



# HEIDENHAIN



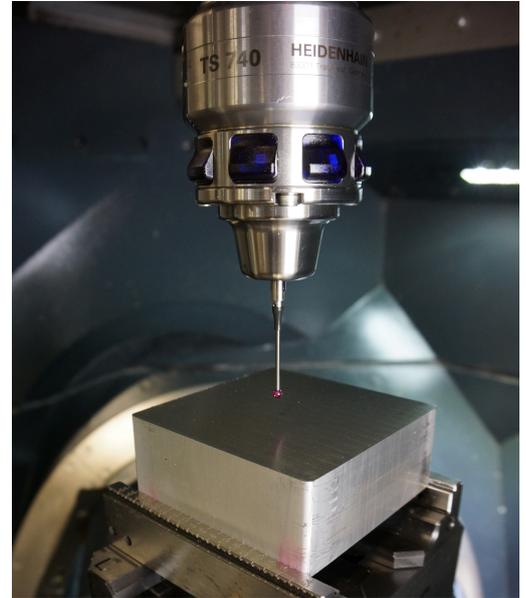
## NC Solutions

Description of NC Program 8210

English (en)  
02/2020

## 1 Description of NC program 8210\_en.h

NC program for setting the Z preset at the largest measured Z coordinate.



### Requirement

The requirement was to automatically measure the Z coordinate at multiple positions on an unmachined surface and subsequently, to automatically set the preset at the largest measured Z coordinate.

### Solution

The requirement was met with a table. In this table, define the X/Y coordinates where the control measures the Z coordinate. The control saves all coordinates of the largest measured Z coordinate in a parameter. When all of the positions have been measured, the control sets the Z preset at the position of the largest measured Z coordinate.

### NC program 8210\_en.h

At first, define the required parameters in the NC program. Then the control calls the 3-D touch probe. Subsequently, the control moves the touch probe to a safe position in the Z axis.

In the next program step, the control calculates the number of repetitions for a later program section repeat. Then it saves the smallest possible numerical value in the parameter QL42. Later, the control always saves the largest measured Z coordinate in QL42. In order to ensure that the control measures a larger value, the parameter is pre-assigned a minimum value.

Subsequently, the control uses the FN26 command to open the table in which the X/Y coordinates for the measurement are saved.



If the table is not saved in the same directory as the NC program, you need to adapt the path in the FN26 function.

Then the beginning of the program section repeat is defined.

In the first step of the repetition, the control reads out the X/Y coordinates from the first row of the table. Then it moves to these coordinates. Then the control measures the Z coordinate at the position with Cycle 427.

After measuring, the control checks whether the measured value in parameter Q160 is larger than the value previously saved in the parameter QL42.

- If the measured value is not larger, the NC program continues.
- If the measured value is larger than the value saved in parameter QL42, the control jumps into a subprogram. In this subprogram, it saves the X coordinate and the Y coordinate of the last measuring position in parameters QL40 and QL41. In QL42, the control saves the current measuring result in the Z axis. Then it jumps back into the program section repeat.

In the next step of the repetition, the control increments the value of the table row to be read out by one. Subsequently, the jump to the beginning of the repetition is defined. The control executes this jump until the defined number of measuring points is read out, and the Z coordinate is measured and has been compared to the value in QL42.

After the end of the program section repeat, the coordinates of the largest measured Z coordinate are saved in parameters QL40 to QL42. The control positions the touch probe to these coordinates in the X/Y plane. Then it executes Cycle 417. With this cycle, the control sets the preset in the touch probe axis. The control activates the newly set preset with Cycle 247. Then it retracts the touch probe and ends the NC program.

Parameter	Name	Meaning
QL1	NUMBER OF MEASURING POINTS	Number of positions that are moved to and measured
QL2	STARTING POINT FOR MEASUREMENT	Z coordinate at which the measuring cycle begins
QL3	Z PRESET TO BE SET AT THE DEEPEST POSITION	Value for the preset which the control sets at the smallest measured Z coordinate
QL4	SET-UP CLEARANCE	Clearance at which the control pre-positions the touch probe above the starting position
QL5	FIRST ROW OF THE TABLE TO BE READ OUT FROM	Number of the first table row from which the control reads out the X/Y coordinates

#### Table 82101\_en.tab

The freely defined table contains the X/Y coordinates of the positions at which the control measures the Z coordinate. The table consists of the two columns X and Y. It must consist of at least as many rows as the number of measuring points you defined in the NC program.