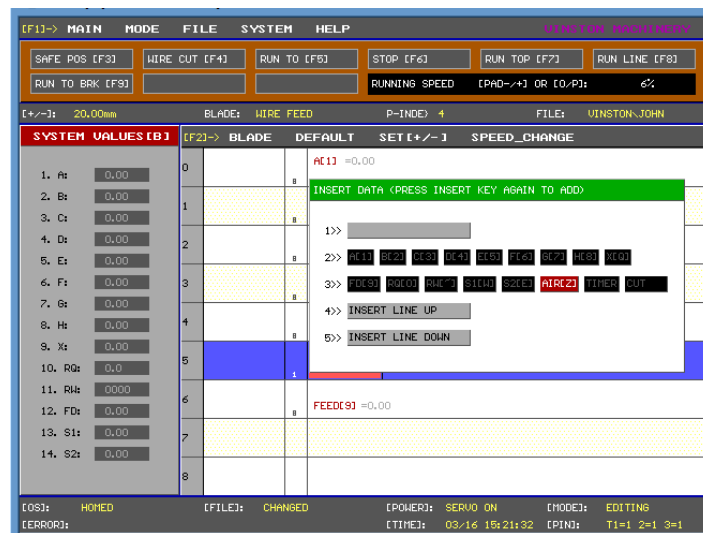


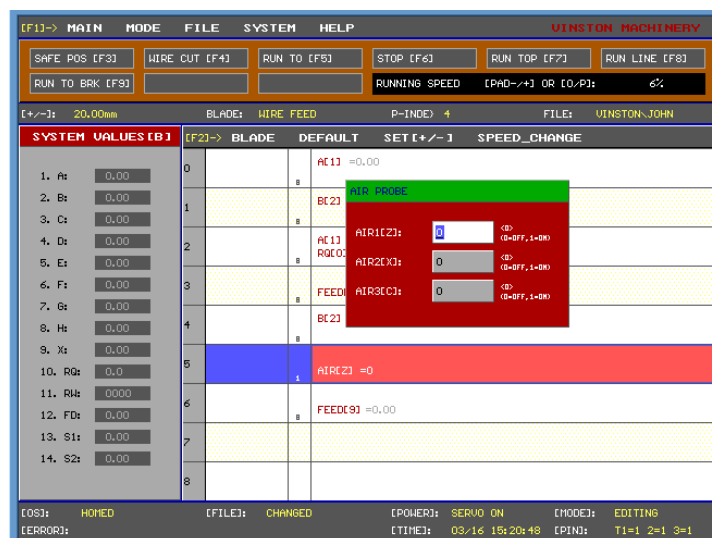
## 13. USE OF PNEUMATIC CONTROLS, PROBE AND TIMER

### 13.1 PNEUMATICS CONTROLS

To insert a pneumatic control into a row, highlight a program line and press the INSERT key. The INSERT DATA prompt will appear:



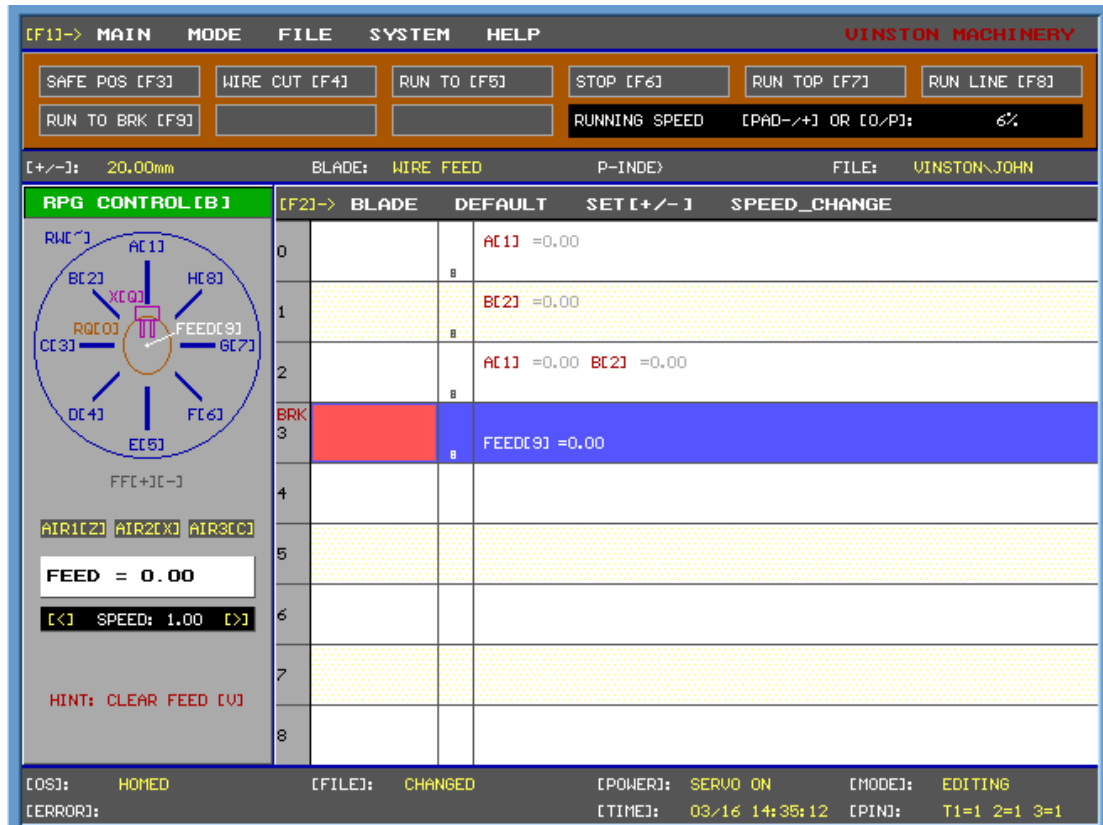
Highlight the AIR [Z] selection and press the INSERT key. With the Air [Z] component highlighted within the program line, press the ENTER key to configure the pneumatic probe:



The pneumatic probe is enabled with a value of 1 and disabled with a value of 0. Whenever a pneumatic probe is enabled, it must be manually disabled within the program at a later point. It will not automatically retract after completing the designated task.

## 13.2 MANUAL PNEUMATIC CONTROLS

The pneumatic cylinder can also be manually controlled directly from the main program interface.



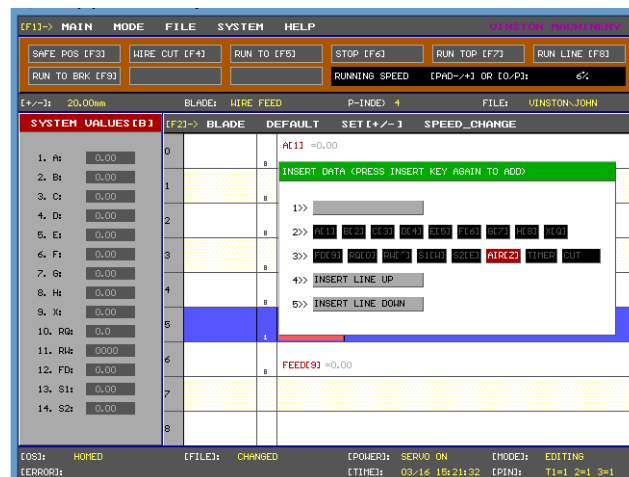
Using the three shortcut keys "Z", "X", "C" allows the user to manually turn the pneumatic cylinders on and off. Pressing each shortcut key once will change the current value from a 1 (Enabled) to a 0 (Disabled) or vice versa. This function is useful in the early stages of developing the program or to test the connections.

## 13.2 PROBES

The probe is used to produce parts with smaller tolerance levels. The probe stops the wire feed at a position designated by the operator. The program allows the operator to decide whether to stop or to continue the program if the probe does not come into contact with the wire. There are two types of probes that can be implemented:

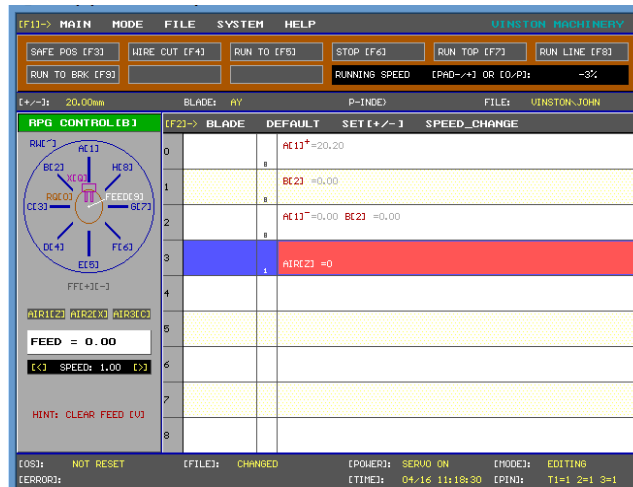
- Contact (wire) probe mounted on a pneumatic cylinder
- Laser Probe

The contact probes are used in conjunction with the pneumatic cylinders. The contact probe is brought into position by the pneumatic controls. The wire is fed at a reduced speed until it comes into contact with the sensor. At this point the program stops the wire feed and the pneumatic cylinder needs to be manually retracted along with the contact probe. The program then proceeds to the proceeding steps. To implement these steps, the operator can create a new programming line or use an existing program line. **Note: In order to use an existing program line, only the rotary wire or wire feed should be present on that program line. Otherwise, the AIR [Z] option will be disabled when the user tries to insert that component.**

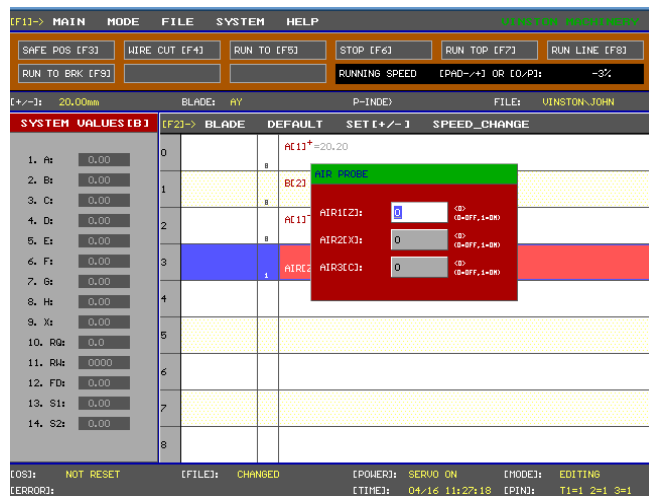


Select the AIR [Z] axis and press the Insert key.

Highlight the row with the pneumatic AIR [Z] = 0 that was just inserted.

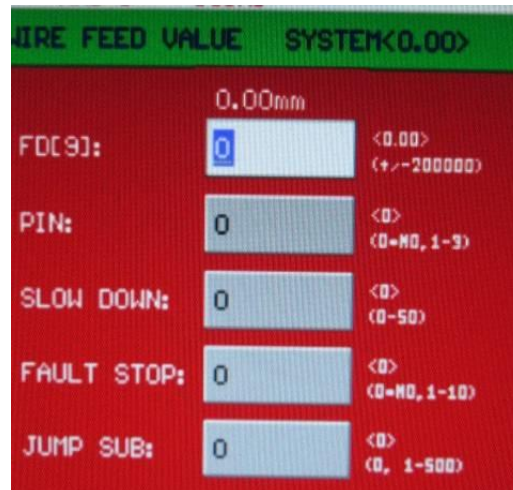


Press the ENTER key to bring up the selection window of the pneumatic cylinders.



Set the value of the pneumatic cylinder in use to a value of 1.

On the following program line, insert the wire feed (FD) axis. Highlight the wire feed and press the ENTER key to configure its movement. **Note: The rotary wire (RW) can be used as well to dictate the probe component.**



The first row, FD[9], allows the user to set the feed length of the wire before the probe comes into contact with the wire. The software will stop the wire feed once contact is made with the contact probe. If the wire does not come into contact with the probe, then the program can be configured to either move on to the next program line or stop and/or jump to a different section of the program.

The second row, PIN, designates which sensor to utilize. The machine comes with 3 sensors by default so the values 1-3 corresponds to each contact sensor. The default value of 0 indicates no sensors are utilized.

The third row indicates a SLOW DOWN process that sets the speed of the wire feed as it approaches the contact probe. The value range is from 0 to 50, where the smaller the value, the greater the speed of the wire feed and vice versa. This option facilitates higher accuracy by minimizing vibrations from higher speed movements.

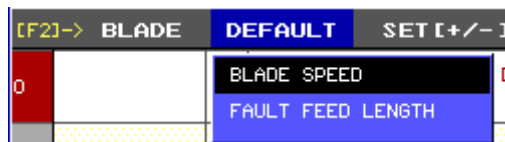
The fourth row designates the FAULT STOP value. The user can designate the tolerance should the wire never make contact with the probe. The options are as follows:

- 0: This will not stop the machine and the proceeding program line is executed. This will result in nonconforming springs and should only be used tolerance is not a crucial factor.

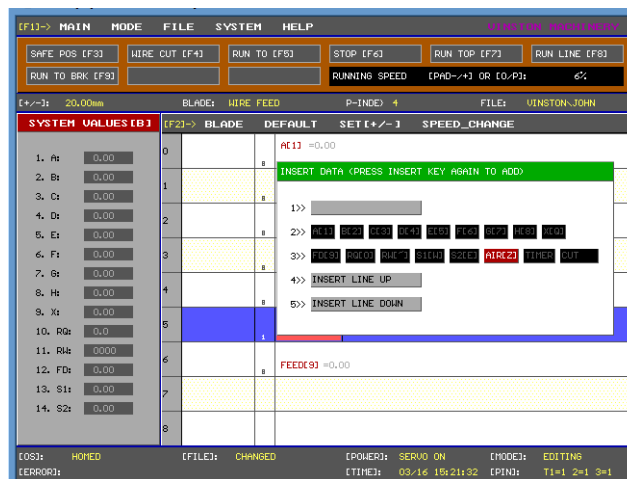
- Values from 1 to 10: The machine will stop production depending on how many times the wire does not come into contact with the probe sensor. For example, for a value of 5, the machine will stop production on the 5<sup>th</sup> failed attempt.

The fifth row, JUMP SUB, is the conditional jump to another row within the program. The typical use of this function is to jump to the wire cutting portion of the program. **However, the user must take caution when performing the jump as other slides may be in the way when the program tries to cut the wire.**

The program also contains a default feed length value when a FAULT STOP is triggered. The FAULT FEED LENGTH (Access with the F2 function) will designate a predefined wire feed length when the FAULT STOP value is reached.



Should the wire successfully make contact with the probe sensor, the pneumatic probe needs to be retracted. Create a new program line to retract the pneumatic probe.



Select the AIR [Z] component and press the INSERT key. Set the AIR [Z] value back to 0 to retract the pneumatic probe.

If the machine comes with a laser sensor instead, the pneumatic cylinder will not be utilized. Insert a new line and add the wire feed (FD) component. Highlight the FD [9] component and press the ENTER key to bring up the following window. **Note: Each laser sensor replaces an existing probe sensor. (E.g. the first laser sensor would replace probe sensor #1) If two laser sensors are utilized, only probe sensor # 3 will be operational.**

Parameter	Value	Range
FD[9]:	0	<0.00> (+/-200000)
PIN:	0	<0> (0=NO, 1-3)
SLOW DOWN:	0	<0> (0-50)
FAULT STOP:	0	<0> (0=NO, 1-10)
JUMP SUB:	0	<0> (0, 1-500)

The values are designated in the same manner as the preceding section regarding pneumatic cylinder controls.

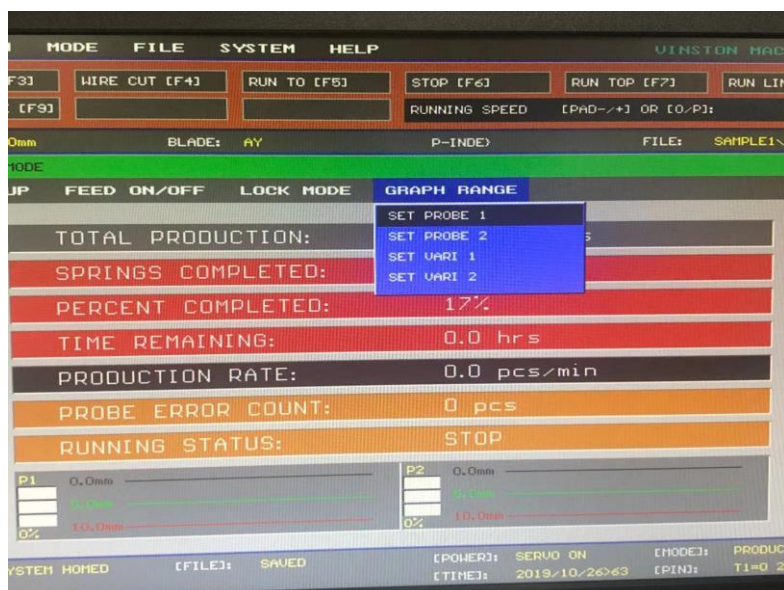
### 13.3 PROBE GRAPH SETUP

- Probe setup (How to designate your Probe under production Mode)
- VARI setup (How to locate the Vari set up under production Mode)

The Probe is easy to designate. Enabling the probe graph will allow the user to designate a percentage tolerance on the probe touch during wire feeds or wire rotations. Select F1 on your keyboard and shift right with the arrow keys over to MODE, then select production mode. Or you can press the shortcut key “]” instead.



Press F2 on your keyboard and use the right arrow key to scroll over to Graph Range. Select SET PROBE 1.





Press ENTER to bring up the selection window of the default feed\_value of probe #1. This value should be equal to or greater than the feed value in the probe designation.



A feed value of 10 mm is the ideal distance for touch probes.

Press F2 on your keyboard and use the right arrow key to scroll over to Graph Range. After you open Graph Range scroll down to [Set Vari 1].



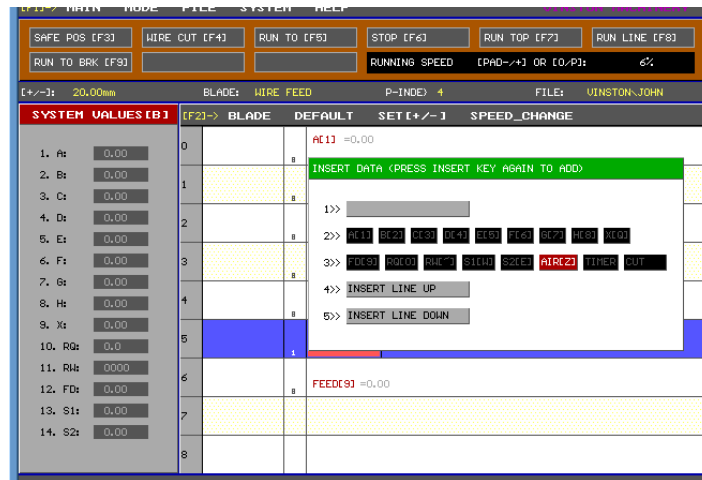
Press ENTER to bring up the selection window of the value for the variation tolerance of touch probe 1. The set value is 30%, meaning the feed variation can be +/- 30% of the default 10 mm feed.

Repeat this section for Probe #2 and it's acceptable variation.

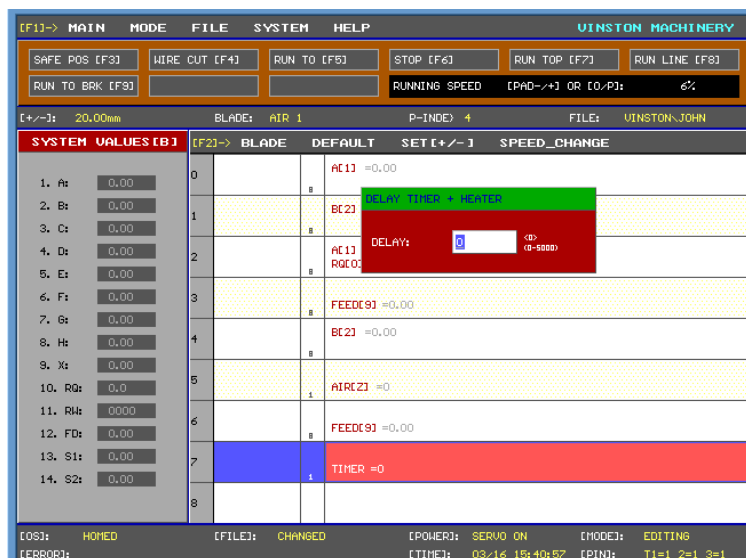


## 13.4 TIMERS

The program has a stop timer option. Highlight the program line where the user would like to insert a stop timer option. Press the INSERT key to bring up the following screen



Select the item TIMER (V) option and press the INSERT key again. Highlight the TIMER component to bring up the follow option. The user can set a value from 0 to 5000, with each unit representing one millisecond. The maximum value is 5 (5000) seconds.



Press ENTER key to confirm changes. This feature is typically used to stabilize the spring as movements up to this point created unwanted vibrations.