

Continuous-Propenzi is Matching Industry 4.0"

As well as future market requirements



Industry 4.0 is a name given to the current trend of digitalization, automation and data exchange in manufacturing technologies. In the widest view, it includes cyber-physical systems, the Internet of Things, cloud computing and cognitive computing. Industry 4.0 is commonly referred to as the fourth industrial revolution for a "smart factory". There are four design principles in Industry 4.0:

- **Interconnection:** the ability of machines, devices, sensors, and people to connect and communicate with each other via the Internet of Things (IoT) or the Internet of People (IoP).
- **Information Transparency:** the transparency and interconnectivity afforded by Industry 4.0 technology provides operators with vast amounts of useful information needed to take appropriate decisions in identifying key areas that can benefit from innovation and improvement.
- **Technical Assistance:** to support humans in real time by aggregating and visualizing information comprehensively in order to take informed decisions and solve urgent problems on short notice with the support of OEM experts who may even be located at another corner of the world.
- **Decentralized Decisions:** The ability of cyber physical systems to take decisions on their own and to perform their tasks as autonomously as possible. Tasks are delegated to a higher level only in case of exceptions, interferences, or conflicting goals.

Propenzi Lines Automation as five levels

Continuous-Propenzi has studied different solutions to achieve the above four design principles in our Lines using the communications within and between the Technological Levels of Automation in an industrial environment (commonly considered in five levels as indicated in Fig. 1). These solutions can be widely implemented, according to the preferences of our customers; a short example for each level:

Level 0 – Sensors, Actuators, Detectors with embedded diagnostic functionalities that collect an extensive and wide range of process parameters automatically identify any possible divergence from the target parameters.

Level 1 – PLC/PC/PID (Control Level): Only the most advanced PLCs are installed for the logic control including diagnostic functions and implementing the capability to transfer the necessary data to all the higher automation levels. The strict integration of the components among them is the basis of data transfer capability.

Level 2 – SCADA (Operations Level): The so-called PIC (Propenzi Integrated Control), already installed in several plants prior to 2011 (when "Industry 4.0" was coined), underlines Continuous-Propenzi's attention to supervisory control of the data acquired and controlled on Level 1 of Automation. All relevant process data are continuously stored in a database and can be viewed in real-time or as historical trends. PIC is a user-friendly SCADA system that is completed by a clear HMI (Human Machine Interface) that displays, analyses and stores a huge amount of data acquired by all sensors and actuators.

Level 3 – MES (Manufacturing Level): Continuous-Propenzi can support our customers by providing the necessary data from our system, defined together with our customers, to be transferred to the management of the "smart factory" to coordinate and connect the other production processes.

Level 4 – ERP (Enterprise Level): Selected data, indicated by our customer, can be transferred to the IT infrastructure of their enterprise.

The new PIC 4.0 (Propenzi Integrated Control 4.0) to be ready today for Industry 4.0

The PIC 4.0 continuously monitors hundreds of process parameters such as temperature and flow of process fluids, temperature of the cast bar,

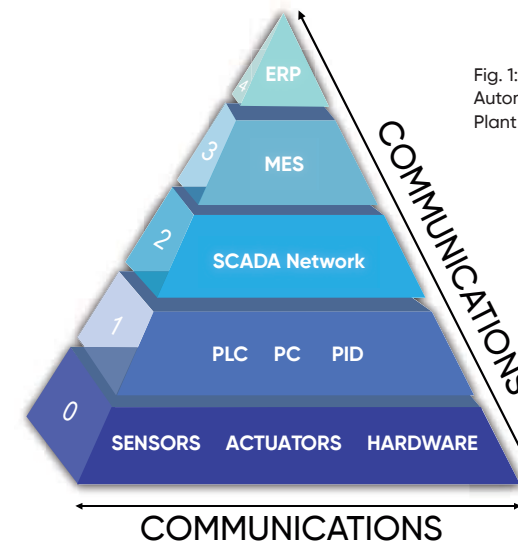


Fig. 1: Technological Levels of Automation in an industrial Plant environment.

conductivity of the rod, geometrical dimensions, etc. acquired through the devices and sensors. The same system allows the possibility to connect and communicate via the IoT the necessary data required to reach the *first goal* "an excellent *Interconnection*" and also to collect and summarize this data in useful information to help the operators to identify the key areas to be improved and to make the appropriate decisions during the production processes for the *second goal* "Information Transparency".

With PIC 4.0 Continuous-Propenzi has implemented not only the possibility to connect and communicate the necessary data (some of which can also be mutually agreed upon with our customers) to the IoT, MES and ERP, but also the possibility to allow remote access by Continuous-Propenzi's experts to the local cameras, real-time and historical data and the complete automation installed within the plant in order to support our customers in solving urgent problems and/or providing suggestions on possible areas of optimization. This is the implementation of the *third goal* "Improved Technical Assistance".

The fourth goal "Decentralized Decisions" is go-

ing to be implemented with an algorithm controlling and comparing part of the data acquired, so that the proposed plant not only monitors this data but also makes fine adjustments in some plant settings in order to keep the target parameters included in the recipes of the HMI, rendering this task as autonomous as possible. In case of main adjustments, the decision is delegated to the operators of the plant.

Several customers are currently modernizing their existing 20+ years old Propenzi Lines by implementing the Propenzi remote technical assistance program. After the modernization of their line and the implementation of this remote assistance kit, whenever the customer requires our assistance, a Continuous-Propenzi's expert can connect himself to the Propenzi line automation and source all the necessary data and process parameters to provide immediate and precise technical assistance. As an example, we have implemented this solution in Thailand or Brazil and, although they are very far from Italy, we can solve their request for technical assistance on the same day as if we actually had a technician on site.

Sources: Wikipedia [https://en.wikipedia.org/wiki/Industry_4.0]



Propenzi CCR (Continuous Casting and Rolling) Aluminium Line.