Enertia ENGINEERING

EnerPulsar
Anti Islanding Protection System

DG Anti-islanding Factsheet

Driven by Energy…

EnerPulsar - Managing an alternative power solution

Interconnecting Distributed Generators (DGs) to the utility power grid has become safe, reliable and cost-effective since Enertia Engineering Ltd. has launched the patented EnerPulsar DG anti-islanding protection system.

DG is a fast growing business and a pro-environment option. Interconnected DGs can be a potential safety hazard if a DG continues to operate in an islanded situation. A reliable and cost-effective solution is needed to detect and protect against this situation.

Enertia Engineering Ltd. recently introduced this innovative product as a simple and proven solution in response to this challenge.

The EnerPulsar system can be applied to any type of DG such as bio-mass, solar, natural gas, diesel, wind, ethanol, small hydro, fuel cells, tidal, etc. With the scalability, the EnerPulsar can be used to protect all DGs served by each substation.

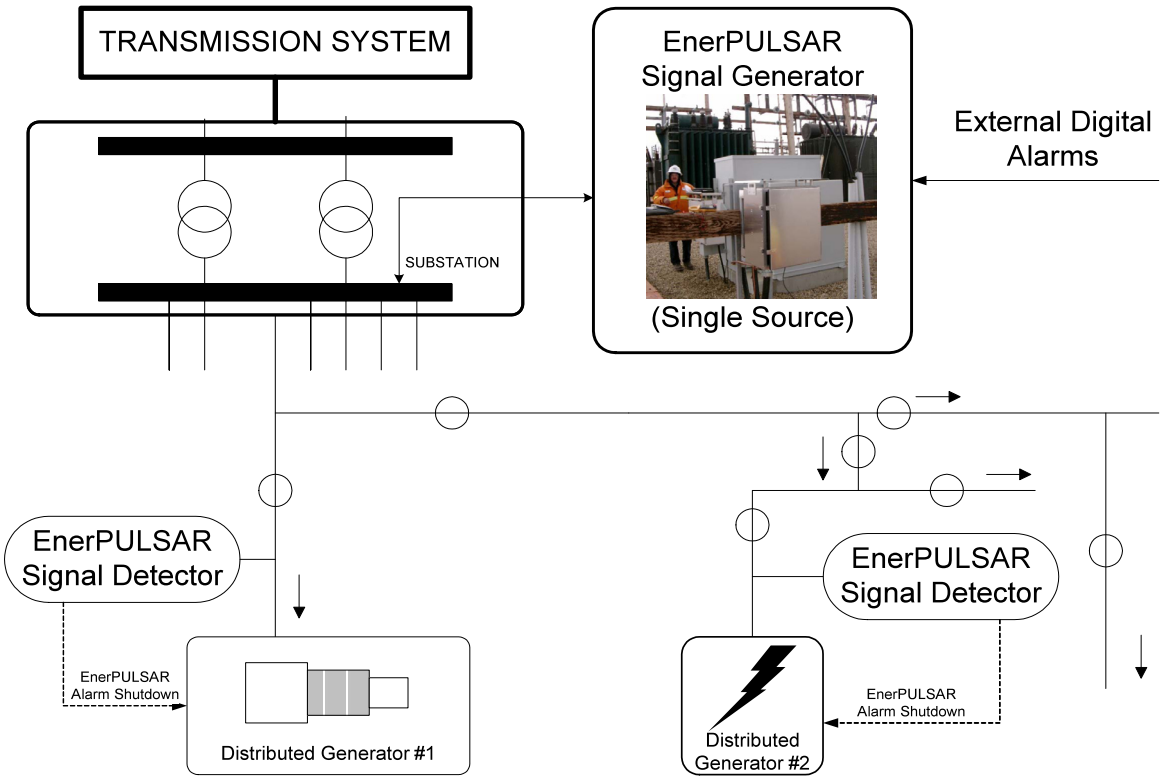
This system is fail-safe, since the lack of signal being detected for any reason causes the DG to trip. The EnerPulsar system has been field tested in Canadian utility companies including ATCO and Manitoba Hydro. Expanded trials begin at Hydro One in early 2009.

EnerPulsar prevents DG's from operating 'islanded', a situation where the DG is isolated from the main grid and forced to provide power to other common line loads

EnerPulsar - How it works

The EnerPulsar system has two main components:

- A signal generator connected to the utility grid, at the secondary side of a distribution substation, continuously producing signals to all downstream feeders. The EnerPulsar creates a carrier line signal at the substation which propagates to all the regional downstream DG sites using the power lines as the signal paths.
- A signal detector equipped at each DG site detects the signal, if the detector cannot sense the signal, the DG is considered islanded from the main grid, an islanded condition is determined to be present and the DG is tripped off immediately.



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Frequently asked questions

What does the EnerPulsar system do?

It automatically detects the absence of a power line carrier signal when the distributed generator becomes electrically isolated (i.e. islanded) from the utility grid due to, for example, the opening of a breaker in the grid. With the knowledge of this situation, distributed generators are automatically disconnected from the grid in a timely manner for safe operation.

Who needs it?

All distributed generator owners and the utility companies who have interconnected distributed generators, without full two-way communication & control already in place.

Why do I need it?

Islanding creates a potential hazard for utility line-workers and the public by causing a line, assumed to be disconnected from the main power grid, to still be energized by the DG.

Without an effective islanding detection system, the distributed generator can become overloaded when forced to power the isolated line.

DG can be damaged when reconnected to the main power grid after being islanded. DG's are unlikely to be synchronized with the system at the instant of reconnection. Such out-of-phase reclosing can inject massive current to the DG causing damage.

While islanded, the DG will produce incorrect voltage and frequency to other power users connected to the power line near the DG. The islanded DG can damage other power users equipment, introducing damage responsibility issues and repair cost liabilities.

Who invented this patented technology?

The anti-islanding technology behind the EnerPulsar was invented and patented by the University of Alberta. Enertia Engineering Ltd. has developed the EnerPulsar systems using this patented technology and manufactures them in Alberta, Canada.

How fast does the system react?

EnerPulsar will begin a "Safe Controlled Shutdown" of the DG within 300ms of signal loss.

What are the special features & technical advantages of the EnerPulsar system?

- It works for all types of Distributed Generators
- It is a fail-safe system
- It automatically detects all types of islanding
- Utilities can customize EnerPulsar to protect
    - all DGs served by a substation
    - some DGs served by a substation
    - individual DGs
- It is cost-effective as one host signal generator protects all the downstream DGs and its cost can be shared among DG owners
- Easy closed-loop test by simply stopping the signal generator without actually impacting the rest of the electrical system
- Works very reliably as multiple signalling patterns and channels are available for use and the signal detection algorithms are very robust in noisy environments
- Works with DG up to 20MW (depends on local utilities guidelines)

What are the Benefits to the Utility Generator?

- Simple installation
- One signal generator can service multiple distributed generators
- Units can be paralleled for redundancy
- Signal is scalable for longer distances
- Signal can be added to end user rate-base
- Signal pattern is programmable to operate at 1, 2, 3, or 4 pulses
- The firing angle is adjustable from 5 to 35 degrees, this allows for adjustable signal strength
- The EnerPulsar will not cause flicker
- Utilities may control DG stop / restart at the substation by turning the signal generator off & on

How easy is the EnerPulsar system to use?

The EnerPulsar signal generator is simple and easy to install at the substation, it uses a fully Scalable Design, Multiple Signal Generators may be used in multiple substations

How much does the system cost?

The EnerPulsar signal generator whch is the largest component, may be shared, and is installed at the utility substation has a significantly lower cost than other comparable solutions, the detector which is installed at each DG location is a low cost addition to the electrical control system.

I'm a DG owner, what should I do?

Contact Enertia Engineering Ltd., a signal generator may already be available at your nearest substation

For more information on this or other products & services email us at:

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