

RFID In Manufacturing

Identification Solutions For Production Processes

RFID (Radio Frequency Identification) can help improve a range of manufacturing approaches for both assembly and process manufacturing. It provides automatic identification of work-in-progress, materials and/or sub-assemblies and finished goods as they move through production. It can track and control tools, containers and other assets such as stillages.

RFID is an easy to implement technology that helps to monitor where products are in the process, how long they have spent at any given stage and whether they have completed all the steps needed. In assembly it contributes to better control of WIP stock levels, reducing manual record keeping and improving delivered product quality. In process manufacturing it can help track batches of product.

RFID solutions use standard technology and can be linked to existing manufacturing control, logistics and inventory management systems.

The Problem

The movement of components, sub-assemblies and part-finished products can be difficult to track. If production steps need to hold partly finished goods for a specified time, for example, or if individual items on a line need different steps or tasks to be applied to them, manufacturing control systems may find it difficult to track their progress.

The same is true of tools or moulds or other reusable elements or the containers used to deliver finished goods, where it might be important to track their lifecycle.

Providing automatic identification of work items can help this. By electronically identifying a sub assembly or a container of part-finished product, for example, an RFID system can know that the item has passed through all the steps needed to complete it. The same systems could check that an item has been kept at a particular stage for a specified time. And it can provide instant details of what stocks are held where. It might also keep track of how many times a mould is used – ensuring it does not continue in use after its planned end-of-life.

RFID can add this capability to existing process and assembly manufacturing processes. Systems use electronic tags to identify work items. Sensing devices show which steps each work item has passed through and when. Electronic tags have benefits over barcodes in being readable from a distance, often without the work item needing to be positioned in a particular way. They also allow many tags to be sensed simultaneously, allowing a rapid check of work held at any particular stage. And, it is possible for the data relating to different tags to be associated with one another. “These tags were all together on that pallet” for example.

Where is RFID of Most Value?

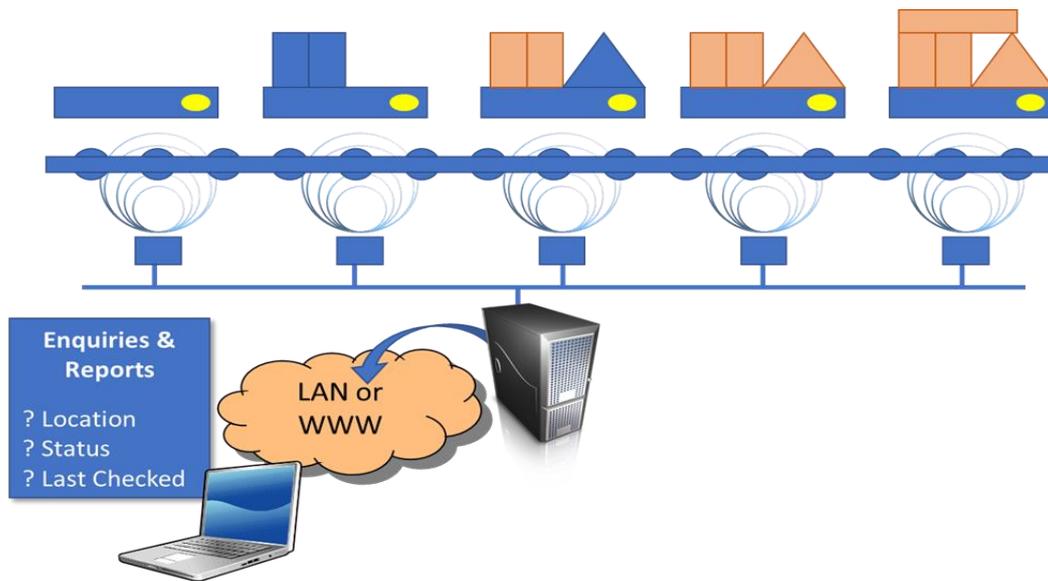
RFID has particular application in production processes where there are manual or a mixture of manual and automatic production steps. It is valuable where part-finished products or sub-assemblies are held waiting finishing or where parts of the production cycle are time dependent (curing, maturing or settling).

RFID is also valuable for manufacture of custom products where each item on the line may require different assembly tasks or different final testing depending on the customer it is intended for. It is particularly suitable in challenging environments requiring high temperatures, chemical or water resistance where it is much more robust than other identification methods.

RFID solutions can also help to link the work done at one production steps with the work needed at a subsequent step. Using RFID tags, work carries its own production history and manufacturing requirements along the line. Because tags come with a wide range of cost options, they can be used as a low cost single use identification (WIP and then gone) or with the product for life supporting warranty returns, field installation, service, recalibration or refurbishment.



RFID can track assembly, test and shipment production steps.



How Does An RFID Manufacturing System Work?

RFID works with reusable, low cost, electronic tags that can be attached to components or sub-assemblies or to trolleys, pallets or stillages used to move products along the line. Tags can be sensed by reader devices at appropriate points such as manufacturing stations or gateways between areas of the factory. The reader devices sense the arrival of a tag, without any human intervention, and flag the occurrence to monitoring software. This monitoring system can track where tags are and when they arrived at and left a particular station. applications are kept up to date without the need to re-key data. Using the configuration of the readers, the system knows the whereabouts of tagged item at any given time.

Most manufacturing systems work with ultra-high frequency electronic tags. These tags can be mounted on product components or on pallets, cages, containers or stillages. A wide range of tags is available for attachment to different materials and for use in different temperature or chemical environments. They can be read from a distance of up to 10 metres and hundreds of tags can be read, virtually simultaneously.

RFID based manufacturing reporting systems can offer a simple traffic light warning system for items exceeding pre-defined conditions at any production step. They can track the line position of batches, carriers or components / sub-assemblies. They can provide a production history for any given finished item, show which production batch it was associated with and which operator worked on it, so providing improved accountability through product traceability. Reports can be displayed locally, on a web browser or exported as data for use in other applications.

RFID solutions developed by CoreRFID are fully supported software customisation, integration and support service as well as supply of necessary hardware, installation and commissioning working directly for you or in collaboration with other manufacturing systems providers. And they can be used alongside bar code and other identification technologies.

Benefits

Manufacturing RFID systems provide:

- Better control of work-in-progress and part finished goods.
- Improved end-of-line and customer-delivered quality.
- More accurate data on line bottle-necks & free resources.
- Reduced inventory costs through better control of ingredients, components & sub-assemblies.
- Reduced costs for custom product delivery.
- Lower costs for providing product traceability
- Visibility of live production data in-house and to manufacturing and distribution partners and customers.