



Future-Proofing Legacy Devices:

**The Importance of Serial to IP Connectivity
in Today's Evolving Networks**

Future-proofing Your Legacy Serial Devices for Emerging Protocols

As industries evolve and adopt modern communication technologies, there is a growing need to bridge the gap between legacy systems that rely on serial communication (RS-232, RS-485, or RS-422) and contemporary network protocols, particularly Internet Protocol (IP). Serial to IP connectivity enables older serial-based devices, such as sensors, meters, and industrial controllers, to be integrated with modern IP-based networks — making data transmission, remote management, and automation more accessible and efficient.

Many industries, including manufacturing, transportation, energy, and healthcare, rely on legacy systems that use serial communication for device-to-device interactions. These systems are reliable but can be challenging to integrate with modern network protocols like TCP, UDP, TLS, and SSH over IP networks.

Challenges with Legacy Serial Communication:



Limited Range



Interoperability Issues



Lack of Remote Management



Maintenance and Cost

Serial to IP conversion addresses these issues by extending the utility of legacy equipment and allowing communication over IP networks, which are widely supported, scalable, and remotely accessible.



How Serial to IP Connectivity Works

Serial to IP connectivity involves converting data from serial communication protocols, such as RS-232, RS-422, or RS-485, into IP packets that can be transmitted over Ethernet, Wi-Fi, or cellular networks. This conversion is achieved using serial to IP converters or device servers.

Serial device: A sensor, meter, or controller that sends or receives data through a serial port.

Serial to IP converter (device server): A hardware device that connects to the serial device and translates serial data into IP packets. These converters support TCP, UDP, or both.

IP network: A system that transmits data from a serial device across a local area network (LAN), wide area network (WAN), or the Internet to its destination.

Receiving device or application: A computer, server, or cloud application that receives the IP packets and interprets the serial data for further processing.

Challenges and Considerations

While serial to IP technology offers significant benefits, it also comes with a few challenges that organizations must address.

Network security: Transmitting data over IP networks exposes legacy devices to potential cyber threats. Encryption and VPNs are necessary for secure communication.

Latency sensitivity: Certain serial protocols rely on low-latency communication, and introducing IP networks might affect response times.

Protocol compatibility: Some older serial protocols might need specialized converters or software to communicate effectively with IP networks.

Reliability: IP networks are susceptible to interruptions and congestion, which can disrupt critical systems if not managed properly.

Configuration complexity: Proper setup of serial to IP converters and network devices requires technical expertise to ensure seamless operation.

5 Serial to IP Implementation Best Practices

- 1 Choose the right converter:** Select a serial to IP converter that supports the required serial protocol (RS-232, RS-485, or RS-422) and offers TCP/UDP options based on your network's needs.
- 2 Implement redundancy:** Use redundant network paths or backup converters to prevent downtime in critical applications.
- 3 Secure the network:** Employ encryption, firewalls, and VPNs to protect data from unauthorized access.
- 4 Monitor network performance:** Regularly monitor the performance of IP networks to identify and resolve potential latency issues.
- 5 Test and validate:** Before deploying serial-to-IP solutions at scale, conduct thorough testing to ensure compatibility and stability.

Click-to-Connect | Fast, Secure Serial Connectivity

[Digi Connect® EZ](#) is a powerful solution for industries that still rely on legacy serial devices but need to integrate them with modern, scalable IP-based networks. By enabling seamless serial to IP conversion, it enhances operational efficiency, reduces maintenance costs, and future-proofs legacy systems for evolving technological needs.





Digi Connect EZ — Part of a Complete Solution

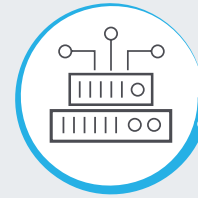
Digi delivers secure, reliable, and scalable solutions for complex connectivity challenges. [Digi Connect EZ](#) comes with built-in [Digi LifeCycle Assurance](#), ensuring optimal performance and protection for critical systems, backed by our commitment to delivering the best IIoT connectivity.

Digi LifeCycle Assurance Solution Components



Management

[Digi Remote Manager](#)[®], a network orchestration platform, provides complete visibility and control, with configuration, remote monitoring, automation, security, and OTA software update capabilities.



Device

High-performance, purpose-built Digi devices, with integrated software, designed to meet the requirements of a wide range of enterprise, industrial, medical, and transportation use cases.



Technical Support

Provides one year of 24/7/365 tier support within a four-hour SLA for device and network troubleshooting to ensure issues are resolved quickly.



Warranty

5 year best-in-class product warranty ensures technology investments can be maximized with mitigated risk.

How Digi Connect EZ Addresses Serial to IP Connectivity Challenges

Enables legacy serial devices to connect to modern networks

— Digi Connect EZ provides a simple solution which enables plug-and-play, serial-to-Ethernet, Wi-Fi, or cellular gateway solution that enables industries to continue using existing serial-based equipment while integrating it into modern TCP/IP networks, which are scalable, remotely accessible, and compatible with a wide range of networked systems.

Remote access and management — Configure, monitor, and troubleshoot serial devices from anywhere over an IP network. This eliminates the need for on-site maintenance and reduces downtime.

Improved compatibility — Convert serial communication into standard IP protocols (TCP/IP) and enhance compatibility between serial-based devices and modern IT infrastructure. Digi Connect EZ supports a variety of protocols including TCP, UDP, TLS, and SSH, making it easier to integrate with existing networked applications, databases, or cloud-based systems.

Scalability and flexibility — Connect multiple legacy serial devices to a single network. This simplifies the architecture and reduces the need for additional hardware.

Security and data integrity — Built-in TLS/SSL encryption and authentication features ensure secure communication over IP networks and protect data transmitted between serial devices and the network.

Simplified integration and deployment — Digi Connect EZ products come with [Digi Navigator™](#) — for seamless discovery and configuration of devices in minutes. No need for manual set-ups.

Cost-effective solution — Extend the life of existing serial devices by connecting them to modern networks, eliminating the need for costly replacements. Digi Connect EZ also minimizes the need for expensive networking infrastructure or complex, proprietary communication systems.

The Digi Connect EZ Product Family

This compact and versatile serial gateway product family comes in a range of sizes and port options to meet the needs of any system.

Digi Connect® EZ Mini



Digi Connect® EZ 2



Digi Connect® EZ 4



Digi Connect® EZ 8



Digi Connect® EZ 16



Digi Connect® EZ 32



Digi Connect EZ Key Features

Digi Connect EZ simplifies serial to IP conversion with advanced capabilities tailored for modern and legacy network integration. Its robust features provide unmatched scalability, flexibility, and security.

Multiple Serial Ports

- Supports 1 to 32 serial ports, enabling simultaneous management of multiple RS-232/RS-422/RS-485 devices
- Ideal for scaling operations without requiring additional hardware

Wide Protocol Support

- Compatible with TCP, UDP, HTTPS, VPN, and other common network protocols, ensuring seamless integration with a variety of systems
- Flexible enough to support diverse applications and industries

Remote Configuration and Management

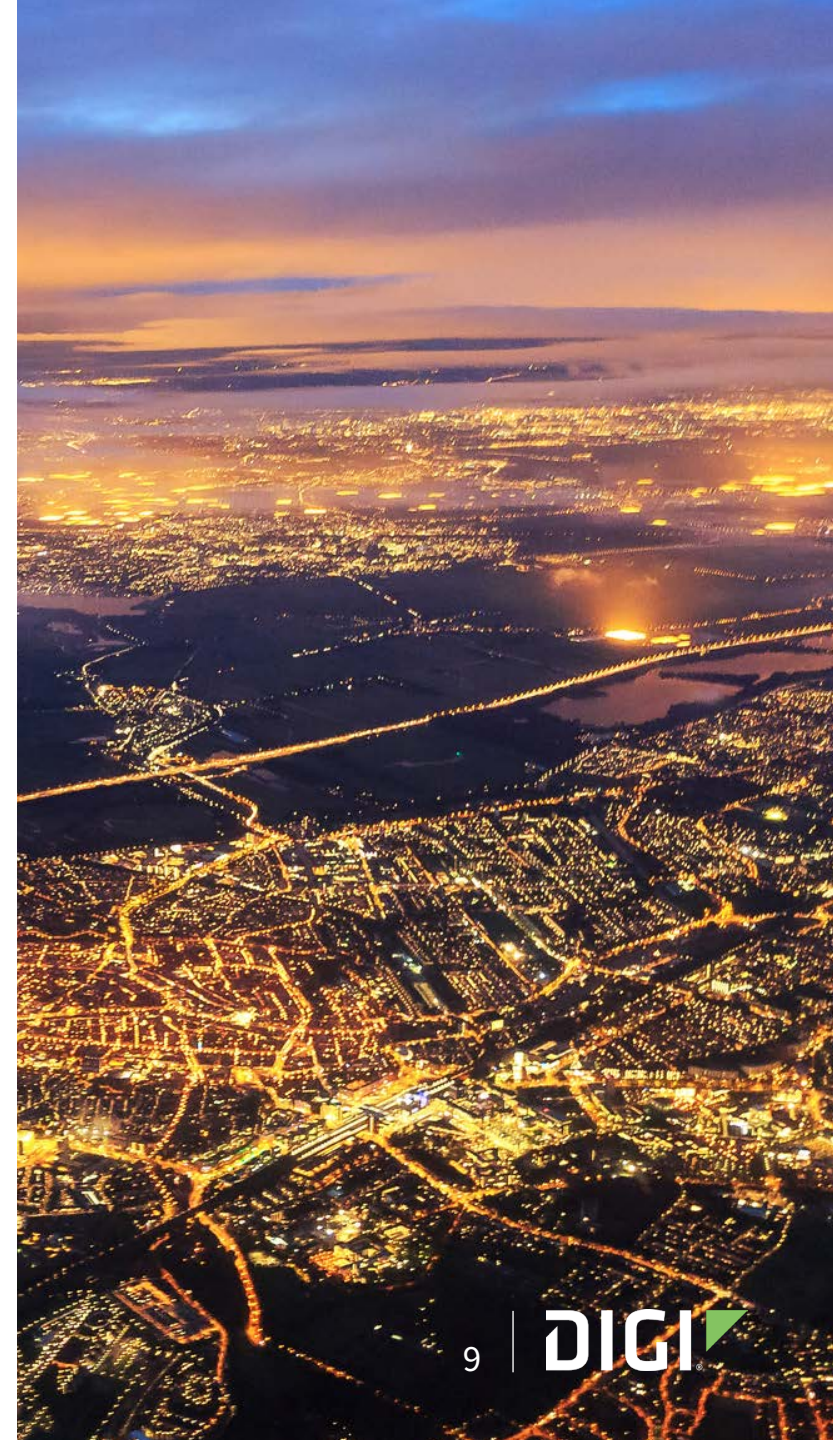
- Accessible through an intuitive, web-based interface, allowing, configuration, management, and remote device diagnostics from anywhere
- Reduces the need for on-site maintenance and minimizes downtime

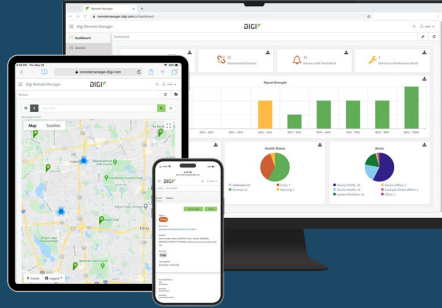
Advanced Security Features

- Digi Connect EZ uses the [Digi TrustFence®](#) security framework to provide a reliable platform now and in the future
- Secure management interfaces safeguard against unauthorized access

Cross-Platform Compatibility

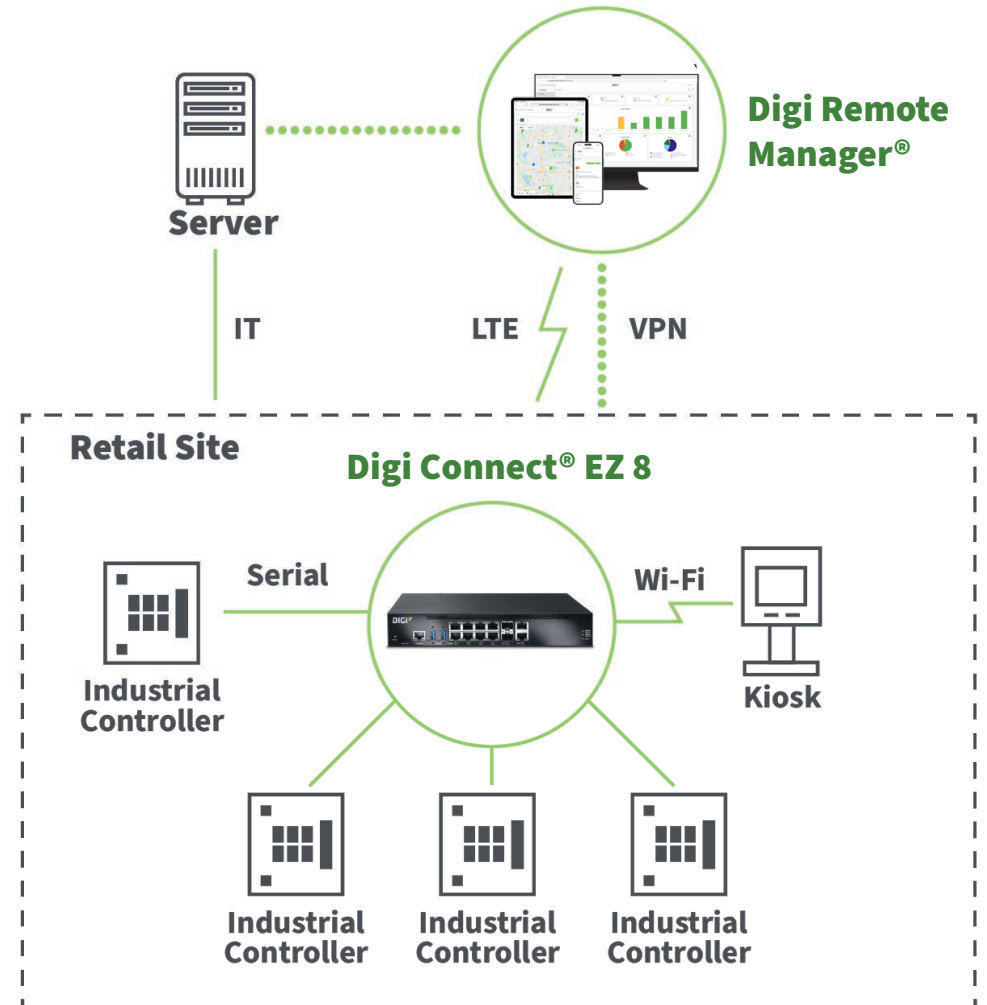
- Digi Connect EZ can integrate a wide variety of devices and operating systems in demanding environments



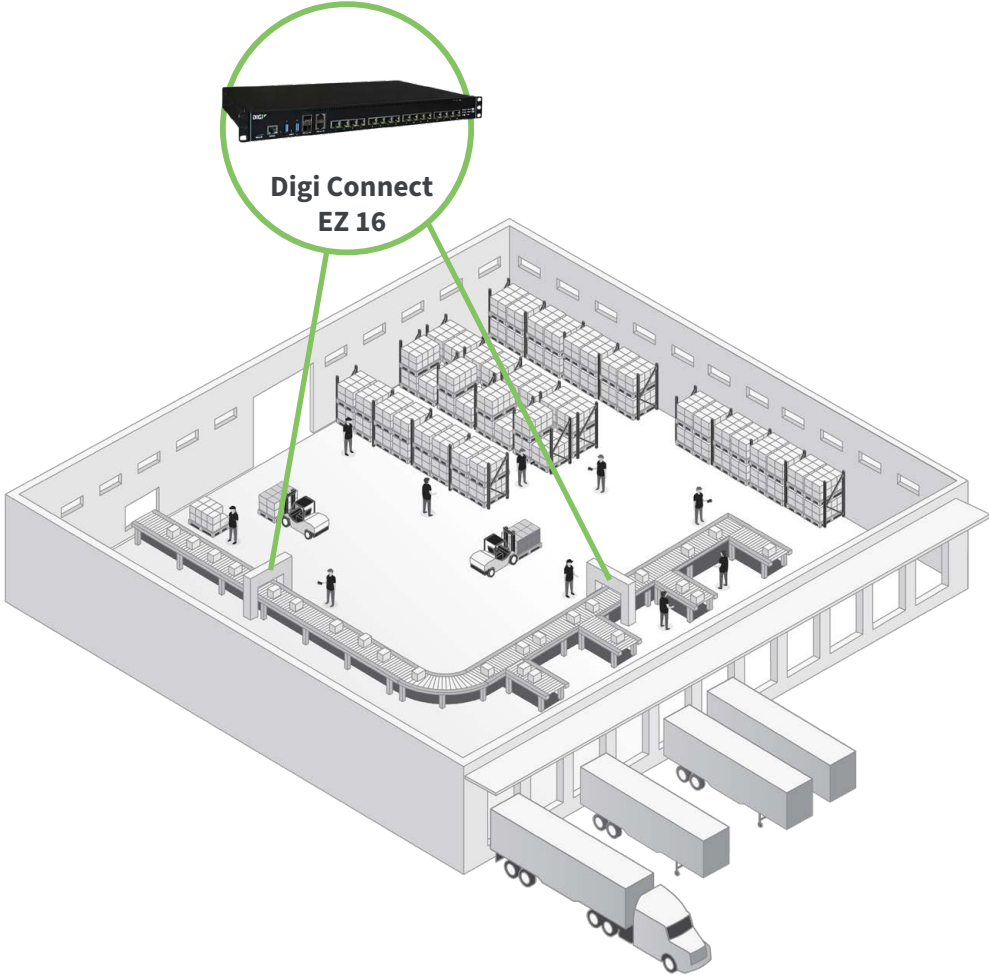
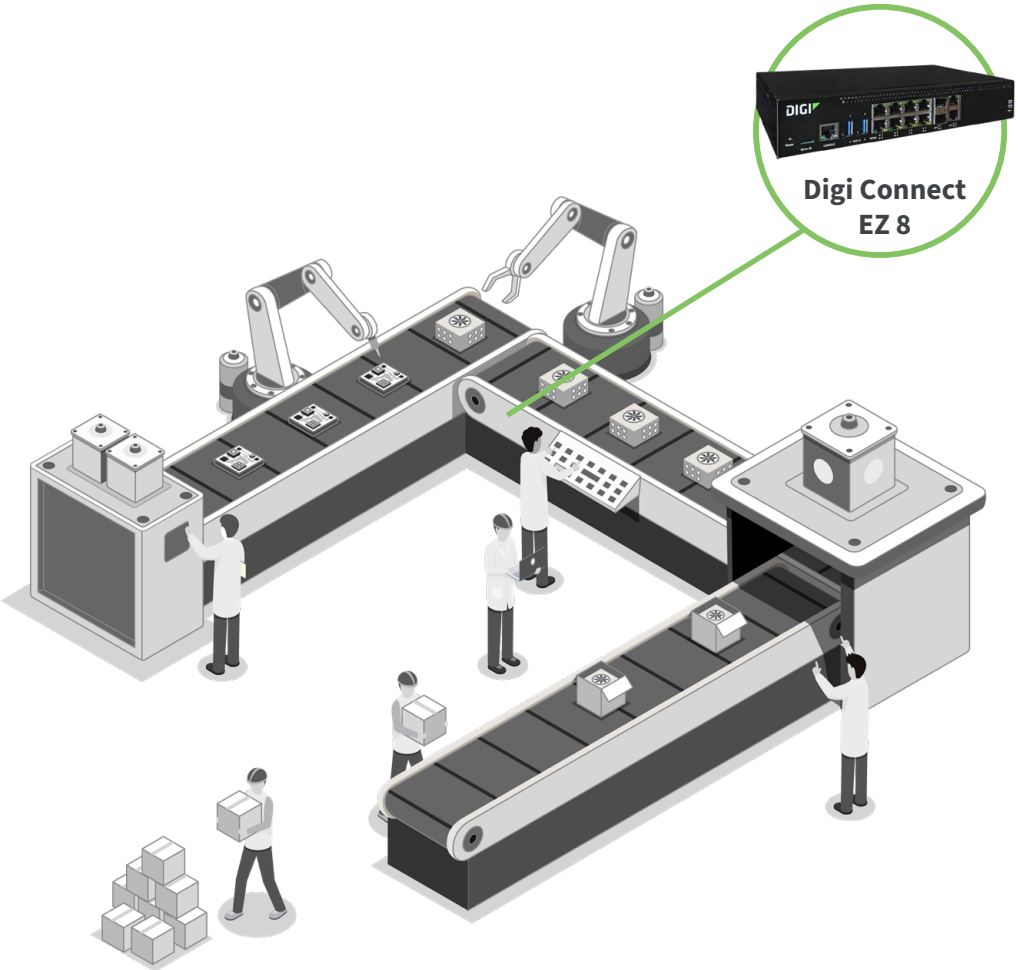


Digi Remote Manager®

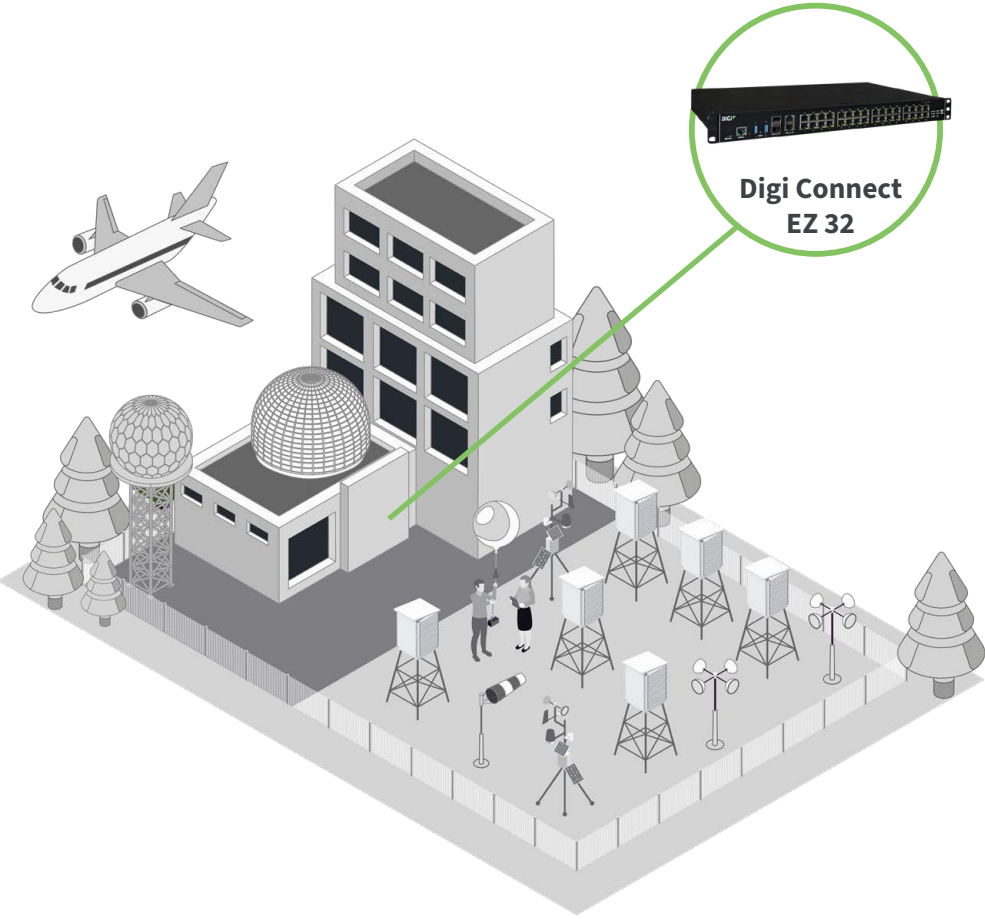
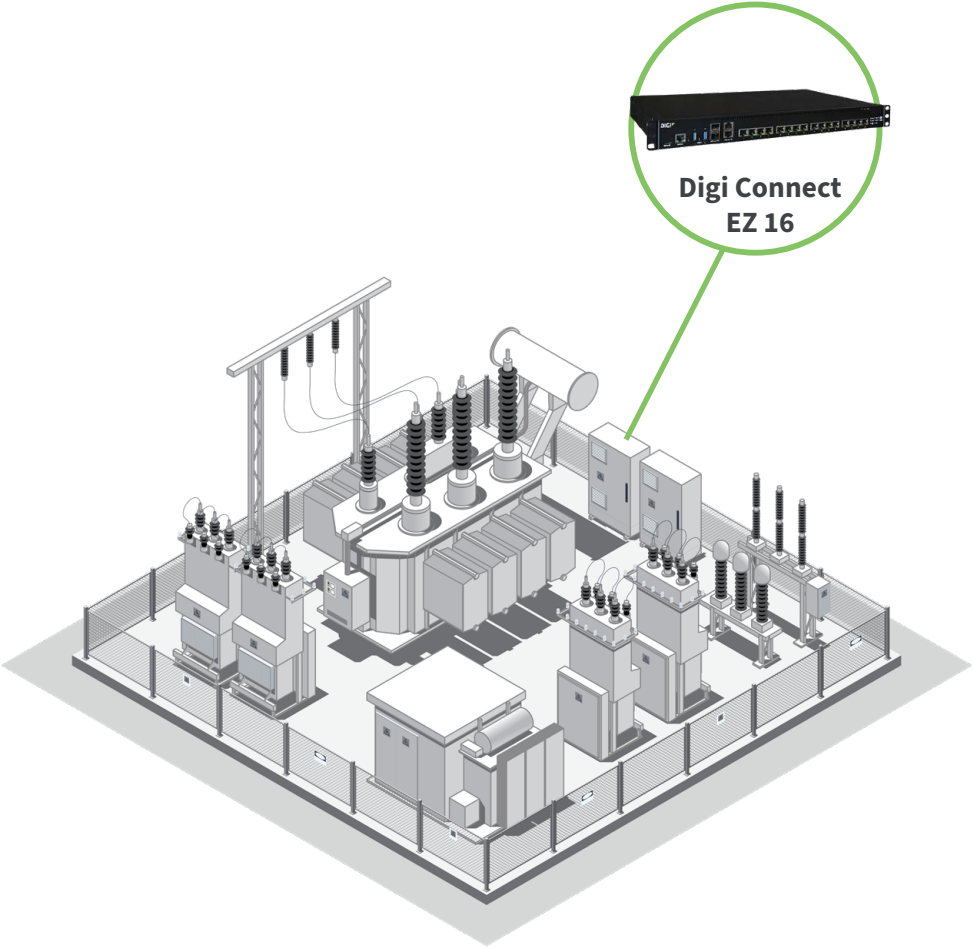
Digi Remote Manager (Digi RM) is a proven technology platform that allows networks, and the teams who manage them, to work smarter. Digi RM transforms dispersed IoT devices into a dynamic, intelligent network. Easy to deploy, Digi RM allows teams to monitor and diagnose thousands of mission-critical devices from a single point of command on a desktop, tablet or smartphone. All the while, software-defined security diligently safeguards your entire Digi ecosystem.



Application Examples: Manufacturing and Logistics



Application Examples: Energy and Aerospace



Why Digi?

As an industry leader in complete IoT and M2M solutions, Digi puts proven technology to work for our customers so they can light up networks and launch new products. Digi infrastructure management solutions for machine connectivity are relentlessly reliable, secure, scalable, managed, and always come through when you need them most.

Ready to talk to a Digi expert?

[Contact us](#) →

