Yo Robot!

Providing Network Solutions for Manufacturers and Industry 4.0

Industry 4.0 promises manufacturing significantly faster, more scalable and more cost-efficient production processes. However, for companies to realize the full potential of digitally-enabled advances such as Big Data, robotics and Artificial Intelligence (AI), they must deploy a communications network that is highly available, reliable and resilient, which is customized to their specific requirements.

eBook

Throughout the U.S. and across the globe, manufacturing is experiencing a resurgence, with many firms now leveraging "Industry 4.0" technologies and applications such as the Industrial IoT (IIoT), Big Data analytics, advanced enterprise resource planning (ERP) and improved business continuity solutions to increase their competitive edge. McKinsey & Company, the management consulting firm, defines Industry 4.0 as "the next phase in the digitization of the manufacturing sector, driven by four disruptions: the astonishing rise in data volumes, computational power, and connectivity, especially new low-power wide-area networks; the emergence of analytics and business-intelligence capabilities; new forms of human-machine interaction such as touch interfaces and augmented-reality systems; and improvements in transferring digital instructions to the physical world, such as advanced robotics and 3-D printing."

A typical Industry 4.0 manufacturing operation will involve continuously integrating extremely large volumes of sensor data from a vast number of endpoints, and at several orders of magnitude beyond what even the largest enterprise environments today manage. Private cloud hyperscale data centers will be needed to support Big Data clusters for processing sensor data in real-time. Industry 4.0 applications will also need more bandwidth for these technologies to run on, which means partnering with a network provider that can offer the optimal fiber solutions for their operational, connectivity and system availability requirements. More on that later.

McKinsey claims these digitally-enabled advances can improve productivity efficiencies by 15 to 20 percent and reduce machine downtime by 30 to 50 percent. So, it's no surprise that manufacturing firms are taking notice. According to MarketsandMarkets, the market size of the IoT in manufacturing is estimated to grow to nearly $21 billion by 2021, up from $6.17 billion three years ago, and tracking at a compound annual growth rate (CAGR) of more than 27 percent.

Welcoming Robot Coworkers

Across this increasingly brave new world, robotics is changing the face of manufacturing —literally. Robots and autonomous applications are able to work in environments that are unsafe for humans and accomplish tasks with greater precision than is humanly possible. Moreover, far from being the job-killers they're sometimes purported to be, of the one million robots currently in operation in such industries as battery manufacturing, consumer electronics, food, solar and wind power, they have been directly responsible for the creation of approximately three times as many jobs, according to the International Federation of Robotics.

Material handling is the most common application of industrial robots, with 38 percent used in such tasks as part selection, transferring, packing, palletizing, loading and unloading, and machine feeding. Another mobile, plug-and-play generation of robots is able to work safely alongside human workers on the production floor thanks to advances in sensor and vision technology, and computing power. In the event a human coworker inadvertently gets in a robot's path — whether to talk football or about weekend plans — the robot will automatically suspend operations, thereby avoiding an accident.

Futuristic Technologies Require Scalable, Future-Proofed Networks

Regardless of whether an organization manufactures autonomous vehicles, chemicals or consumer goods, the goal of any production environment is to improve cost and labor efficiencies. Digitalization offers the manufacturing industry opportunities for significantly faster, more scalable and more cost-efficient production processes. That said, if companies want to realize the full potential of Industry 4.0 technologies, they must have a communications network that is tailored to their specific requirements. In manufacturing, time equals money, so when a device, server, or application that's instrumental to a business fails, every minute of downtime impacts production, and ultimately, revenue.

One of the key requirements of Industry 4.0 applications is the need to share large amounts of data from multiple devices in real-time. Many existing industrial network solutions are built on mature but relatively slow network technologies. And as the number of devices connected to industrial networks rises, and the volume of data they produce increases, the capacity shortfall can become a bottleneck.

In the search for additional capacity, there is growing interest in the development of industrial networks based on faster and more resilient underlying technologies that can deliver the necessary bandwidth and availability. In Pittsburgh, for example, some of the largest and best-known manufacturing companies have taken advantage of technological developments such as 3D additive printing, RFID technology, and real-time communication with automated machinery. However, the old copper wire infrastructure they relied on for incoming revenue, communications and manufacturing processes was not reliable enough to support these essential business functions. When they lost network connectivity, their operations ground to a halt.

DQE Communications consulted with a number of these leading manufacturers, including a polymer development company and a steel producer, to develop reliable solutions for their connectivity challenges. We customized a dark fiber network enabling these firms to effectively perform their business functions with cutting-edge technology at guaranteed high speeds and exceptional network performance. With the deployment of new fiber-optic networks, both of these companies now enjoy increased bandwidth and real-time backup capabilities, as well as data center connectivity, disaster recovery services and secure cloud-based applications.

Looking towards the future, and as emerging technologies including Artificial Intelligence (AI) and machine learning based systems and applications proliferate throughout the manufacturing industry, companies can be assured that network capacity demand will only increase over time. Hence, future-proofing the production environment is not solely about adopting Industry 4.0 solutions. It means leaving vulnerable legacy networks for optimized, scalable and secure network architecture, which can accommodate more devices and nodes while delivering the requisite network reliability and performance today and tomorrow.

ABOUT DQE

Headquartered in Pittsburgh, Pennsylvania, DQE Communications is one of the leading providers of high-speed, data networking for businesses and carriers. The company's continually expanding fiber-optic network currently spans thousands of miles and over 1,900 buildings and 114 business parks. DQE Communications' growing list of services include Metro Ethernet, Wavelength, Internet, DDoS Mitigation, Cloud Solution, Dark Fiber, and Colocation. A subsidiary of Duquesne Light Holdings, DQE Communications was established in 1997 to provide businesses with secure, reliable and flexible network services. For more information, visit www.DQECOM.com or call 1-866-GO-FIBER.