



Connected Factory: it's full speed ahead for Marcegaglia's factory of the future.

The Marcegaglia Group chooses a complete Cisco Factory Network, Factory Wireless and Factory Security architecture to guarantee uninterrupted connectivity for its sophisticated automation systems.

“Cisco's Connected Factory has laid the foundations for increasingly advanced and effective automation”

**Livio Bonatti, Network Infrastructure Manager,
Headquarters Marcegaglia**

The challenge of digital transformation for industrial companies is twofold. Process digitization and business intelligence go hand in hand with automation of all systems and the full integration of their plants into the corporate network, with all this evolution entails in terms of the reliability, flexibility and security of the infrastructure in the field. Marcegaglia has made the Cisco Connected Factory strategy a reality. Today, thanks to a Cisco Factory Network architecture that includes an innovative Factory Wireless component, the Group is using technology to add further value to its all-Italian excellence.

The challenge

- Implement a wired and wireless network architecture capable of ensuring the efficiency of the automated systems
- Optimize productivity and logistics by automating warehousing and coil handling
- Guarantee the highest levels of reliability and safety in the plants

The Marcegaglia Group, a world leader in the steel processing sector, operates globally out of Italy with 43 plants distributed across the country and internationally, for a total dedicated production area of 6 million square meters. Each day Marcegaglia produces 5,500 kilometers of carbon and stainless steel products, and distributes it to more than 15,000 customers, for a total of roughly 6 million tons processed each year.





In 2009, the Group launched an industrial automation project as part of expanding its two plants in Ravenna and Casalmaggiore, for a total investment of 250 million euros. In order to achieve maximum results, the new production facilities had to be equipped with automated systems for all the operations involved in handling the raw material and moving and storing the products, throughout the various stages of processing.

It was therefore essential to design and implement a wired and wireless network architecture capable of exchanging data and information with the new systems integrated into the plants. In addition to a level of reliability able to guarantee the productivity requirements, a primary consideration was the safety factor, given the context in which men, machines and steel coexist and seamlessly interact.

Case Study | Marcegaglia

Headquarters: Gazoldo degli Ippoliti (Mantua)

Sector: Industry

The high reliability of the Cisco network allows full exploitation of the benefits of plant automation and enables products and raw materials to be handled in complete safety.

The solution

• Cisco Connected Factory

Ultra-advanced automation

At their plant in Ravenna, dedicated to processing and finishing coils (the gigantic spools of steel), Marcegaglia integrated a fleet of automated guided vehicles (AGVs), fully automatic shuttles that transport the coils from one processing facility to another then move the finished products to the loading points for final shipment.

At the Casalmaggiore plant, where tubing of different diameters and dimensions is produced from the coils, a system of overhead travelling cranes was installed to pick up bundles of tubes directly from the processing facilities, move them to warehouse storage and later to the shipping points where they are loaded onto the trucks that will transport them. The entire process is now fully automated.



" The investment we had to make was aimed at completing the transformation of Marcegaglia into a connected factory," said Livio Bonatti, Network Infrastructure Manager, Marcegaglia Headquarters, " by adopting a unified network for the company and the plants that could enable process re-engineering from an Internet of Things perspective all the way along a totally computerized supply chain."

Productivity is online

Both the overhead travelling cranes and the AGVs, in their respective plants, receive and transmit data and information to each other and to the central system that gives the orders and assigns the missions while guiding the machines with the perfect precision required to move materials of very substantial weight and dimensions.

" A blockage or a slowdown at the plants due to orders and missions not being communicated correctly could result in business losses for Marcegaglia," Bonatti continued. " To enable uninterrupted communication and data exchange between the automated machines, the PLCs and the system, it is essential to have a fast, reliable and high performance architecture, as well as the right network devices for an industrial environment like ours. "

" The data from the overhead travelling cranes requires stable and continuous transmission" , said Roberto Ferrari, Director of the Casalmaggiore plant. " The cranes are programmed to continuously exchange data in milliseconds in order to identify their respective positions. If the communication is not up to scratch, the cranes will slow down and stop, with serious consequences for production."

These needs are perfectly in line with those of the Ravenna plant. " The AGVs move around using sensors to identify their route in areas of the plant where they could run into each other or where operators might be passing through," said Emiliano Dini, Head of Automation at the Ravenna plant. " Even though they are equipped with their own security tools, it is vitally important that they be always connected to the network which monitors and controls their location."

The plant is connected

The architecture implemented by Marcegaglia reflects the Cisco Factory Network approach and the infrastructure is based on the devices that guarantee connectivity, the Cisco Industrial Ethernet 2000 Series switches. Added to this is the Factory Wireless component that extends connectivity to all areas of the plants, and includes Cisco 1600 and 2700 access points and the 5500 Series Wireless Controller, all managed by Cisco Prime Infrastructure.



The infrastructure is completed by the Factory Security component, which together with the 5500 Firewalls, the Sourcefire IPS sensors and the Cisco Identity Services Engine protects the network of the Group and the plants from external and internal attacks. The result is a platform that, by fully integrating the plants into the corporate network environment in a secure, easy-to-manage and high performance manner, enables all the systems automation and, consequently, promotes productivity.

Results

- Minimized risk of human error
- Maximum visibility of systems functioning
- Optimization of production and warehouse management
- Improved physical safety for personnel and improved IT security for connected systems and devices

Industry is ready for the future

The long list of benefits obtained by the Marcegaglia Group starts with the advantages in the field enabled by the quality of the solution. " Cisco uses standard technologies and languages that allow systems in industrial environments and, consequently, network performance to be totally customized," clarified Bonatti.

Thanks to the Factory Network architecture, Marcegaglia has obtained maximum visibility of all systems, making it possible to detect problems before they occur. The reliability of Cisco solutions also ensures that everything works exactly as it should, with unsurpassable benefits for business. The advantages also include savings in time and the cost of staff formerly employed to carry out operations now delegated to machines that are constantly at work without the need for manpower.

" We have reduced the risk of production errors to zero," added Bonatti. " By programming each operation and communicating it via the Cisco network to the cranes and the AGVs, each processing phase and all handling and storage takes place according to schedule. This makes us more efficient, thanks to a system that is also able to report a potential human error in the few manual procedures that remain."

Not to mention that, with an automated system, personnel no longer need to climb up onto the overhead cranes, stand beneath suspended loads, monitor operations alongside the systems or control the movement of material, thereby improving the safety of employees.



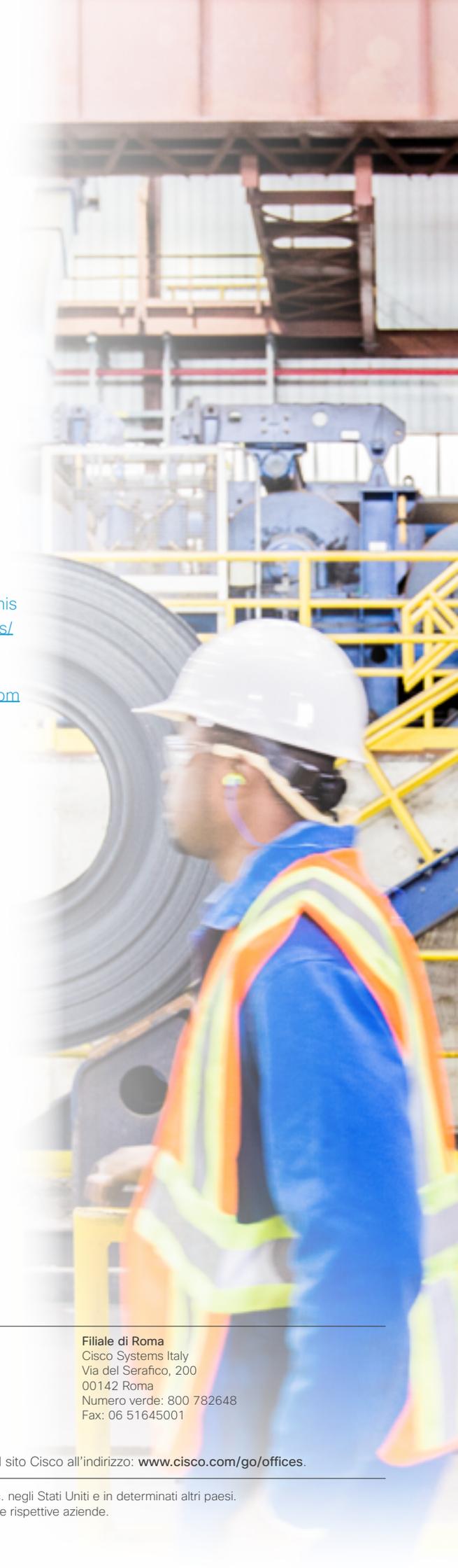
Physical safety corresponds to a high level of IT security. Thanks to the paradigms of Cisco Factory Security, Marcegaglia is now protected from attacks, attempts to take control of its systems, data theft, and, in general, the risks of interruption to business operations.

"Cisco's Connected Factory has laid the foundations for increasingly advanced and effective automation," concluded Bonatti, "helping us improve production processes and making us more competitive for the challenges Marcegaglia will face in the future".

For more information

More information about the Cisco architectures and solutions referred to in this case study are available at www.cisco.com/c/en/us/solutions/internet-of-things/manufacturing-digital-transformation.htm

For more information about the Marcegaglia Group, see www.marcegaglia.com



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