

Secure Connected Factory

CYBER SECURITY DIVISION





Secure Connected Factory is Leonardo's solution conceived to support the digital transformation in the industrial sector, through a model that integrates advanced applications, hyper-connectivity and digital security. It allows the complete and integrated control of all the processes and assets of a production plant, to increase efficiency and reduce development time and costs: it aims to provide real-time strategic information, a differentiated view of the data collected by the systems, as well as complete control over the assets and industrial processes, in turn supporting the decisions of workers, supervisors and managers, all within a mindset of complete digital transformation.

Secure Connected Factory is based on the ability to connect any machine, automation system, CNC, PLC or sensor from the world's main manufacturers.

The data collected at the factory are transferred in real time to the cloud (public or private), made immediately usable by remote monitoring and analysis tools that are targeted at supervising, optimising production and reducing downtime.

In addition, it is possible to display the data in an interactive way and create dashboards for monitoring and analysing orders and mechanical part wear.

However, a secure connected factory must look to the future and use mixed-reality technologies, machine learning and artificial intelligence; it must create new channels of interaction such as chat bots and teams, which allow the machines to communicate with workers in a natural language or through holograms virtually positioned on machine tools.

The solution has the aim of improving the efficiency and productivity of machinery and plants. Furthermore, thanks to predictive maintenance, it also has the future goal of being able to share information along the entire supply chain - resulting in a reduction of unplanned downtime by up to 90%, all in complete security.

FEATURES

- › **Real-time Monitoring:** real-time monitoring of telemetries coming from machines by means of specific dashboards.
- › **Industrial Predictive Analysis:** by applying Advanced Analysis and Data Mining techniques (both in unsupervised and supervised modes) to historical data (big data) coming from the field and integrated with data from management systems (ERP, MES, PLM) it is possible to perform anomaly detection, to establish predictive models and to extract information useful for optimising production activities, maintenance and product quality.
- › **Overall Equipment Effectiveness (OEE) Analysis:** monitoring the overall efficiency of a machine and a plant, which takes into account availability, quality and performance parameters.
- › **Plant Energy Management:** monitoring energy consumption at a granular level, of the production machine, and the subsequent analysis, aggregated at a plant, process, and product level, produces information that is useful both for efficiency, and for the informed negotiating of tariffs by time slot.
- › **Mobile Worker:** optimisation of worker activities in the field (both in the production phase and after sales and maintenance), providing easy and immediate access to information connected to the assigned activities. Moreover, using machine learning and artificial intelligence, through programs called ChatBot, which simulate a robot-human interaction, it is possible to communicate with machines in a natural language. Finally, the solution relies on Mixed Reality: for example, machine tools can inform workers by displaying telemetry data through holograms or using this feature for training / maintenance.

CYBER SECURITY

The Industry 4.0 paradigm foresees the pervasive use of technologies such as Big Data, Artificial Intelligence, the Internet of Things (IoT) and Cloud which, in addition to continuously interconnecting systems, resources, processes and making critical infrastructures and industrial players interoperable, also contribute significantly to increasing exposure to cyber attacks.

In light of these considerations, the Secure Connected Factory solution was implemented with a secure by design approach specifically conceived to reduce the risks posed by potential fraud or sabotage, and which already begins in the software design and development phase.

Secure Connected Factory can also be integrated with Intelligence-driven Cyber Security services and solutions developed by Leonardo to proactively and protectively protect data and critical assets of companies and organisations, both with regard to ICT and in terms of Operations Technology (OT) systems.

ARCHITECTURE

The platform architecture includes the following layers:

- › **Data Sources:** consisting of production machines that monitor and sensors that feed the other layers.
- › **IoT Connectivity & Management:** it allows you to connect production machines with the cloud, as well as implementing OT security solutions.
- › **Operational Execution:** this level sees the processing of the transactions activated in the application layer.
- › **Big Data & Analytics:** big data engine and advanced analytics, data collection, normalisation and analysis operations to support the applications take place at this level.
- › **Application:** applications that implement the features of the Secure Connected Factory.



BENEFITS

- › Greater transparency and real-time control of production activities
- › Optimisation of production processes
- › Optimisation of energy consumption on a machine, production site and production process level
- › Better support for field service activities
- › Increased availability of information geared towards continuous product improvement
- › Establishment of maintenance plans linked to actual operating conditions
- › Increased availability of plants in operation
- › Optimisation of maintenance operations and spare parts inventory 'on site'
- › Reduction of costs related to anomalies.



LEONARDO FOR INDUSTRY 4.0

Leonardo views Industry 4.0 from a privileged position - at the same time it takes on the role of the leading manufacturing company in the Aerospace, Defence and Security sectors, as well as that of providing solutions and services for Industry. This experience allows us to work alongside and support our Clients along the path of design, production, maintenance and supply chain process transformation in accordance with the most advanced business models.

Secure connected factory is one of the components of Leonardo's vast product portfolio for industry 4.0: **the bundle**, created to support the digital transformation of Industry, is composed of advanced hyper-connected and secure solutions, industrial cyber security and cloud services, coupled with experience in big data & analytics projects and expertise in core manufacturing processes. By taking advantage of innovative technologies such as the IoT, big data, artificial intelligence and machine learning, mixed & augmented reality, chat & bots, it is possible to support industry along the evolutionary journey towards the 4.0 paradigm, ensuring transformation into a modern and protected Connected Company.

The Secure Connected Factory solution received the "SMAU Innovation Award" in 2016



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Leonardo's solutions for industry 4.0 are based on a Big Data Analytics & the IoT engine and offer the following application modules:

- › **STRATEGIC DECISION SUPPORT:** solutions for the analysis and correlation of data from complex and operational manufacturing companies to support strategic decisions, performance measurement, improvement and synchronisation of production processes, supply chain, maintenance and customer service.
- › **SMART PRODUCTION:** monitoring of plant operations to identify potential or unexpected factors that could influence the success of production programmes and activities; real-time rescheduling of production sequences in order to maintain expected performance.
- › **SMART MAINTENANCE:** correlation and analysis of historical data and information from both inside and outside the plant in order to plan and perform maintenance intervention through a predictive model makes factory maintenance costs more efficient and maximises operational availability.
- › **MOBILE WORKER:** tools to support workers in production and maintenance activities in order to remotely control equipment and for production and maintenance activities, also through chat bots and augmented reality technologies.

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MM08937 09-19

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