RFID solution delivers 100 % reliability to Seagate's disk cleaning line

Seagate Technology is recognized as the largest global manufacturers of disc drives, magnetic discs and read-write heads. Stratus Automation Corp. is a California based manufacturer of conveyor systems used in hard disk and semiconductor industries. Stratus incorporates Escort Memory Systems RFID technology into the conveyor systems they design and manufacturer to improve their customer's production quality and efficiency.

Problem: Disk Drive Media Cleaning Line must have 100% Reliability:

Seagate requires that every process step for each disc is totally under control and each process step a disc goes through is permanently recorded. Further, tracking each step in a real-time can greatly reduce product scrap. Prior methods for controlling WIP (work in progress) included paper travelers and manual input to terminals located throughout the process line. With manual input terminals traceability accuracy was often lost due to operator (human) input errors. Engineers later experimented with barcode technology but found the labels could not reliably survive the processing steps and barcodes are read-only media; not meeting the read/write requirement. These methods did not meet the requirements and additionally generated scrap because of delays in obtaining information required for decision making (not real time).

Seagate's Requirements:

In Seagate's totally automated line, a complex material handling system moves product cassettes between processing stations including cleaning steps that are repeated periodically during processing. Each cassette carries with it a unique RFID tag containing a lot identifier. The plant automation system maintains the process flow for each lot of discs and maintains real-time information about which process steps have been completed and which steps are next for any given lot. Key to this system is the ability to read and write data to the unique RFID tag as it passes branching points on the conveyor; locations where a choice of paths must be made in order to get to the correct next step. Any deviation from this correct routing leads to mis-processing of the cassette of discs and results in the discs being scrapped. In other words, 100% reliability is required for each cassette's path along the conveyer system. The path a cassette takes through the conveyer must be recorded in the plant automation database for permanent record keeping. A further requirement for the new automated handling line was that it must support high speed communications with its host computer.

Escort Memory Systems Unique Solution:

Using Escort Memory System's HF-0405 integrated RFID controllers and GWY TCP Ethernet interfaces to read and write to Escort Memory Systems HMS108 tags, Stratus Automation designed a conveyor system meeting all of Seagate's requirements including:
1. 100% Reliability

2. Detailed record of material movement within a facility
3. Real-time
4. High speed communications to host computer
5. Read and write to tags

This was accomplished by placing HF 0405's at each decision point along the conveyor system. At each decision point, Escort Memory Systems HMS108 RFID tags imbedded in the cassettes are read and the information sent back to the host computer. The host computer determines which path the cassette should take based on the routing information for that lot. It a cassette is determined to be in the wrong location for some reason, data is written to the tag that identifies it as being out of sequence. This data is recognized by each subsequent HF 0405 and the cassette is automatically routed to a holding area to await dispositioning. Because this process occurs in real-time, the cassette will be caught by the host system as being out of place before it is actually processed. This allows it to be placed back into the system at the correct location and moved to the correct next step; avoiding scrapping out of the cassette full of discs.

Up and Running

Stratus' results to date show more than 15,000 read/write cycles without any failures for each HF 0405 connected to several GWY TCP Ethernet interfaces. Steve Ng, Project leader for Stratus Automation had this to say, "We saw over 15,000 reads without a single read failure with the HF-0405's and GWY TCP's. We've also seen the wiring reduced, and setup is fast".

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