Certified Integrator

AEROTECH

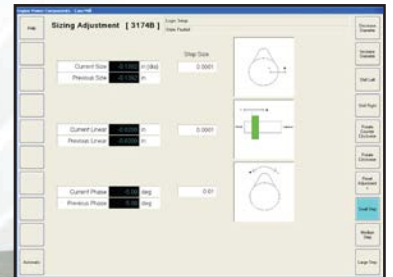I²T Integrated Industrial Technologies, Inc.
Innovative Ideas in Motion

Aerotech 2011 Certified Integrator

The engineering staff at Integrated Industrial Technologies, Inc. (I^{2}T) has been providing unsurpassed solutions to demanding motion control applications using the Aerotech product family for nearly 20 years. Located near the Aerotech World Headquarters, our unparalleled engineering talent will eliminate project risk and ensure the solution will be completed on time and on budget.

I^{2}T is recognized as a leader in the motion control systems and services industry. The engineering staff is well positioned to support the entire range of Aerotech control and mechanical components and has successfully delivered a wide range of solutions for the following industries and applications:

- Automotive (painting, grinding, milling, engine and transfer lines)

- Glass (cutting, bending, inspection and furnaces)

- Machine tool (grinding, milling, polishing, CNC and conveyor systems)

- Robotics (palletizing, part handling, inspection, part placement, medical and educational)

- Packaging (wrappers, stackers, labelers, printing and inspection)

- Tire and rubber (1st stage, 2nd stage, uni-stage, cutting, handling and storage)

- Metals (furnaces, coating lines and grinders)

- Web processing (paper, foil, film and filament lines)

- Aerospace (submarine simulators, missile testing and tracking systems)

Focus on Service

As a service-oriented company, our technical and engineering staff can assist you in the application design phase, proposal generation as well as provide a complete turn-key solution. We can expedite the customer project by providing a wide range of complete technical services:

- Project management, application architecture and design specifications

- Software development testing and validation

- Mechanical and electrical design and drawings

- Panel build and system prototyping

- On-site startup and remote support

- Training

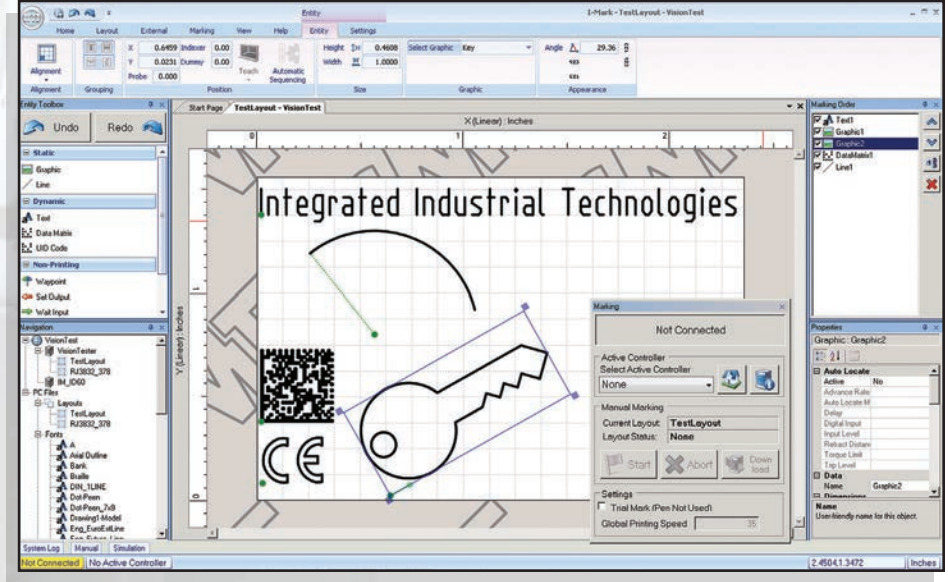From our single location we have supplied unsurpassed engineering development and support to our customers worldwide.

At I^{2}T we are committed to providing quality solutions that are tailored to meet customer needs. With our 100% success rate guarantee, you are ensured that your project will meet or exceed your expectations.

Custom Software

With a well proven track record in software development, I²T has completed numerous applications on the Aerotech controller platforms that precisely meet the customers' needs and fit seamlessly into their process requirements. We offer the following expertise:

- *Custom Windows Applications (C#.NET, C/C++, LabVIEW®) that provide a tailored user interface experience with specialized process logic*

- *Motion Logic (CNC, AeroBasic™) for deterministic, high-precision motion control, often networked with other components (HMI, PLC, other)*

- *Libraries and Interfaces to encapsulate the motion logic so customers may spend their time focused on the overall process*

Product	Typical Applications	Example Projects
A3200 with Ndrive/Npaq	• New system development • Full rebuild of existing systems	• Crank shaft millers • Cam lobe grinders • Semiconductor inspection • Training simulators
A3200 with Nservo	• Control upgrade to existing systems	• Gantry robots • CNC grinder • Automated part storage and retrieval
Ensemble & Soloist	• Distributed control • New system development	• Impact and scribe marking control system • Materials handling • Micromachine electro-chemical etching
PLC / BA	• Motion coordinated by PLC	• Tire and rubber manufacturing • Brush filament winding and wrapping • Grinders • Vapor deposition on glass substrate • Part loaders

Standard Software Modules for Machine Tools	
Core Framework	Includes fault handling, event log, app lifecycle
State Machine Engine	Architecture for state logic programming that controls application processes; multi-threaded and event based
A3200 Wrapper	I²T specific logic that brings A3200 API into Core framework and state machines
Grinder Engine	Machine logic to handle grind and dress process logic; base user screens for editing part data; calculations for cam profile, work speed and point adjustments

Example: Camshaft and Crankshaft Milling and Grinding Package

Part Definition

- *Each lobe in the camshaft is uniquely programmable*

- *Select lobe profiles from standard .p file formats*

- *Visual representation of the shape of the selected lobe*

- *Visual representation of the phase of the lobe for verification against prints*

- *Visual shaft spacing and selection to verify part linear spacing*

Offsets

- *Individual offsets for Linear, Phase and Size for each lobe*

- *Display programmed values for reference*

- *Graphical display of how the offsets affect the process*

Profile Adjustment

- *Manual adjustment of the shape of the lobe profile*

- *Allows for correction for process errors in software*
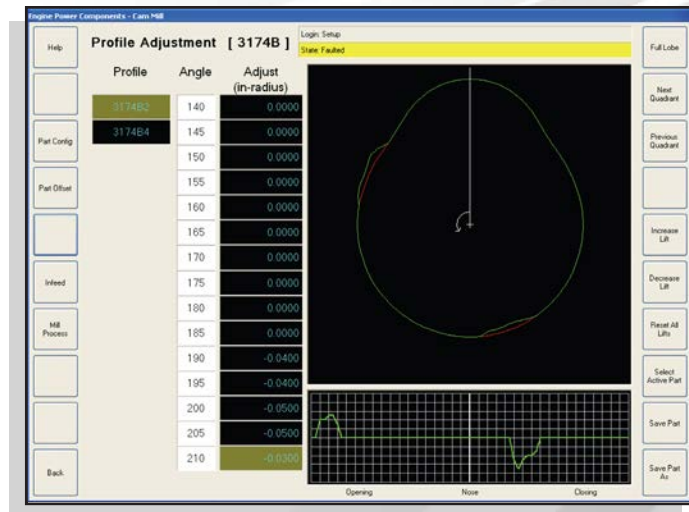
In-feed Setup

- *Define multiple in-feed options*

- *Each distance and speed separately editable*

- *User-friendly names provided by the operator*

- *Manually teach the distances against a known reference part*

Process Sheet

- *Create the order of execution for the lobes on the system*

- *Assign in-feed, work-speed profile and average rpm to each lobe individually*

- *Ability to process the lobes in any order*

Automatic Control

- *Live status as the process is executing*

- *Status messages for fault and process information*

- *Time-stamped activity of all actions performed by the controls*

- *Live contact angle displayed against lobe profile*

- *Part status information for production information*
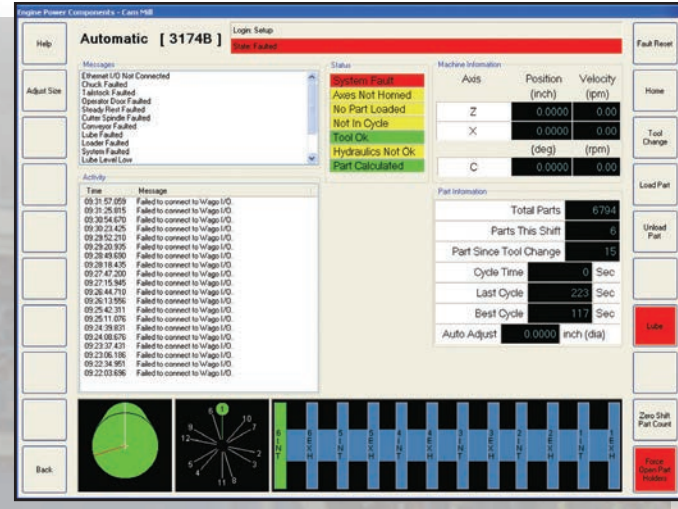
In-Process Adjustments

- *Allows the operator to make global process adjustments*

- *Value changes are bounded to minimize user error that could cause part damage*

- *Graphical help to show how the adjustments affect the process*
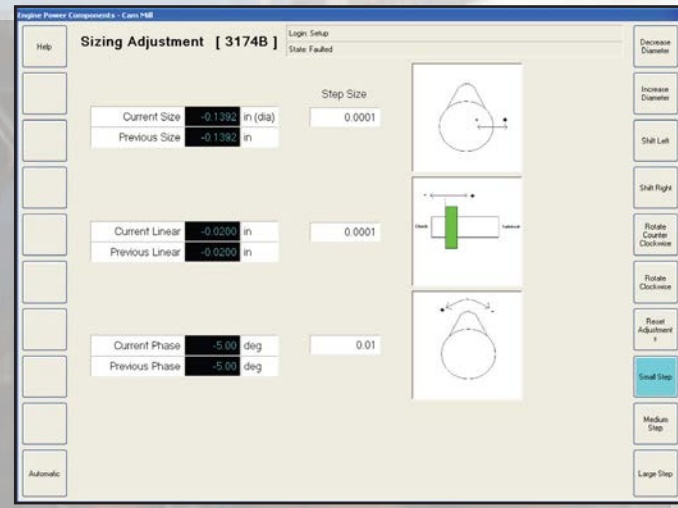
Manual Jog

- *Full manual control of all servo axes*

- *Ability to teach individual locations of the machine and store the data to the part file for future use*

- *Detailed fault and activity information*
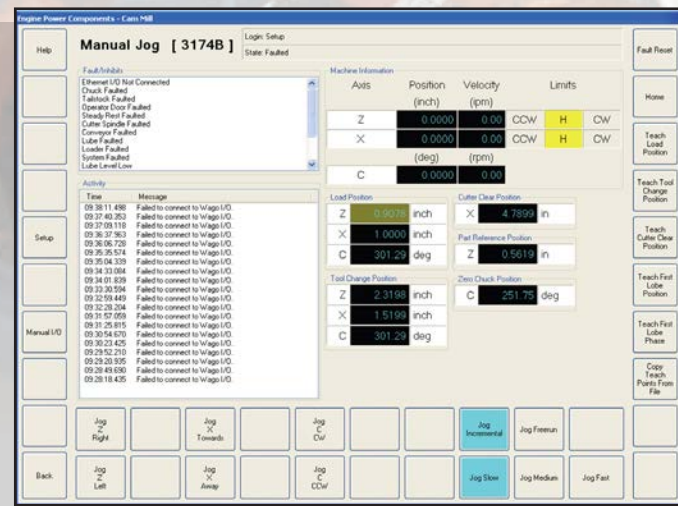
Manual I/O

- *All system signals presented to user for diagnostic purposes*

- *Signals grouped by functional component*

- *Command buttons to exercise each component with feedback of status on the button*
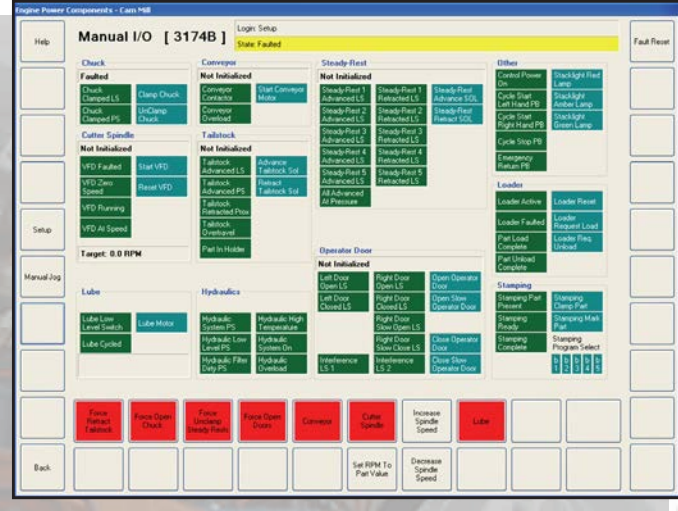
Parameters

- *All application data presented to user for view and editing*

- *Parameters divided into separate pages to better navigate the data*

- *Consistent editing experience throughout the application*
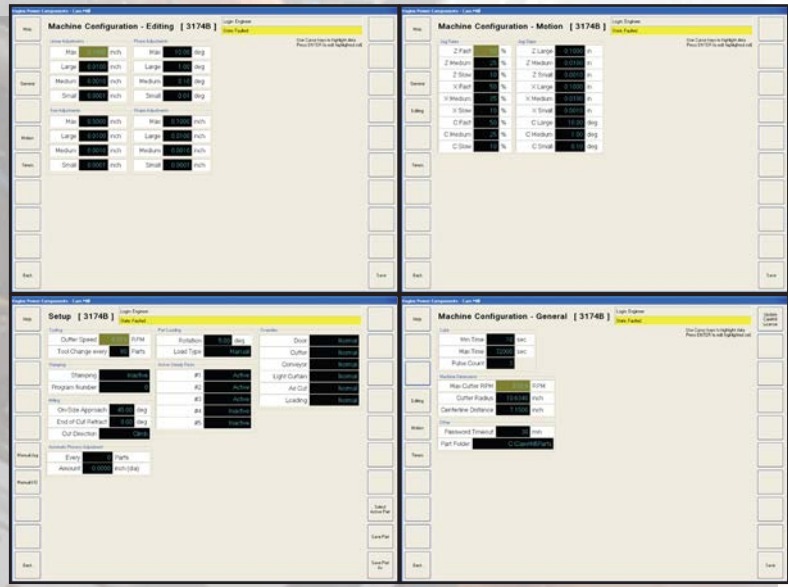
Diagnostics

- *Active faults displayed to assist in machine troubleshooting*

- *Full record of all actions performed by the machine stored in human-readable text files*

- *Able to open older log files to review extended history*

- *Full details of an event when selected with custom data fields*

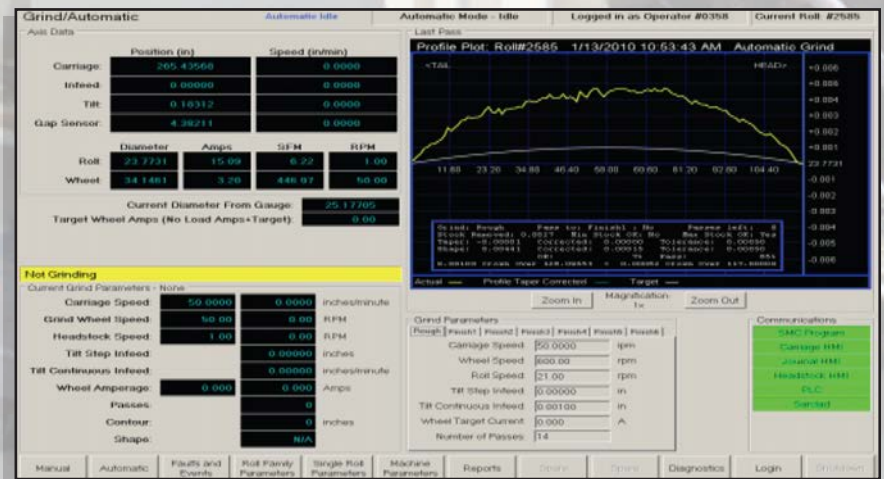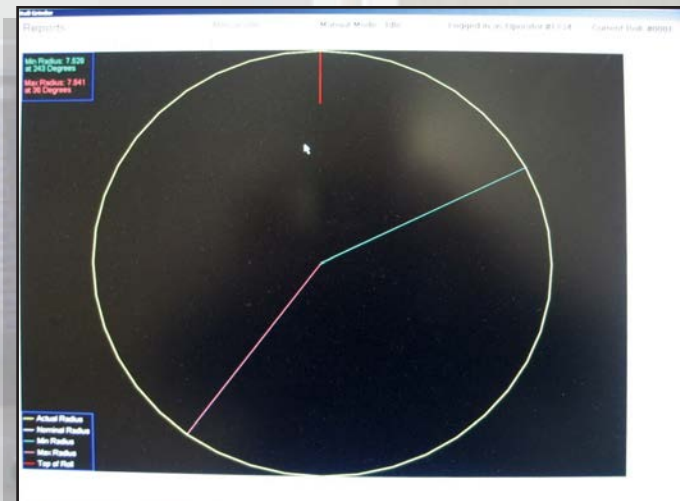- *Filter string to narrow down searches*
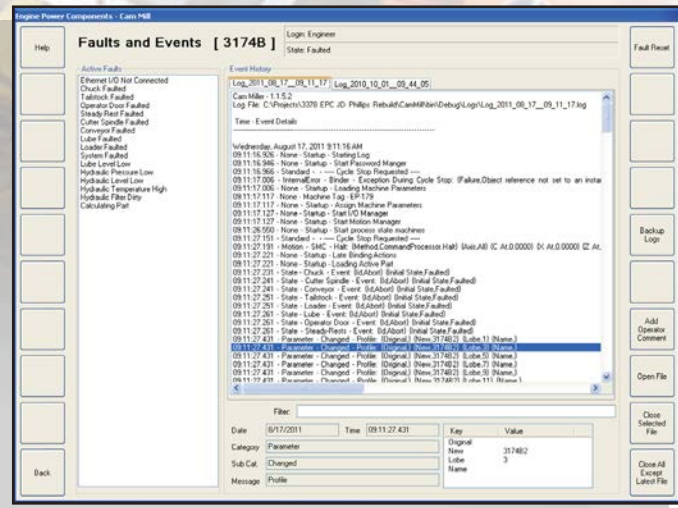
Example: Roll Grinder

Automatic

- *Live display of surface quality through external measuring device*

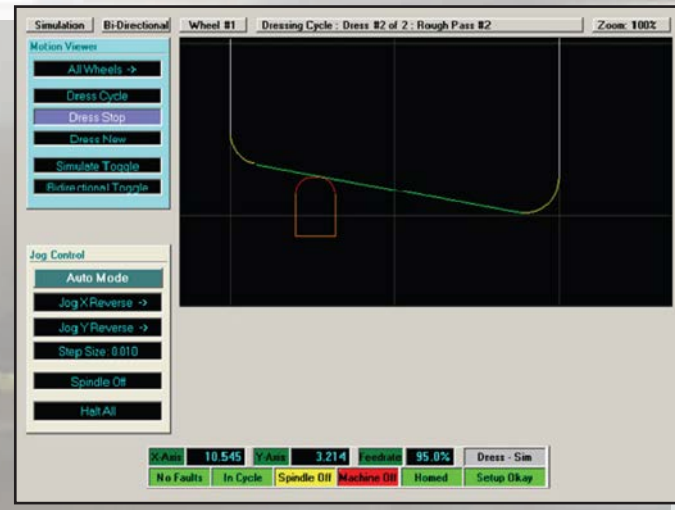- *Feedback of system during cycle*

Eccentric Testing

- *Radial measurements of roll*

- *Validate the roundness of the part*

- *Highlight angles of min and max radius locations*

Example: CNC Dresser

Motion Viewer

- *Display relative positions of dress wheel and grind wheel surface*

- *Show profile of grind wheel*
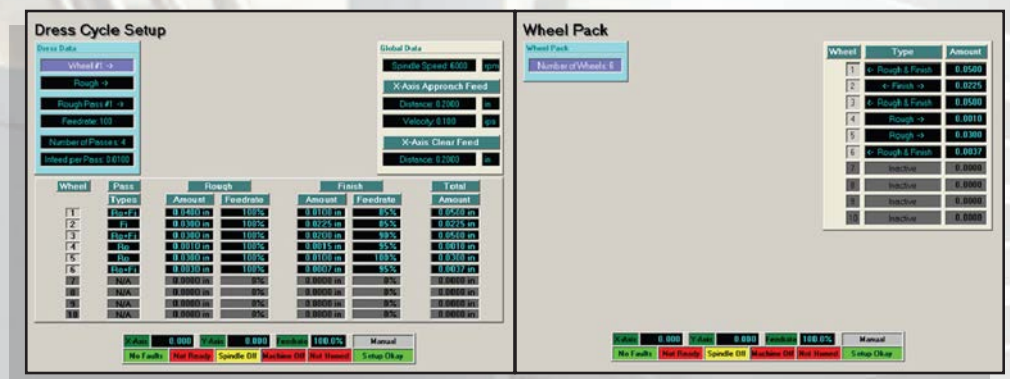
- *Live update of graphics during process*

Profile Editor

- *Create any arbitrary grind wheel shape using standard arcs and lines*

- *Edit individual segments*

- *Re-order segments*

Wheel Configuration

- *Select one or more grind wheels in the system*

- *Set the types of dressing patterns to apply to each wheel and amount of material to remove*

Aerotech Motion Control Solutions for Camshaft Grinding Machine Retrofits

Advanced Motion Controllers

- CNC-based multi-axis motion controls
- High-power servo amplifiers
- Drive brush, brushless, step motors
- Encoder, sine/cos or resolver feedback
- PLC

Scalable Automation

- Spindle, wheel feed and traverse axes
- Dresser package
- Crowning axes/swivel wheel

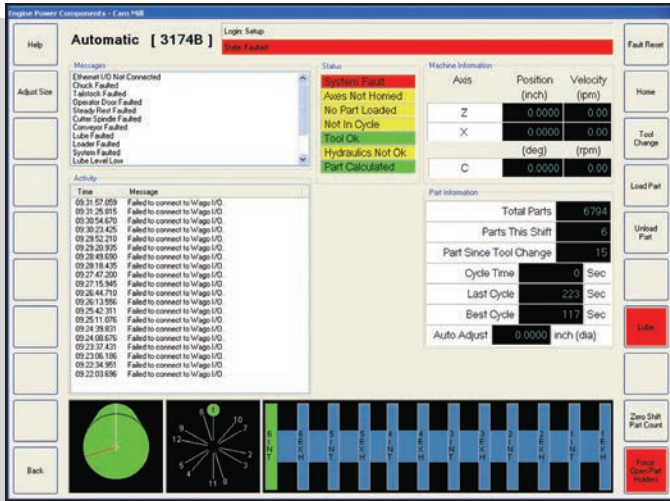## Superior Software Solutions

- Part in-feed, offsets and process adjustments
- CNC dresser package
- Eccentric testing
- Diagnostics and more

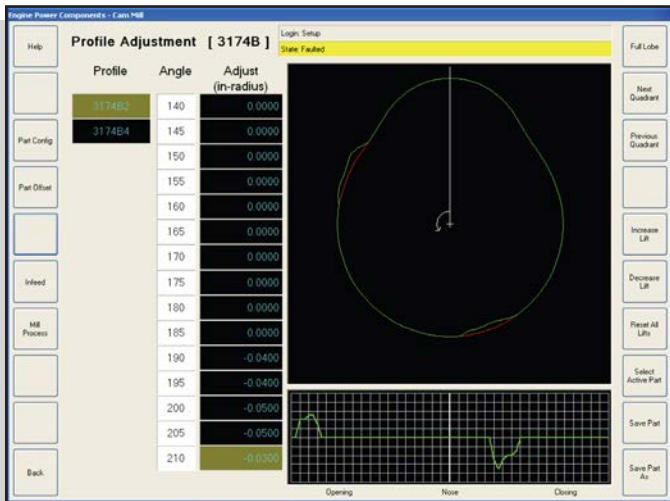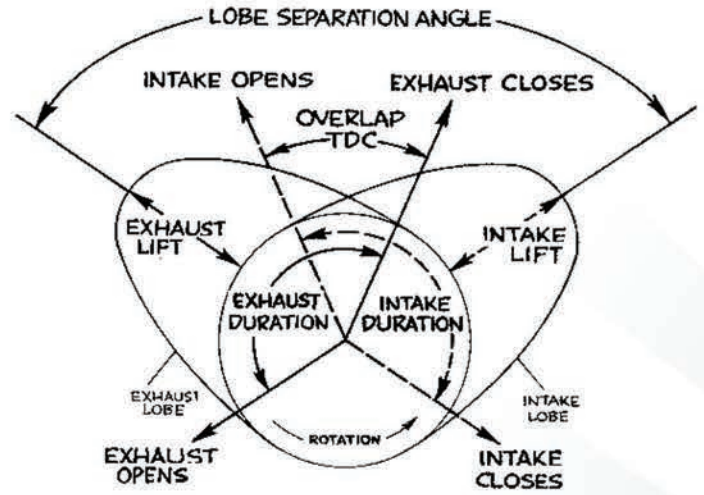## Retrofit Solutions

- Panels and software
- Control console and software
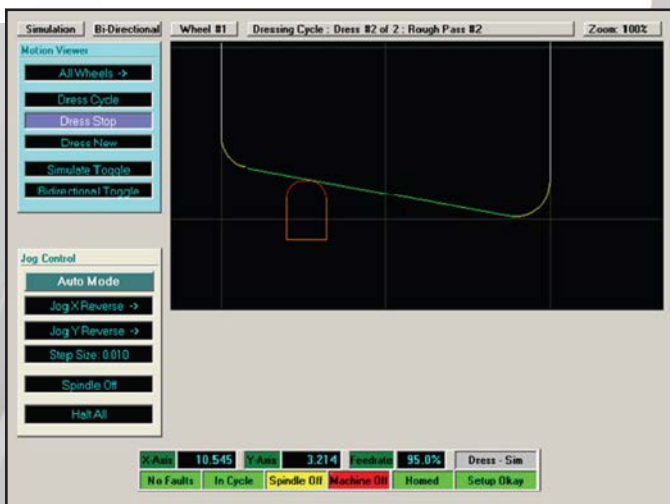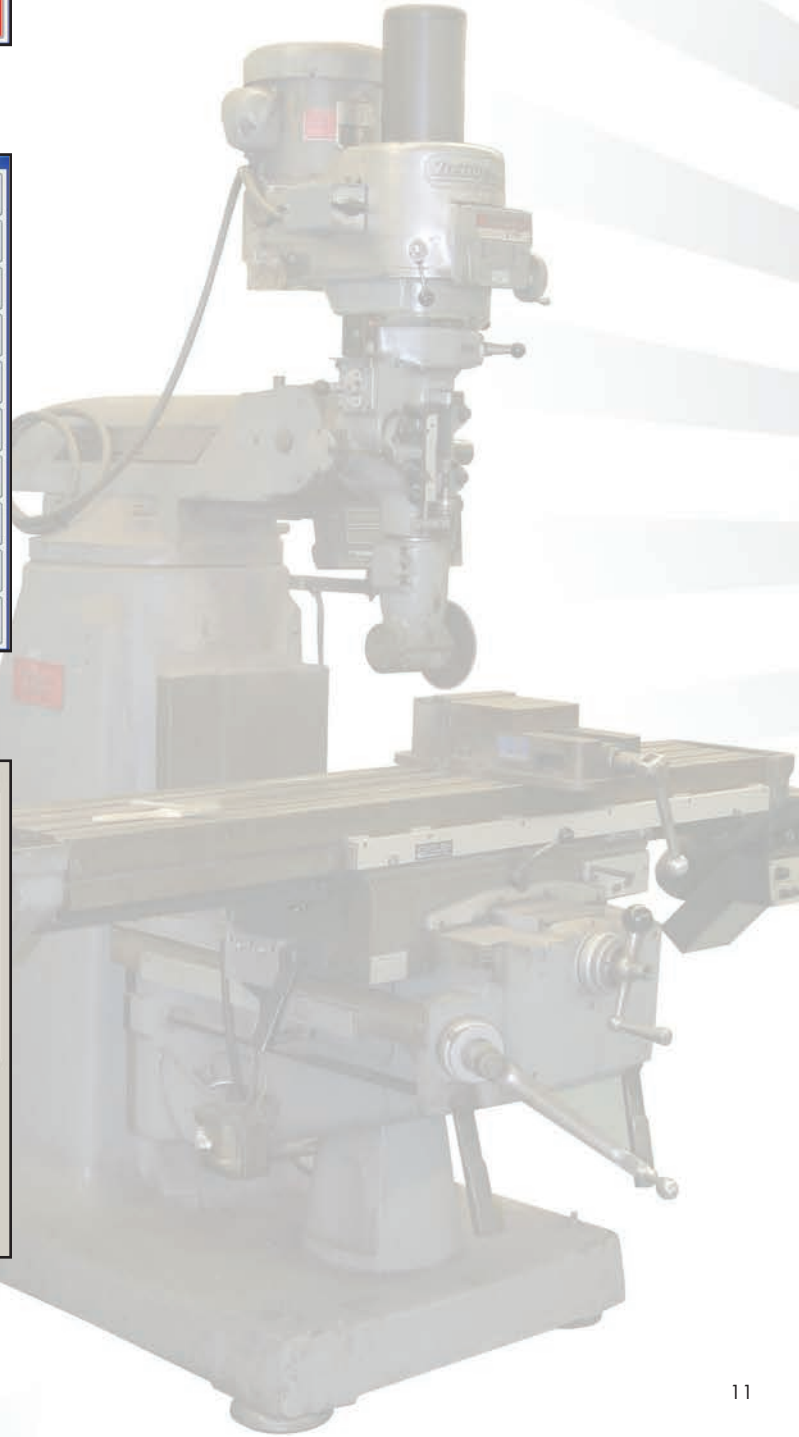- On-site installation
- Training

Camshaft part definition allows each lobe profile to be defined and offers visual representation for verification.
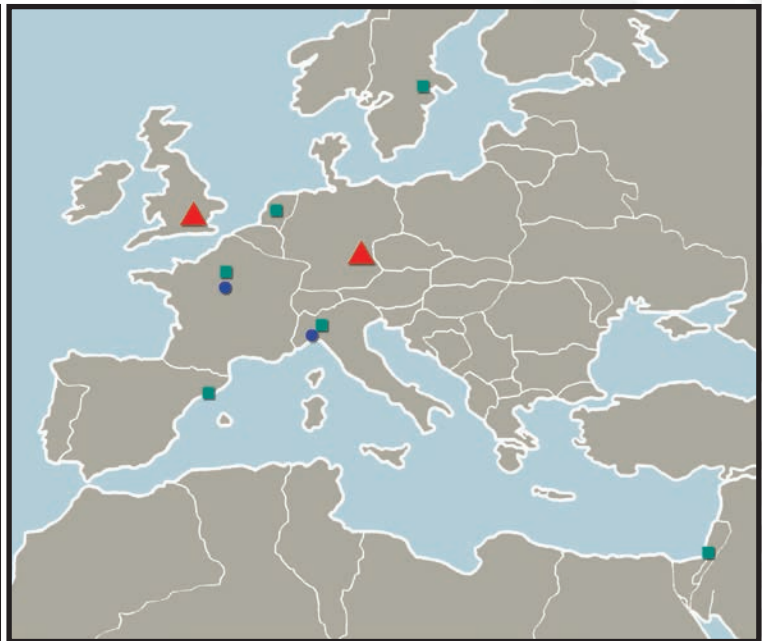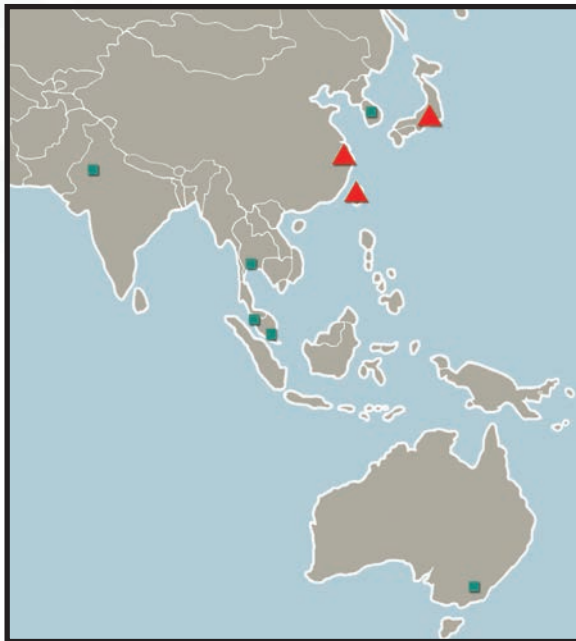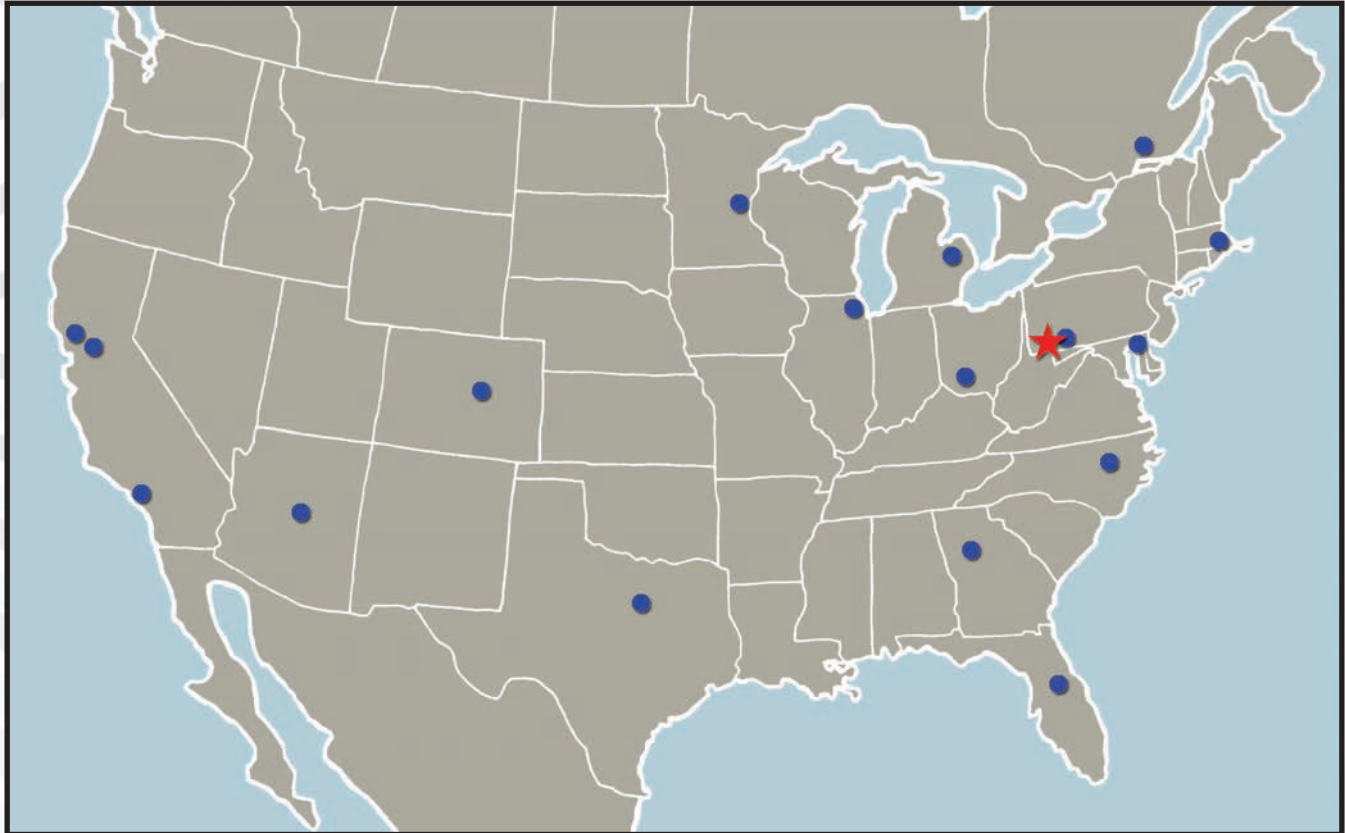

Profile Adjustment allows for manual adjustment of the lobe shape correction of process errors.

CNC Dresser displays relative positions of dress wheel and grind wheel surfaces.

Aerotech's Worldwide Sales and Service Locations

★ - Aerotech Headquarters   ● - Direct Field Sales Office   ▲ - Aerotech Subsidiary   ■ - Representative

WORLD HEADQUARTERS

Aerotech, Inc.: 101 Zeta Drive, Pittsburgh, PA 15238 • Ph: 412-963-7470 • Fax: 412-963-7459 • Email: sales@aerotech.com

Aerotech France: 28300 Coltainville • Ph: +33 2 37 21 87 65 • Fax: +44 (0)1256 855649 • Email: cmonnier@aerotech.com

Aerotech Germany: Gustav-Weißkopf-Str. 18 • 90768 Fürth, Germany • Ph: +49 (0)911 967 9370 • Fax: +49 (0)911 967 93720 • Email: sales@aerotechgmbh.de

Aerotech UK: The Old Brick Kiln • Ramsdell, Tadley • Hampshire RG26 5PR • Ph: +44 (0)1256 855055 • Fax: +44 (0)1256 855649 • Email: sales@aerotech.co.uk

Aerotech China: Room 101, No. 28 Building • Tianlin Road 140 • Xuhui District • Shanghai, China 200234 • Ph: +86 (21) 6126 1058 • Email: sales@aerotech.com

Aerotech Japan: WBG Marive East 22F • 2-6-1 Nakase • Mihama Ward, Chiba • Japan 261-7122 • Ph: +81 (0)50 5830 6821 • Fax: +81 (0)43 306 3773 • Email : sales@aerotechkk.co.jp

Aerotech Taiwan: 5F, No 32, Aly 18, Ln 478 • Ruiguang Road • Neihu District, Taipei City, 114 • Taiwan R.O.C. • Ph: +886 (0)2 8751 6690 • Email: sales@aerotech.tw