DTect-IT Maintains Part Accuracy with Very Tight Tolerances

RESULTS – INSTALL 9209

CHALLENGE

The customer was robot loading long cylindrical parts into a rotary table collet on a vertical mill. They had a very tight tolerance to hold, so the position of the part in the collet was critical. The robot was not able to hold the position close enough (+/- 0.0003" tolerance) so they were looking for a way to measure the part after it was clamped in the collet.

The cycle time was very short, so probing was ruled out. They had the idea of using a Keyence Digital Contact Sensor to measure the deviation from nominal and adjust the cutting program.

TECHNOLOGY

D/Tect-IT

Keyence Contact Sensor

SOLUTION

Caron Engineering's sensor and software monitoring suite (DTect-IT) has an analog sensor option to easily connect and monitor any sensor with a 4-20ma signal, and up to four sensors can connect to a single analog module.

The customer implemented DTect-IT to read the analog output of the Keyence Digital Contact Sensor mounted in the machine. With the analog module, the 4-20ma signal from the sensor can be converted to distance in inches or millimeters. Using the displacement unit conversion, this scale can be displayed on the DTect-IT analysis screen.

RESULTS

- *Improved part quality and consistency*
- *The overall part accuracy is within the 0.0003" tolerance*
- *No additional cycle time was added using this in-process measuring*
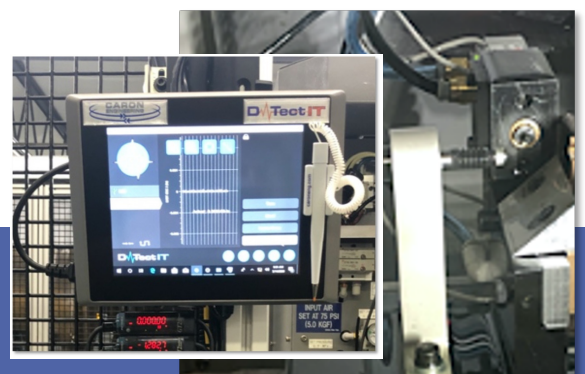
INDUSTRY

Medical

MACHINE TYPE

Small VMC

TOOLING

Standard

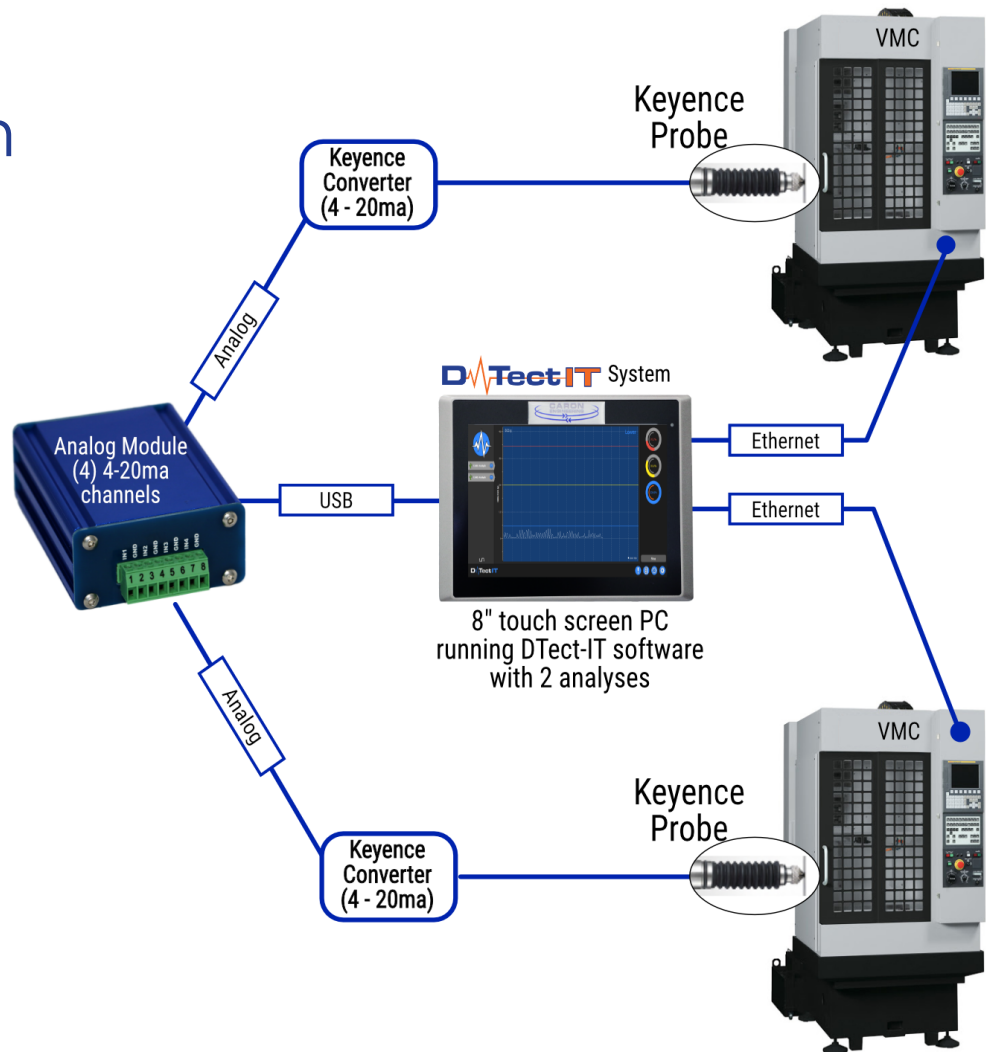DTect-IT monitoring the displacement of the Keyence Digital Contact Sensor

SMART MANUFACTURING SOLUTIONS

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DTect IT can communicate to multiple CNC controls simultaneously, and separate analyses can be created for each CNC. A single DTect IT with one analog module can communicate with up to four machines.

This allowed the customer to set up a limit analysis with DTect-IT for each sensor to identify parameters for deviation and communicate the results to the respective CNC control. This deviation is used to adjust the program position. If deviation limits are exceeded or not reached, DTect-IT will automatically set an alarm in a variable in the machine to signify the alarm condition. This required no operator intervention after setup.

System Setup

Keyence Converter (4 - 20ma)

Keyence Probe

VMC

Analog

D Tect IT System

Analog Module (4) 4-20ma channels

USB

Ethernet

Ethernet

8" touch screen PC running DTect-IT software with 2 analyses

Analog

Keyence Converter (4 - 20ma)

Keyence Probe

VMC

The program flow is as follows:

1.) The robot loads a new part in the collet of the rotary table
2.) The machine program confirms load complete and closes the collet
3.) The machine sets variable to start DTect IT analysis
4.) DTect-IT updates a variable with the current part displacement
5.) The program is adjusted by the value in the variable
6.) DTect IT analysis is stopped
7.) Part is machined

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