

RESONETICS

THE LEADER IN LASER MICRO MANUFACTURING FOR LIFE SCIENCES

RapidX250 Upgrade

Prepared for UC Irvine

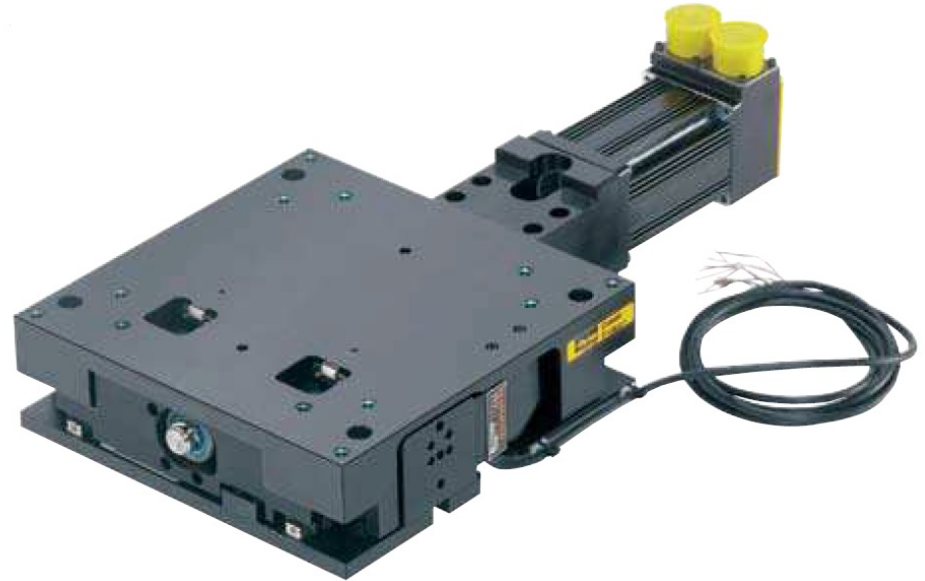
June 2017

Upgrade Summary

- Rotary stage
- Vertical lift Z stage
- Computer
- Motion controller
- Software (GUI)

Vertical Z stage (ZP200)

- Wedge design with
 - precision ball screw (5mm lead)
 - Recirculating square rail bearing
 - Stepper motor
- 25mm travel
- Max velocity: 100 mm/s
- Repeatability: +/- 3 μm
- Max Load (15 kg)



Rotary Stage (RT206)

- 6" diameter platform
- Two angular contact circular bearings races
- Gear drive (45:1 ratio)
- Stepper motor
- Max. speed: 0.3 rev/sec
- Repeatability: 0.3 arc min (unidirectional)
- Max. Load: 68 kg



Computer, Motion controller and software

- New computer (Windows 7 OS)
- A3200 modern motion controller, expandable to 32 axis of motion
- Motion Composer interface and CNC Operator Interface
- Advanced motion command capabilities:
 - Industry standard G-Code like programming
 - Point to point motion
 - Linear and circular interpolated motion
 - Velocity profiling and acceleration limiting
 - Smooth path generation between user-defined points
 - Laser control commands
 - Software flow control (conditional, branching, etc..)
 - Variables and mathematical functions
 - Laser firing commands
 - Status windows
 - Operator input pop-up window

CNC Operator Interface

The screenshot displays the A3200 CNC Operator Interface (4.09.001) by Aerotech, Inc. The interface is divided into several functional areas:

- Control Panel:** Features buttons for X, XX, and Lsr axes, each with a green 'Home' icon and a blue 'Home' icon.
- Status:** Shows 'Homed' for X, XX, and Lsr axes, with 'VH' (Velocity Hold) indicators.
- Program Position Feedback:** Displays 0.000 mm for X, XX, and 0 shots for Lsr.
- Program Velocity Feedback:** Displays 0.000 mm/sec for X, XX, and 0 shots/sec for Lsr.
- Coordinated Distance Remaining:** Shows 0.000 mm for X, XX, and 0 shots for Lsr.
- Execute Immediate Command:** Includes a 'Command:' dropdown and a 'Select Task' field set to '1'.
- Run Mode:** Set to 'Auto' with a 'Change' dropdown.
- Retrace Mode:** Set to 'Off' with a 'Change' dropdown.
- MFO:** Set to 100% with a slider control.
- Program Editor:** Shows a G-code program with lines 1 through 8, including commands like 'PORT X DIRECTION 0 OUTPUT', 'ENABLE X XX Lsr Enc', and 'HOME X XX Lsr Enc'. It also includes parameter settings for BeamStop, ProcessGas, DoorLock, and Exhaust.
- Jog Pad:** Contains directional arrows (up, down, left, right) and buttons for '+XX', '+Lsr', '-X', '-XX', and '-Lsr'. It also includes 'Jogging Inactive' and 'Jog Type' (Low, High, Freerun, Distance, Distance Hold) settings.
- Speed Settings:** A table for setting distance and speed for each axis.
- Select Page:** Includes buttons for 'Operator' and 'Default'.
- Function Keys:** A grid of buttons for Part Type 1-6, Unwind Tension Enable/Disable (F10, F11), and Enter Standby (F12).
- Axis Distance/Speed Table:**

Axis	Distance	Speed
X	10 mm	50 mm/sec
XX	10 mm	50 mm/sec
Lsr	10 shots	15 shots/sec
- Bottom Bar:** Includes icons for File (Alt+F), Debug (Alt+D), Cycle Start (F5), Feedhold (F3), and Abort (Ctrl+Shift+A). It also features Help (F1), User (Alt+E), Utilities (Alt+U), Controller (Alt+C), Acknowledge All (F2), and System Stop (Ctrl+Shift+S). The status bar shows 'Connected' and 'George Gee Task 1 - Program Complete'.

Motion Composer GUI

The screenshot displays the A3200 Motion Composer software interface. The window title is "A3200 Motion Composer (4.07.001) - Aerotech, Inc.". The menu bar includes File, Edit, View, Controller, Build, Debug, Diagnostics, Tools, and Help. The toolbar contains various icons for file operations and execution.

The "Axis Manager" section shows the status of three axes (X, Y, Z). All axes are "Hommed" and have a speed of 450 mm/sec. The "Jog" section provides controls for moving each axis. The "Program Position Feedback" and "Program Velocity Feedback" sections show current values of 0.0000 mm and 0.0000 mm/sec, respectively.

The "Task 1" tab is active, displaying a G-code program named "EAGLE.PGM". The code includes initialization, header information, and a loop for checking exhaust flow.

```
1 | 1/7/2014 8:01:35 AM
2 | #define CoordinatedMotionTransitionFeedrate 80
3 | #define ShapeFeedrate 20
4 |
5 | ' Program Initialization
6 | ;*****
7 | ;* Header
8 | ;* Date:
9 | ;* Creator: CADFusion Export
10 | ;* Purpose: Cut an eagle on a business card
11 | ;* Version:
12 | ;*****
13 | DVAR $Response,$Skip
14 |
15 | ;*****
16 | ;* CADFusion Header
17 | ;*****
18 | ;Check the system air flow
19 | $Skip = 0
20 | WHILE (!ExhaustFlow)AND(!$Skip)
21 |     UserIntervention = 1
```

The status bar at the bottom shows "Connected", "Ready", and "Task 1 - Idle".

CAD Fusion CAD/CAM Interace

