

LEP MAC6000 Keypad Operation Manual 6048



Ludl Electronic Products, Ltd.
p/n: 90M046

Revision B
2/12/2014

Contents

Contents	1
1.0 Introduction.....	3
2.0 Requirements.....	3
2.1 System	3
2.2 Tools	3
3.0 Hardware Installation	3
3.1 MAC6000 Controller	3
3.2 USB Monitor.....	3
3.3 LEP Touch Screen Controller	3
4.0 Starting the LEP MAC6000 Touch Screen	5
5.0 Software Installation.....	8
5.1 VNC-Viewer	8
5.2 Putty Client.....	10
5.3 FileZilla Client.....	12
6.0 Main Navigation.....	14
6.1 Stage	14
6.2 Filter Wheel	14
6.3 Configuration	15
7.0 System Configuration	16
7.1 MAC6000 IP Address:.....	16
7.2 XY Stage Parameters.....	16
7.3 Z Axis Parameters.....	17
7.4 Recipe	18
8.0 Main Screen Functions	19
8.1 Stage Functions	20
8.2 Filter Wheel	21
9.0 Loading a Stage Program Recipe	23
10.0 Creating a Stage Program Recipe	24
10.1 Teach Command Window.....	25
10.2 Scanning Modes	25
10.3 Button Definitions	27
11.0 Saving a Stage Recipe Program.....	38
12.0 Clearing a Stage Recipe Program from Memory	39
13.0 Running a Stage Recipe Program	39

List of Figures

Figure 1 - Connections.....	4
Figure 2 – Power On Screen	5
Figure 3 – System Connected and Initialized	6
Figure 4 - Connections.....	7
Figure 5 – VNC Connection	8
Figure 6 – VNC View #1	9
Figure 7 – VNC View #2.....	9
Figure 8 – PuTTY Configuration	10
Figure 9 – PuTTY Login Prompt	11
Figure 10 – PuTTY Connected	11
Figure 11 – FileZilla Client	12
Figure 12 – FileZilla Connected.....	13
Figure 13 – FileZilla Directory	13
Figure 14 – Stage Control Tab.....	14
Figure 15 – Filter Wheel Control Tab.....	14
Figure 16 – Configuraiton Tab	15
Figure 17 – System Configuration.....	16
Figure 18 – Main Screen.....	19
Figure 19	20
Figure 20	21
Figure 21 – Load Recipe Dialog.....	23
Figure 22 – Edit Recipe Dialog	24
Figure 23 – Save Stage Recipe Dialog	38

1.0 Introduction

This manual will cover the setup, programming and operation of the 73006048 LEP MAC6000 touch screen. The modular nature of the MAC6000 controller and flexibility of the software allows for a wide range of configurations. Each option and configuration will be described in this manual.

2.0 Requirements

2.1 System

Input Voltage: 100-240Vac 50/60Hz 19W (Automatic International Voltage Selection)

2.2 Tools

No tools should be required for setup of the keypad.

3.0 Hardware Installation

The basic touch screen system consists of the following components.

3.1 MAC6000 Controller

The touch screen can work with most MAC6000 configurations. Including XY stage, Focus Control, and filter wheel control.

3.2 USB Monitor

3.3 LEP Touch Screen Controller

Monitor and Ethernet cables get connected to this controller.

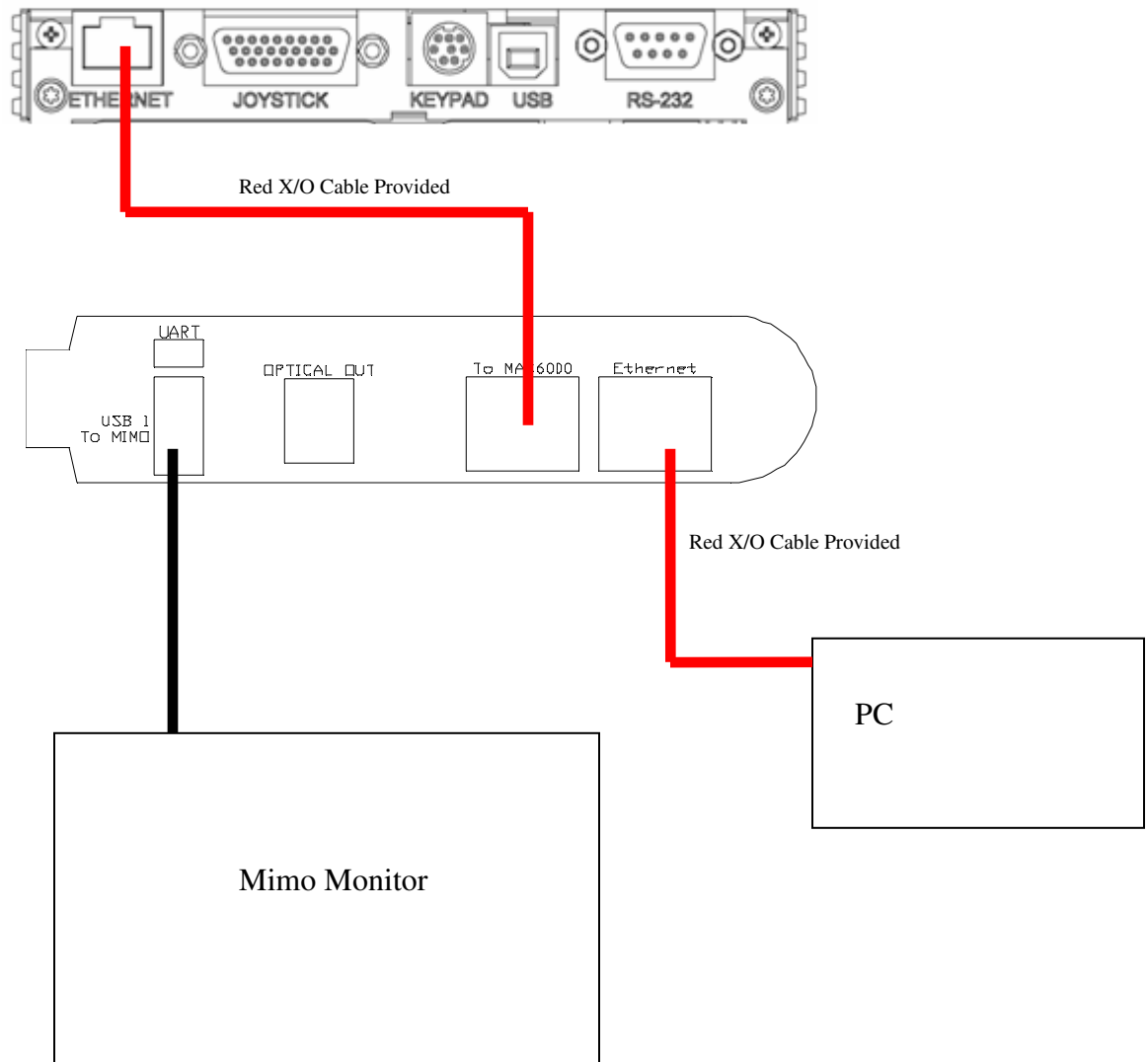


Figure 1 - Connections

4.0 Starting the LEP MAC6000 Touch Screen

The MAC6000 Touch Screen is self-configuring. The system checks for specific MAC modules in the controller. This determines which functions the application will enable.

After the system is turned on (in approx 1-2 minutes) the following screen will be displayed. Make sure the MAC6000 controller is powered up before continuing.

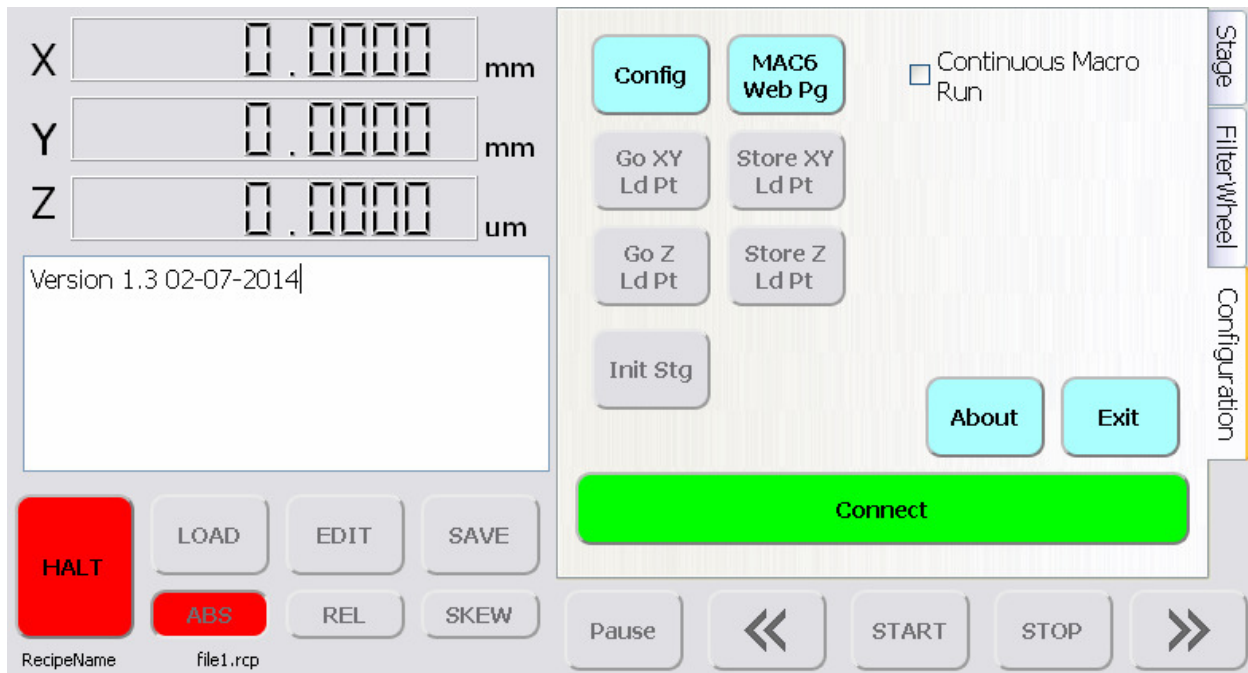


Figure 2 – Power On Screen

Click the **Connect** button. The software verifies the MAC6000 controller has been turned on and is connected to the touch screen controller. The system will scan the module configuration of the controller to determine which functions need to be enabled.

The system, if configured to do so will then go through a calibration procedure. This procedure will center the stage and set that position to 0,0.

With a successful boot up, display will change to something like:

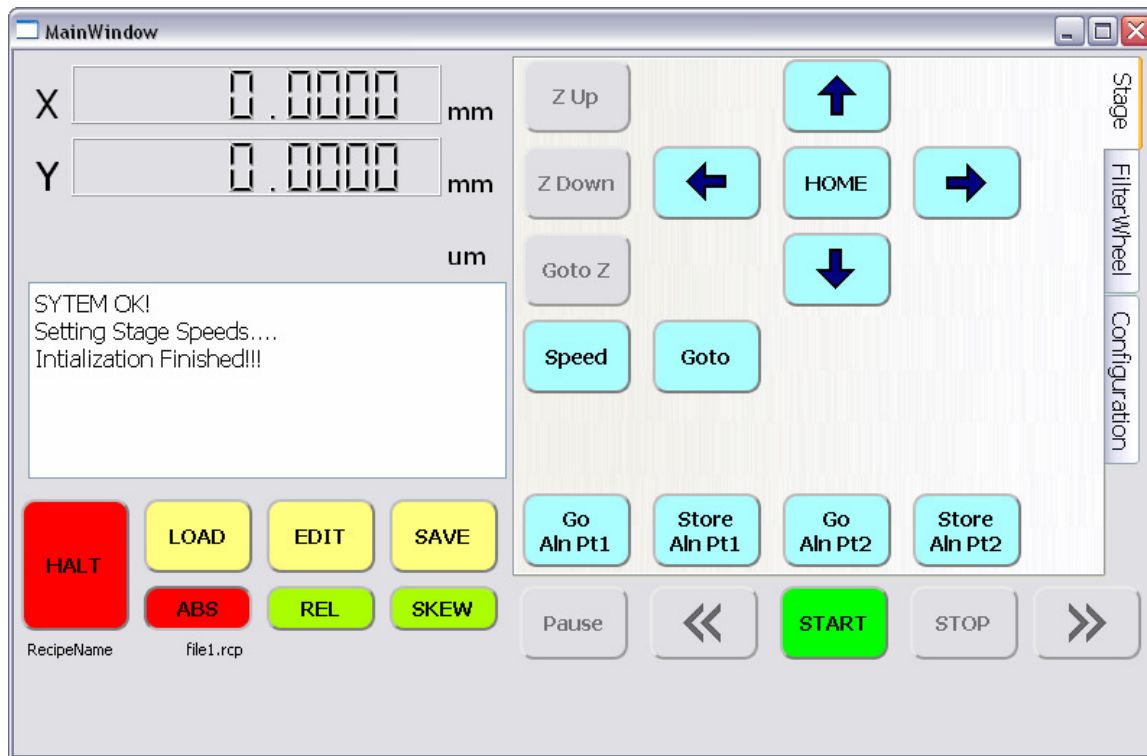


Figure 3 – System Connected and Initialized



If there were any problems, the touch screen will alert the user and disconnect from the MAC6000 controller.

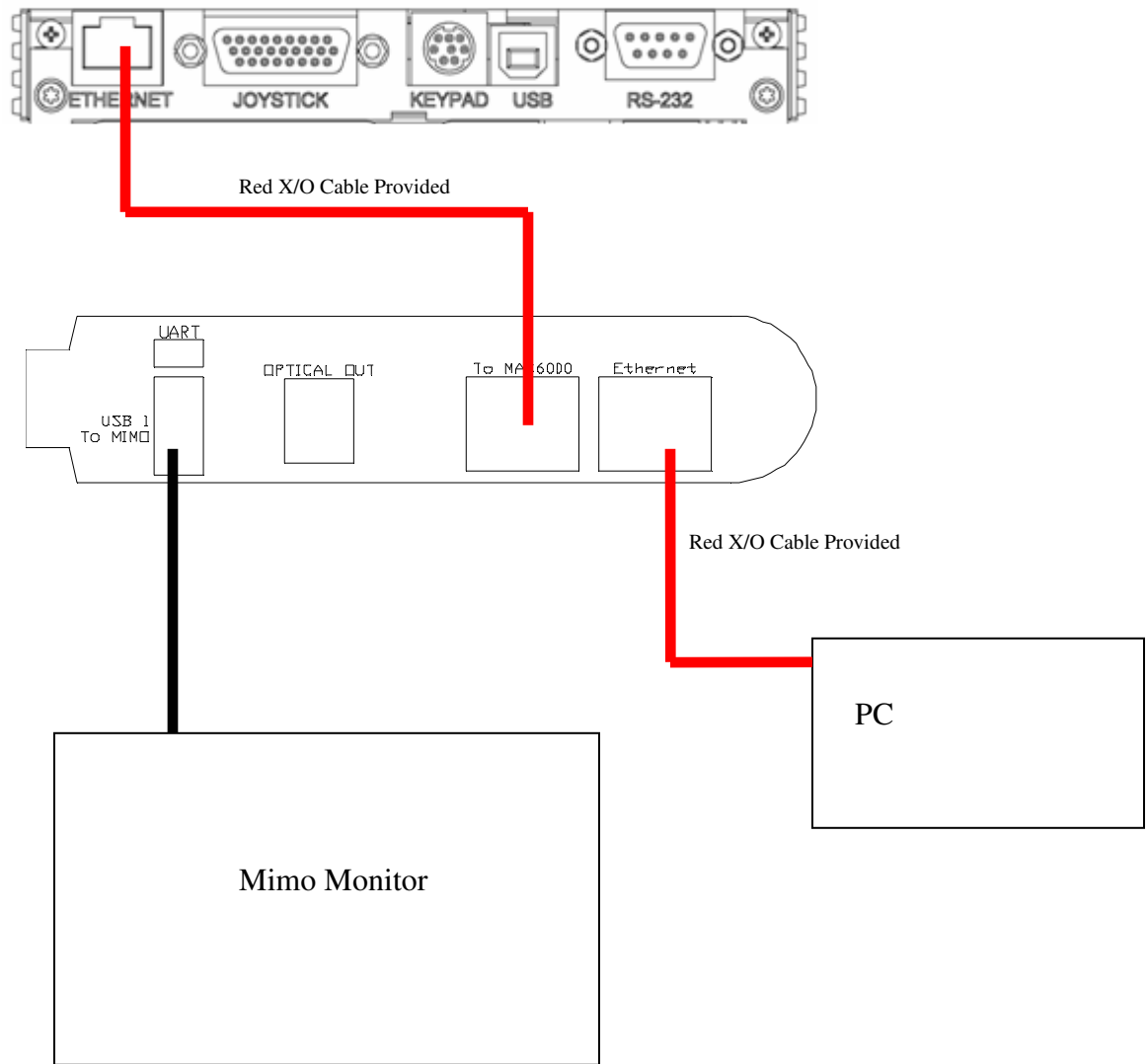


Figure 4 - Connections

5.0 Software Installation

There is no software that needs to be installed in order to use the MAC6000 Touch Screen. There is some software that is included to allow field upgrades of the device as well as diagnostics. All these utilities require that the PC is connected to the MAC6000 Keypad controller as shown in Figure 4.

VNC-Viewer – Remote desktop viewer

Putty – command line client

FileZilla Client – FTP file transfer client

5.1 VNC-Viewer

The VNC Viewer utility allows viewing and controlling of the MAC6000 Keypad controller from your windows based PC. This utility might be required when updating software on the MAC6000 Keypad Controller.

NOTE: Before running this utility, unplug the Mimo Monitor and power cycle the controller.

When this utility is run a window will open like the following:

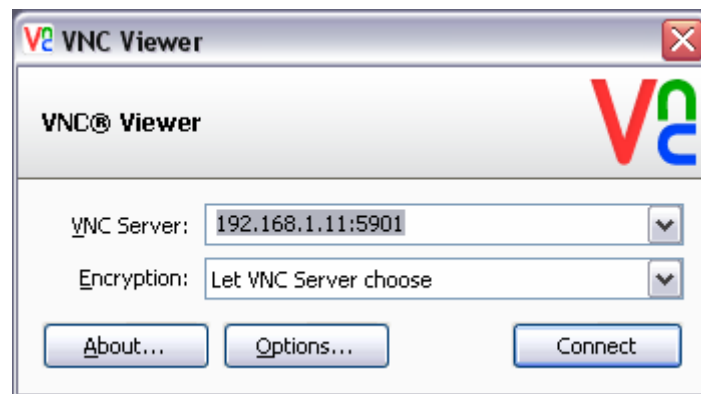


Figure 5 – VNC Connection

Enter 192.168.1.11:5901 in the VNC Server Box and then click on the Connect button

When prompted for a password: enter nosoup4u and click ok. This will connect you to a virtual desktop of the controller.

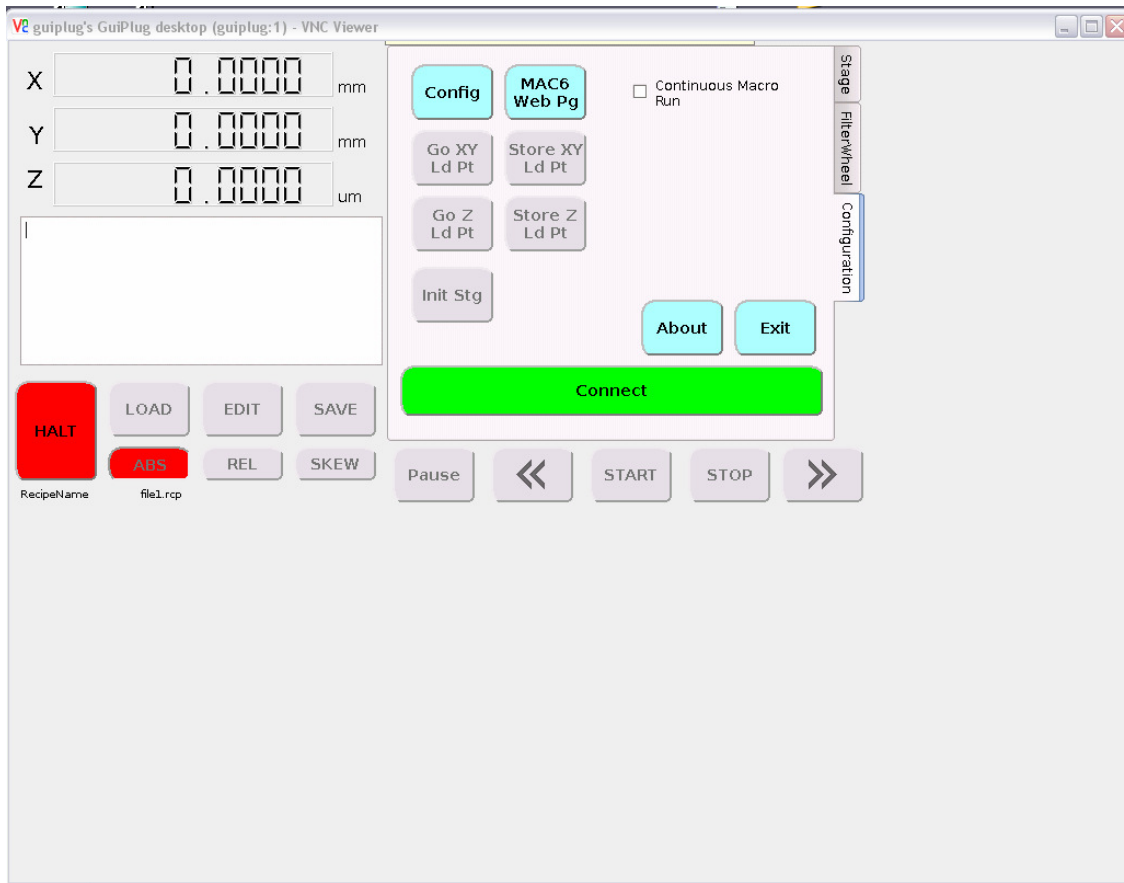


Figure 6 – VNC View #1

To get to the main desktop select the Exit button and enter 769.6111 as the password and click ok. This will bring up the virtual desktop as shown below

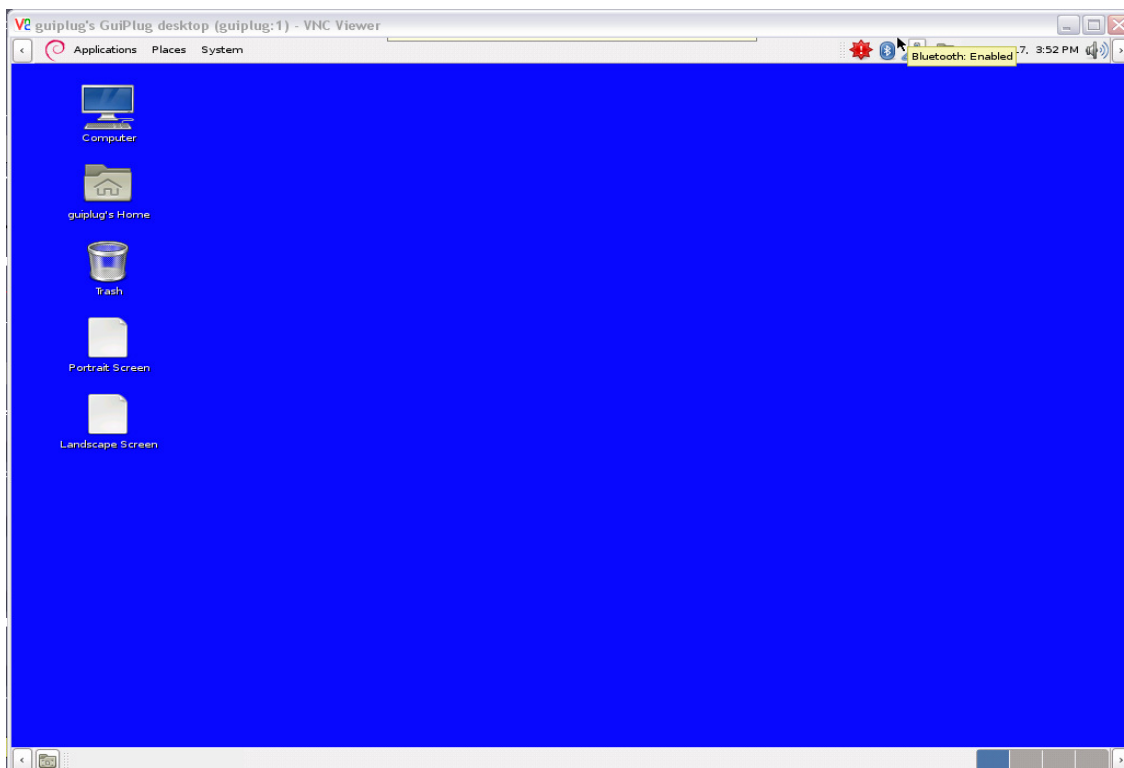


Figure 7 – VNC View #2

5.2 Putty Client

The putty client is used to gain command line access to the MAC6000 Keypad controller from your windows based PC. This utility is useful when debugging configurations. To connect, run the program and enter the IP address of 192.168.1.11 into the window. It should look like this:

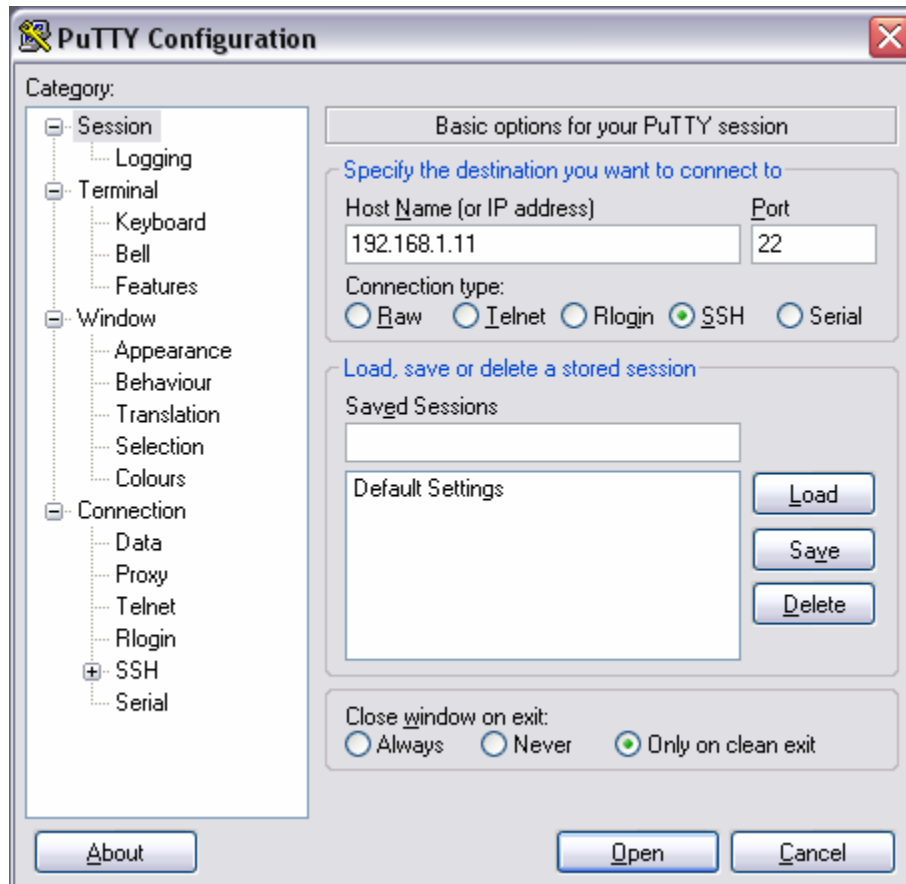


Figure 8 – PuTTY Configuration

Then click open and you should see a screen that looks like



Figure 9 – PuTTY Login Prompt

To log in use the following username and password:

Login as: root

[root@192.168.1.11's](#) password: nosoup4u

This will bring up the screen:

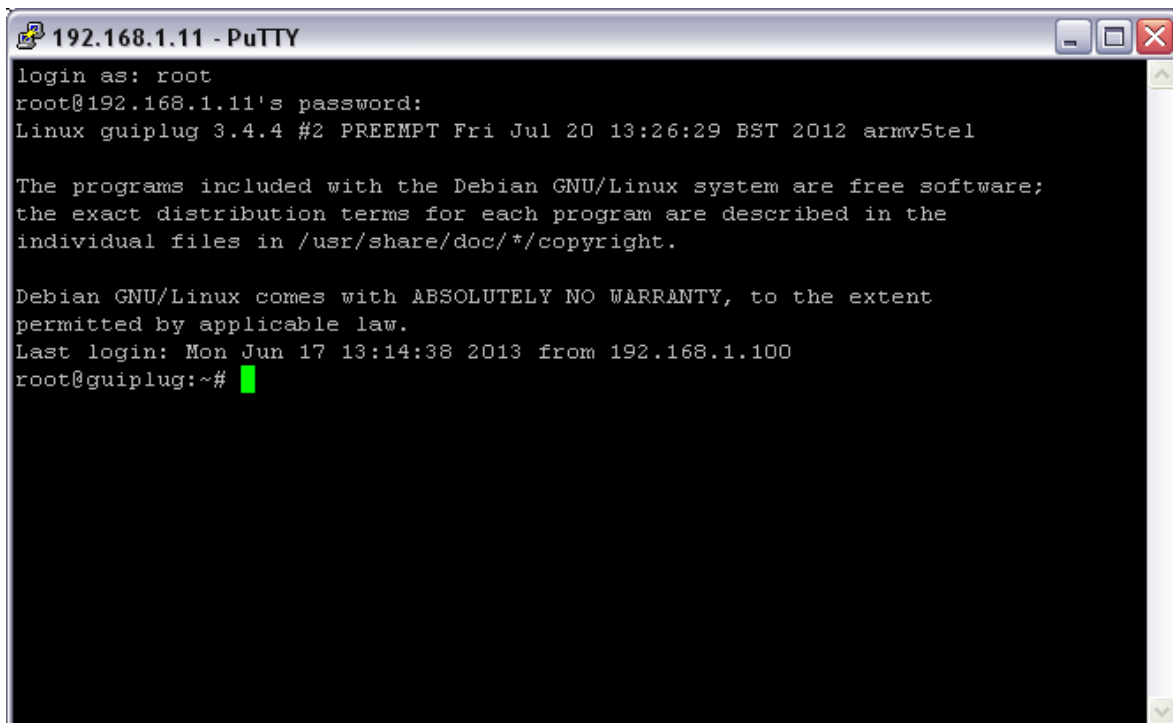


Figure 10 – PuTTY Connected

5.3 FileZilla Client

The filezilla client is used to transfer files to and from the MAC6000 Keypad controller. This is required when updating the controller or downloading log files from the controller. When the program is run the following screen will appear:

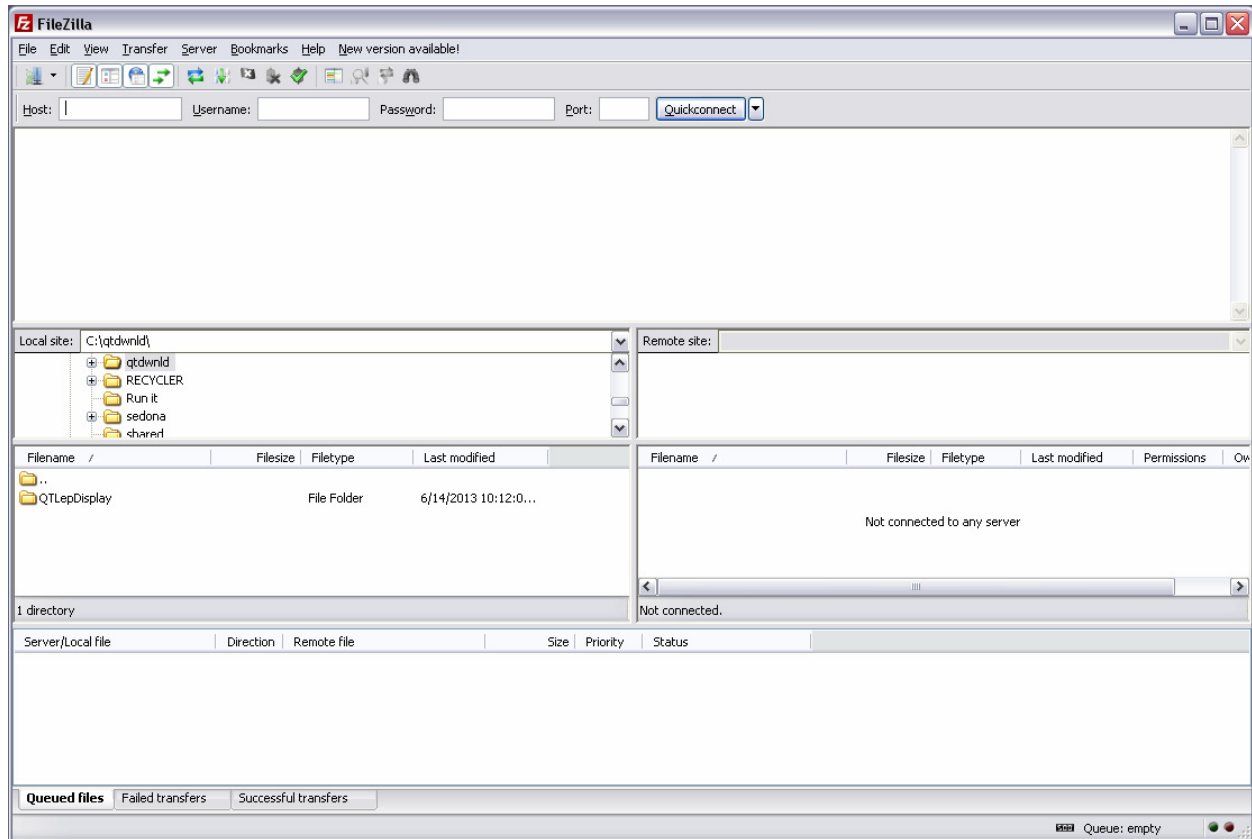


Figure 11 – FileZilla Client

To make the connection to the controller fill in the following:

Host: 192.168.1.11 Username: root Password: nosoup4u Port: 22

Press the Quickconnect button to start the connection.

After the connection is made the screen should look like that shown in Figure 12.

To transfer a new version of the keypad software type the following in the Remote site box:
/home/guipug/QTLepDisplay/bin

This will make the screen look like that shown in Figure 13.

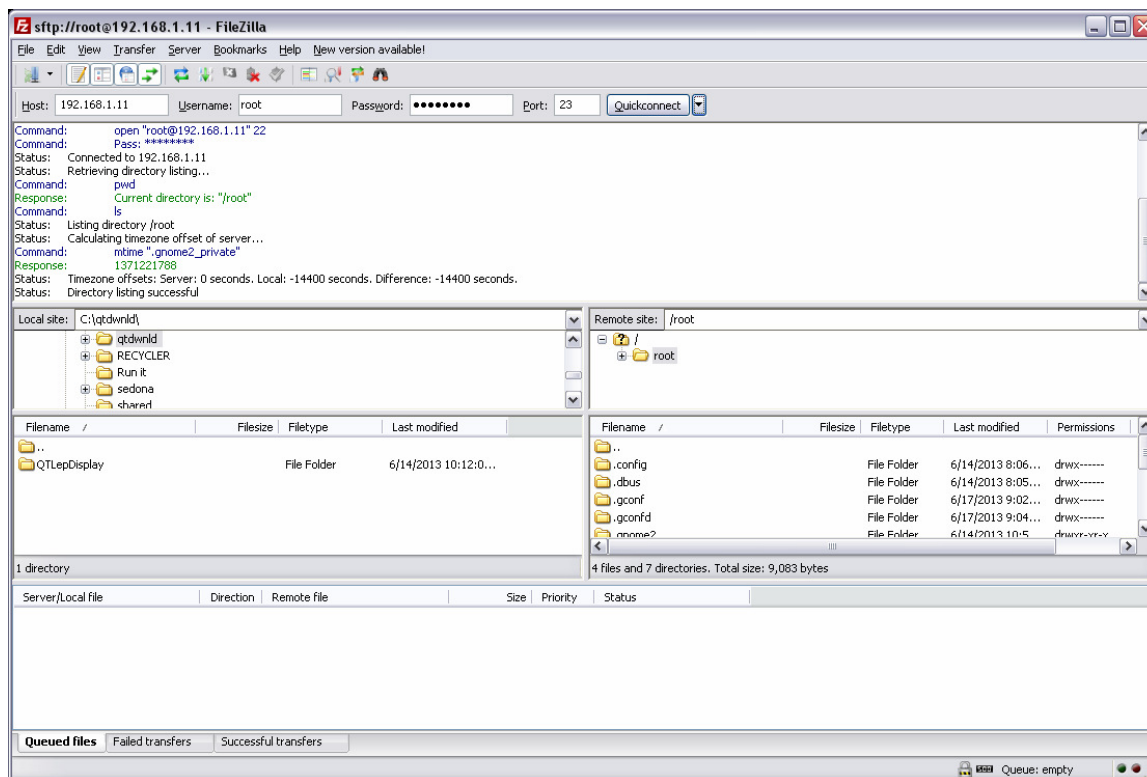


Figure 12 – FileZilla Connected

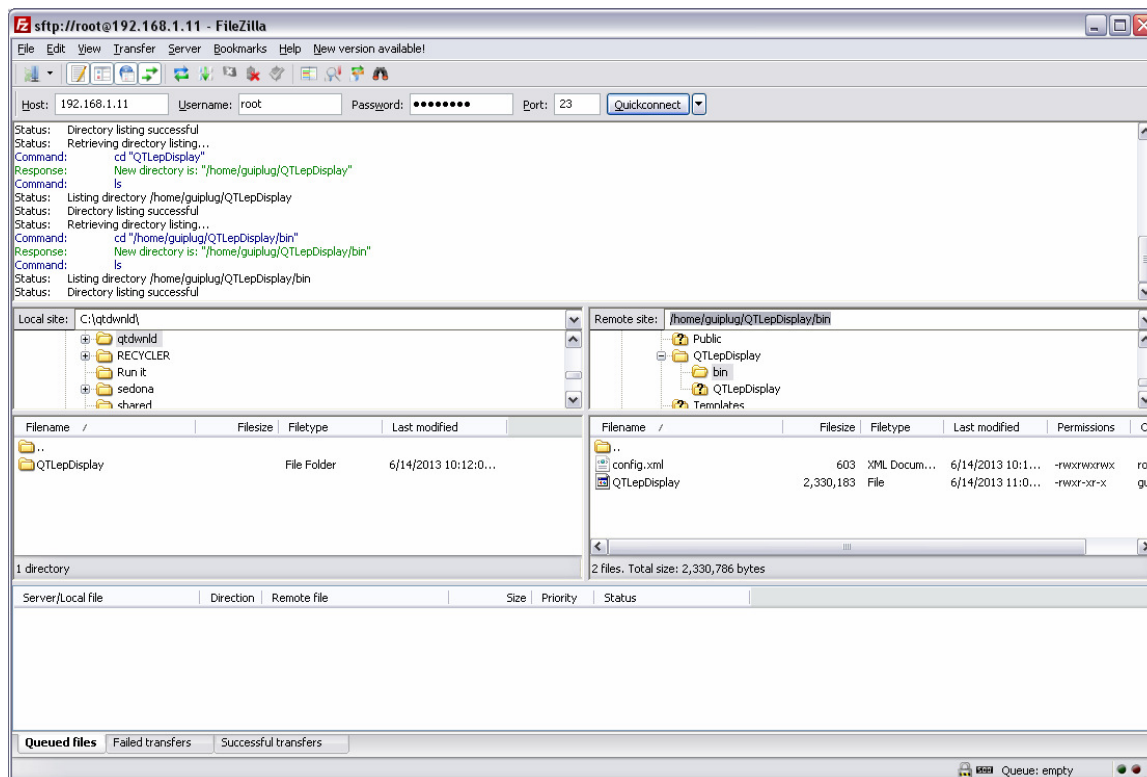


Figure 13 – FileZilla Directory

At this point locate the new version of the program using the local site boxes, right-click on the file to transfer, and select upload. This will transfer the file to the controller. Once completed, exit the FileZilla client and power-cycle the keypad controller.

6.0 Main Navigation

Navigation is done using the tabs on the right hand side of the screen. As seen below there are three tabs, Stage, Filter Wheel, and Configuration. Each tab will bring up a screen that has appropriate buttons to allow control over that aspect of the device.

6.1 Stage

Clicking on the **Stage** tab will display the stage control screen.

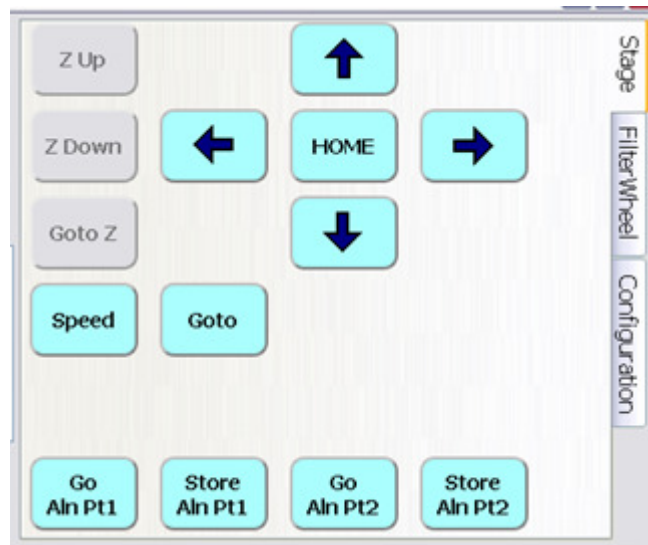


Figure 14 – Stage Control Tab

6.2 Filter Wheel

Clicking on the **Filter Wheel** tab will display the filter wheel control screen.

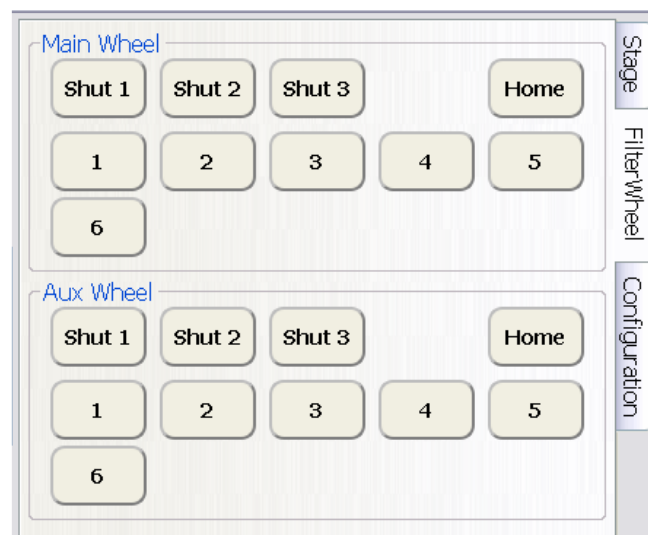


Figure 15 – Filter Wheel Control Tab

6.3 Configuration

Clicking on the **Configuration** tab will display the configuration screen.

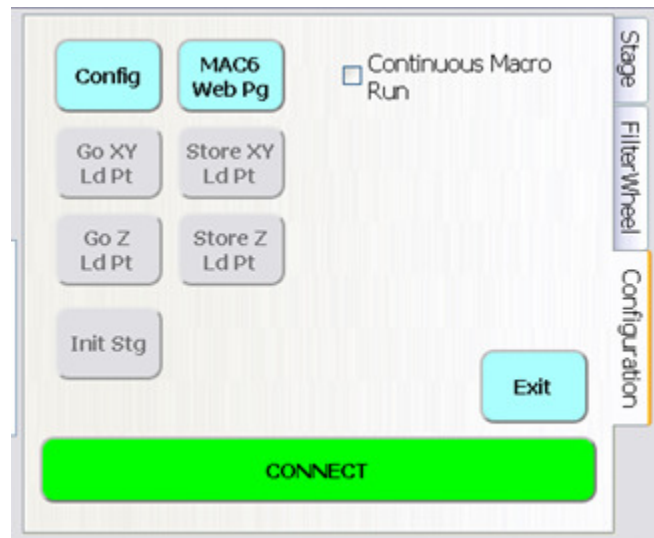


Figure 16 – Configuraiton Tab

Config – Will bring up the System Configuration Screen

MAC6 Web Pg – Will bring up the MAC6000 web based configuration pages.

Go XY Ld Pt – Will move the XY Stage to the stored Load Point

Store XY Ld Pt – Will store the current XY Stage position as the Load Point

Go Z Ld Pt – Will move the Z axis to the stored load point

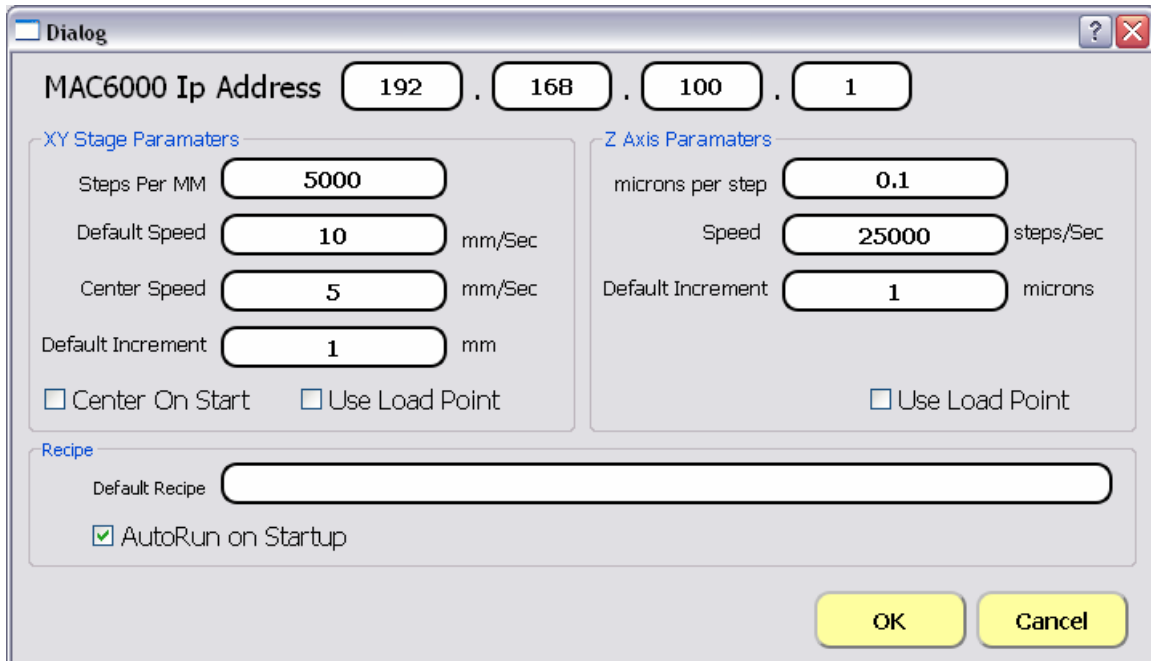
Store Z Ld Pt – Will store the current Z Stage position as the Load Point

Init Stg – Will re-initialize the XY Stage. It will center the stage and set that position to 0,0

7.0 System Configuration

To make changes to the keyboard configuration click on the Config Button.

The Default configuration should be what is shown below.



The screenshot shows a 'Dialog' window for system configuration. At the top, the 'MAC6000 Ip Address' is set to 192.168.100.1. Below this, there are two main sections: 'XY Stage Parameters' and 'Z Axis Parameters'. The 'XY Stage Parameters' section includes 'Steps Per MM' (5000), 'Default Speed' (10 mm/Sec), 'Center Speed' (5 mm/Sec), 'Default Increment' (1 mm), and checkboxes for 'Center On Start' and 'Use Load Point'. The 'Z Axis Parameters' section includes 'microns per step' (0.1), 'Speed' (25000 steps/Sec), 'Default Increment' (1 microns), and a checkbox for 'Use Load Point'. At the bottom, there is a 'Recipe' section with a 'Default Recipe' text field and a checked checkbox for 'AutoRun on Startup'. 'OK' and 'Cancel' buttons are at the bottom right.

Figure 17 – System Configuration

7.1 MAC6000 IP Address:

The default address for the MAC6000 is 192.168.100.1. If using a standard configuration, this parameter does not need to be changed.

7.2 XY Stage Parameters

Steps Per MM:

The software has certain parameters that are hardware dependent which affects the operation of the stage.

For stages with encoders this parameter is the ratio of the number of encoder steps per millimeter of travel for the X, Y axes. The ratio can easily be calculated based on the following formula:

$$STEPS/mm = \frac{1}{ENCODER RESOLUTION}$$

Ex: for a 100nm resolution encoder it would be 10000 steps/mm.

For stages without encoders this parameter is the ratio of the number of motor steps per millimeter of travel for the X, Y axes. The ratio can easily be calculated based on the following formula:

$$STEPS/mm = \frac{MOTOR\ RESOLUTION}{LEAD\ SCREW\ PITCH\ in\ mm}$$

Ex: for a stage with 2mm pitch leadscrews and a motor resolution set to 10000 steps/revolution the Steps/mm would be = (10000/2) = 5000 steps/mm



All stage positions are stored in the measurement units

Default Speed:

The default speed is the speed at which the stage will move during positioning commands if no speed is specified in the recipe.

Center Speed:

The center speed is the speed at which the stage will move during the initial centering operation performed during startup if the Center on Start option is enabled.

Default Increment:

The default increment is the distance the stage will move when the arrow keys are pressed providing the values are not specified in the recipe.

Center on Start:

This option specifies whether the stage will find the center of travel and use that as the 0,0 origin.

Use Load Point:

This option if enabled will move the stage to a load position before the macro runs to facilitate placing of the sample on the stage.

7.3 Z Axis Parameters

Microns per step:

This defines the step size of the motor or encoder connected to the Z axis. When the system is using an absolute encoder the values are 0.023 micros per step.

Speed:

The speed is the speed at which the focus will move during positioning if no speed is specified in the recipe. Note that this speed is specified in encoder steps/sec.

Default Increment:

The default increment is the distance the Z axis will move when the arrow keys are pressed providing the values are not specified in the recipe.

Use Load Point:

This option if enabled will move the Z axis to a load position before the macro runs to facilitate placing of the sample on the stage.

7.4 Recipe

This specifies the default recipe. If the AutoRun on Startup option is selected this recipe will automatically load and start.

8.0 Main Screen Functions

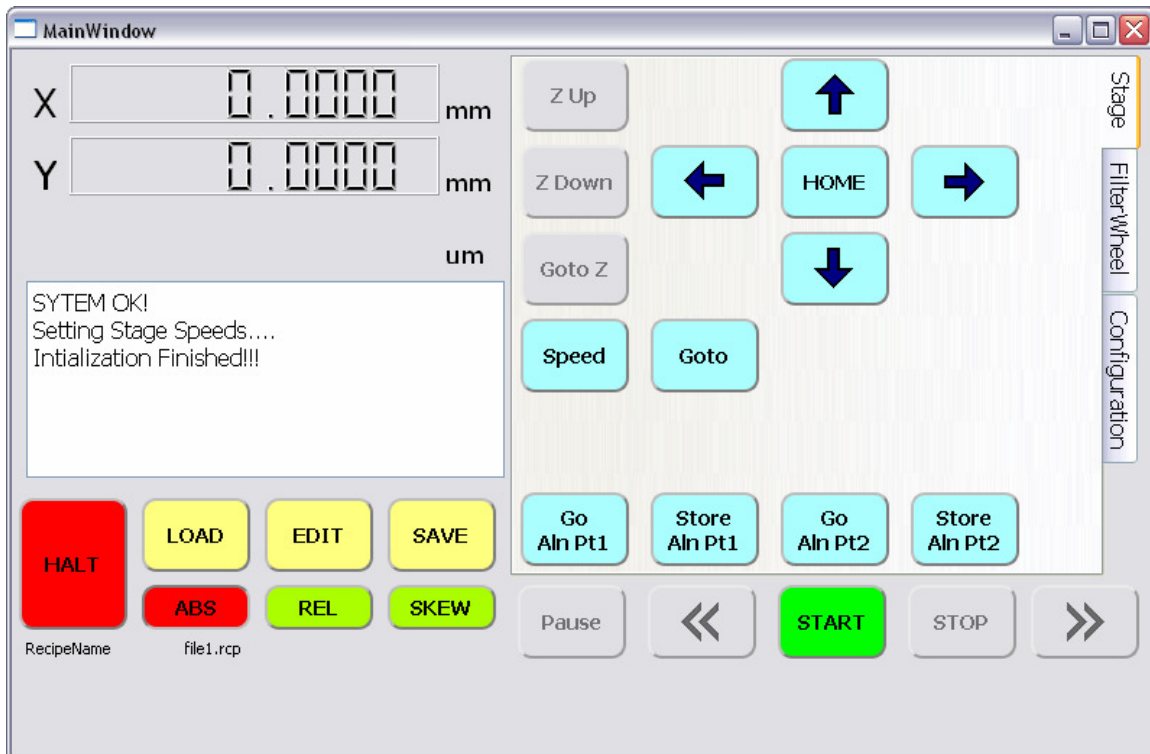


Figure 18 – Main Screen

Microscope Coordinate System

X: This shows stage X position in mm.

Y: This shows stage Y position in mm.

Z: This shows microscope Z position in um.



A z-axis motor needs to be installed.

HALT:

This button stops all stage movement and stops the current recipe from running.

LOAD:

This button loads a recipe into the system.

EDIT:

This button will bring up the recipe editor.

SAVE:

This button will save the current recipe to a file.

ABS:

The **ABS** button will display the stage coordinate system as an absolute value. The stage center will be 0,0 with four quadrants. The microscope coordinate position display will change to reflect the respective display mode. A red button indicates the current coordinate system in use.

REL:

The **REL** button shows the coordinate system from any particular point. When pressed the position display will be set 0,0.

SKEW:

The system is in SKEW mode, all coordinates are in specimen coordinates. Care should be taken that no points are programmed in normal mode if the deskew feature is to be used.

PAUSE / RESUME:

This button will pause or resume the execution of the current recipe.

<<:

This button will move the stage to the previous point in the recipe.

>>:

This button will move the stage to the next point in the recipe.

START:

This button will start the recipe.

STOP:

This button will stop the recipe. Once the recipe is stopped it needs to be started again from the beginning. Use the PAUSE / RESUME button to momentarily pause the recipe.

8.1 Stage Functions

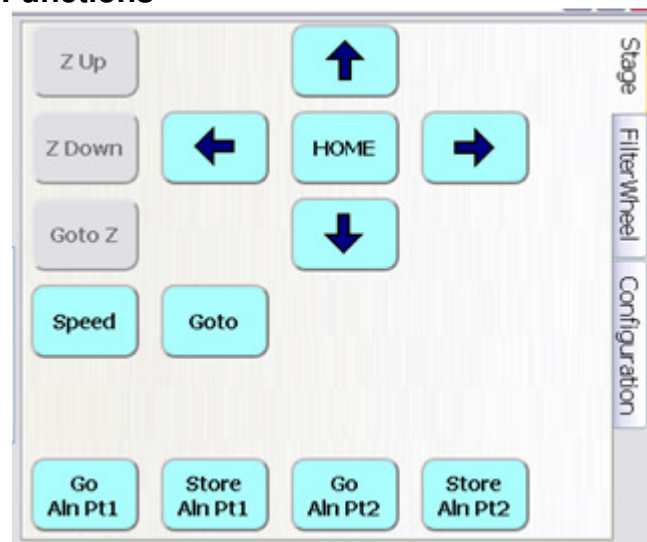


Figure 19

Home:

This button will move the stage to the 0,0 position.

Arrow Keys:

These buttons will move the stage by current increment amount. This value is either specified in the current recipe or on the configuration screen.

Speed:

This button will allow changing of the X, Y and Z Speeds.

GOTO:

This button will prompt for a X,Y position and then move the stage to that position. All units are specified in mm.

Z Up, Z Down:

These buttons will move the Z axis by the current increment amount. This value is either specified in the current recipe or on the configuration screen.

GOTO Z:

This button will prompt for a Z position and then move the Z axis to that position. All units are specified in mm.

GO Aln Pt1, GO Aln PT 2:

These button will move the stage to the align points used for the de-skew operation. Please see that section for more details.

Store Aln Pt1, Store Aln PT 2:

These button will store the stage position as the align points used for the de-skew operation. Please see that section for more details.

8.2 Filter Wheel



Figure 20

If there is a filter wheel controller in the system this screen will be available. It allows the control of the position of both wheels and control over the three shutters.

Shut 1, Shut 2, Shut 3:

These buttons correspond to the three shutters that can be connected to the MAC6000 filter wheel controller. When the button is highlighted in RED it indicates that the shutter is open. Pressing the button will toggle the state between open and closed.

1 - 10:

Pressing one of these buttons will move the corresponding filter wheel to that position. The current position will be highlighted in RED.

Home:

This button will move the corresponding filter wheel to the home or #1 position.

9.0 Loading a Stage Program Recipe

From the main screen, click the **LOAD** button. This will automatically clear any previous recipe file in memory.

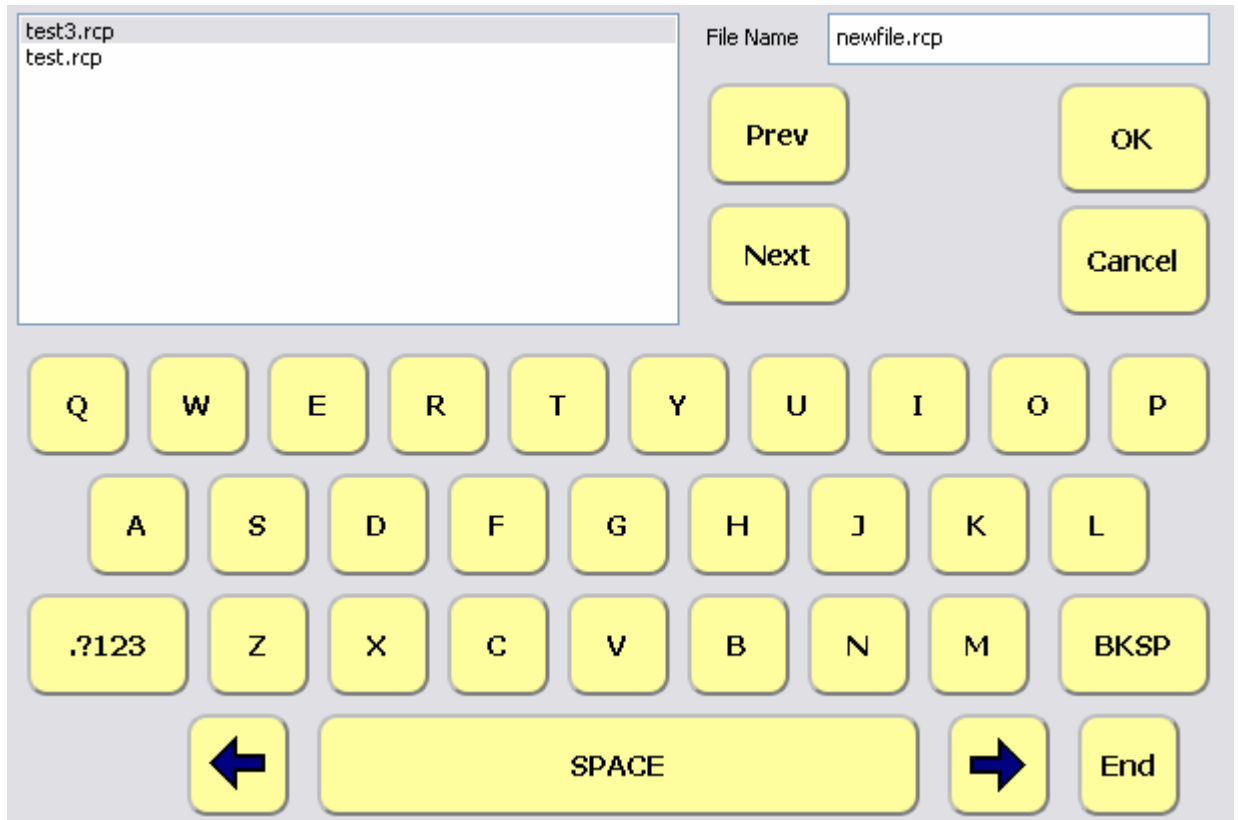


Figure 21 – Load Recipe Dialog

File List Box:

The current saved recipes will be listed in the box on the top left. To choose a file to load press on the file name or use the **PREV**, **NEXT** buttons to highlight the desired file name. The keys can also be used to type in the desired file name.

10.0 Creating a Stage Program Recipe

The recipe programming provides a flexible and friendly means for programming simple or complex stage patterns. From the main screen, click the **EDIT** button. This will open up the main stage program recipe window.

Control and setup of the stage recipe is achieved by using a combination of menus and buttons.

The joystick will be enabled and allow the creator to drive the stage to specific points. After the desired point is reached, the **STORE** button should be clicked to save that location.



To enter values directly rather than moving the stage to points use the ENTER button and follow the prompts.

Figure 22 – Edit Recipe Dialog

The recipe programming screen is divided into several key areas. The numbers at the top left of the screen are the stage position in X, Y and Z. Immediately below that are the filter wheel and shutter positions. Below that is the current line being edited. The box below the current line contains the current recipe. The highlighted line is the one currently being edited. To select a line to edit, either touch the screen on the line or use the NEXT, and PREV buttons at the bottom of the screen to move the highlighted line. New lines are inserted before the highlighted line.

The Teach command window contains status messages as well as buttons to aid in the entering of commands.

The green buttons outside the teach command window are the available commands for use in the recipe. These are divided into two groups, Stage/General Commands and Filter Wheel Commands.

The buttons at the bottom of the window are used for editing the recipe.

NEXT – moves selected line to the next line in the recipe.

PREV – moves selected line to the previous line in the recipe.

DELETE – deletes the selected line from the recipe.

NEW RECIPE – erases all the lines in the recipe and starts a new one.

GO XYZ – prompts for x, y, and z coordinates and moves the stage to that position.

OK – accepts the edits made to the recipe and exits the recipe editor.

CANCEL – discards the edits made to the recipe and exits the recipe editor.

10.1 Teach Command Window

The Teach Command window at the right side of the main screen will display simple step by step instructions for storing the desired command.

GOTO – moves stage to teach point.

PREV – goes to previous point in command definition

NEXT – goes to next point in command definition

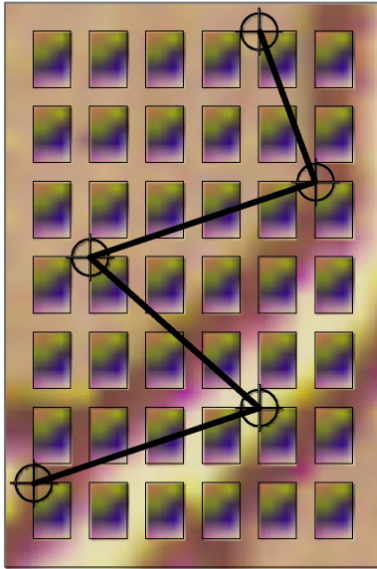
STORE – Stores point

ENTER – allows direct entry of command parameters.

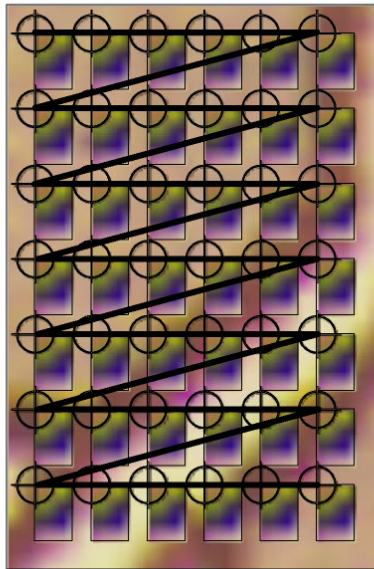
10.2 Scanning Modes

The program level is defined by either a SCATTER, RASTER, or COMB POINT. The RASTER and COMB modes are similar in that they both will move the stage to cover a rectangular area. They differ only in the sequence of the scanning. The SCATTERED POINT mode allows the user to set up individual points for scanning. The program will sequentially move through this point program.

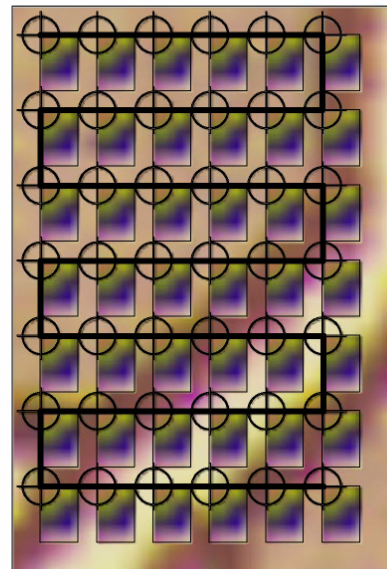
SCATTER



RASTER



COMB

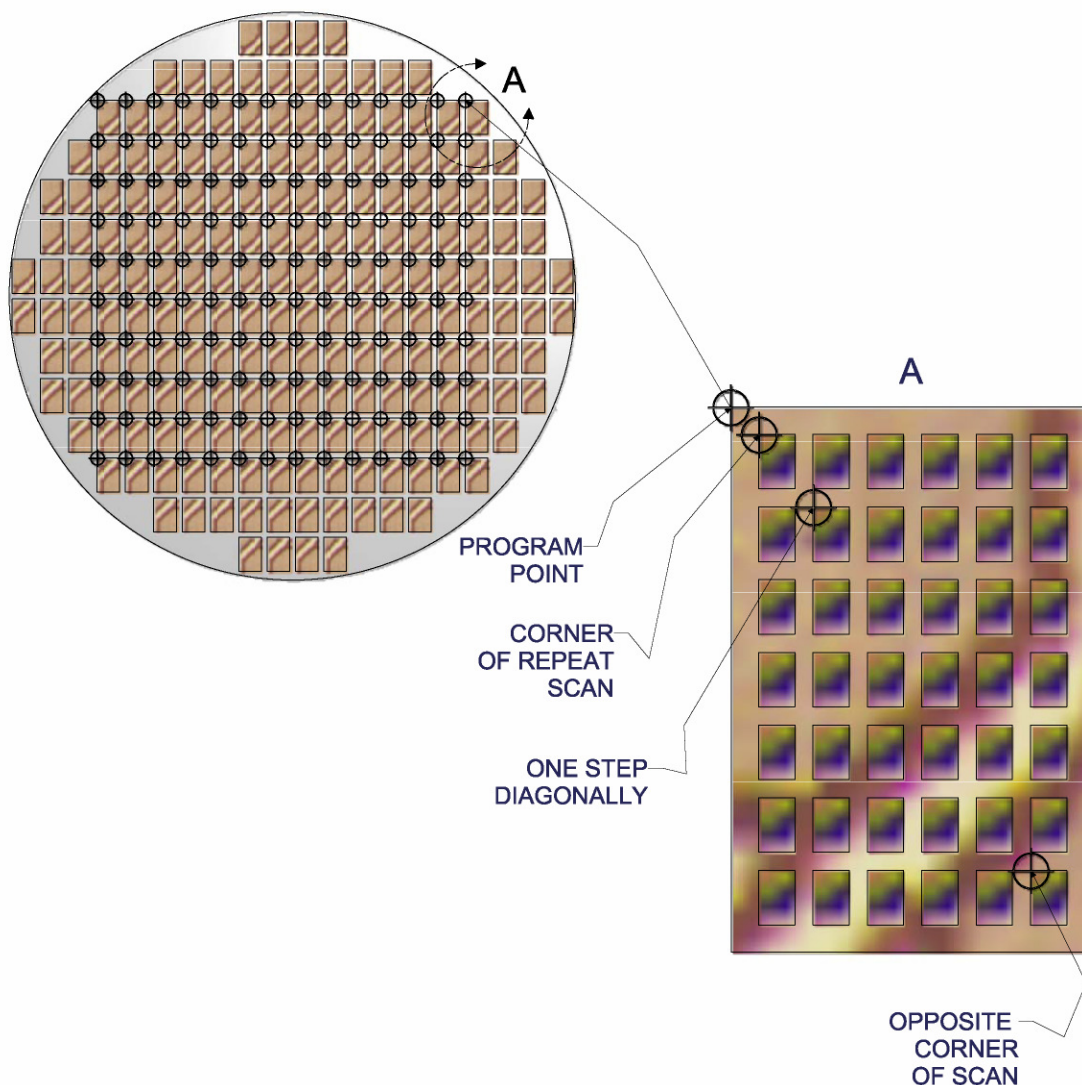


The repeat pattern is a sub-program mode that is executed at each program position. The repeat patterns have the same modes as the program level except that the positions must be stored relative to a program position. In a program execution the repeat pattern is executed in its entirety before continuing to the next program point.

10.3 Button Definitions

DEFREP or Define Repeat Pattern:

This function can be used to repeat scanning patterns at multiple points. The DEFREP should be inserted in the recipe file before it is to be used.



Example:

DEFREP {X,Y}

DEFREP -90.000,90.000

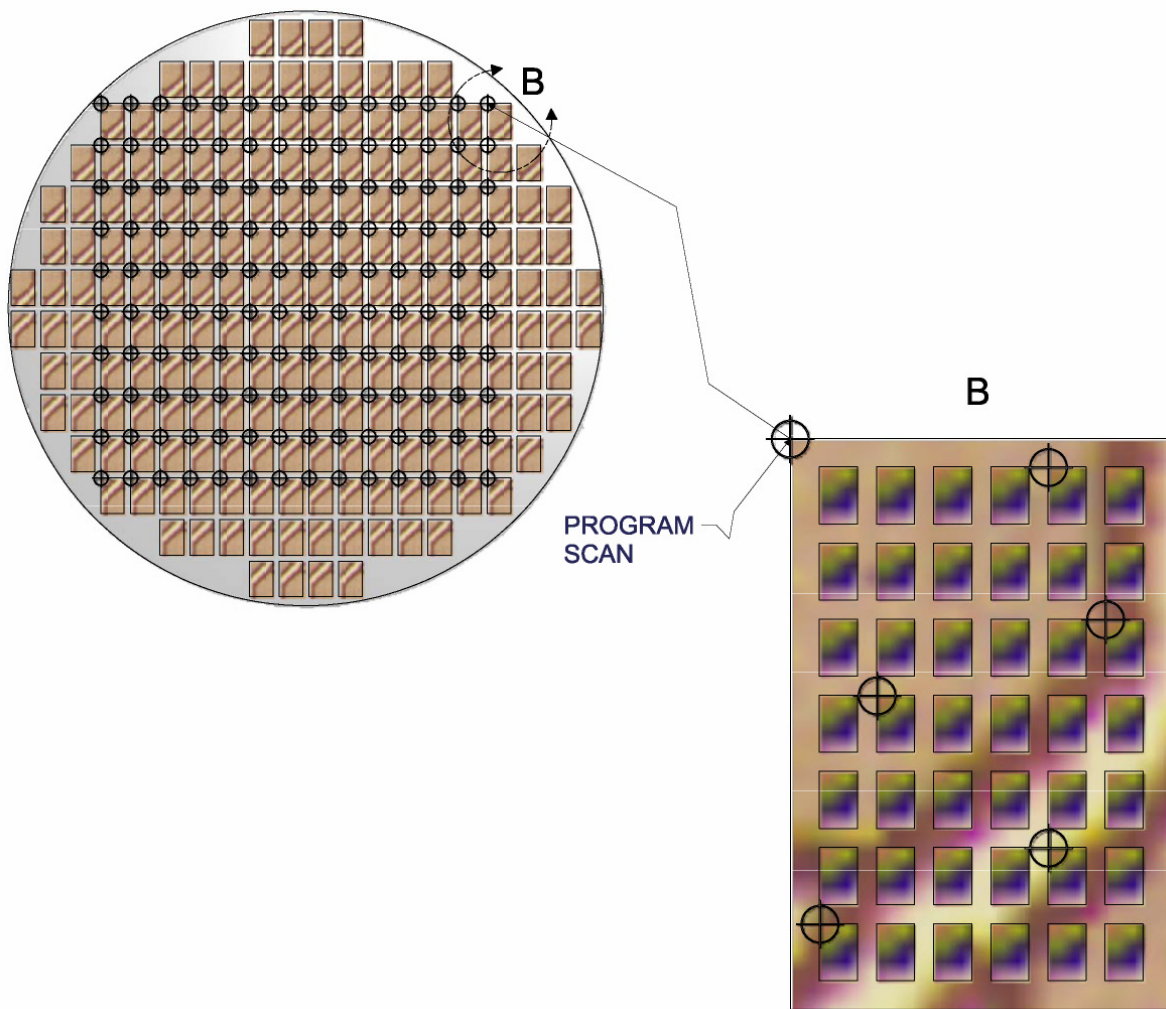
DELAY 3000

RASTER 1.000,-1.000,5.000,-5.000,10.000,-15.000,.500

ENDREP

RASTER -90.000,90.000,-80.000,80.000,80.000,-80.000,2.000

This program will perform a raster scan inside a raster scan. The internal scan will have relative points to the program scan point. Between each internal scan there will be a 3 second delay.



Example:

DEFREP {X,Y}

DEFREP -90.000,90.000

DELAY 3000

POINT 8.000,-1.000

POINT 9.000,-3.000

POINT 2.000,-3.000

ENDREP

RASTER -90.000,90.000,-80.000,80.000,80.000, -80.000,2.000

This program will perform a scatter point scan inside a raster scan. Between each internal scatter point there will be a 3 second delay.

ENDREP or End Repeat Pattern:

This function will end the repeat pattern.

CLRREP or Clear Repeat Pattern:

This function will clear any repeat pattern in the sequence.

ARC:

This function will create an arc scan. Three points will be stored with this command. Starting point, ending point and any mid point on the arc, the **STORE** button should be used after each point has been reached. The final step is to enter the Arc Step distance in mm.

Example:

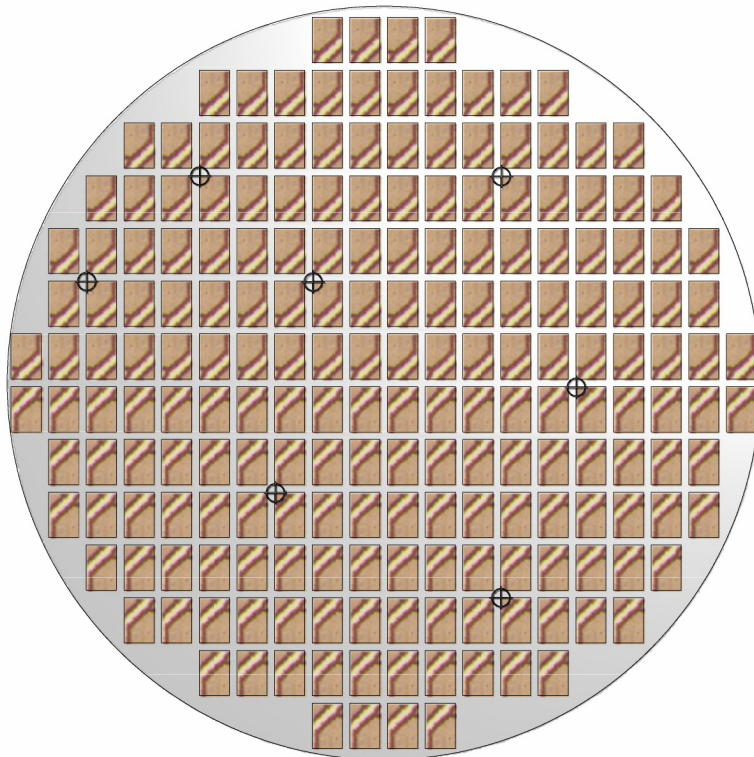
ARC {Xs,Ys},{Xe,Ye},{X_{3rd},Y_{3rd}},{Distance}

ARC -100.000,0.000,0.000,100.000,70.700,70.700,2.000

The stage will move every 2mm on a 200mm arc path from the start point to the end point.

XY POINT:

This function will create and store an XY point.



Example:

POINT{X,Y}

POINT 56.230,-45.231

The stage will move that specific coordinate.

Dialog

Arc Step Distance in mm

0.000

7	8	9
4	5	6
1	2	3
0	+/-	.
CLEAR	Backspace	OK

CIRCLE:

Much like the ARC command, this function will create a circle scan. Three points will be stored with this command. Starting point, ending point and any 3rd point, the STORE button should be used after each point has been reached. The final step is to enter the Circle Step distance in mm. The circle command will always start at the 12:00 o'clock position.

Example:

CIRCLE {Xs,Ys},{Xe,Ye},{X3rd,Y3rd},{Distance}

CIRCLE -100.000,0.000,100.000,0.000,100.000,0.000,2.000

The stage will move every 2mm on a 200mm circle path from the start point to the end point.

XY LINE:

This function will create a line scan. Two points will be stored with this command, starting and ending points. The final step is to enter the line step distance in mm.

Example:

LINE {Xs,Ys},{Xe,Ye},{Distance}

LINE -40.000,20.000,40.000,20.000,1.000

The stage will move every 1mm from the start point to the end point.

RASTER:

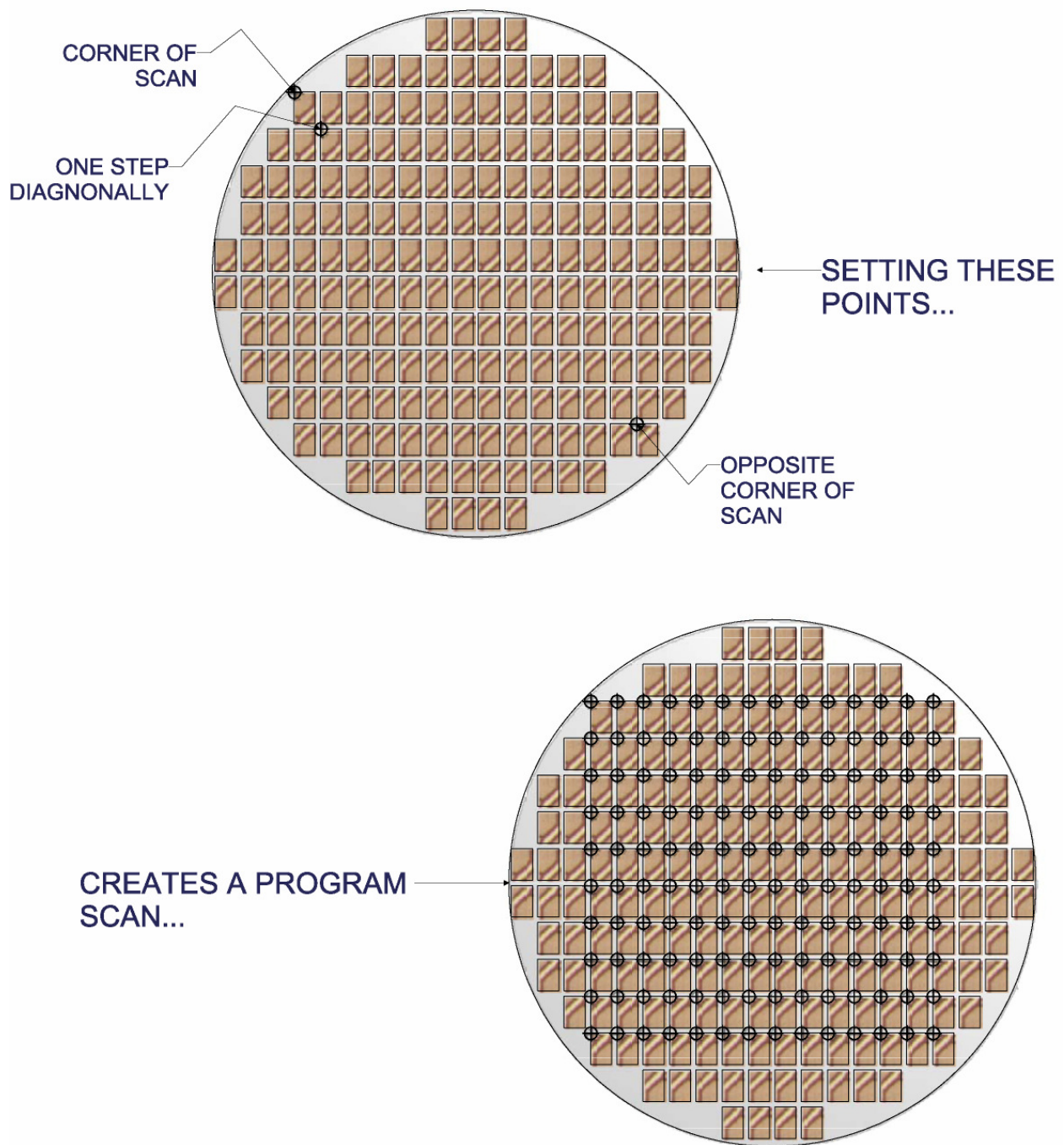
This function will create a raster scan. The three step process involves teaching the corner of the rectangular area, the diagonal corner of the next rectangle, and the opposite corner of the scan area.

Example:

RASTER {Xs,Ys},{Xi,Yi},{Xe,Ye}

RASTER -70.000,70.000,-60.000,60.000,60.000,-60.000

The stage will move to every rectangle pattern in a left to right movement always starting from the left side.



COMB:

The COMB scan function is exactly identical to the RASTER scan, but with scanning direction.

Example:

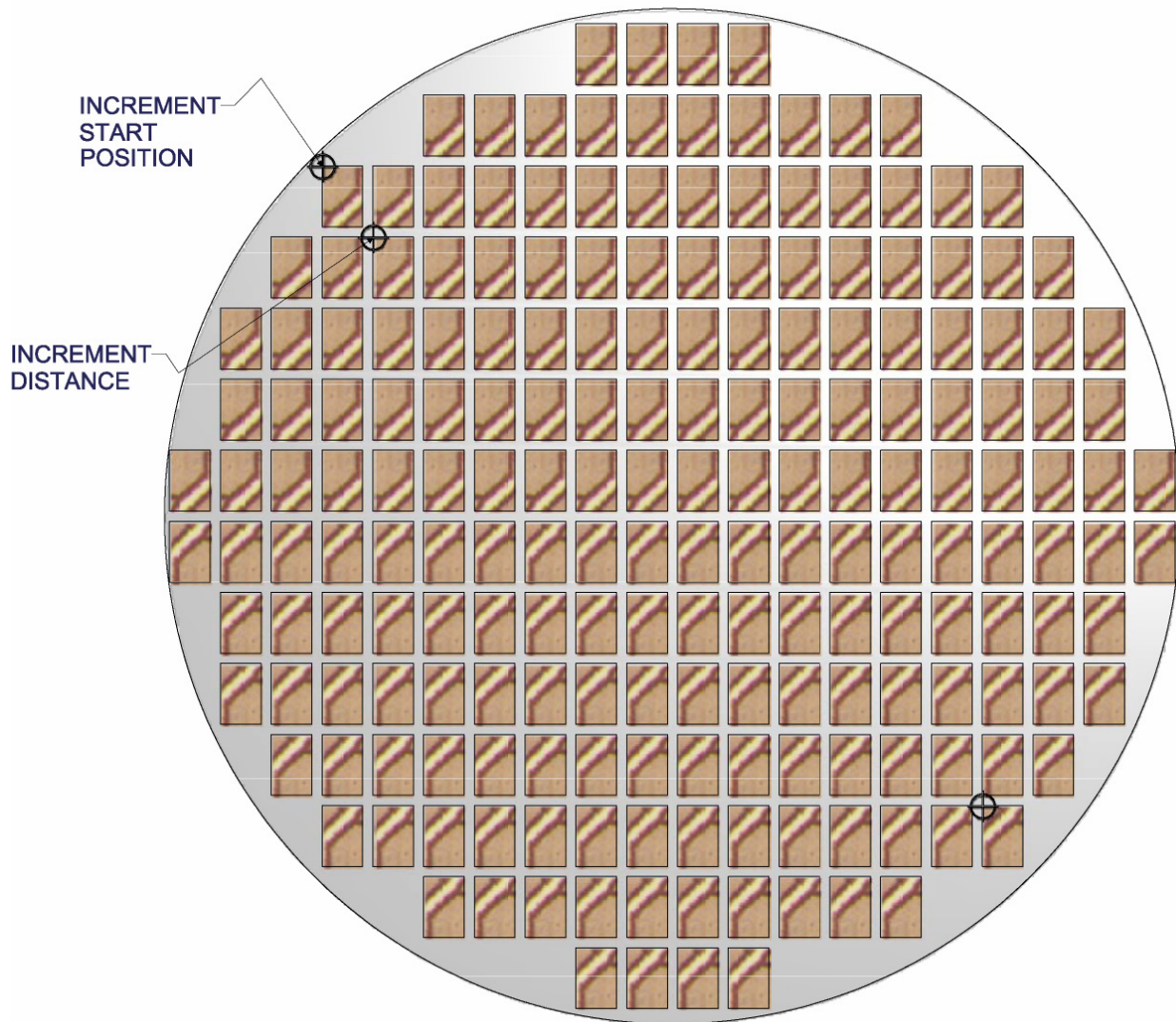
COMB {Xs,Ys},{Xi,Yi},{Xe,Ye}

COMB -70.000,70.000,-60.000,60.000,60.000,-60.000

The stage will move to every rectangle pattern starting from a left to right movement, then right to left and so on till the end of the scan area

INC or INCREMENT:

This function will create increment scan. Two diagonal points will be stored with this command, starting at base point and increment distance point. The STORE button should be used after point has been reached.



Example:

INC {Distance}

INC 1

The incremental distance will equate to a 1mm move.

XY SPEED:

The stage speed can be changed at any point during the scanning process by inserting a new speed command.

Example:

SPEED {Speed}

SPEED 40

Speed 40 will set the stage speed to 40 mm/sec.

Z SPEED:

The focus speed can be changed at any point during the scanning process by inserting a new speed command.

Example:

ZSPEED {Speed}

ZSPEED 60000

Speed 60000 will set the focus speed to 60000 steps/sec.

DELAY:

Delays can also be added between each point to give the operator enough time to view the point.

Example:

DELAY {Time}

DELAY 1000

Delay 1000 would equate to 1 sec or 1000ms.

Z Point:

This Function will create and store a Z focus point

Example:

ZPOINT {Z}

ZPOINT 1126

The focus axis will move to the desired point.

DEFMAC or Define Macro:

This function can be used to repeat a set of filter wheel commands. The DEFREP should be inserted in the recipe file before it is to be used.

Example:

```
DEFMAC  
DEFMAC  
EXPTIM 1,500  
F1MOVE 1  
SHEXP 1  
F1MOVE 2  
SHEXP 1  
ENDMAC
```

This defines a filter wheel macro that when invoked will move filter wheel to position 1, expose the shutter for 500ms, move the filter wheel to position 2 and expose the shutter for 500ms.

ENDMAC or End Macro:

This function will end the macro definition.

FMACRO or Filter Macro:

This function will execute the macro previously defined.

Example:

```
FMACRO  
DEFMAC  
EXPTIM 1,500  
F1MOVE 1  
SHEXP 1  
F1MOVE 2  
SHEXP 1  
ENDMAC  
POINT 0,0  
FMACRO  
POINT 1000,1235  
FMACRO
```

This defines a filter wheel macro that when invoked will move filter wheel to position 1, expose the shutter for 500ms, move the filter wheel to position 2 and expose the shutter for 500ms. The stage moves to the first point (0,0) and then executes the filter wheel macro. Then the stage moves to the second point (1000,1235) and executes the filter wheel macro again.

FMOVE:

This Function will move both wheels to the desired location. If the 0 position is selected for a given wheel that wheel will not move.

Example:

```
FMOVE {W1,W2}  
FMVOE 1,4
```

The main filter wheel will be moved to position 1, the secondary wheel will be moved to position 4.

SCTRL:

This Function will control all three shutters. Commands are as follows: 0-close, 1-open, 2-expose, 3-do nothing.

Example:

SCTRL {SH1, SH2, SH3}

SCTRL 1,0,3

This command will open shutter 1, close shutter 2 and leave shutter 3 in it's current state.

F1MOVE:

This Function will move filter wheel #1 to the specified position.

Example:

F1MOVE {W1}

F1MOVE 5

This command will move filter wheel #1 to position 5.

F2MOVE:

This Function will move filter wheel #2 to the specified position.

Example:

F2MOVE {W2}

F2MOVE 3

This command will move filter wheel #2 to position 3.

SHOPEN or Shutter Open:

This Function will open the specified shutter.

Example:

SHOPEN {SH# }

SHOPEN 3

This command will open shutter 3.

SHCLOSE or Shutter Close:

This Function will close the specified shutter.

Example:

SHCLOSE {SH#}

SHCLOSE 3

This command will close shutter 3.

SHEXP or Shutter Expose:

This Function will open the specified shutter for a time determined by the previous EXPTIM command and then close it.

Example:

SHEXP {SH#}

SHEXP 1

This command will expose shutter 1.

FDELAY or Filter Delay:

This Function will wait the specified number of milliseconds before going to the next command. This can be used to implement delays between filter wheel moves.

Example:

FDELAY {Time in ms}

FDELAY 500

This command will delay execution of the recipe for 500ms.

EXPTIM or Exposure Time:

This Function will set the exposure time for the specified shutter.

Example:

EXPTIM {SH#, Time in ms}

EXPTIM 1,1500

This command will set the exposure time for shutter 1 to 1500ms or 1.5 seconds.

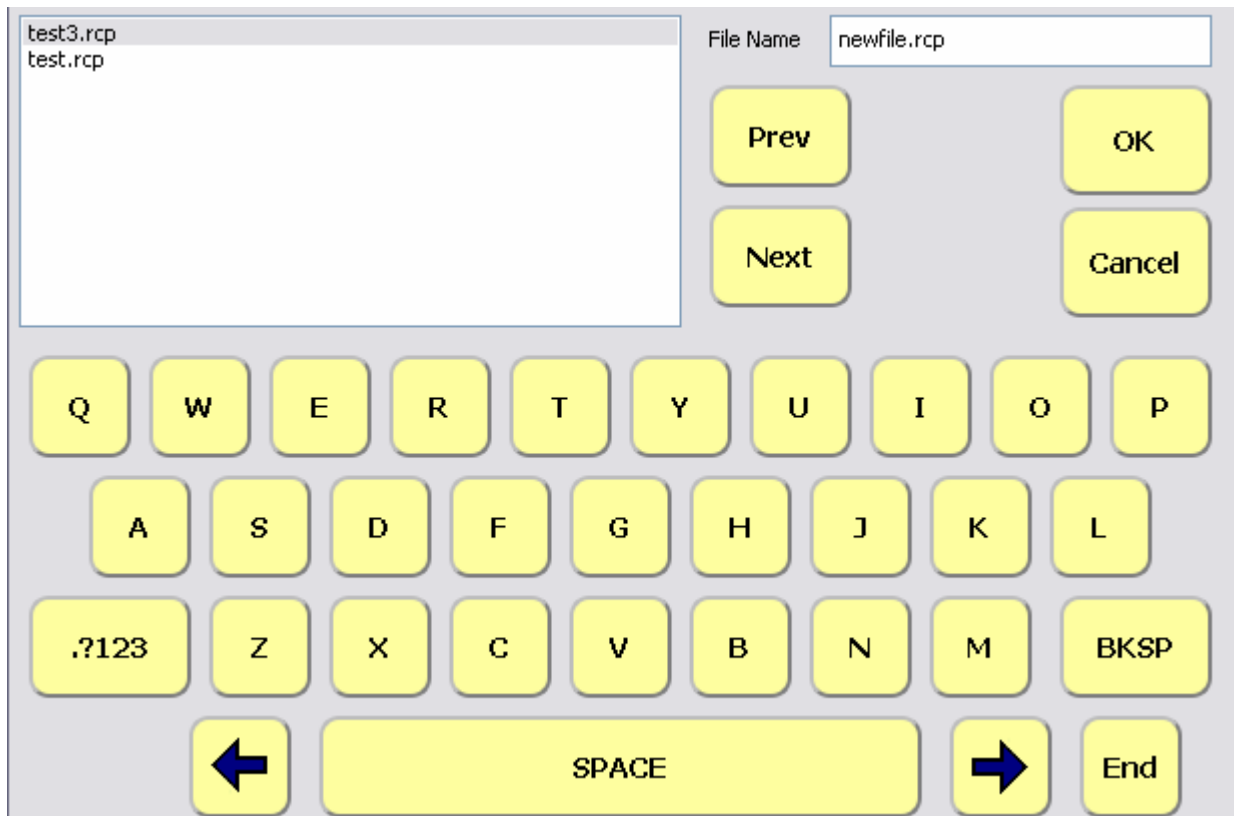
Common Recipe

```
INC 4.000,4.000
DELAY 1000
SPEED 40
DEFREP -90.000,90.000
DELAY 3000
POINT 8.000,-1.000
POINT 9.000,-3.000
POINT 2.000,-3.000
ENDREP
RASTER -90.000,90.000,-80.000,80.000,80.000, -80.000,2.000
{END}
```

This program will perform a raster scan of the defined area on a wafer. At each raster program point, (3) scatter points will be looked at. There will be a 3 seconds delay between each scatter point and a 1 second delay between each raster program point.

11.0 Saving a Stage Recipe Program

Once a stage recipe has been written, it needs to be saved. From the main screen, click the **SAVE** button. The following window will be displayed.



The dialog window for saving a stage recipe program. It features a text area on the left containing 'test3.rcp' and 'test.rcp'. To the right is a 'File Name' input field with 'newfile.rcp'. Below these are four buttons: 'Prev', 'Next', 'OK', and 'Cancel'. At the bottom is a virtual keyboard with three rows of yellow buttons. The first row contains Q, W, E, R, T, Y, U, I, O, P. The second row contains A, S, D, F, G, H, J, K, L. The third row contains .?123, Z, X, C, V, B, N, M, BKSP. Below the keyboard are four navigation buttons: a left arrow, a large 'SPACE' button, a right arrow, and an 'End' button.

Figure 23 – Save Stage Recipe Dialog

12.0 Clearing a Stage Recipe Program from Memory

To clear a stage recipe, click the **EDIT** button on the main screen. This will bring up the recipe editor. Then click the NEW STAGE PROGRAM button. That will automatically clear any previous recipe file in memory.

13.0 Running a Stage Recipe Program

After a stage recipe has been created, it can be executed by using the **START** button on the main screen. Once the **START** button is pressed the user will be prompted to place a sample on the stage and press **RESUME**. At that point the stage recipe will execute and the stage will move to all the stored points. The user can press **PAUSE/RESUME** at any time to pause the execution of the **RECIPE**.

NOTES

NOTES

Ludl Electronic Products designs and manufactures a wide range of automation accessories for microscopes and instrumentation.

www.ludl.com

Ludl Electronic Products, Ltd.

171 Brady Avenue
Hawthorne, NY 10532
Voice: (888) 769-6111
Fax: (914) 769-4759

Support@ludl.com
Sales@ludl.com