

# JUSTIFYING YOUR DCC CMM



by Eric Bennett and Silke Scholz

When manufacturing firms spend money on new equipment, their top priority is increasing productivity. That's why, each year, many manufacturers replace their outdated stationary manual coordinate measuring machines (CMMs) with automatic direct computer controlled (DCC) CMMs.

In their heyday, stationary manual CMMs were cost effective alternatives to traditional hand tool based inspection methods. However, emphases on increased production capacity, tighter part tolerances, and reduced inspection costs have made stationary manual machines less attractive.

# Justifying your DCC CMM

High speed production along with high standards of precision makes it difficult for manually based quality control functions to handle the demand for increased inspection throughput. Machined parts are becoming increasingly complex, with more critical measurement features and tighter tolerances. Stationary manual CMMs are often too inaccurate to support advanced manufacturing processes. Furthermore, higher skilled labor is often required.

Automatic DCC CMMs provide many advantages required for modern manufacturing and result in a fast return on investment. Such advantages are:

## Improved accuracy and repeatability

A major advantage of a DCC CMM is improved accuracy and repeatability. Accuracy and repeatability of DCC CMMs are much better than stationary manual CMMs, which are extremely operator dependent and increase the potential for human error. With better accuracy and repeatability, the CMM is much less likely to reject good parts or pass bad parts. To show the improvement in accuracy and repeatability available with an upgrade to a modern DCC CMM, consider an entry level, shop floor CMM, the 4.5.4 SF as compared to the stationary manual MicroVal 3.4.3.

## Higher throughput and time savings

When it comes to throughput and time savings, DCC CMMs offer many advantages over stationary manual CMMs:

- Inspection time on the same part is reduced by approximately 30%.
- The CMM operator can be relieved of the extremely time consuming task of manually taking hits for each measurement feature.

## Faster feedback to production

Another aspect of higher throughput is faster First Article Inspections (FAIs) and response to production problems. Until the inspected part passes FAI, the machine tools remain idle. A DCC CMM minimizes this costly downtime. The alternative is to start production too early and risk making 100% scrap. For existing production lines, faster inspection means quicker response to production problems and reduced scrap and rework.

## Less skilled and smaller workforce requirements

Automatic DCC CMMs require a less skilled and smaller workforce. Since the measurement routines are automated, they do not necessarily require a highly skilled inspector to execute them. The routines for a specific part can be taught to less skilled operators, often in less than a day.

	Manual MicroVal 3.4.3	DCC 4.5.4 SF
Volumetric Accuracy	10 microns	6 microns
Repeatability	4 microns	2 microns

Automatic DCC CMMs provide many advantages required for modern manufacturing and result in a fast return on investment

# Justifying your DCC CMM

In addition to running faster, DCC programs run unattended, freeing up more skilled personnel from tedious manual measurements.

## A fast return on investment

The benefits of switching from a manual to a DCC CMM add up to a fast return on investment. The typical payback times typically run in the order of months, not years.

To calculate the potential ROI, you should take into account:

- Reduced inspection time savings for in-process and final inspection
- Reduced production machine tool downtime for FAI
- Reduced scrap and rework due to more accurate inspections.

To estimate the payback period based on your CMM cost and the details of your manufacturing operation, visit [www.HexMet.us/estimate](http://www.HexMet.us/estimate) or use the included worksheet.

## Conclusion

In conclusion, to boost a company's productivity a logical step would be to upgrade a manual CMM with a DCC version. The continued drive to increase production capacity, tighten part tolerances, and reduce inspection costs make DCC CMMs the right choice. They improve accuracy, repeatability, throughput times, feedback to production, and cut labor costs - in short increase the company's productivity.

DCC CMMs are key pieces of equipment that slash inspection costs, remove subjective analysis, and greatly improve product quality. They are an excellent tool to increase output from existing manufacturing equipment and personnel to deliver a fast return on investment.

## Consider Capital Leasing

An alternative way to purchase a DCC CMM is through a capital leasing program. Leased equipment normally falls under an expense budget rather than a capital budget. For some companies, this provides more flexibility to finance the machine, improves their bottom line, and allows them to make the commitment faster.

Typical lease to own programs are structured based on 100% of the equipment value at a low interest rate over a 60 month term. At the end of the term, there is a \$1.00 buyout to own the equipment outright.

To see if a capital leasing option is feasible, visit [www.HexMet.us/financing](http://www.HexMet.us/financing).



# Justifying your DCC CMM - Worksheet

Use our online calculator at [www.HexMet.us/estimate](http://www.HexMet.us/estimate) or fill out the worksheet below to estimate your payback.

## Reduced Inspection Time Savings

$$\boxed{\phantom{000}} \times \boxed{\phantom{000}} \times \boxed{\phantom{000}} = \boxed{\phantom{000}} \times \boxed{30\%} = \boxed{\phantom{000}}$$

Hours to Inspect Part in Process      Internal Labor Rate per Hour      Parts per Month      Cost to Inspect Parts in Process      Estimated Increased Efficiency per Month      Labor Savings with DCC CMM per Month

$$\boxed{\phantom{000}} \times \boxed{\phantom{000}} \times \boxed{\phantom{000}} = \boxed{\phantom{000}} \times \boxed{30\%} = \boxed{\phantom{000}}$$

Hours to Final Inspect Part      Internal Labor Rate per Hour      Parts per Month      Cost to Final Inspect Parts      Estimated Increased Efficiency per Month      Labor Savings with DCC CMM per Month

## Reduced Production Machine Downtime

$$\boxed{\phantom{000}} \times \boxed{\phantom{000}} \times \boxed{\phantom{000}} = \boxed{\phantom{000}} \times \boxed{30\%} = \boxed{\phantom{000}}$$

Idle Hours due to First Article Inspection      Internal Labor Rate per Hour      Parts per Month      Cost of Idle Labor per Month      Estimated Reduction in Idle Labor per Month      Labor Savings with DCC CMM per Month

$$\boxed{\phantom{000}} \times \boxed{\phantom{000}} \times \boxed{\phantom{000}} = \boxed{\phantom{000}} \times \boxed{30\%} = \boxed{\phantom{000}}$$

CNC Idle Hours due to First Article Inspection      CNC Machine Cost per Hour      Parts per Month      Cost of CNC Idle Time per Month      Estimated Reduction in Machine Idle Time per Month      Production CNC Machine Efficiency Savings per Month

## Reduced Scrap and Rework

$$\boxed{\phantom{000}} \times \boxed{35\%} = \boxed{\phantom{000}}$$

Cost of Monthly Scrap      Estimated Reduction in Scrap Rate      Savings by Reducing Scrap with DCC CMM

$$\boxed{\phantom{000}} \times \boxed{40\%} = \boxed{\phantom{000}}$$

Cost of Monthly Rework      Estimated Reduction in Rework Rate      Savings by Reducing Rework with DCC CMM

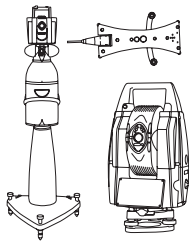
# \$

Total Savings per month  
(Add all BLUE boxes together)

## Payback Period

$$\boxed{\phantom{000}} / \boxed{\phantom{000}} = \boxed{\phantom{000}}$$

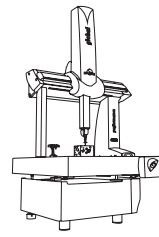
Cost of DCC CMM      Total Savings per Month      Payback in Months



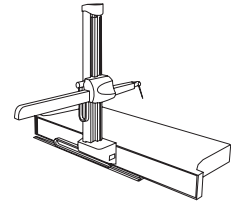
Laser Trackers & Stations



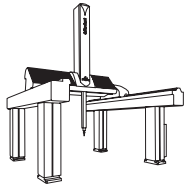
Portable Measuring Arms



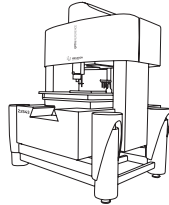
Bridge CMMs



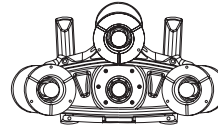
Horizontal Arm CMMs



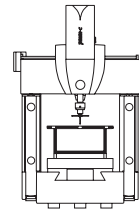
Gantry CMMs



Multisensor & Optical Systems



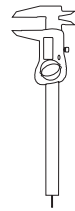
White Light Solutions



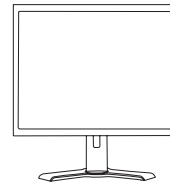
Ultra High Accuracy CMMs



Sensors



Precision Measuring Instruments



Software Solutions



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