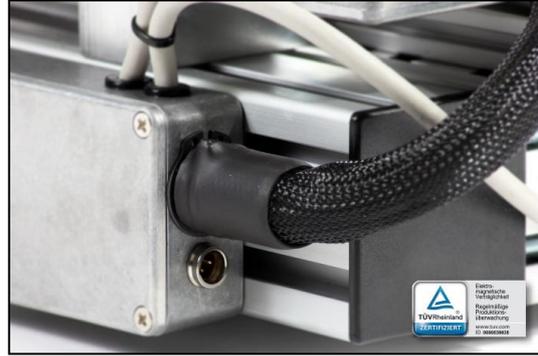


## Tool Length Sensor Instructions (3-pin Version)

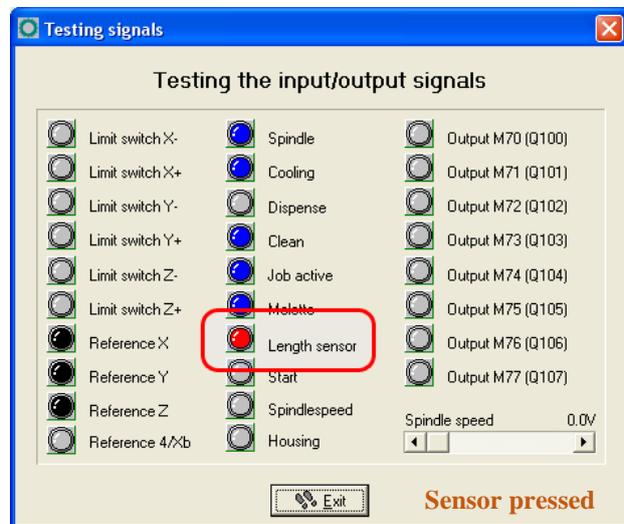
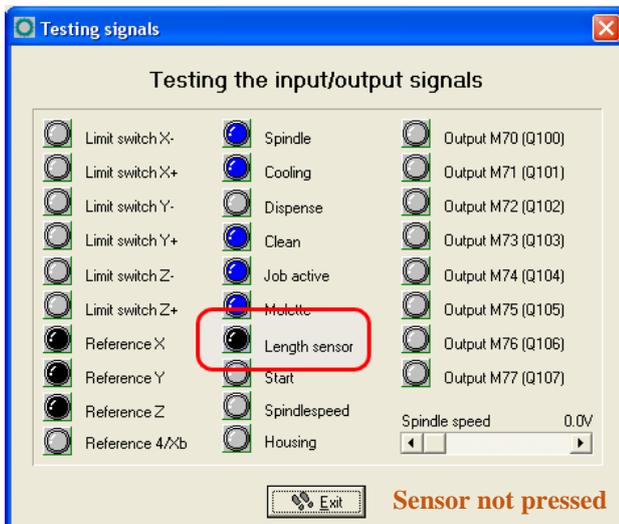
### 1) Testing the Sensor

Start WinPC-NC and switch the controller unit on.

Connect the tool length sensor into the 3-pin connector down near the motor at the far end of the machine's x-axis.

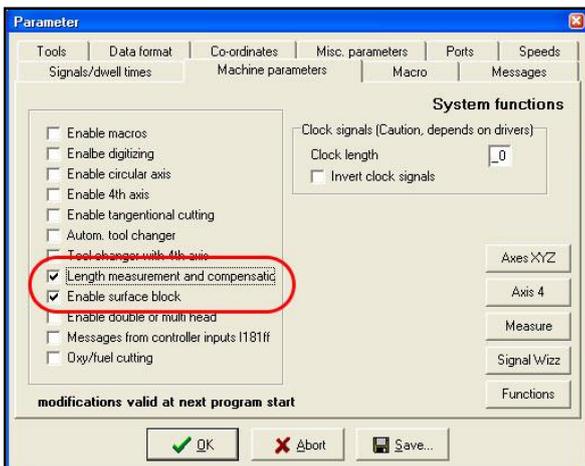


To verify that the sensor is configured correctly, go to the WinPC-NC 'Special Functions > Signal Test' menu and confirm that the 'Length sensor' indicator shows as black when the sensor is not pressed but turns red when the sensor is pressed down (see screen shots below).



If the opposite to this happens, i.e. it is normally showing as red but turns black when depressed, then you need to change the configuration setting for the sensor via the WinPC-NC parameters. To do this you need to go to 'Parameters > Machine Parameters > Signals' menu and on the left hand side under the Inputs column, scroll up/down the pinout options for Pinning Setting 'I221 Surface Sensor' and select the 'LPT1 Pin15' entry. On the drop down change 'LPT1 Pin 15' to 'LPT1 Pin 15 inv' or vice-versa and then click on the 'Accept' button to update this change. Save the parameters and exit. Go back to the 'Special Function > Signal Test' menu and verify that the length sensor indicator now toggles from black to red when pressed. Do not proceed until you have verified the above behaviour.

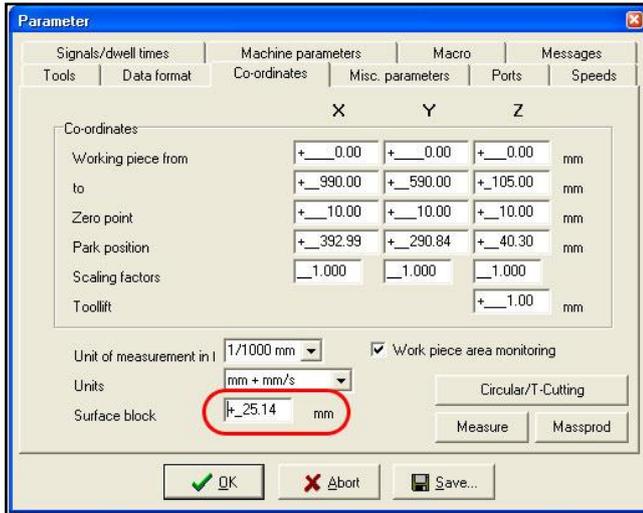
### 2) Enabling the tool length and surface block functions



- Go to menu 'Parameter > Machine Parameter > Functions'.
- Tick the 'Length measurement and compensation' option.
  - Tick the 'Enable surface block' option.
  - Save parameters and ok to exit. Close and re-start WinPC-NC.

### 3) Entering the sensor activation height

Each sensor will have a different sensor activation height. The sensors we now supply have this value already measured and supplied with the sensor, saving you from having to do the sensor height measurement (step 6).



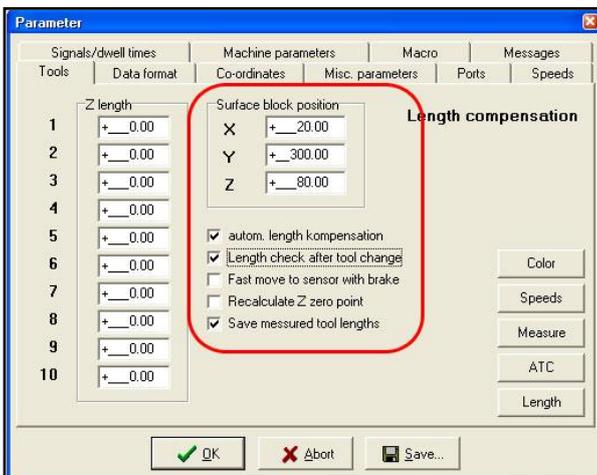
To enter this sensor activation height value, navigate to the 'Parameters > Co-ordinates' menu and enter in the height value into the 'Surface block' entry. Then save and exit and you're ready to go.

### 4) Using the Sensor after a tool change (recommended approach)

- Change the tool in your Kress and jog over some flat section of your workpiece material (note: it should be an area that is still present after the current toolpath completes, enabling the next measurement to be made for the next tool).
- Place the sensor body underneath the tool tip, leaving 5-10 mm below the tool tip, with the tip centred over the sensor button.
- Select the 'Move to > Block - zero point Z' menu option via the jog control. The tool tip will now start slow jogging down until the sensor is pressed. The tool will then lift back up and the new Z zero height for the fitted tool will automatically be calculated in WinPC-NC.
- You can now continue the job.

Note: If you have the drop down 'Parameters > Misc. Parameters > Change Tools' set to 'Yes', the job will pause at a tool change in your G-Code. Click on the small manual jog icon from this prompt to bring up the jog control and do the above steps.

### 5) Using the sensor for automatic tool change (only if you have an auto-tool change system)



If you want to automate the measurement of the tool during a tool change, you can define the surface block position where the tool length measurement will take place via the 'Parameters > Tools > Length' menu. Jog over where the sensor will be positioned. Enter the X, Y and Z coordinates, with Z about 10mm above the centre of the button. Also tick the 'automatic length compensation', 'length check after tool change' and the 'save measured tool lengths' and then save and exit. Now, when you confirm the tool change (via the on screen prompt during a job) the tool measurement will automatically commence, with the tool going over to the sensor position, initiating the measurement procedure, and then continuing with the job.

## 6) Calibrating the activation Height of the sensor

Note that this step is not required for your sensor if you received the height value parameter with it. You only need to do this if you don't already know the activation height, or if you wish to re-calibrate it.

- Reference the machine and then jog out to a comfortable position and fit a tool if necessary. The best type of tool here is one with a pointed tip that is easy for you to accurately see when it touches the surface.
- Via the jog control, move the tool down to just touch the surface of your table or some sheet of material that is clamped flat onto the table presenting a similarly flat surface. Record the Machine co-ordinate for Z of this position, to 2 decimal places. For example Z = 66.02.
- Jog up in Z so you can place the sensor underneath the tool tip and the tool tip is about 10mm above the sensor, and place the sensor with the button centred beneath the tool tip. Record the co-ordinate for X, Y and Z of this position, to nearest mm. For example X =107, Y =80, Z = 35.
- Exit the jog control and go to 'Parameters > Tools > Length' menu and enter in the co-ordinates from the previous step into the 'Surface Block' entries e.g. X =107, Y =80, Z = 35.
- Go to 'Move > Select Tool' menu and click on the '1' button in the Length column. This will start the tool length measurement procedure. The tool will first lift up to machine Z 0.00 and then down again to the surface block position we have just defined. It then starts travelling down in a slow jog until it presses the sensor button. Whilst this is happening you will see a message on the screen indicating that the length measurement is in progress. Once the button press is sensed, it stops and lifts up again. When it is finished click ok to close the Select Tool dialogue.
- Now go to 'Parameters > Tools > Length' menu again and you'll now see that in the Z Length list on the left hand side that there is a recorded tool length for Tool 1. Write this Z value down, recording to 2 decimal places. For example 41.23.
- Now take the recorded Z values away from each other. e.g.  $66.02 - 41.23 = 24.79$ . This value 24.79 is the sensor activation height.
- Change over to the 'Parameters > Co-ordinates' menu and enter in the sensor height into the 'Surface block' entry, e.g. 24.79.
- The system is now set up for using the surface block. The surface block height, 24.79mm, will automatically be added to Z axis offsets when you measure tools with the length sensor using the 'Block - zero point Z' function via the jog control.