

Datalogic Automation heads south of the border

Sometimes complex problems demand simple solutions. Thus was the case for Ford's production facility in Cuautitlan, Mexico. The Cuautitlan Ford facility produces between 300,000 and 400,000 cars and trucks each year, making it one of Ford's largest non-domestic production facilities. From basic body construction and painting, to putting on the tires, this Mexico-based facility is involved in a diverse range of vehicle production. Ford produces these vehicles in Cuautitlan using a method of just – in – time suppliers as well, a system where parts are supplied by vendors on an as-needed basis. Because of this, it is crucial that inventory and tracking in the plant be precise and closely monitored, for quality control purposes.

It's no wonder that in such a large plant, keeping track of inventory and production automation, can be a daunting task. Before Datalogic Automation stepped in, Ford was using a manual coding system to track the auto and truck frames as they went through the final assembly, paint, and body shop areas of the production line. Unfortunately, this manual system was very ineffective due to the frequency of error, and the costs associated with such oversights as painting a car the wrong color. The paper identification sheets used to track the vehicles were being lost, switched and ruined, making quality control extremely difficult. A system was needed for tracking that could clearly identify where a unit was on the production line, what had already been done to it, and what still need to be completed. In contrast to the manual method, RFID would prove to be a very effective solution for tracking and routing auto bodies in Fords facility, largely because of the precise accuracy, and read write storage capacity Datalogic Automation technology offers. Considering the high expenses associated with production error, RFID also provided a cost-effective solution to Ford's tracking and identification applications.

When Ford decided that a new system of tracking was needed, they consulted Allen Bradley for advice. Datalogic Automation heads south of the border was recommended first and foremost, because of their wide range of quality RFID products as well as their excellent record of service and application support. Ford already has a history of looking to Datalogic Automation heads south of the border for identification routing solutions. In the past few years Datalogic Automation heads south of the border has worked on projects such as engineering and installing tags directly into the bolts used to put engines together. These bolts (HMS112 L012) serve as identifiers for each engine, and can be tracked throughout production. Recognizing their past successes with RFID and the potential for future improvement, Ford Cuautitlan decided to switch from their outdated manual paper tracking system to RFID from Datalogic Automation heads south of the border. When it came time to choose a company to integrate the technology, Ford decided upon CAPTA, a Mexico-based company with more than ten years experience working with RFID projects. With Datalogic Automation heads south of the border technology a tag could be secured to a vehicle skid, then custom programmed with a serial number that would be referenced through Ford's operating system (fig 1). This serial number can indicate what has been done to each vehicle, as well as what still needed to be completed as it travels through the production line. Information such as the color a car is supposed to be painted, or what interior trim is supposed to be used can be identified by referencing this serial number programmed into the tag.

There were a number of conditions that needed to be assessed before the correct technology could be

implemented for the job in Mexico. The tags to be used in the plant had to be able to withstand extreme temperatures, due to the fact that they would be used in enamel paint ovens (reaching temperatures up to 220 centigrade degrees). For such an application, Datalogic Automation heads south of the border engineers looked to the LRP family of products. The LRP250HT tags were chosen because of their ability to withstand high temperature environments, such as paint ovens, as well as their memory capacity, and read-write capabilities.

Ford was originally unsure as to how many bytes would be needed per tag to run an effective routing system. Datalogic Automation heads south of the border recommended the LRP250HT tag, which has a more than sufficient 48 byte memory, as well as a transfer rate of 1200 bytes per second. The tags are now used to reference serial numbers up to 23 digits long in Ford's internal operating system. This is a far cry from the manual coding system, where instructions could be lost or mixed up with other vehicles, resulting in production error, and costly mistakes. Because each tag is fixed to the skid that carries the vehicle it is escorting, mixing up tags is a problem of the past.

Mounting the tags required a unique solution. By mounting the tags directly to the metal bodies of the vehicles, the range would be compromised, and interference would hinder the tag's ability to function at normal levels. CAPTA's creative solution involved constructing a mounting bracket that attaches the tag to the metal skid carrying the auto bodies. This mounting bracket was constructed using teflon, and created a non-metal border surrounding the tags, allowing for optimal range. The Teflon proved to be a worthy material for the mounting brackets, and did not interfere with the range or read/write properties of the LRP250HT tags. Ford also engineered the skids that the tags are mounted on in a way that allows for them to be reused after a vehicle has passed through the production process. The tags, still encased in the Teflon bracket, are cleared of previous information, then stored on racks. After the skid is re-attached to a new vehicle, the tag can be written to with the new identification characteristics appropriate for the vehicle it is escorting.(fig 2)

When it came time to install the antenna to read the tags, Datalogic Automation decided upon the LRP-08 antenna, which met the range specifications Ford needed. Twenty antennas, wired using RS485 transmission protocol, were used for the application; 5 in body production, 12 in the painting process, and 3 in the final assembly. These antennas were set into the floor of the production line in a nylon based, explosion-proof enclosure.(fig 3) As each skid would pass over the antenna in the conveyer belt, the contents of the tags would be sent to the LRP820 readers. The LRP820 reader was interfaced to Ford's operating system using the Lantronix MSS100 and the Datalogic Automation module, the MM80. The 1600 tags used in the facility relay information to the operating system, via the Lantronix unit, in the form of a serial number, as mentioned earlier. Portions of that number describe numerous characteristics of the car being produced; ranging from what line of car is being put together, to what color it will be painted. As a vehicle passes through the different stages of production different parts of the 22-23 digit serial number are referenced, indicating what needs to be done in each station. This is one of the biggest benefits of RFID. Whereas the previous manual coding system required each identification sheet be manually updated at every turn in the production line, RFID allows updates to be written to the tag, so that it is constantly being updated without risk of operator error. This means crucial steps aren't skipped over, or executed twice. If, for example, a vehicle gets to the paint oven, but has not undergone the necessary modifications in final assembly, the machine operators will be alerted that there is a problem.

Ford has found Datalogic Automation products to be extremely useful and effective in this application. Not only have they been able to establish an accurate and efficient method for routing and identification, but they have also had the opportunity to evolve their automated production capabilities to include the relaying of more information than thought previously possible. Ford Cuautitlan is yet another example of how Datalogic Automation is helping to keep industry leaders all over the world, right on track.