



DX3 DG Anti-islanding Factsheet

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DX3 DG Anti-islanding Technology- Managing an alternative power solution

Interconnecting Distributed Generators (DGs) to the utility power grid has become safe, reliable and cost-effective since DX3 Enterprises Ltd. has launched the patented DX3 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.

DX3 Enterprises Ltd. recently introduced this innovative product as a simple and proven solution in response to this challenge.

The DX3 Anti-islanding 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 DX3 Anti-islanding system can be used to protect all DGs served by each substation.

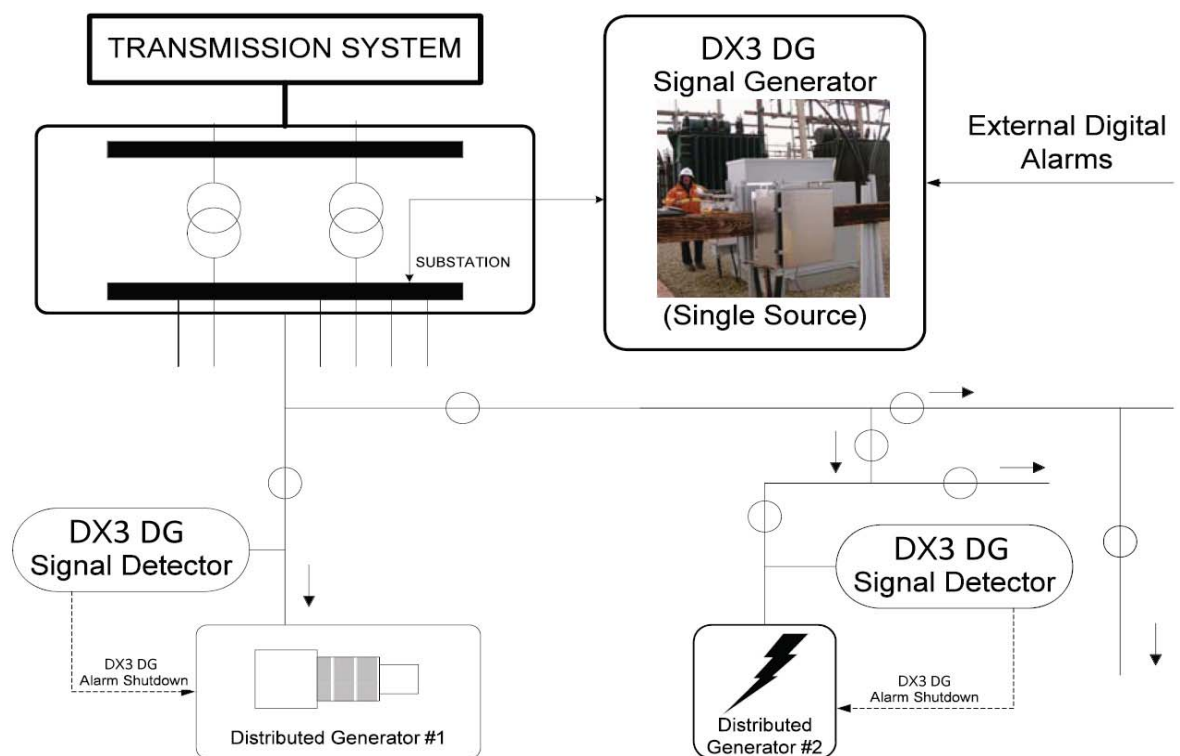
This system is fail-safe, since the lack of signal being detected for any reason causes the DG to trip. The DX3 Anti-islanding system has been field tested in Canadian utility companies including ATCO and Manitoba Hydro. Expanded trials begin at Hydro One in early 2009.

DX3 Anti-islanding system 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

DX3 DG Anti-islanding Technology - How it works

The DX3 Anti-islanding 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 DX3 Anti-islanding system 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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The DX3 Anti-islanding system has been field tested in Canadian utility companies including ATCO and Manitoba Hydro. Expanded trials begin at Hydro One in late 2009.

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Frequently asked questions

What does the DX3 Anti-islanding 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 DX3 Anti-islanding system was invented and patented by the University of Alberta. DX3 Enterprises Ltd. has developed the DX3 Anti-islanding system using this patented technology and manufactures them in Alberta, Canada.

How fast does the system react?

DX3 Anti-islanding system will begin a "Safe Controlled Shutdown" of the DG within 300ms of signal loss.

What are the special features & technical advantages of the DX3 Anti-islanding 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 DX3 Anti-islanding system 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 DX3 Anti-islanding system will not cause flicker
- Utilities may control DG stop / restart at the substation by turning the signal generator off & on

How easy is the DX3 Anti-islanding system to use?

The DX3 Anti-islanding 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 DX3 Anti-islanding signal generator which 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 DX3 Enterprises 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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