

Alternative Energy

Connect, monitor and control
diverse remote sites and processes



Applications Include:
Wind Power | Solar Power | Hydro Power

Alternative Energy

Alternative energy is a growing sector of the world's power supply. For wind, solar and hydro sources to reliably scale, production must become more dependable and cost effective. Energy sources of the future will require next-generation infrastructures. Red Lion Controls gives producers the ability to remotely connect, monitor and control all types of assets, from wind turbines to solar panels to submersible hydroelectric generators.

Because key production variables change by the second, operators need real-time data collection, communication and control systems. The controls used to run traditional power generation operations are giving way to more intelligent, powerful and standardized systems. Red Lion's industrial automation and networking solutions include Ethernet switches that quickly transfer and process data, Wi-Fi and cellular routers for wireless access to remote assets and HMIs that enable organizations to monitor status in real time.

Reliable data access and communications provide operators with the information they need to instantly adjust blades, turbines and valves to maximize power generation and monitor equipment health. Timely access to remote data is essential to predicting required maintenance and minimizing costly down time. Our software and configuration tools make it easy to integrate intelligent new equipment monitoring capabilities with existing SCADA, maintenance management and other systems.

Built for reliability and ease of use, our rugged industrial products deliver the performance required to help ensure infrastructures stay up and running. This is why Red Lion is considered an industrial automation and networking leader within the Alternative Energy industry. As a trusted partner, we help organizations worldwide develop systems that improve output efficiency and reduce downtime.





Companies worldwide rely on Red Lion to keep systems running safely and reliably around the clock, regardless of location. Red Lion offers intelligent industrial solutions that provide the connectivity, monitoring and control required to get the job done across Alternative Energy applications that include:

Wind Power

Building real-time intelligence, communication and control capabilities into wind turbines helps improve uptime and efficiency in several ways. Gearbox failures, for example, can be prevented by using programmable controls to continually monitor oil temperature, pressure and variables from other sensors. An application on the controller can automatically initiate corrective action as condition thresholds are reached. Turbine problems can be prevented and efficiency can be improved by monitoring and correcting for excessive vibration, over speed and braking, while optimizing output by automatically adjusting pitch and yaw of the blades. Even bird strikes can be dealt with more efficiently by integrating Ethernet or wireless communications with video cameras, enabling blades to be inspected remotely without the need to send a technician to the site after sensors detect an event.

Solar Power

Proactively prevent problems by adding the ability to respond instantly to troubling changes in temperature or other performance indicators. Panels, transformers, inverters and other components can be monitored in real time. With the ability to receive and process input from multiple remote I/Os, operators can detect leaks, blocked panels and other problems and correct them quickly to minimize loss. Remote video surveillance can be integrated with control systems to see what is causing shade or other problems and determine if a technician needs to be dispatched. Control systems provide the data to accurately diagnose problems and plan the appropriate response to maximize labor efficiency.

Hydro Power

Remote monitoring and control capabilities can be extended to hydroelectric generators and the underwater components that power them. Tidal turbine blades can be automatically adjusted depending on the strength and direction of the tide using input from sensors connected through the network. The pressure and flow through various valves, pumps and pipes can also be monitored and controlled in real time to keep operations within safe and efficient parameters. Intelligent systems not only provide real-time control, but help long-term maintenance by collecting performance data via open protocols to provide data to other monitoring, predictive maintenance and M2M communication systems.

Red Lion can put you on the path to improved productivity and reliability with industrial automation and networking products that give you the ability to seamlessly connect, monitor and control your operations.



Connect

Connectivity is at the heart of what Red Lion does, from our industry-leading line of Ethernet, Wi-Fi and cellular M2M products to the extensive protocol support and connectivity options that are built into our RTUs and HMIs. You'll find secure reliable communications options that provide visibility into remote operations, collect performance data from critical assets, and enable complete remote maintenance and troubleshooting.

Ethernet and cellular technology allow for the seamless connection of numerous I/O devices regardless of location. We offer industrial Ethernet switches, Wi-Fi radios, cellular routers and other communications products. Supported standards include Ethernet, USB, RS-232 and RS-485 communications, HSPA, GSM, GPRS and EDGE cellular, 802.11a/b/g/n Wi-Fi and others. Red Lion's feature-rich products include:

- N-Tron and Sixnet series industrial Ethernet switches available in managed, unmanaged, monitored and PoE models.
- N-Tron series Wi-Fi radios that are IEEE 802.11a/b/g/n compliant and support data rates up to 300 Mb/s.
- Sixnet series cellular routers and RTUs support multiple 4G and 3G networks and native Modbus support to simplify connection to multi-node sites.
- Red Lion HMIs deliver the widest range of protocol support in the industry and have native drivers for hundreds of industrial control products used in Alternative Energy operations.
- Many of our products offer security features that meet NERC CIP requirements, including 1024-bit encryption, 802.1x compatibility, VPN support and IP blacklisting.

With products that enable the easy retrieval and logging of critical telemetry data, our industrial solutions provide real-time remote access to "always-on" monitoring equipment located in the field. The end result is streamlined data collection and improved network uptime, which improves safety and productivity by reducing the need for site visits.

Monitor

The protocols that our HMIs, panel displays and other products support make it easy to monitor multiple devices whether you are at the point of activity or thousands of miles away. You can get a true picture of performance by using the native drivers that are built into our HMIs to get data and status information from equipment, without having to add a protocol converter. By using our flexible Crimson® software or programmable RTUs, you can seamlessly take advantage of real-time data to create new applications that optimize performance and uptime. Red Lion's comprehensive support and flexibility take time out of installation and integration and add new capabilities to existing equipment.

- Red Lion HMIs not only provide sleek displays, but can also double as data loggers to collect information for statistical analysis. And, with a built-in webserver, you can easily monitor your installations on mobile devices.
- Crimson HMI configuration software includes drivers for over 250 protocols, allowing complete integration with virtually any PLC, PAC, RTU or motor drive controller.
- Our products can even monitor themselves through self-diagnostic capabilities. For example, native support of the N-Tron series N-View protocol allows our HMIs to monitor and display port-level status of N-Tron series Ethernet switches.

The ability to process input from more sources and integrate with more systems and applications gives Red Lion customers the unmatched ability to monitor operations in real time and benefit from increased visibility.



Industrial Ethernet Switches

Red Lion's new N-Tron and Sixnet series industrial Ethernet switches are designed to meet diverse networking environments. Built-in redundancy coupled with robust reliability ensures infrastructures like yours stay up and running around the clock.



RTUs & I/O Modules

Red Lion's rugged RTUs and I/O provide simple yet powerful means to reliably monitor and control remote sites. Our compact automation systems can start small and grow as needs increase without requiring hardware replacement.



Human Machine Interfaces

Red Lion's operator interface panels give you complete HMI functionality for PLCs, motor drives and other communications-capable devices. With Ethernet as standard on all models, you can network-enable any serial devices connected to the panel.



Wi-Fi Radios

Red Lion's family of IEEE802.11a,b,g,n hardened wireless products provide a powerful solution for industrial applications. Data rates up to 300 Mb/s can be attained using the 802.11n MIMO wireless technology.



Control

Red Lion's powerful control features for valves, pumps, gearboxes, solar panels and other equipment have already been highlighted. But controlling equipment and processes is only one requirement for RTUs and other industrial automation products. They should also help operators control costs. Red Lion products do that with features that minimize deployment, integration and support.

First, our products help reduce capital equipment costs by performing multiple roles:

- Red Lion HMIs serve as protocol converters;
- HMIs and Sixnet series RTUs provide data logging functionality;
- Sixnet series cellular automation routers combine data concentrator, router, cellular modem and RTU capabilities into a single device.

Because our products fulfill multiple roles, our customers have fewer devices to install, power, monitor and maintain. Second, we make our products easy to integrate by providing flexible configuration options, supporting open standards and leading protocols, and simplifying application development through software tools and preconfigured drivers. A product sampling follows:

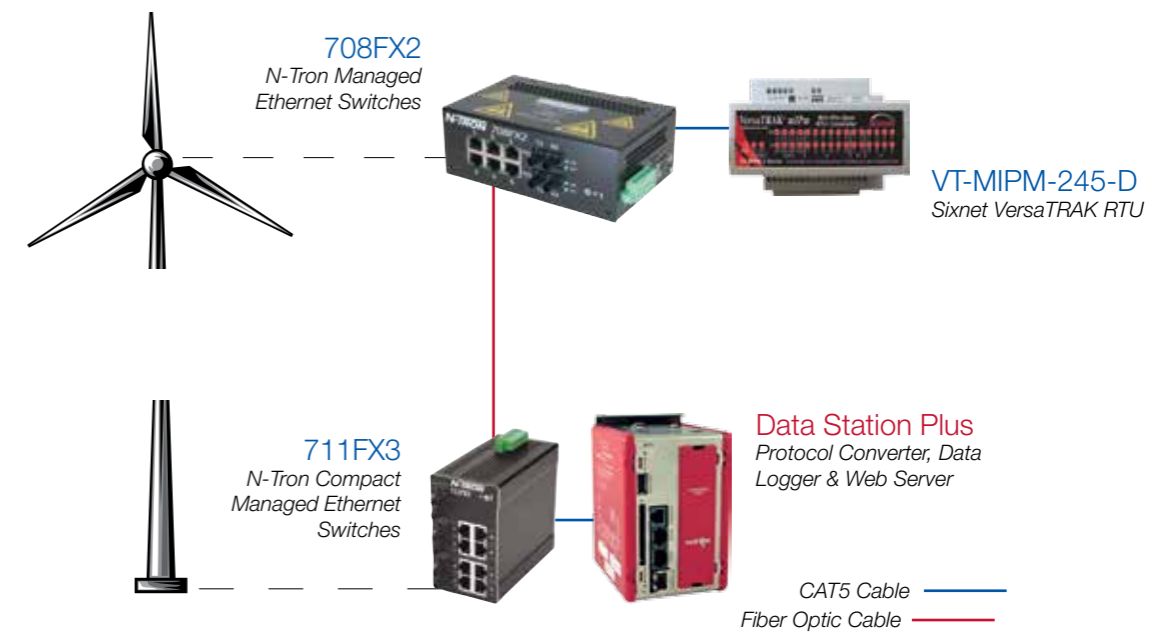
- Sixnet series RTUs feature a Linux operating system so there are no proprietary operating systems and development environments to learn, and support multiple communication options, including Modbus and DNP3 for tight integration with enterprise systems.
- Our process control product line includes RTUs, distributed I/O modules and controllers that can enhance existing PLCs or form the foundation of advanced new control systems.
- Multifunctional capabilities plus various wireless and Ethernet connectivity options enable our products to play key roles in M2M systems.

While wind, sun and the flow of water are all variable, Alternative Energy producers can ensure there is a steady flow of data to keep their operations running at peak efficiency. By building intelligence, control and communications capabilities into components and systems, organizations can break free from the constraints of weather conditions or limited technician availability. Red Lion has the tools and expertise to allow you to connect, monitor and control assets even in the most remote and challenging environments. We can help produce the uninterrupted flow of data that is essential in keeping production consistent and reliable.

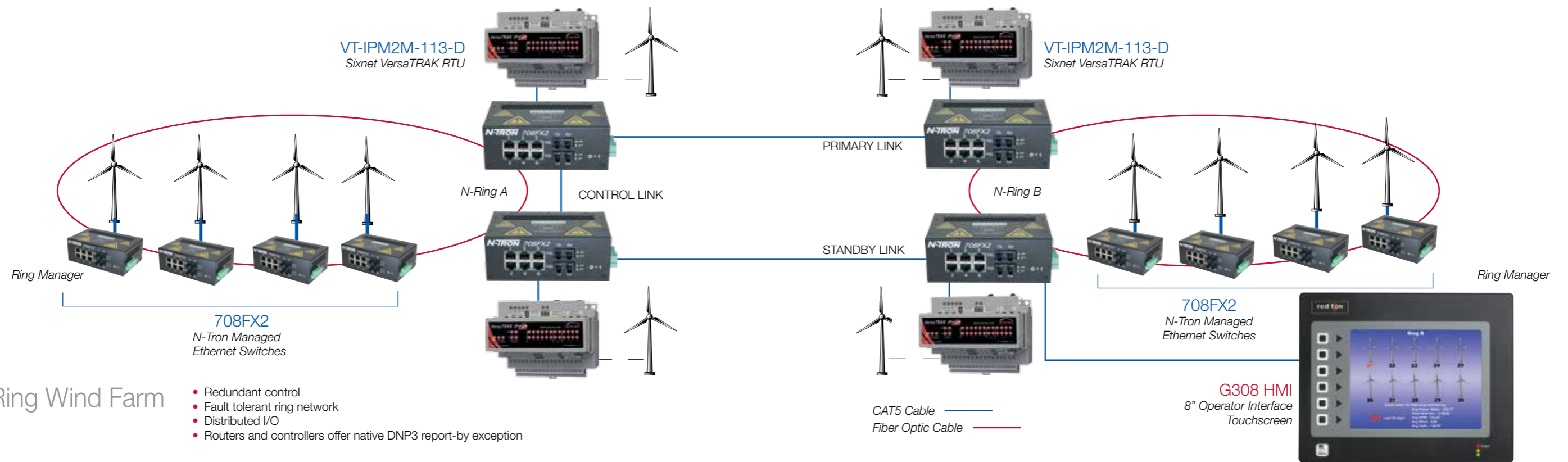
Network Topologies

Red Lion's industrial automation and networking products can be configured in a multitude of ways, customized to suit specific applications. A few Alternative Energy network topology examples follow:

- Turbine Configuration
- Multi-Ring Wind Farm
- Single-Ring Wind Farm

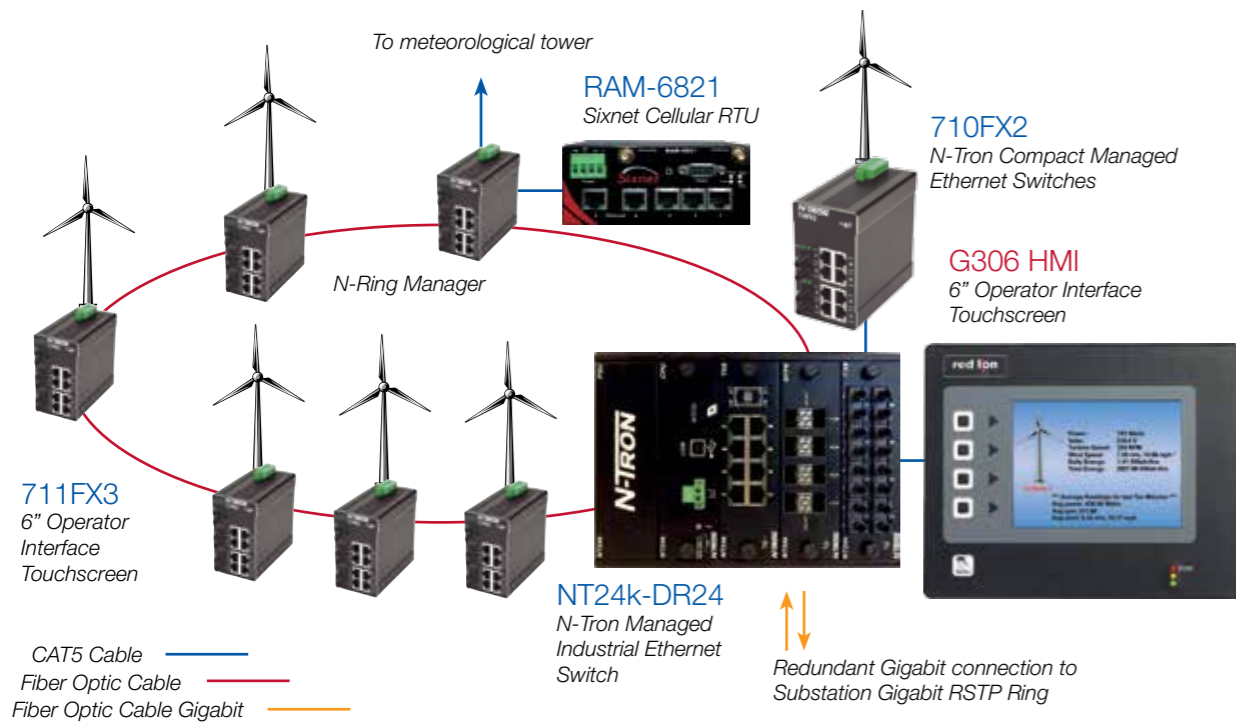


Turbine Configuration: • Datalogging for process analysis
• Built-in web server for remote control



Multi-Ring Wind Farm

- Redundant control
- Fault tolerant ring network
- Distributed I/O
- Routers and controllers offer native DNP3 report-by-exception



Single-Ring Wind Farm

- N-Ring provides 30 ms healing time
- Fiber link provides immunity to noise
- Extremely rugged switches prevent downtime
- Reliability and ease of maintenance
- Remote monitoring

About Red Lion

Red Lion is growing. In addition to the panel meters, HMIs and other industrial automation products that Red Lion customers have always trusted, we now offer a broad selection of communication technologies for industrial networks. Our networking products include industrial Ethernet switches, Wi-Fi devices and cellular M2M routers.

The end result? A comprehensive set of products that enable you to connect, monitor and control anything. From one device to a thousand devices. Connecting serially, via Ethernet, or over high-speed wireless networks. Speaking one protocol, or hundreds of protocols. On a single machine, across your factory, or spanning multiple sites all over the globe.



A comprehensive portfolio of industrial automation and networking solutions to **connect. monitor. control.**



Industrial Automation

Process Control

- PID Controllers
- Data Acquisition
- RTUs & I/O Modules
- Signal Conditioners
- Sensors

HMIs & Panel Meters

- HMI Operator Panels
- Panel Meters
- Large LED Displays
- Industrial TV Displays

Industrial Networking

Ethernet Switches

- Unmanaged
- Monitored
- Managed
- PoE
- Routers
- Wi-Fi Radios

Cellular M2M

- Cellular Routers
- Cellular RTUs

Communication Converters

- Protocol Converters
- Media Converters
- Serial Converters

As the global experts in communication, monitoring and control for industrial automation and networking, Red Lion has been delivering innovative solutions for over forty years. Our award-winning technology enables companies worldwide to gain real-time data visibility that drives productivity. Product brands include Red Lion, N-Tron and Sixnet. With headquarters in York, Pennsylvania, the company has offices across the Americas, Asia-Pacific and Europe. For more information, please visit www.redlion.net/together. Red Lion is a Spectris company.



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