

CMM retrofit at John Deere gives big productivity boost

When faced with increased production at John Deere's construction and forestry products manufacturing facility in Davenport (Iowa USA) the company also had to address resultant capacity challenges to keep up with component verification. John Deere's high quality standards meant that it also needed to measure more features, in the same amount of time, than ever before. To meet these challenges, including the measurement of very large parts, an upgrade of their existing co-ordinate measuring machine (CMM) by Renishaw has led to a capability for 'lights-out' inspection coupled with a major increase in productivity.

The company originally faced two choices: it could order a new CMM tailored to the job, or alternatively could attempt to greatly improve the productivity and performance of their existing 'large' CMM, a Leitz PMM 60 38 25 bridge machine. Affectionately nicknamed 'Christine', this machine has X=6000 mm, Y=3800 mm and Z=2500 mm axes. The 'new' route would take some ten months to come on-stream with substantial cost. In contrast, Renishaw was able to offer a complete retrofit solution based on its UCC controller that would breath new life into 'Christine' by updating to the very latest technologies at just a fraction of the 'new' cost and timescale.

John Deere decided to trust Renishaw's proven expertise and innovative products, the retrofitted machine having now been running very successfully since early 2005. Mike Heard, Supervisor of Measurement Services at Davenport is delighted and says: "Our machine is quite large, however the UCC controller is handling the machine well. With the flexibility the PH10M/SP25M probing system provides, we now have the reliability and flexibility required to keep up with the changing demands of our customers. Retrofitting our machine with Renishaw equipment was a positive move for the overall productivity of our measurement process".



The John Deere 644J, 4-wheel-drive loader, is among construction and forestry products produced at John Deere's Davenport Works (Photo courtesy of Deere & Company)



'Christine' has been given a new lease of life by the Renishaw retrofit

The confidence to run with a Renishaw solution had actually been cemented earlier following successful pilot trials carried out at the John Deere Technology Centre located at the world headquarters in Moline (Illinois, USA). There, Cory Leland, the Lead Project Engineer, had evaluated the Renishaw controller and both the SP25M and SP80 scanning probe products over several months. Cory is a highly experienced metrologist and having put the entire 'system' through its paces became suitably impressed and then steered the retrofit project through.

The Renishaw retrofit solution of 'Christine' includes the powerful new UCC2 universal CMM controller and SPA2 multi-axis servo power amplifier, which together run the dual 'Y' axis drive system (four-axes under control). Renishaw flexible tape scales and digital readheads were fitted to the axes, whilst a PH10M motorised indexing probe head, together with the SP25M compact scanning probe system, provides the necessary feature accessibility and sensor flexibility.

This permits accurate measurement of a wide variety of part features in numerous orientations. The SM25-4 scanning module, with its 400 mm long styli reach, has proven to be particularly versatile for reaching deep features. A notable benefit of the new probing package is that just six SP25M styli/module configurations, used with the simple, compact and automatic flexible change rack system (FCR25), has replaced some 30 bulky fixed-styli configurations that were previously required using the original probing system. This has also freed up significant working volume allowing even larger parts to be measured than was previously possible.

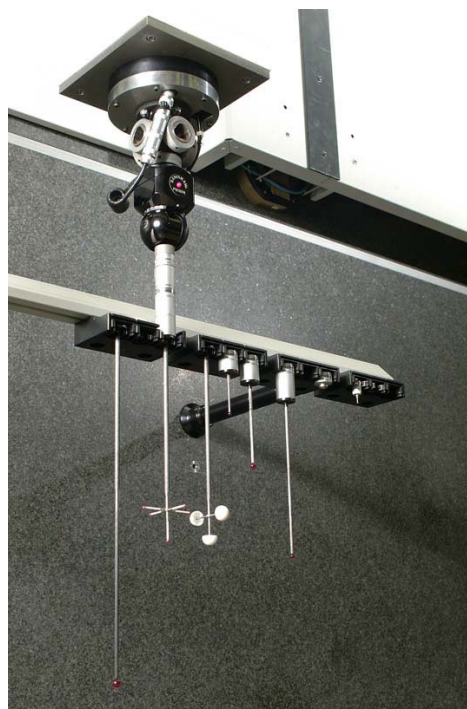
'Christine' is now running efficiently on extended shifts. John Deere is also pleased to be able to run inspection tasks unattended during the night, which has further aided productivity. Maintenance interruptions are also minimal, so 'up-time' is maximised.

As Ernest Jackson, Manager, Quality, for John Deere's construction and forestry operations comments: "The most important benefit that we see from the upgrade of the Davenport CMM is the speed and accuracy of the data we deliver to our engineers. Our customers will definitely see the results of the improvements that we make on our products".

Looking to the future, John Deere has a clear strategy for implementation of industry standards and is particularly pleased that the UCC controller family, via Renishaw's UCCserver, is compliant with the I++DME protocol



SP25M mounted to PH10M head gives required sensor flexibility and access to part features



Simple SP25M probing kit, which can be oriented on the PH10M, replaces 30 fixed-styli assemblies used previously

standard. This is seen as core to aiding inter-operability throughout John Deere's CMM installations.

John Deere has been so impressed by the transformation of 'Christine' that the company has ordered several new CMMs, which are to be supplied with UCC2/SPA2 control, and PH10M/SP25M or SP80 probing systems.