FIVE ESSENTIAL CONCEPTS IN AUTOMATION

ANN

ARTIFICIAL NEURAL NETWORK (ANN)

An ANN is a computer model based on the structure of a biological neuron network. The network is made up of interconnected sensors that transmit information.

The synapses throughout the network can learn and adapt from internal or external information just as a biological creature would.

DCS

DISTRIBUTED CONTROL SYSTEM (DCS)

In a DCS, autonomous controllers are placed throughout the manufacturing system and usually controlled by a central supervisory operator. DCS' are often used in manufacturing for continuous or batch-orientated processes.

Using a DCS can minimise downtime. The placement of nodes and control processing throughout the system means that any issues would only affect one part of the manufacturing process.

HMI

HUMAN MACHINE INTERFACE (HMI)

HMIs allow humans to interact with machines, meaning that production can be closely monitored and changing production demands can be responded to quickly.

HMIs allow humans to operate and control the machine as the machine feeds information back to the user which helps with the decision-making process.

SCADA

SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA)

SCADA is a control system architecture, which is a network comprised of computers, data communications and user interface. SCADA provides a high level of supervisory management in plants.

A SCADA network can be applied to multiple sites. The use of HMIs and PLCs allows the network to be remotely accessed.

PLCs

PROGRAMMABLE LOGIC CONTROLLERS (PLCS)

PLCs are industrial computers that are made of materials designed to withstand extreme temperatures or harsh environments such as the factory floor. They are referred to as real time systems as the system must respond to the plant's conditions quickly.

PLCs monitor the control of the manufacturing process and are designed to be highly reliable. They are also easy to program and faults can quickly be diagnosed.