

## Keeping Robots In-Line – Someone Has To Do It

Robots are becoming more evolved and a part of the daily workplace in many industries such as automotive, packaging and palletizing, metal fabrication, foundry and forging and plastics. There are so many different ways robots can be used, including welding, assembly, painting, spraying, cutting, handling, packing, etc. But, robots only do what they are told to do. What happens when they forget or get out of line? Someone has to monitor these robots to ensure integrity and accuracy of the procedures inputted into these robots' diagnostics. ABB, a leading supplier of industrial robots, has taken the steps and put a plan into place to resolve these questions and provide a valuable resource to their customers.

Traditionally, customers requesting technical assistance would need to extract the programs and diagnostic files and e-mail the data to ABB or verbally to the ABB Technician via telephone. This would be time-consuming and cause loss of revenue and production.

ABB Remote Monitoring developed a wireless solution that enables a remote interface between the robot control system and the ABB Technical Support Center. Using Internet and cellular connectivity, ABB is able to remotely monitor robot performance and provide diagnostics in case of a downtime event. S4C, S4C Plus, and IRC5 robots can now be monitored and diagnosed from anywhere there's access to a standard Internet connection.



This new service is aimed at extending the mean time between failure of robots and robotic components, shortening the subsequent mean time to repair (MTTR) and lowering the overall cost of ownership of the robot unit. An additional beneficiary will be the environment, with fewer service-related call-outs, traveling and fuel-associated costs involved.

"A reduction in MTTR increases the overall equipment effectiveness (OEE) for our customers," said Robert Krukowski, manager – Technical Services, ABB, Inc. "These companies are dependent on robot reliability to meet their daily production commitments and cannot afford downtime. Additionally, the increased mean time between failure (MTBF), coupled with a shorter MTTR, produces better plant performance and can be verified by bottom line improvement."

### PROCESS

During the occurrence of a robot alarm or error event, a complete back-up of the robot programs and diagnostic logs are posted to the password-protected ABB Web site. [Abbmonitoring.com](http://Abbmonitoring.com) is directly linked into the ABB technical support phone and e-mail systems. A series of alerts are sent to the Technical Support Specialists that a robot error has occurred.

Upon receipt of the robot fault logs, an ABB Advanced Technical Support Technician works to establish the root cause, proper corrective actions and provide technical assistance until the problem is fixed. The customer is provided with a Root Cause Analysis so that corrective and preventative actions may be implemented. If additional support is required, ABB is able to dispatch a service engineer to the site who is fully briefed on the problem, along with the tools and spare parts needed to make the repair.

Based on historical data saved in the remote diagnostic software, ABB will be able to provide proactive suggestions for training, maintenance and proper spare parts inventory. This has worked successfully in current installations and has been documented in reducing downtime.

## DEVELOPMENT

The objective was to develop a system that would enhance the overall equipment effectiveness (OEE) and could be used over the Internet, either through a firewall or via cellular connection. ABB had worked with Advantech before and knew of their capabilities and products and approached them in how to develop this remote system. Advantech recommended using the UNO-2170, an embedded automation computer with Intel Celeron M processor. The UNO-2170 monitors the diagnostics of each robot by running software designed for the specific task. If there is a robot failure, the diagnostic data is uploaded through the UNO-2170 and sent to ABB using a cellular modem or through the Internet. ABB calls the customer and provides technical support to repair the issue. All this happens within minutes of the failure, providing fast recovery service for the customer and the robot. The UNO-2170's application speed and process has greatly reduced the MTTR process.



## CONCLUSION

The primary advantage is the profitability. A 10-percent increase in OEE for one of ABB's customers could drive a \$9.3 million profit increase. To achieve this same result, the customer would have to increase unit prices by more than 6 percent or reduce maintenance costs by more than 95 percent.

There are 50 robots using this process and many more are being planned. ABB, using Advantech's UNO-2170, has provided a valuable asset to their customers and foresees this being a long-term project.

As one customer has said, "It's like having an ABB technician on-site, full-time at a fraction of the cost."

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