



## ***Freedom 3000 Rework Station***

### ***Freedom Series for Advanced Process Development, Prototyping & Rework***

The Freedom Series is **A LOT MORE** than simple rework stations. Actually they are the industry's most advanced, yet easy-to-use component placement, heating and removal systems. In fact, they are best suited for BGA, CSP, Flip Chip or leaded component process development and prototype production.

The Freedom 3000 uses custom Windows™-based control software that incorporates features available only on the most advanced reflow soldering ovens. Control of your process, through thermal profiling and editing of heating parameters, is completely at your fingertips. As a result, thermal processing of advanced components is accomplished repeatably from thin "low-mass" PCB's to large "high-mass" PCBs up to 20" x 20" (50.8 cm x 50.8 cm).

The Freedom Series standard powerful top and bottom heating system applies precise quantities of forced convective energy directly to the component and board. Any combination of gas velocity, temperature and heater height can be used to adjust the heating rate. For "high-mass" assemblies, our Honeycomb IR bottom-side pre-heater is ideal. Its large surface area and ultrahigh heat transfer coefficient provide the additional horsepower needed for rapid soldering while maintaining decreased temperature deltas, thus preventing board warp.

The placement accuracy of the Freedom 3000 can't be beat. With its "component-to-pad" vision/alignment system, spring-loaded work board holder and integral vacuum pickup system, the Freedom will place Flip Chips with bump spacing as low as 0.004" (0.1mm). Also incorporated is an adjustable board support to maintain circuit board flatness during the heating cycle.

With the Freedom 3000 automated optics system, a user-friendly interface is achieved. This concept continues with up-front controls, and a work bench style platform. Heating is precisely controlled through password protected process development, creating probably the easiest system for operators of high-end rework equipment.

The fact is, more corporations are now using the Freedom Series than any other system for advanced prototyping and rework.



### ***Standard Features***

- Windows™ based control system
- Automated optics train
- 15" LCD monitor
- Top and bottom forced convective heaters
- Bottom side board support
- Independent gas flow, temperature and working height adjustment parameters
- Integrated frame with slide out access panels for easy service and maintenance
- Massive precision-machined frame for repeatable positioning and component placement
- Live video display for alignment of simultaneous component and pad images
- Low cost, multifunction nozzles with integrated vacuum pickup

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# Freedom 3000 Basic Information

## Control System

- Intel Pentium™ based computer
- High Resolution video processor card
- 15 inch LCD monitor
- 10 GB (or larger) hard disk drive
- Trackball for “point and click” operator control
- Integrated keyboard and mouse tray
- Industrial-duty programmable logic controller (PLC) for reliability and I/O control
- Real-time PID control for forced convection gas heaters
- (6) process thermocouple ports for real-time profile monitoring and development
- Automated optics train

## Hardware

- Precision optics, placement accuracy to  $\pm 0.001$  inch ( $\pm 0.025$ mm)
- Standard flat mirror or optional split mirror for improved large component alignment
- Fine adjust PCB positioning table with x-axis, y-axis and theta adjustments
- Rigid station base for repeatability and durability
- Variable gas flow control for top and bottom process heaters
- Switchable air or nitrogen mode operation (with separate air and nitrogen inputs)
- Storage for up to 14 nozzles
- Vacuum wand attachment for component handling
- Universal board holding fixture

## Machine Dimensions

- 50 inches (127 cm) wide
- 32 inches (81 cm) deep
- 66 inches (168 cm) tall

## Software

- Microsoft Windows™ 98
- Two different operating modes. Engineering (which offers full access) and operator
- Conceptronic custom operating software access
- Password-protected software access
- Interactive process development (teach-mode)
- Datalogging with report generation
- Product/machine time vs. temperature profiling
- Virtually unlimited parameter adjustability (multiple flow rates, temperature set points, etc.)
- Programmable control of z-axis drive
- Board/component/location library development capabilities (with linking)
- Remote diagnostics option (includes modem and interface software)

## Component Handling Capacity

- 2 inch (51 mm) square maximum recommended component size
- 0.3 inch (7.6 mm) maximum recommended component height
- Handles both grid array and leaded type components (BGA, CGA, QFP, PLCC, TSOP, CSP, FLIP-CHIP and many others)

## Board Handling Capacity

- 2 inch x 2 inch (5 cm x 5 cm) minimum recommended board size
- 20 inch x 20 inch (50.8 cm x 50.8 cm) maximum recommended board size
- Able to repair boards with up to 2.4 inch (61mm tall) components

## Primary Voltages

- Single phase, VAC
- 190, 200, 208, 220, 230, 240
- 380, 400, 416, 440, 460, 480

1. Due to our policy of continuous improvement, machine specifications are subject to change without prior notice.
2. Consult “Standard Machine Specifications” and “Standard Option Description” for additional information.