

Automation Saves A Watch Maker Time



Titan Industries is the world's fifth largest and India's leading manufacturer of watches. Corporately based in Tamil Nadu, India, the company has manufactured more than a 100 million watches to date and has a customer base of over 80 million.

The umbrella brand Titan is one of India's leading watch brands that brought about a paradigm shift in the Indian watch market, offering quartz technology with international styling.

Today, the Titan portfolio has over 60% of the domestic market share in the organized watch market. The company has 247 exclusive showrooms christened 'World of Titan' making it amongst the largest chains in its category backed by 700 after-sales-service centers. The company has a world-class design studio that constantly invents new trends in wrist watches.

The company's watch case plant manufacturing facility includes a process where the watch cases are handled and component connections are machined. Until now this step in the manufacturing line required the parts to be loaded manually. Loading the cases manually meant that production speed was limited as an operator could only continually maintain loading and unloading the pieces for a period of 3 hours. This repetitious machining step in the line was using valuable skilled employee resources that could be better utilized elsewhere in the production facility. The company started to consider automation as a solution to free human resources from this tedious step. But what about cost and what would the company's return on investment be?

Mr. Ravi Chandran, the company's senior manager at their watch case plant determined that a 4-axis robot with a vision system was the ideal solution. The process requires horizontal loading so a lower cost 4-axis robot was chosen over a

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Published on Industrial Maintenance & Plant Operation (<http://www.impomag.com>)

more dexterous and costly 6-axis model.

“After researching the options available from all of the leading automation manufacturers we determined that an Adept Cobra 4-axis robot combined with an AdeptSight vision system might fit the bill,” said Mr. Chandran.

Titan purchased and received the robot and vision system and proceeded to automate this process using internal engineering resources. The Adept Cobra™ i600 is an affordable, high-performance robot system with no external electronics. It is a self-contained, standalone SCARA 4 axis robot. AdeptSight is an easy-to-use, vision guidance and inspection package that runs on a PC, and comes complete with all the necessary hardware and accessories. The software includes a powerful framework that can be used to develop customized vision guidance and inspection applications. Its simple graphical user interface allows the user to quickly develop robust and accurate vision applications.



“Once we installed the software & went through the help menu we found that the programming language was similar to MSDOS version of ‘C’ software. This coupled with the sample program & the help file made our job much easier,” said Chandran. “In all we were up and running a couple of weeks.”

In addition to the robot and vision system the company’s engineers designed the gripper, conveyor and additional parts of the workcell from materials they already had available. So all the company needed to purchase was the robot itself and the vision system.

The robot was situated in such a way that it could attend a set of three machines. In doing so, they could reduce the number of operators required from three down to one employee per shift. Since the company runs two shifts this freed up four operators total per day. Without the need to manually load the machines, the operator’s only task is to set the line and do component inspection. Setting of the robot after setting the machine takes only five minutes. The Z -axis brake release switch comes very handy for setting if this switch was not provided it would have taken us more than 30 minutes to complete the robot setting.

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One operator brings a stack of trays holding 25-50 components per tray depending on the size of the parts being worked on that day. The trays are then fed into the work area automatically as needed. The components are not oriented so the Adept Vision system is used to orient the parts. The robot picks up a part and places it on a stage in order for the vision system to capture an image and orient the part. The robot then picks the component from the stage and places it into the first of three machines for the machining process to take place. As each machining process is completed the robot moves the machined component to the next machine for the next machining step. Stages are used between the machines as resting points for parts while the robot unloads a part from one machine preparing it for the next component. The robot continuously loads and unloads the parts through each of the three machines and finally unloads the completed piece from the third machine. So the robot is continually loading and unloading parts as each piece moves from one machine to the next to complete this three step machining process. The entire sequence takes approximately 15 seconds.

With this process almost fully automated the company's volume in an 8 hour shift has doubled from the original 750 pieces being processed per shift to now 1,500 pieces processed per shift.

"With doubling our production and freeing up a total of four employees to work on other projects I would say that through this project we anticipate a return on investment of less than 12 months," said Chandran. "This easily justifies using automation and we hope to automate other processes going forward."

For more information on the companies mentioned in this article please go to: Titan Industries — www.titanworld.com [1] — and Adept Technology, Inc. — www.adept.com [2].

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[1] <http://www.titanworld.com/>

[2] <http://www.adept.com>