

EFFECTIVE PLANT CONTROL TO OPTIMISE PRODUCTION

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"The first rule of any technology used in business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency." *Bill Gates*

The automation of plant is no longer optional but necessary for any manufacturing business to survive. In the plating or metal finishing industry this statement is even truer where specifications, environmental challenges and productivity have pushed the limits beyond human performance. A typical zinc plating plant with a production capacity of 100 Kg per flight bar will move 200 tons of products per shift amounting to 49 500 tons per year. To achieve this the carrier will stop and start its motors 990 000 times. The carrier will travel up to 2000 km in a year whilst stopping and starting every 15 seconds to an accuracy of 3 mm on a 100 mm diameter wheel. Reliable and accurate position control is therefore key to the success of the plant. This position feedback via encoders is used to optimise the motor speed, acceleration and deceleration ensuring reliable movement with the correct accuracy.

Process control via pH, conductivity, flow, pressure, temperature, level, voltage and current is the heart of the plant ensuring consistent quality and tolerances. The modern technology has simplified these process control items, allowing the plant manager to set the variables at the touch of a button. Through screens (HMI)¹ or SCADA² packages all of the process control data is adjusted recorded and logged for future reference and traceability.

All remote and field devices are linked via Profibus³ communication to the PLC⁴ such as HMI's, rectifiers, drives, encoders, pH and temperature controllers. All of these devices are accessible to the programmer remotely via Ethernet allowing minimum downtime for intelligent fault finding and configuration. Automation is no longer a black box in the back of the plant but is the transparent flow of operational data to ensure quality, quantity, productivity and ultimately maximize profits. 🔄

¹HMI - Human Machine Interface; ²SCADA (supervisory control and data acquisition) is a system operating with coded signals over communication channels to provide control of remote equipment *Wikipedia* ³PROFIBUS. (PROcess FieLdBUS) An industrial control network used for factory automation, process control, motion control and safety networks. Using a master/slave architecture, specialised "Profiles" are used to support each of these areas. ⁴PLC - A Programmable Logic Controller is a digital computer used for automation of typically industrial electromechanical processes, such as control of machinery on factory assembly lines, etc.