Centrix Advanced Feeder Automation

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.

Let us show you the advantages of Centrix

Contact your ACS sales manager for additional information or to arrange a demonstration of the Centrix feeder automation system. We can show you how Centrix will not only meet the immediate needs you have for improving service reliability, but provide a ready platform for expansion that will integrate seamlessly into your overall Smart Grid plans.

Description

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 from Advanced Control Systems (ACS). Centrix is 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 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. ACS 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 up to 20 feeders per island, and available 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.

ACS first installed FDIR in 1998, and it has been successful worldwide in reducing feeder outage restoration time from over one hour to less than 20 seconds.
Centrix Advanced Feeder Automation

Robust features

Centrix is configured to autonomously isolate faults and re-store service to un-faulted sections without operator inter-vention. 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:

- Enables 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

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.

An interoperable solution: use existing devices

Centrix integrates easily with existing sectionalizing switches or automatic reclosers for localized FDIR on distribution feeders. ACS 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. In some cases, you can retrofit lower cost switch units with a motor and automate existing switches using the ACS NTX-20 Feeder Terminal Unit and DO60 Analog Input Module. 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 be configured to operate with an array of controllers and IEDs, including popular models from SEL, S&C, Nulec, Cooper, ABB and more.

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.

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.

Broad application potential with unlimited expansion

The Centrix network model is expandable without limitation. Most self-healing 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.
Centrix Advanced Feeder Automation

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