Product description

The PD3® Instrumentation Platform (“Power Donut 3”) can be applied to a variety of state-of-the-art data acquisition, data logging, and alarm monitoring applications for overhead transmission lines. As with the previous generations of the Power Donut® Line Monitor, the latest generation is completely self-contained and self-powered. It enables voltage and current event capture, and measures RMS current, RMS voltage, MW, MVars, conductor temperature, conductor vibration, and conductor sag angle. Power Donut 3 stores 100-cycle voltage, current, and fault current waveform data on board, and transmits data on demand using 2G/3G/4G wireless data service or by a built-in 2.4 GHz radio transceiver. A GPS receiver is used to provide highly accurate time synchronization signals.

Installation

The PD3® Instrumentation Platform requires no supporting infrastructure; it can be installed onto a live conductor using a hot stick without taking an outage. A fitted hub assembly attaches Power Donut 3 to your conductor; hubs are available for the entire range of transmission conductor sizes, including bundled conductors. Power Donut 3 is powered by magnetic flux coupling from the conductor, operating on all voltage levels up to 765 kV. A high-temperature version enables application on high temperature-capable composite conductors up a maximum operating temperature of 250°C.

Information technology

The built-in 2G/3G/4G wireless data module establishes secure communications with a designated server using TCP/IP over the internet. Power Donut 3 may be used in real-time Wide Area Management Systems, and SCADA and Energy Management Systems. It has on-board flash memory for synchronous event data logging. A 2.4 GHz radio transceiver provides an alternate means of communication, and enhances security and reliability by providing a backup data channel.
Power Donut 3:  
**PD3® Instrumentation Platform**  
for overhead transmission lines

**Physical**
- **Diameter**: 12.6 inches (32.1 cm)
- **Width**: 5.5 inches (14.0 cm)
- **Weight**: 19.6 pounds (8.9 kg)
- **Operating temperature**: Range: -40°F to +140°F, -40°C to +60°C (ambient).
- **Environmental**: Fully weatherproof (IP65 rating). Corona-free operation through 765 kV rated voltage.
- **Installation**: Energized (hot stick) or de-energized. Suitable for bundled conductor applications.

**Power Supply**
- Powered from conductor magnetic field and a rechargeable internal lithium-ion battery pack.
- No external power supply is required. Nominal current required to operate is 80 A at 60 Hz.
- **Battery operation**: Runs on battery for 4 hours (programmable) when not operated by line current. Will initiate an orderly shutdown on low battery. Battery charges when the line current is above 150 A. Typical charge time is 10 hours.

**Measurements**
- **Conductor current**: +/- 0.5% of reading. One reading per second. Measures up to 3000 A.
- **Conductor voltage**: Up to 765 kV rated voltage +/- 5%.
- **Conductor temperature**: +/- 1°C accuracy. 0.25°C resolution. One reading per minute. Standard temperature range: -40°C to +170°C. Extended range: -40°C to +250°C.
- **Inclination angle**: +/- 0.05 degrees accuracy. 0.02 degrees resolution. One reading per minute. +/- 11 degree measurement range (able to be offset).

**Communications**
- Built-in 2G/3G/4G cellular telephone and 2.4 GHz radio are installed, standard.
- **Cellular telephone**: 2G/3G/4G cell phone: 850/1900MHz (US), 900/1800MHz (Europe).
- **2.4 GHz radio**: 63 mW (configurable) license-free spread spectrum radio transceiver channel.

**Diagnostic software**
- Windows-based software providing comprehensive diagnostics and the ability to configure all communications inputs. Software is also compatible with CAT-1™ Dynamic Line Rating System.

**Power Donut server**
- Windows-based data management system for handling data and managing communications.

**Dynamic Line Ratings**
- Software module for computing real-time ampacity. Includes IEEE Standard 738 weather model and proprietary conductor temperature model, as well as sag and tension calculations.

**USi Weather Station**
- Self-contained solar- and battery-powered unit. Battery life: five-year design.
- Measures wind speed, wind direction, solar radiation, ambient temperature, humidity, rainfall.
- Communicates directly with the Power Donut® Line Monitor.

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