It's no secret that remaining competitive in today's market is tougher than ever. Although getting a product to market faster – whilst increasing its quality and decreasing its manufacturing cost – has always been the goal of any manufacturer, rapid globalisation and technological advancement have changed everything.

As commercial pressures have grown to meet new regulatory mandates set by governments around the world, the need for manufacturers to focus on traceability processes has increased significantly. Where paper records and manual data entry were once the norm, the automation of the manufacturing process mitigates the risk of product recalls, reduces costs and serves to increase quality. Defined by ISO 802, traceability is simply 'the ability to trace the history, application or location of an entity by means of recorded identifications.' For manufacturers in today's market, this amounts to tracking and tracing components – from suppliers and manufacturers through to the assembly line, and finally to the product's delivery.

It's in this market that the appetite among the manufacturing industry for Radio Frequency Identification (RFID) and barcode technologies has increased exponentially. The need for reliable and cost-effective traceability systems means these technologies have expanded at a rapid rate all over the world. Adoption of traceability programs in manufacturing, whether in asset tracking, plant-based material flow, production control, material flow or all of these areas is a must for operating within an 'intelligent' market.

RFID technology wirelessly transmits radio-frequency electromagnetic fields in order to identify and track tags. These tags are attached to objects and have...
electronically stored information. Although the use of RFID has exploded in recent years, it is not a new technology by any stretch of the imagination.

Jim Wallace, product manager at Balluff, says: “At Balluff we’ve been developing and manufacturing RFID products since 1984 – in fact we’ve been making it for so long that many of our long-term customers refer to these products as ‘Balluff chips’ and don’t necessarily acknowledge them as RFID at all.”

First used commercially in the 1970s, the earliest barcodes were used to identify products in a retail environment, and RFID was used to prevent theft, control access and identify livestock. Whilst these methods are still being applied today, the technology has become much more refined and the data more reliable, resulting in increased quality and leaner processes. Private companies and public corporations, small and medium sized enterprises (SMEs) and governments the world over have concluded that these technologies are what’s needed to bring the necessary visibility and automation into their processes.

Automation in manufacturing has evolved tremendously as a result of insight, thought leadership and calculated risk-taking by experts in the field. Progress results from informed decisions being made based on accurate data: therefore, automating data capture dramatically decreases the risk of entry errors and the cost of quality.

Richard Neill, product marketing manager at Balluff, states: “There has long been a movement towards reducing the paper-trail within the manufacturing process. A traceability strategy can help to achieve this at a number of levels – tracking the progress of parts through the manufacturing process itself, quality assurance, material flow and asset management.”

A recurring word used throughout the manufacturing industry – and one vital to traceability – is ‘visibility’: to see and understand the process from start to finish. By analysing reliable data and taking appropriate action, a truly efficient, transparent system can be achieved. Neill says: “read/write RFID tags which can have information written to them by a read/write antenna at each workstation allow the work in progress to be updated at each point in the manufacturing process, allowing any failures to be isolated at the exact point of error. This prevents the unfinished, flawed product from receiving more work at the next station.”

Being able to trace the work in progress from the first stage in the build process to the final stage allows organisations to have full confidence that the product being sent to market meets requirements. Neill continues: “More importantly, traceability in the process adds value to the final product by ensuring quality and eliminating inefficiencies in the process.”

Wallace adds: “The functionality offered by the RFID tag massively impacts the level of potential product recalls – which in turn affects quality, revenue and the amount of stock held. It also means that you know your real time inventory – which then prevents needless parts being stored and valuable space being wasted. Overall, this technology enables the whole manufacturing process to become leaner and much more efficient, with data and accountability available at every stage of the overall supply chain process.”

The road towards ubiquitous automation will continue to be the pattern for all industries: the much-used term ‘the Internet of Things’ describes a near future where all things are interconnected and traceable, and human error is all but vanquished. For manufacturers to thrive in such an environment, embracing both existing and emerging technologies and implementing a thorough traceability system will not only be a commercial benefit, but a necessity.

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