

Centrix Advanced Feeder Automation

Overview

Your choice for Feeder and Distribution Automation is no longer limited to either a distributed approach using pre-determined scripts or a complex control-center based approach requiring a full DMS. Efacec introduces **Centrix**, the first solution that combines the performance and quick deployment of a distributed solution with the power and reliability of a dynamic, model-driven approach.

Centrix is an advanced distribution automation platform flexible, scalable, easy to configure, and cost-effective to implement.

Using proven technology, **Centrix** leverages your existing infrastructure to:

- Reduce outage durations from hours to seconds through automatic isolation and service restoration, including a “return to normal” function with no violations or further service interruptions
- Dramatically improve permanent outage statistics SAIDI, CAIDI and SAIFI transforming the majority of the service interruptions to momentary outages
- Reduce voltage losses and improve power factor

Centrix uses a new, advanced approach to Distribution Automation at the feeder level. This innovative approach makes **Centrix** a powerful Smart Grid automation foundation to support many companion applications. Efacec has taken the functionality and capability of our model-driven advanced DMS applications and developed a stand-alone system that is easier to configure and deploy. The cost of a **Centrix** installation is comparable to that of a peer-to-peer distributed approach, without requiring vendor-specific hardware.

Because **Centrix** is a model-based solution, it supports additional optimization applications including Loss Minimization and Interactive Volt/VAR Control without the complexity normally associated with creating the model.

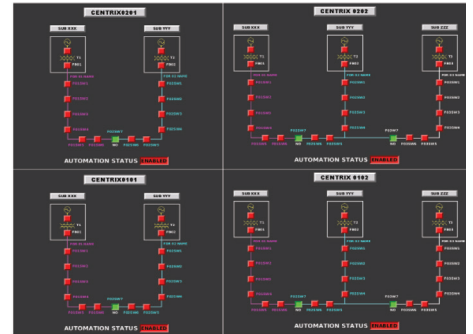
Centrix models are easy to build, using pre-defined templates for 2-feeder, 3-feeder, 4-feeder and other customer-specific configurations. **Centrix** is a field-proven solution for self-healing feeder automation, based on our advanced Fault Detection Isolation and Restoration (FDIR) application.

Our FDIR product was first installed in 1998, and has been successful worldwide in reducing feeder outage restoration time from over one hour to less than 20 seconds.

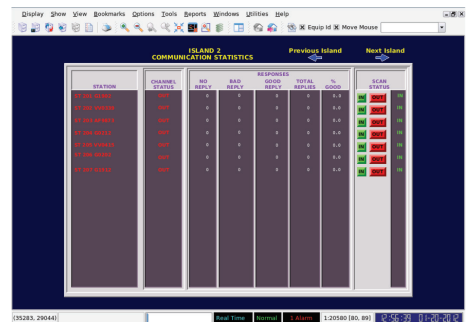
Pre-defined Topologies for Quick and Easy Deployment

Centrix has the ability to model and automate very complex network topologies. It greatly simplifies this process by using pre-defined automation “island” topologies, allowing you to de-activate non-existing switches and configure existing switches as needed. The network model is then populated with a form-driven application, which defines all of the variables, load limits/ current limits, voltage levels, device types, etc. This creates a run-time model that is loaded into **Centrix** for field operation.

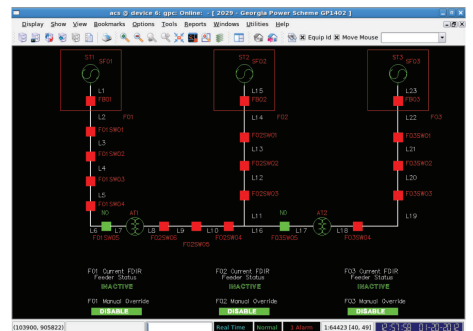
Centrix does not require a three-phase distribution load flow model; it determines the load transfer capability and requirements based on measured data. The Topology Processor enables the system to handle multiple fault conditions or abnormal network configurations.



Template matrix



Centrix communication status display



Centrix template display

Robust Features

Centrix is configured to autonomously isolate faults and restore service to un-faulted sections without operator intervention. It quickly isolates faults and restores power both upstream and downstream, analyzing switching options and choosing the one that maximizes the restored load. The system adapts immediately to changes in the network topology, even if the network is in an abnormal state. This means that optimum restoration solutions are always within reach. Moreover, **Centrix** easily accommodates the switches and protection schemes you already have in place. Other features include:

- Disables automation following a loss of communications, but only to the affected device or feeder
- Six definable device-level flags for disabling automation on active islands
- Substation dead-bus detection
- Two-way SCADA/DMS interface
- Sequence-of-events logging
- Secure remote access
- Response to multiple faults (schemes are independent of each other and can operate simultaneously)
- Return-to-Normal function
- Control center HMI

Optional optimization applications may also be implemented on the **Centrix** platform, making it a true Smart Grid solution with improved return-on-investment. These applications include:

- Loss minimization: reduce feeder losses while improving voltage control through coordinated control of capacitor banks
- Integrated Volt/VAR control: provide optimal control of feeder load and/or losses through coordinated control of capacitors and LTCs

An Interoperable Solution

Centrix integrates seamlessly with Efacec RTUs and IEDs, from either the SmartGate or CLP 500 families, and also integrates easily with existing sectionalizing switches or automatic reclosers, either from Efacec or third party vendors, for localized FDIR on distribution feeders. Efacec creates interface profiles for each controller or device in order to seamlessly interface to legacy equipment meaning in many cases no additional feeder automation equipment is needed. This remotely automates the switching device, and also provides the required three-phase measurements, such as fault flag, fault direction and three phase P & Q, to perform the self-healing function. This allows you to decrease your cost by using more economical devices and leveraging existing installed devices. **Centrix** can hence be configured to operate with an array of controllers and IEDs through multiple communication protocols. **Centrix** also operates without interfering with the existing protection schemes. When a fault is detected, **Centrix** waits until the recloser or relay issues a “lock out flag” and the switch opens before commencing with isolation and restoration actions.

Broad Application Potential with Unlimited Expansion

The **Centrix** network model is expandable without limitation. Most selfhealing feeder products (particularly distributed solutions) are limited in their complexity and expansion capabilities. The largest operating network model in service with the FDIR application that drives **Centrix** includes over 1,000 feeders.

Adapts to Network Changes

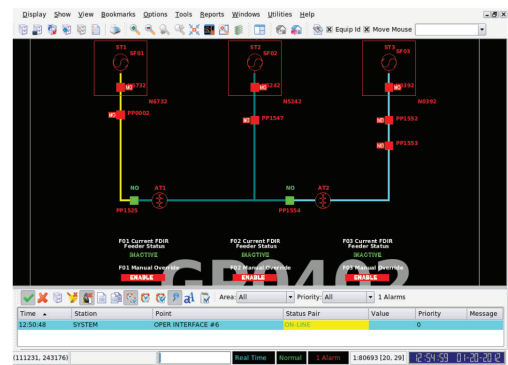
Unique to this approach of an easily-configurable solution is the ability to adapt to different network topologies, including abnormal network conditions. Unlike rules-based decentralized solutions, **Centrix** adapts to the actual network state that is calculated in real-time by a topology processor application. **Centrix** does not require a predefined system topology in order to operate. As a result, changes to the network topology due to switching or protective device operation do not inhibit **Centrix** from determining an optimum solution. All switching solutions are derived from the current topology. Since all switching devices, including manual switches, are modeled, the “operation” of these switches at the control center interface can be reflected in the new feeder topology calculation. It is also not necessary to alter the program logic for expansion, since it will adapt to any configuration.

Optimizes Asset Utilization and Operating Efficiency

Centrix provides an optimum solution that makes the most effective use of existing equipment as well as its own infrastructure. **Centrix** supports other applications, adapts to abnormal network situations, and provides optimum control of conflicting devices such as capacitor control and voltage regulation, helping to further justify the investment in a feeder automation platform.

Safety Features

Centrix supports many failsafe modes for safety reasons. The system supports the option of disarming itself if certain parameters are detected to be in an abnormal condition. Typical failsafe functions supported by **Centrix** include: remote SCADA control from the control center or substation operator; hot line tag; and local/remote operation of the switches. **Centrix** will also automatically disable the FDIR function upon a loss of communications, but only for the affected device or feeder meaning restoration functions are still available for areas of the automation island where communications are normal. The system also provides up to six selectable flags per device that will disable automation on active islands.



Centrix one-line display



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View the product on our website.

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