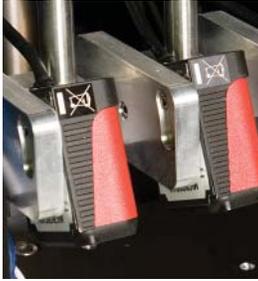


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## Bar Code Readers Increase WIP Visibility for Industrial Appliance Manufacturer

In order to stay ahead in today's competitive manufacturing environment, effective inventory management must extend beyond the warehouse and include real-time monitoring of work-in-process inventory as well. When a large manufacturer of industrial electronic appliances decided it was time to implement a data-driven production line system in their China-based facilities, they set out to achieve very specific goals. The automated component traceability system needed to provide a complete manufacturing history of each unit and the visibility required to optimize production line efficiency.

In a data-driven production line, the operation at each production station depends entirely on product identification. The successful operation of the production process rests on the quality of the symbol used to identify the product and the bar code readers used to decode it. "We knew bar code production and identification would form the core of our new system," commented the department manager of the project. "That's why we spent a few years testing and evaluating fixed-position bar code readers from several manufacturers with the sole purpose of finding an outstanding product." They eventually selected the Quadrus® MINI imager and the MS-3 laser scanner from Microscan. "Not only did Microscan offer high-performance products," the project manager said, "But they were able to bring it all together into a complete, integrated solution that increased the stability of our system."

While the manufacturer requires their symbols to meet high quality standards, reading them within the confines of production equipment at high speeds still proved to be a challenge. The application includes high speed, fluctuations in read range requirements, and an extremely narrow location to install the bar code readers. Fortunately, the Quadrus MINI's small form factor (1.80" width, 2.10" depth and 1" high footprint) and 30 degree read envelope enables it to fit within the space and still provide robust read performance. The imager's autofocus capabilities allows it to quickly adjust to fluctuations in product dimensions and variations in the symbol's location. Likewise, the MS-3 laser scanner's compact shape and 70 degree scanning angle provides the mounting flexibility needed to accommodate the cramped space inside production equipment.

Since the entire production process relies on the ability to read the bar codes on the products, quality validation is a critical task performed immediately after the bar codes are applied to the products. Two readers, a Quadrus MINI and an MS-3 laser scanner, are installed at the bar code generation. Once the

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symbols are applied to the unit, the readers validate that the codes meet the manufacturer's established quality specifications. The Quadrus MINI reads the 2D codes and the MS-3 reads the linear bar codes. Once the quality of the codes are accepted, the unit is created in the system and the product enters the production process. If a code does not meet the standards, the unit is diverted from the line. Performing symbol quality validation early in the process prevents bottlenecks from occurring down the line due to inconsistent decoding.

As the unit arrives at the first station in the product process, the Microscan bar code reader scans the code and sends the information to the server. The product ID is referenced in the central database to determine the specific production step to be performed on the unit. Based on the product identifier, the equipment then performs the appropriate operation on the unit. Once the operation is completed, the product is tested and results from the test are logged in the database under the product's ID.

As the units pass through the various stations on the production line in a specified sequence, the identification process is repeated. This documents the type of procedure that was performed, the equipment that performed it, and attaches a time/date stamp for when it occurred, providing the entire manufacturing history of each unit and real-time visibility of work-in-process (WIP) inventory. By using a data-driven production system, the manufacturer can customize the process for specific products much more efficiently than it could with its previous manufacturing system. Tracking the complete process also provides the necessary documentation needed for proper inventory management and confirmation that the customized specifications were performed as ordered. Since the scanned data at each production station is stored in a central database, it can be accessed in real time by several departments, improving inventory and WIP visibility.

By establishing high quality standards for bar code readability and investing in state-of-the-art readers to decode them, the manufacturer was able to achieve their project goals within a few short months of the system's operation. Subsequently, they have realized additional benefits as well, including fewer tracking errors, more efficient workflow, and increased customer satisfaction.



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