 70E Standard-2012