

Automation Tester



For UCP1 Systems (VLS Desktop, VLS Platform, PLS & ILS)

Automation Tester

The purpose of this document is to give the user an overview of how the automation tester works along with a brief explanation of the ULS automation hardware and software functions.

PNP/NPN Switch

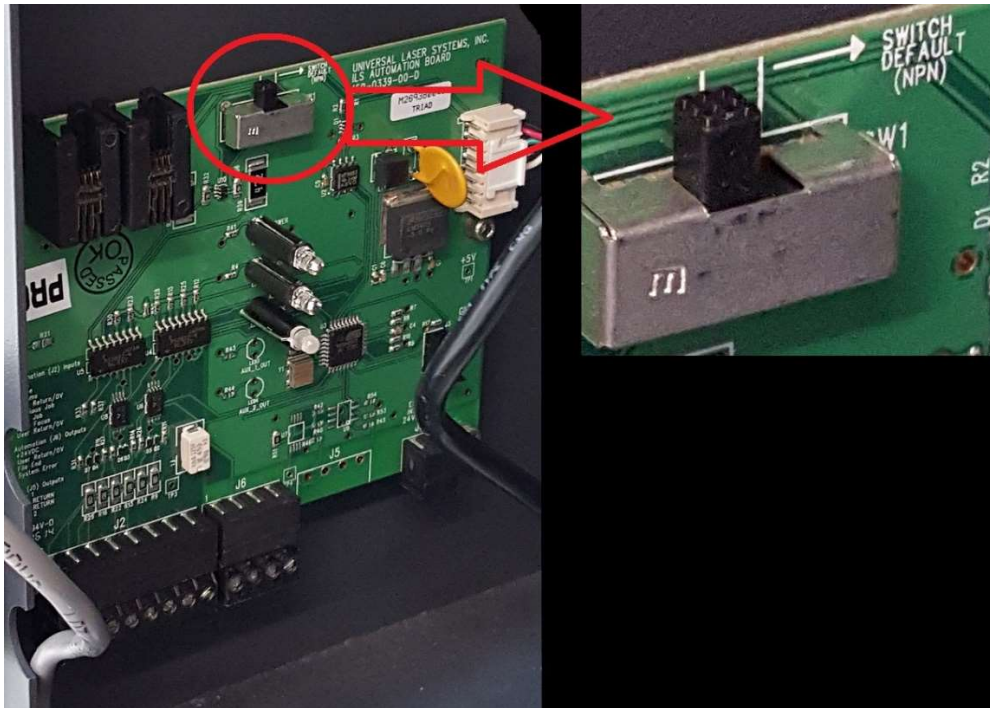
It is very important that the PNP/NPN switch on the ULS automation box (VLS PLS) and ULS Automation PCB (ILS) be set to "PNP." Failure to set the switch to "PNP" do so may damage both the automation tester and the ULS automation box / PCB. The automation tester is setup to work only with PNP mode of operation. This only affects the two output functions of the setup – input functions are not affected by the switch position.

PNP (Source) Mode – The automation tester supplies the necessary +5VDC to power the outputs through J6-1.

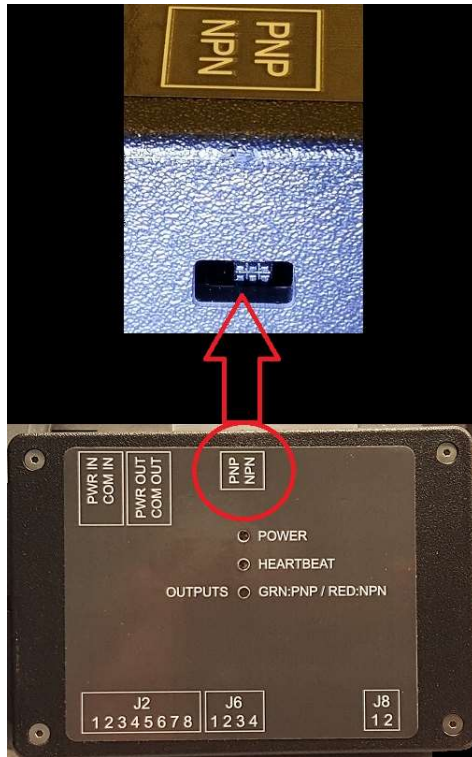
NPN (Sink) Mode – Power would have to be supplied into the actual output ports (J6-3 & J6-4). If this is done incorrectly (ie not putting resistors to limit the current to 25mA max, it will damage the output ports on the automation box / PCB).

PNP (Source) is the preferred method as the current limiting is already built in to the automation tester.

The images below show the location of the PNP/NPN switch on the automation PCB & automation box.



Location of the NPN/PNP Switch on the ILS Automation PCB. Ensure that the switch is set to the left which is PNP (the default setting is NPN which can cause damage to the tester or automation board if the switch is not set to PNP).



Location of the NPN/PNP Switch on the VLS PLS Automation Box. Ensure that the switch is set to the left which is PNP (the default setting is NPN which can cause damage to the tester or automation box if the switch is not set to PNP).

Proper Connection of the Automation Tester to the Automation Box (VLS PLS) / Automation PCB (ILS)

Ensure that the engraver is turned completely off when connecting or disconnecting cables and connectors – failure to do so may damage the automation box / PCB and the automation tester.

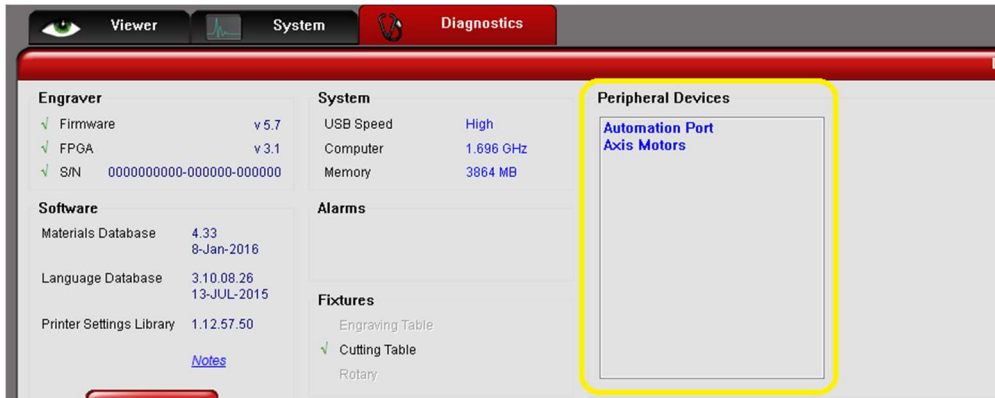
VLS / PLS – When using the ULS automation box, connect the 8 pin green connector from the automation tester cable to J2 of the automation box. Connect the 4 pin green connector from the automation tester cable to J6 of the automation box.

VLS Platform & VLS Desktop – Connect the RJ11 (telco) cable between the PWR IN / COM IN port on the ULS automation box and one of the RJ11 jacks on the VLS engraver (near the CPU).

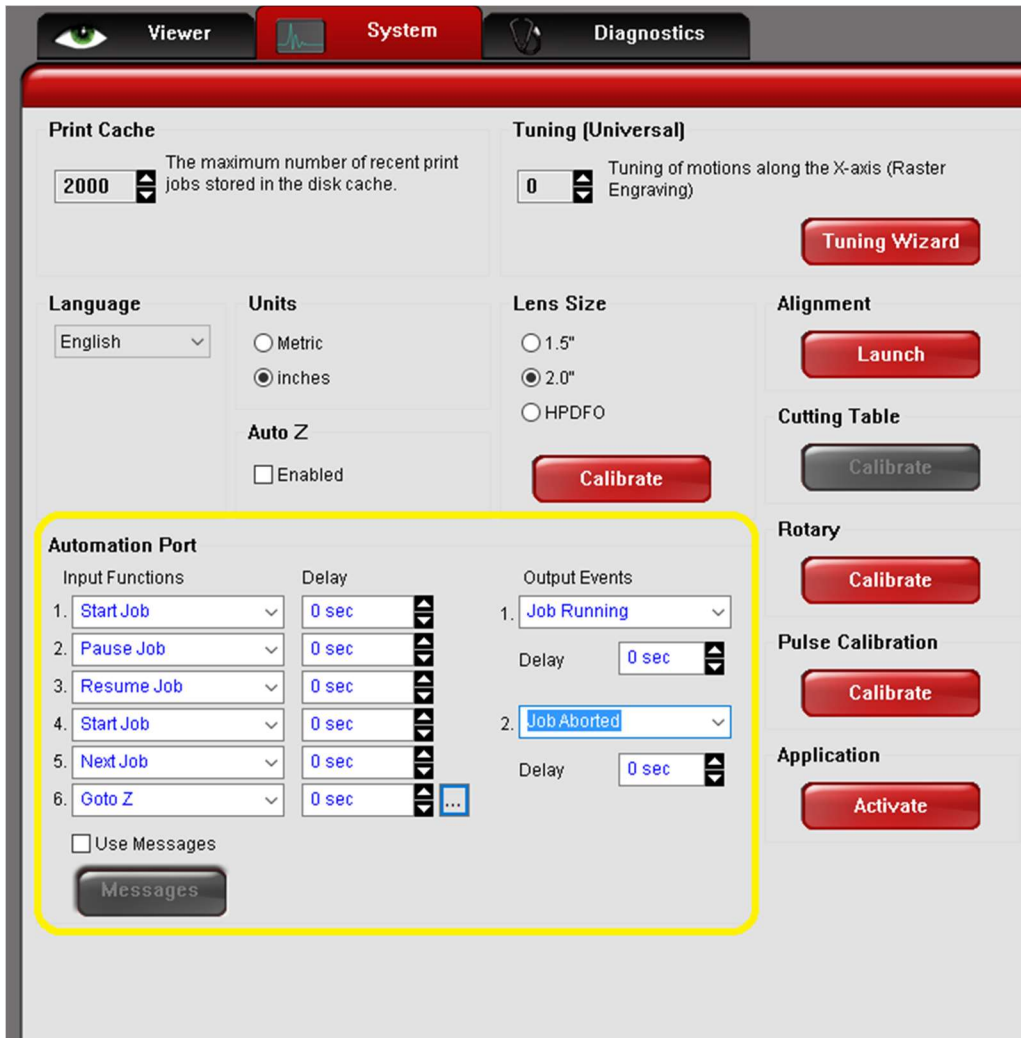
PLS – Connect the cable between the RJ11 (telco) PWR IN / COM IN port on the ULS automation box and the Conxall (round 4 pin) connector on the bottom rear of the PLS. **Older model PLS engravers do not have the Conxall connector installed unless they have computer controlled air assist (in which case you have to use the CCAC connector and will be unable to use computer controlled air while using the automation box). Newer PLS models have a dedicated Conxall connector for usage with automation. (Newer model PLS engravers with CCAC also have a second dedicated Conxall connector for usage with computer controlled air.)**

ILS – Connect the 8 pin green connector from the automation tester cable to J2 of the automation PCB. Connect the 4 pin green connector from the automation tester cable to J6 of the automation PCB.

After all of the connections are securely made, start the UCP software on the computer and turn on the engraver. Once the engraver is fully booted up, you should be able to see “automation port” displayed in the list of peripherals on the UCP diagnostics tab:



On the systems tab of the UCP you should now see the automation port section available:



Note: There are six inputs functions and two output events available.

Available Input & Output Functions

Input Functions

Input Functions	Delay
1. Start Job	0 sec
2. Disabled	0 sec
3. Start Job	0 sec
4. Pause Job	0 sec
5. Resume Job	0 sec
6. Previous Job	0 sec
Next Job	0 sec
Autofocus	0 sec
Goto Z	0 sec
Message	0 sec
Quit Application	0 sec

Messages

There are six input functions available. Each of which can be programmed in one of ten settings:

Disabled – the input function is disabled

Start Job – starts the current job

Pause Job – pauses the current job

Resume Job – resumes the current job

Previous Job – selects the previous job in the UCP queue

Next Job – selects the next job in the UCP queue

Autofocus – on the ILS & PLS initiates autofocus. Autofocus is not available with either VLS model.

Goto Z – will move the Z to a specified position. Discussed in more detail below

Message – will cause a user defined message to appear. Discussed in more detail below

Quit Application – terminates the UCP

Output Functions

Output Events	Delay
1. Job Running	0 sec
2. Job Running	
Disabled	
Job Complete	
Job Aborted	
Job Running	
Processing Request	

There are two output events available. Each of which can be programmed in one of five settings:

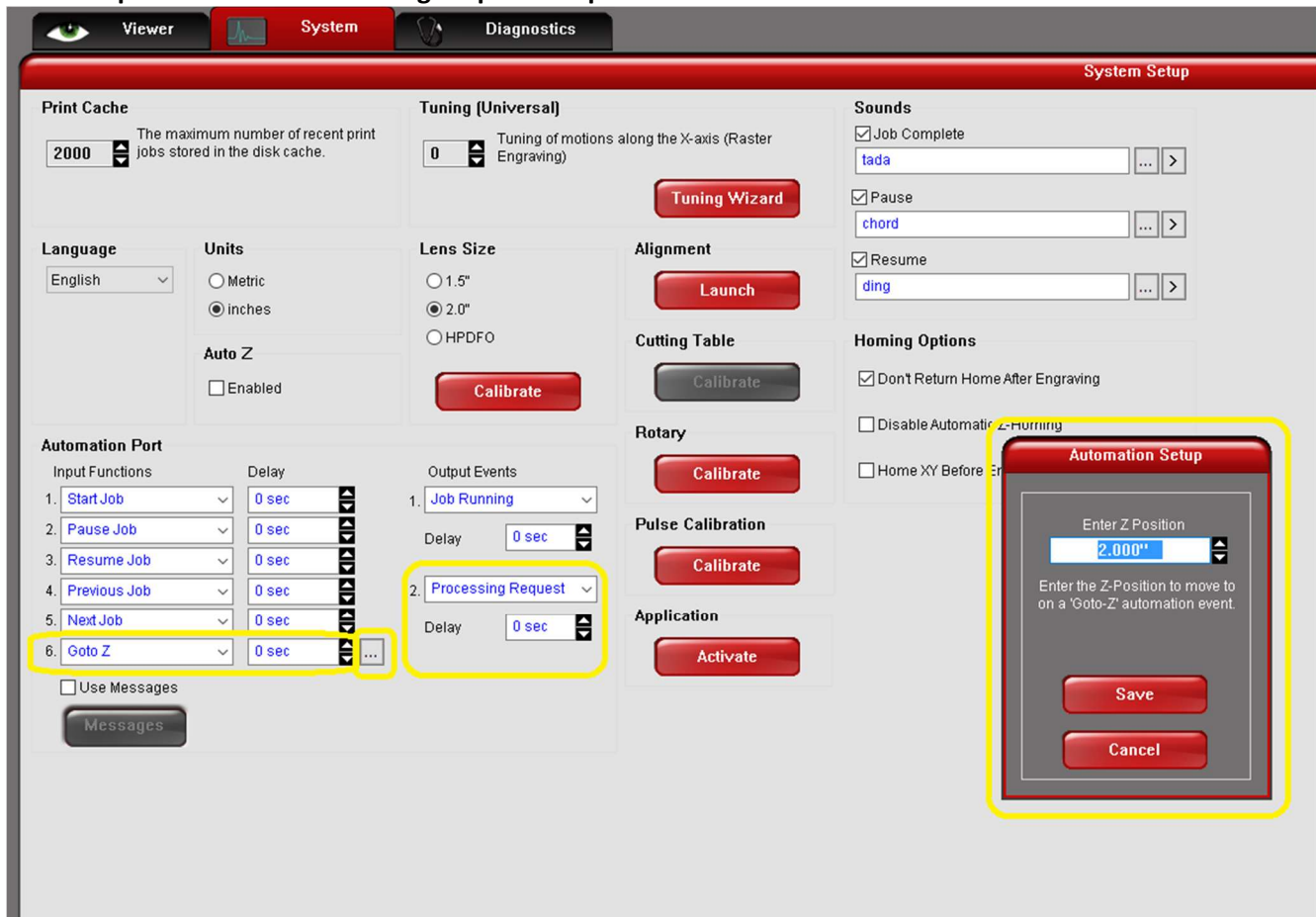
Disabled – the output event is disabled

Job Complete – the output channel LED will light on the automation tester when the job is completed

Job Aborted – the output channel LED will light on the automation tester when the job is paused

Job Running – the output channel LED will light on the automation tester while the job is running
 Processing Request – the output channel LED will light on the automation tester when a Goto Z input function is in operation. Discussed in more detail below.

Goto Z Input Function & Processing Request Output Function



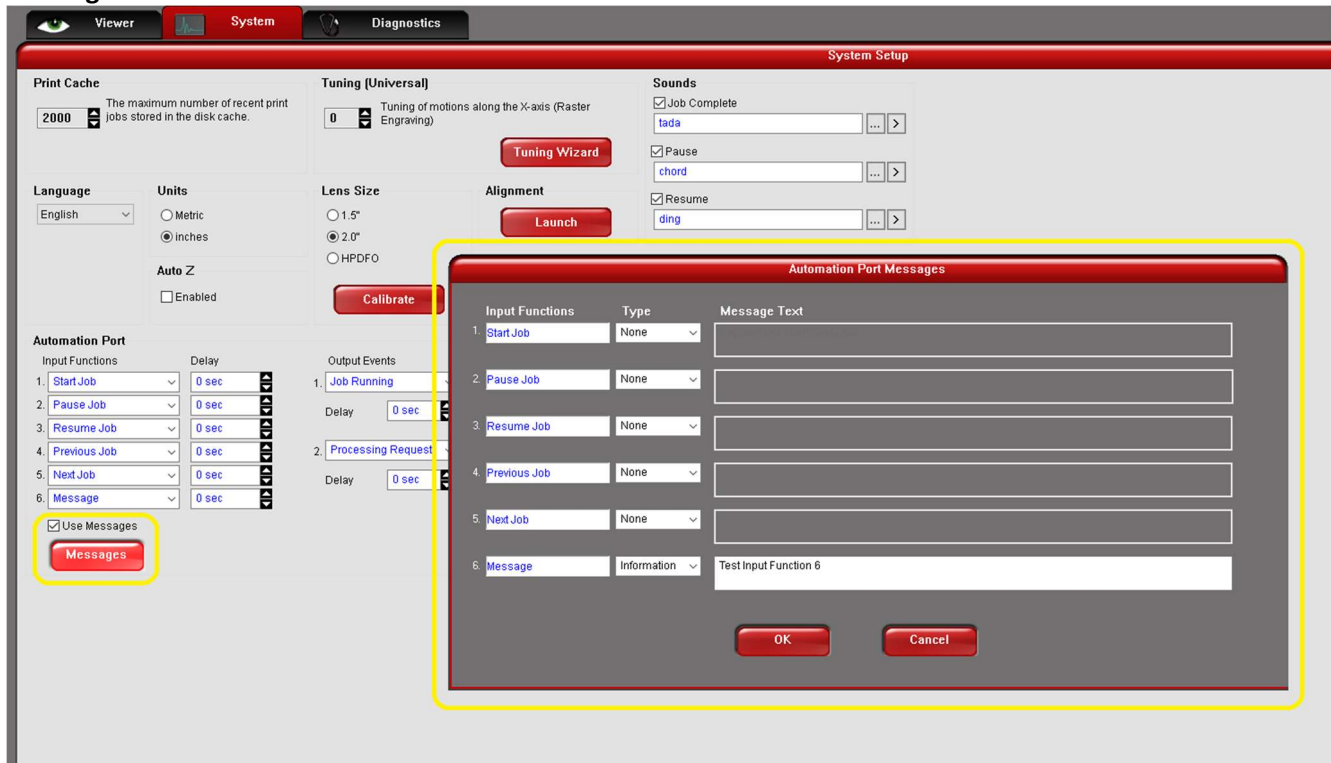
These two events work together. In this example, Input Function 6 (shows as Input Function 7 on the UCP screenshot) is set to “Goto Z” and a small square with an ellipses appears to the right of the delay setting. When this ellipses square is clicked, the dialog box shown will appear and the desired Z value can be entered and saved. Also, output function 2 is set to “processing request.”

When input function 6 is initiated two things will happen:

1. The Z will start moving to the previously defined Z value
2. The output 2 channel LED will light

Once the move is completed, the UCP will now show the current Z value as the same Z value that was previously entered. Once the move completes, the output channel 2 LED will extinguish.

Messages



When the “Use Messages” checkbox is enabled, user defined messages will appear as desired for the input functions. To add, delete or edit messages, click the “Messages” button and the dialog will appear that will allow the user to define messages as they wish them to appear. Messages can be enabled or disabled – it is up to the user’s preference.

Testing

You are now ready to use the automation tester. A few quick tests below will verify that the automation tester is working correctly as well as the UCP & automation box / PCB:

Open the top door of the engraver (jobs will be run but it is not necessary to actually laser anything)
Create in CorelDraw (or other graphics program) a large vector hairline circle of 8” in diameter
Set the speed of the pen color you have drawn the circle in to 10% speed. (all other settings are irrelevant).
Send the job to the UCP from CorelDraw and press the play button to verify the file will run correctly.
After the file is verified to run, we can now begin using the automation tester.
Ensure the “Don’t return home after engraving” checkbox on the Systems tab of the UCP is checked

Test 1:

On the UCP software set the ports as shown below:

Input Function 1: Start Job

Input Function 2: Pause Job

Input Function 3: Resume Job

Output Event 1: Job Running

Output Event 2: Job Aborted

(Output Event 1 LED will light when active)

(Output Event 2 LED will light when active)

Press pushbutton 1 on the automation tester and verify that the following is happening:

1. The job starts running
2. Output Event 1 LED is on

Press pushbutton 2 on the automation tester and verify that the following is happening:

1. The job pauses
2. Output Event 1 LED is off
3. Output Event 2 LED is on

Press pushbutton 3 on the automation tester and verify that the following is happening:

1. The job resumes
2. Output Event 1 LED is on
3. Output Event 2 LED is off

Let the job complete and verify that both output event LEDs are off.

If each step above works as described, we have verified that that pushbuttons 1 through 3 on the tester are functioning properly and that both output function LEDs on the automation tester are functioning correctly. We have also verified that the automation box /PCB and UCP software input functions 1 through 3 are working correctly as well as both output events are working correctly. We have also verified that the following states are functioning correctly: Start Job, Pause Job, Resume Job, Job Running & Job Aborted.

Test 2:

On the UCP software set the ports as shown below:

Input Function 1: Start Job

Output Event 1: Job Complete (Output Event 1 LED will light when active)

Press pushbutton 1 on the automation tester and verify that the following is happening:

1. The job starts running
2. When the job completes, Output Event 1 LED is on

If the Output Event 1 LED is lit when the job completes, the Job Complete state is functioning correctly.

Test 3:

On the UCP software set the ports as shown below:

Input Function 4: Previous Job

Input Function 5: Next Job

Switch to the Viewer tab of the UCP if not already there.

Press pushbutton 4 on the automation tester and verify that the following is happening:

1. The job displayed on the UCP viewer is the previous job in the UCP queue.

Press pushbutton 5 on the automation tester and verify that the following is happening:

1. The job displayed on the UCP viewer is the next job in the UCP queue.

If each step above works as described, we have verified that that pushbuttons 4 and 5 on the tester are functioning properly. We have also verified that the automation box /PCB and UCP software input functions 4 and 5 are working correctly as well. We have also verified that the following states are functioning correctly: Previous Job & Next Job.

Test 4:

(Skip if testing VLS Desktop or VLS Platform engraver as they do not have autofocus). This test is for the ILS and PLS model engravers only.

On the UCP software set the ports as shown below:
Input Function 6: Autofocus

Press pushbutton 6 on the automation tester and verify that the following is happening:

1. The system will go into autofocus mode. If the engraver autofocus has been properly calibrated, the Z table will adjust to perfect focus height once the autofocus procedure completes. The table will initially drop down then raise & lower several times until the autofocus procedure has finished.

If the step above works as described, we have verified that that pushbutton 6 on the tester is functioning properly. We have also verified that the automation box /PCB and UCP software input function 6 is working correctly as well. We have also verified that the following state is functioning correctly: Autofocus.

Test 5:

On the UCP software set the ports as shown below:
Input Function 6: Goto Z

Output Event 2: Processing Request (Output Event 2 LED will light when active)

Make sure the Z table is in perfect focus.

On the UCP Input Function 6, click on the small button with the ellipses next to the delay box. A new window that will allow you to set a Z value will appear. Enter **2.000"** and click save. This window will now close.

Press pushbutton 6 on the automation tester and verify that the following is happening:

1. The Z table will start moving downward
2. Output Event 2 LED is on
3. When the movement stops, Output Function 2 LED is off
4. When the movement stops, the Z table is now at 2.000" as read on the UCP

If each step above works as described, we have verified that the following states are functioning correctly: Goto Z & Processing Request.

Test 6:

On the UCP software set the ports as shown below:
Input Function 6: Message

Make sure the "Use Messages" checkbox is checked

Click on the "Messages" button and a window appears that will enable you to have a message displayed for any of the six input functions. Click on the "Type" dropdown box for input function 6 and select "Information." In the "Message Text" box for input function 6, type "Input Function Test Message" and then click OK and the Message window will close.

Switch to the viewer tab of the UCP.

Press pushbutton 6 on the automation tester and verify that the following is happening:

1. A message box appears that says "Input Function Test Message"

If the step above works as described, we have verified that the following state is functioning correctly: Messages.

You can set messages to appear for any combination of input functions or to have no messages displayed at all. It is strictly user preference as whether to use the messages feature or not.

Test 7:

On the UCP software set the port as shown below:

Input Function 6: Quit Application

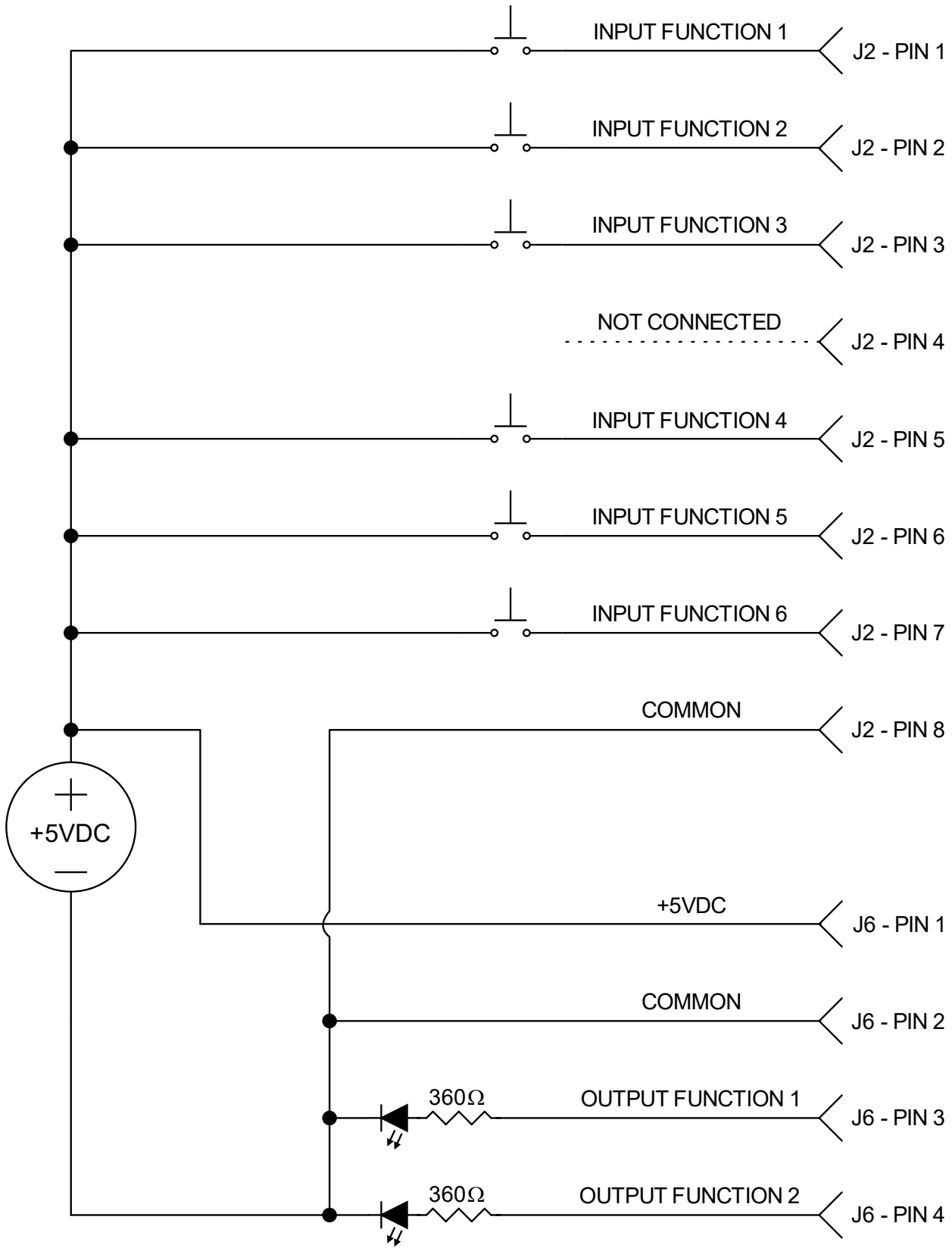
Press pushbutton 6 on the automation tester and verify that the following is happening:

1. The UCP closes and engraver disconnects from the computer.

If the step above works as described, we have verified that the following state is functioning correctly: Quit Application.

Testing is now complete:

If all of the tests above pass then the automation tester, automation box / PCB and UCP software are all working correctly.



Automation tester schematic diagram