

# Ribbon Integrated Solutions

Making Networks Complete



### Taking Responsibility for a Complete Network Solution

Whether you are upgrading your existing network, or building a new network from scratch, it is often a challenge to put all the pieces together. Ribbon's multi-skilled Integrated Solutions division provides critical complementary turnkey services and integrated technologies to ensure that Ribbon's IP and optical networks are ready to generate revenues and easy to operate from day one. With thousands of field-proven deployments, Ribbon IS takes responsibility for making your network complete.



#### Infrastructure

Access Radio, WiFi, P2P Trunks,  
Power Systems, Shelters, Outdoor  
Cabinets, Customized Racks



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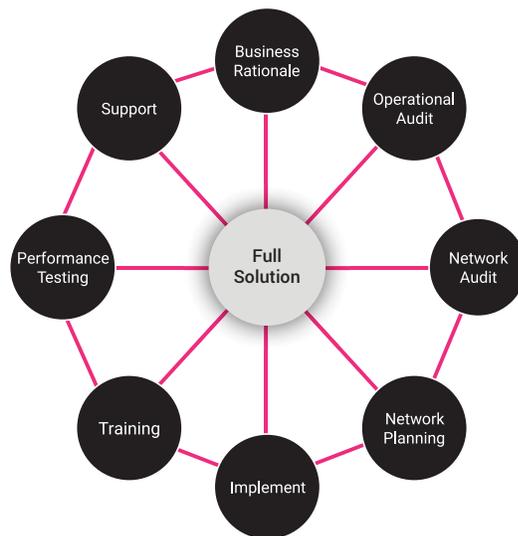
## Turnkey Services

Ribbon IS turnkey services cover the complete lifecycle of services from concept to realization of a new network build, and ongoing support.



### Business Rationale

Applies a business case methodology, covering opportunities and risks, revenues and costs, and alternative approaches, to chart an optimal course for decision makers for a new network build or upgrade.



### Operational Audit

Assesses operations for organizational efficiency, process efficiency, and security, against best practices, and recommends methods for improving through a holistic approach that combines network and operations modernization.



### Network Audit

Uses comprehensive infrastructure site surveys to assess the ability of the current network to meet the operator's strategic direction and specific business needs. Identifies areas for improvement and alternative approaches for achieving these, including network upgrades, overlays, or replacements.

### Network Planning

Once a network modernization course is decided, applies state of the art tools to plan and design a specific solution, which takes into account multiple inputs such as projected traffic, robustness against failures, and cost.



### Implementation

Depending on need, can participate in the complete procurement, including best of breed non-Ribbon network equipment and ancillary apparatus such as housing and power, and manages integration, staging, installation, turn-up, and acceptance testing of network nodes.

### Performance and Penetration Testing

Following implementation, uses a suite of tools to verify that the network meets SLAs and delivers expected QOE, and that it is secure against hacking attacks.



### Network Operations Center

Implements a network operations center for centralized provisioning, performance monitoring, and maintenance of the network.

### Training

Provides training to planning, engineering, operations and field personnel, to ensure ongoing efficient use and operation of the network to maximize its revenue generating potential at minimum cost.



### Ongoing Support

Tailored support for customer needs from various levels of remote assistance to full staffing of a local NOC.

## Integrated Technology Solutions

Ribbon IS adds value by packaging together various technologies to form a substantial portion of a networking solution. Here are leading packages that Ribbon IS has deployed for multiple customers in thousands of locations.

### DCN Security and Forensic Information and Event Management

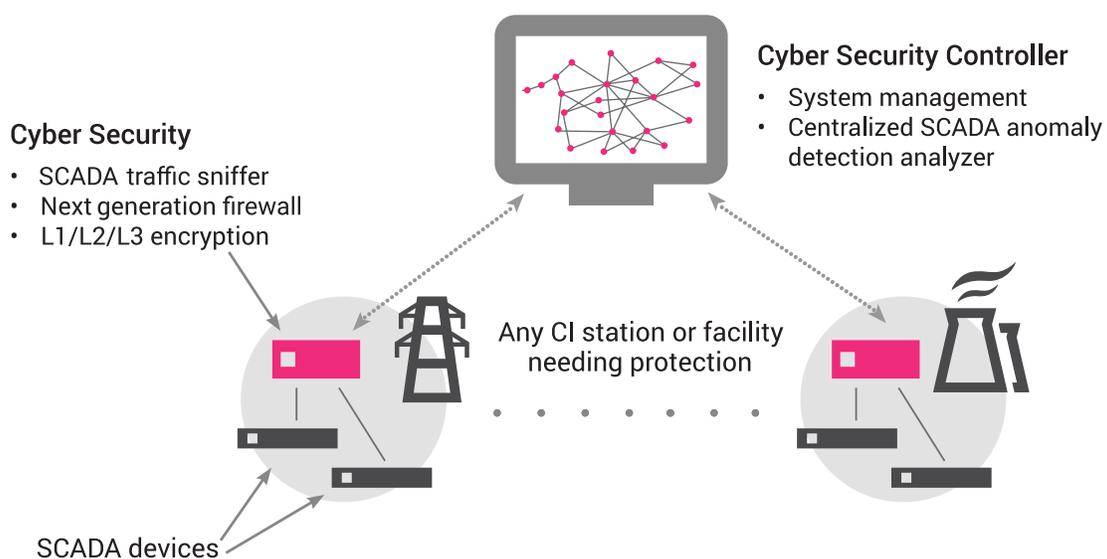
Your data communication network (DCN) carries the information that powers business applications and services to end customers. Ribbon IS provides a unique and comprehensive DCN security solution that segments the problem space into manageable geographic domains and threat classes, and links local security instantiations with a global view. The solution covers three broad categories:

- Multilayer encryption to protect the data in transit from interception, including L1 optical encryption, L2 MACsec, and L3 IPsec.
- Universal threat management (UTM) tools that mitigate attacks at both the data and application layers.
- Analysis, forensics and management tools to detect threat and attack patterns early on, to advise on proactive steps before a serious attack is launched.



### Critical Infrastructure SCADA Cyber Protection

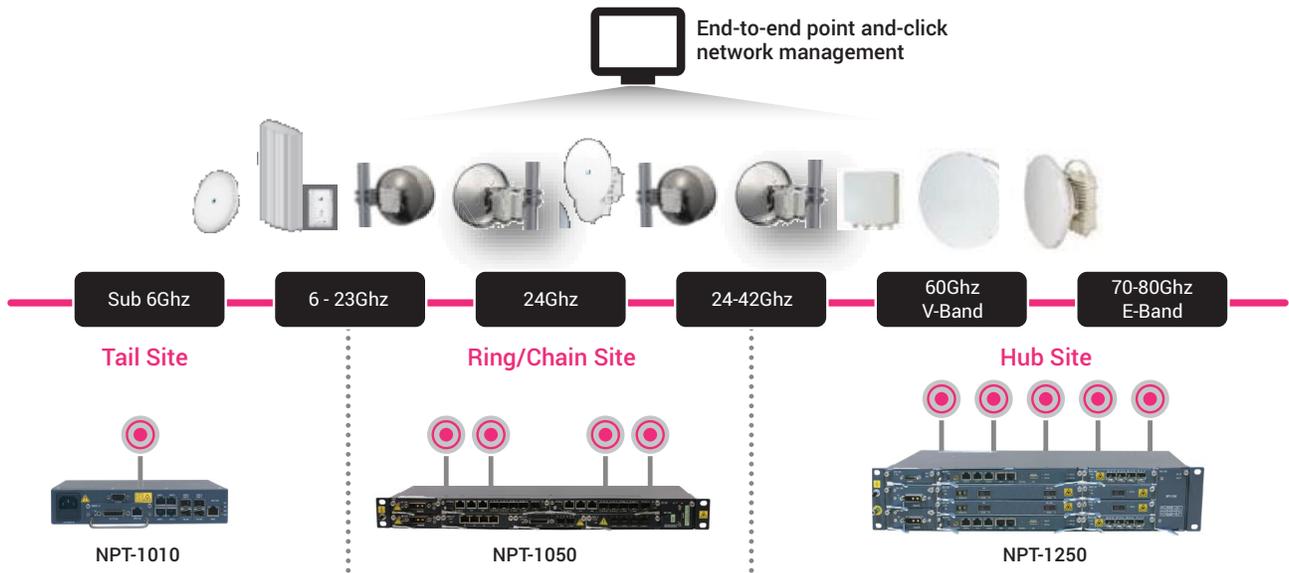
Ribbon IS enables geographically-distributed critical infrastructures to protect against multiple attack vectors on Operational Technology and SCADA networks, including man-in-the-middle, lateral, and zero-day attacks. Economical run-time platforms deployable at any CI facility consolidate cyber-security functions and prevent attacks before they can cause harm. The platforms and their functions are managed centrally and provide SOC personnel with early warnings of anomalies and impending attacks.



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## Microwave Wireless

Ribbon IS extends connectivity in segments where fiber is unavailable. The solution connects RF heads that fits the specific spectrum available, whether it is licensed or unlicensed. It uses a common switching layer as the landline portions of the network, providing common management for the whole network.



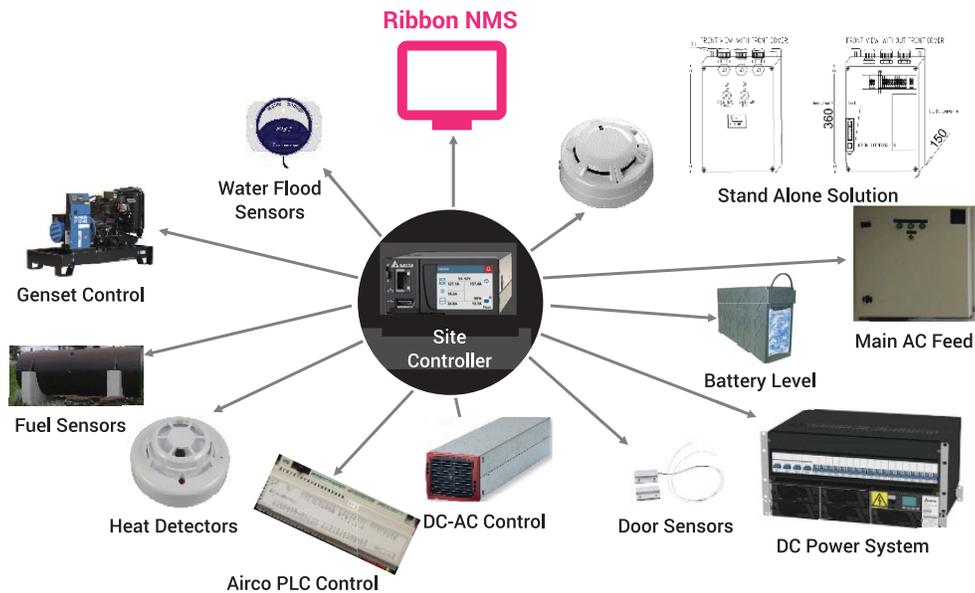
## Power Solution Packages

Many networking solutions need to extend from a classical DC-power to a full multi-source and backup solution. Ribbon IS uses a series of building blocks to create tailored solutions to customers' specific requirements. Ribbon provides tailor-made solutions, including custom-made power and telecommunications racks.



## Full Site Management

Many network sites often are deployed in remote locations. Ribbon IS puts together all the elements to make sure these operate in a secure, monitored, and climate controlled environments. All of Ribbon networking solutions, including all of a site's sensors, are managed from Ribbon's Network Management System.



## Shelters and Cabinets

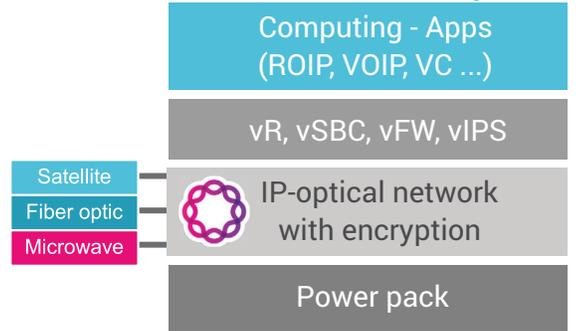
Ribbon IS provides complete turnkey solutions of telecom grade shelters and street cabinets to satisfy situations where the customer has a lack of space or there is a need to deploy at new sites. The solution includes all site sensors and a central management solution, air conditioning, heat exchange, and power systems.



# Ribbon Integrated Solutions

## Rapidly Deployable Cloud in a Box

For multiple reasons such as disaster recovery, emergency services, mobile hotspots, and rapid network expansions, there is often a need to rapidly deploy compute and storage resources close to the end-users. Ribbon IS has a multi-technology cloud-in-the-box solution that works seamlessly with the transport network. Key features include a sophisticated QoS scheme to support real time applications over narrowband links radio links, high availability with multiple levels of hardware and link redundancy, and a cyber-security suite.



## Need Something More?

This is just a sampling of the capabilities of Ribbon's Integrated Solutions team. Moreover, if we cannot fulfill your needs from our existing toolbox, we have established and proven processes to bring on and certify new suppliers and solutions quickly. Our mission is to ensure you have a complete network that meets all your business and technical needs.

**Contact Us**

Contact us to learn more about Ribbon solutions.

## About Ribbon

Ribbon Communications (Nasdaq: RBBN) delivers communications software, IP and optical networking solutions to service providers, enterprises and critical infrastructure sectors globally. We engage deeply with our customers, helping them modernize their networks for improved competitive positioning and business outcomes in today's smart, always-on and data-hungry world. Our innovative, end-to-end solutions portfolio delivers unparalleled scale, performance, and agility, including core to edge software-centric solutions, cloud-native offers, leading-edge security and analytics tools, along with IP and optical networking solutions for 5G. We maintain a keen focus on our commitments to Environmental, Social and Governance (ESG) matters, offering an annual Sustainability Report to our stakeholders. To learn more about Ribbon visit [ribbon.com](https://www.ribbon.com).