



Wired vs. wireless network options for the factory floor

As manufacturers consider introducing new technologies to the factory, they must decide which technologies are the best to bring reliable factory internet connectivity to their factory floor. There's more than one way to approach factory internet connectivity, with the biggest decision focused on understanding the differences between a wired vs. wireless network.

Wired vs. wireless network: What to consider

The right network choice depends on current needs and future plans for your factory. Here are the top five factors:

1. Business objectives: Consider how technology decisions relate to larger business goals for digital transformation, smart factory implementation, Industry 4.0, sustainability and growth plans.
2. Budget: When selecting a network, think about installation and other initial costs as well as maintenance and other ongoing costs.
3. Operational needs: Determine your requirements for mobility, inventory tracking, quality control and all aspects of operational management.
4. Security: Ensure a strong cybersecurity plan as connectivity can open pathways for cyberattacks such as malware and ransomware.
5. Environment: Evaluate the potential for signal interference or physical obstacles that could impede networking.

“ Manufacturing has seen an increase in error-related breaches. The installation of malware after hacking via the use of stolen credentials is somewhat commonplace. ”

– [Verizon 2024 Data Breach Investigations Report¹](#)

The benefits of wireless internet for the factory floor

Efficiency and productivity

Use data from Internet of Things (IoT) devices to inform predictive maintenance. Transition from a reactive calendar-based schedule for repairs and maintenance to a proactive, data-based program that will have an impact on overall equipment effectiveness and operations.

Gain greater efficiency with your mobile robots and automated guided vehicles by using a reliable, low latency 5G wireless network with less interference to gain greater operational efficiency.

↑ Greater insight into the entire manufacturing chain with robots and IoT sensors

↓ Robots allow manufacturers to significantly reduce their warehousing costs

↑ Robotics can help significantly improve workers' health and safety conditions by taking more dangerous tasks

↓ Reducing machine downtime through predictive maintenance and identifying when equipment is likely to fail

Quality control

- Introduce high-definition cameras, machine vision and extended reality for quality control and inspection
- Ensure the accuracy of digital twins by sending near real-time IoT data to simulation models
- Track raw materials, inventory and finished goods, sending alerts if they fail to meet quality standards

Innovation

Manufacturers are looking at technology to help solve challenges such as labor shortages, economic pressures, net-zero emissions goals and increase overall operational efficiency. The right network can help manufacturers with their plans to integrate new technologies into their factories, according to the Manufacturing Leadership Council, a division of the National Association of Manufacturers:

30%

30% of manufacturers are defining a roadmap for implementing manufacturing 4.0

43%

43% expect the future factory model to be a hybrid of humans and machines, incorporating robotics, digital production systems and digital processes

60%

60% plan to adopt machine learning, edge computing, digital threads, augmented reality/virtual reality (AR/VR) and metaverse technologies by 2026

Wired vs. wireless network comparison

Wired

- Ethernet and fiber optics
- Reliability with consistent cable connections
- Installation could be costly and can take time to complete
- May lack flexibility, which can make it difficult to reconfigure and scale
- Requires physical upkeep because of the potential for wear and tear

Wireless

- 5G
- Mobility supports IoT integration and connectivity for equipment that moves around the factory floor
- Installation and long-term maintenance can be cost-effective and much faster.
- Can be customized, reconfigured and scaled to meet evolving business needs
- Enables coverage in places where it is difficult to install physical cables and where there could be significant interference with Wi-Fi

Wireless internet can help enable manufacturing innovation

- Mobile edge computing allows manufacturers to process and store sensitive data on-premise, with lower latency and bandwidth optimization for near real-time data-driven decisions.
- Private wireless networks bring Verizon's reliable, secure 5G coverage into the factory as a closed system that provides connectivity exactly where you need it.
- The Internet of Things (IoT) can help support automation and improve efficiencies

Learn more about innovative wireless solutions for the manufacturing industry.



The author of this content is a paid contributor for Verizon.
¹ Verizon, 2024 Data Breach Investigations Report, page 67.