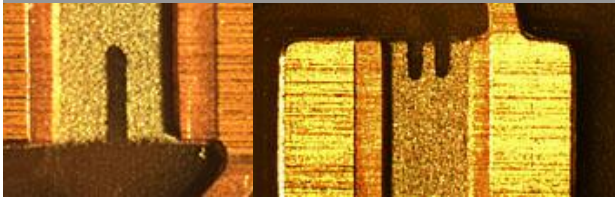
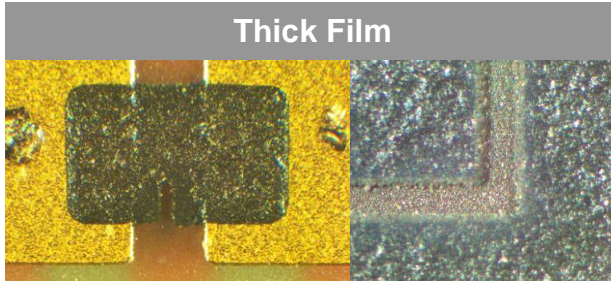


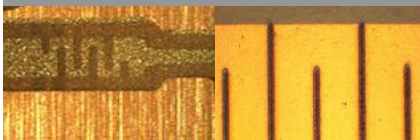
Thin Film



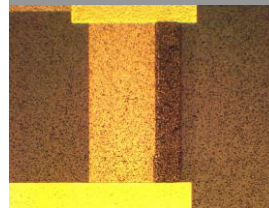
Thick Film



Serpentine Trim



Scan Trim

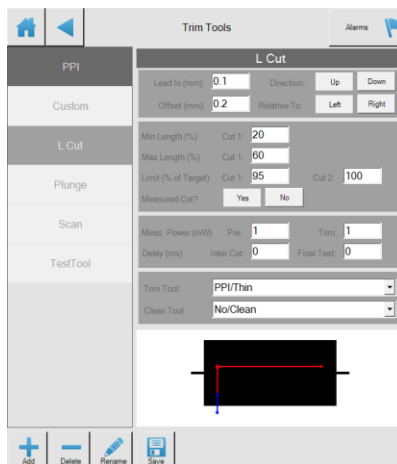
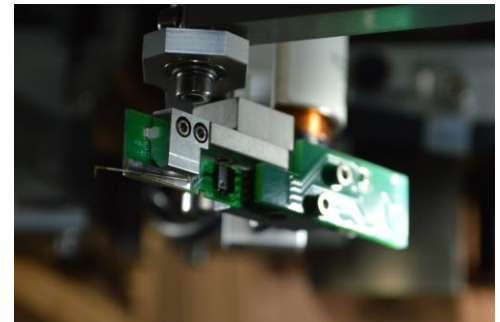


RapiTrim™ Series

- Unique, proprietary flying probe technology for rapid, accurate trim and test operations
- High reliability fiber laser or DPSSL
- Unlimited circuit size and shape
- No restrictions on component size, shape, orientation or density
- Compatible with both thick film and thin film materials
- Optimized for hybrid, PCB, SMT and embedded circuit trim and test
- Fast job changeover for quick-turn production
- High accuracy and throughput with advanced probe and laser spot position control

Designed for Next-Generation Circuit Trim and Test

- Lower cost of operation than fixture-based trimmers – no expensive probe cards to buy
- Enhanced layout capability – no limit on circuit size, orientation or density
- Operational flexibility – system is fully programmable, no waiting days for probe cards
- High throughput – designed for high volume production



Advanced ProSys™ Control Software

- Intuitive graphical user interface
- Automated file conversion and job generation
- Visual display of job features, process status and trim results
- Custom tool creation and assignment
- Full trim measurement data reporting

The RapiTrim™ Fixtureless Advantage

RapiTrim™ systems enable volume production trim and test using flying probe technology for advanced hybrid circuits and embedded passives.

Through the use of proprietary **fixtureless** technology, probe cards and their inherent **limitations are eliminated**. Restrictions on design layout are lifted, and operational delays waiting for probe cards are removed.

Circuit designers are **no longer limited** by the practical size and density of probe card designs:

Circuits can be as large as the substrate itself.

Probing of dense designs is effortless - this previously required multiple passes with multiple probe cards.

Four independent flying probes - **any component location, size, orientation and layout** can be accommodated.

RapiTrim systems function as **stand-alone testers**, improving ROI.

High Reliability Fiber laser provides unmatched stability and low cost of ownership.



RapiTrim Standard Features

Intuitive Graphical User Interface with ProSys operating software.

Advanced Beam Positioning and Laser Pulse Control provides high throughput, accuracy, and process stability.

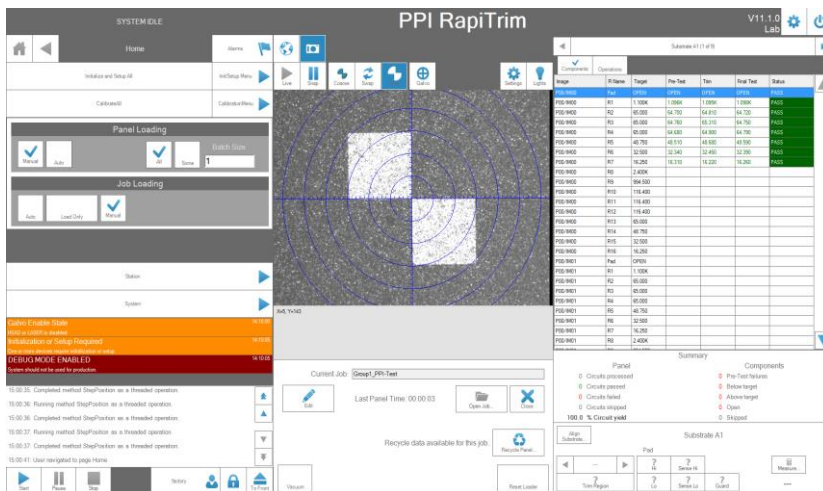
High Accuracy Measurement system.

Auto-Calibration functions ensure repeatable quality.

Extensive System Diagnostics continuously monitor all critical components and machine performance.

Sealed Beam Delivery protects optics from process debris, extending component lifetimes

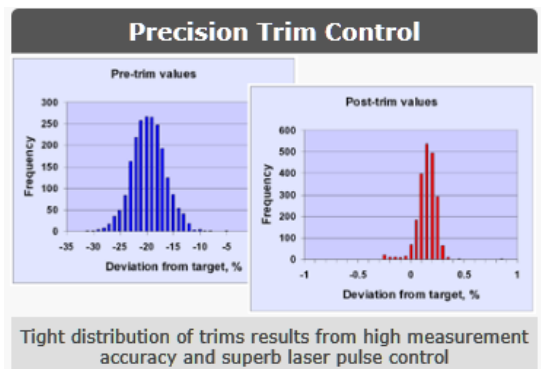
Touch screen operation (full HD size)



Optional Automated probe tip changer

When a change in probe tips is required, the current set (one or all) are unloaded into an empty holder and fresh tips loaded from an adjacent holder.

Probes are automatically calibrated and trimming can resume, all without operator handling.



Software Features

Simple operator interface - load substrates and job, then just press Start.

Process map - visualize all job components in map or camera overlays. Clearly see at a glance what and where the process is, in real time, including pass / fail indication.

Visualize trims and markings in the map or camera overlay on actual resistors

Process **multi-up, panelized, or individual** fixtured substrates

Laser scribed marking for serialization and circuit pass / fail status

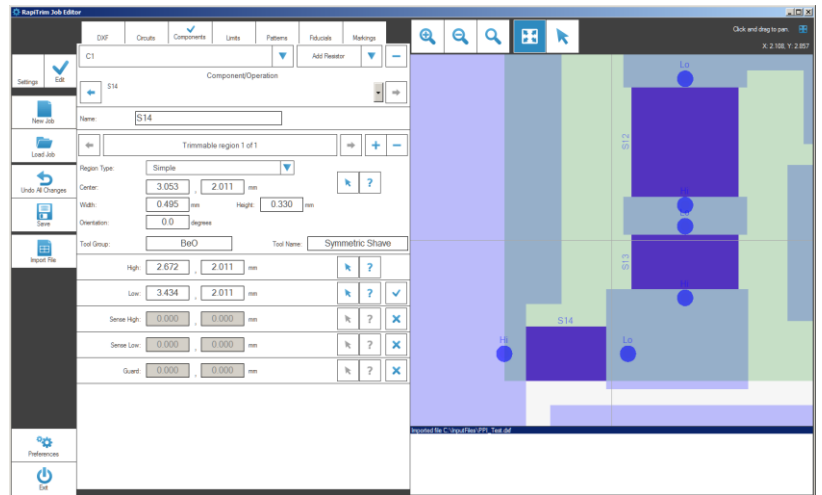
Probe touchdown counter can be used for predictive tip replacement

Trim profile graphing for detailed process analysis

Maintenance Tracker keeps log of all system maintenance and history, and provides prompts at maintenance intervals

Full system **diagnostics** and **data logging** for enhanced product support and predictive maintenance

Remote access through the internet allows factory support **without the cost of a service visit**



Job Creation

Create jobs through an interactive **graphical map** of components, circuit features, alignment targets, and trims

Extensive **DXF and IPC-D-356 file import support** automates and speeds job creation

Resistor location, orientation, values, and limits are automatically defined

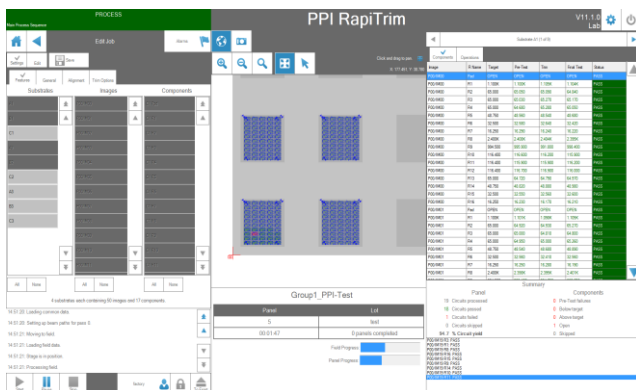
Probe test points can be **automatically defined** from DXF metallization information

Interactive graphical process library editor - no programming required

Trim and measurement tools can be shared by resistors of different sizes and orientations - minimizes setup steps

Settable min / max cut length limits

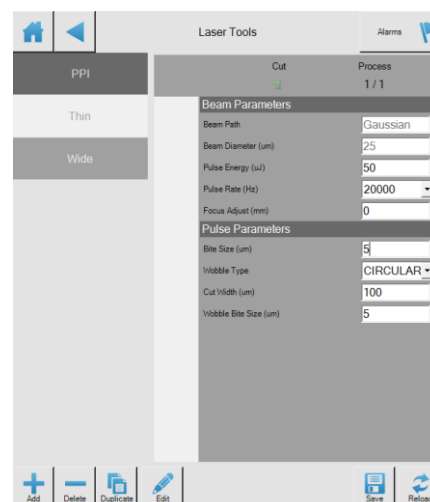
Independent control of laser pulse energy, repetition rate and bite size.



Trim and Test Results

Easily view detailed results for each component

Data **logged** by substrate serial - provides off-line historical data review and tracking and **Statistical data** report generation



RapiTrim Specifications**

Trim Types and Accuracy

- Single-plunge, double-plunge, L, L-vernier, scan, serpentine, and custom multi-leg cut types
- Typical trimmed resistor distribution <1% (3 sigma)
- Advanced laser pulse control optimizes the process and minimizes substrate damage

Optical System

- High reliability fiber laser or DPSS laser. Air cooled, long lifetime. IR, green or UV wavelengths.
- Spot Size: 10 - 50 μm .
- Automated laser power calibration with integrated power meter
- Automated vision system for precision alignment with scaling, offset, trapezoidal and rotation compensation
- Low mag camera field: 20 mm (diag)
- High mag camera field: <3 mm (diag)
- Beam scanning field: 50 x 50 mm
- Beam placement accuracy 15 μm (3 sigma) over whole process area
- Beam position resolution <0.5 μm
- Telecentric scan optics on precision z-axis focus stage with 0.5 μm resolution

Mechanical System

- Precision linear motor XY stages with linear optical encoder feedback
- XY travel: 300mm x 450mm or 610 x 965mm
- XY Accuracy: <5 μm
- XY resolution: 0.1 μm
- XY repeatability: 0.1 μm

Moving Probes

- Number of flying probes: 4
- Range of tip sizes and materials for single or full Kelvin (double tip) probes
- Automated probe tip calibration
- Probe positioning accuracy: <25 μm
- Probe XYZ resolution: 0.5 μm
- Probe repeatability XYZ: <10 μm
- Servo controlled tip contact

Measurement System

- Fully programmable force voltage or force current
- Resistor range: 0.1 Ohm to 1 GOhm
- Ratio trim and guard functions
- Resistance measurement accuracy:
Low Range (<10 Ω): $\pm 0.05\%$ ($\pm 0.05\%$ / R)*
Mid Range (10 Ω to 1 M Ω): $\pm 0.05\%$ *
High Range (>1 M Ω): $\pm 0.05\%$ $\pm 0.02\%$ per M Ω *

Voltage Source Ranges and Measurement Accuracy:

Range	Resolution	Accuracy (% FSR)*
$\pm 20\text{V}$	80 μV	+/- 0.01%
$\pm 2\text{V}$	8 μV	+/- 0.01%

Current Source Ranges and Measurement Accuracy:

Range	Resolution	Accuracy (% FSR)*
4 μA	30 pA	+/- 0.1%
40 μA	300 pA	+/- 0.05%
400 μA	3 nA	+/- 0.01%
4mA	30 nA	+/- 0.01%
25mA	200 nA	+/- 0.01%
250mA	2 μA	+/- 0.05%

* after measurement system calibration, full Kelvin

Part Handling

- Part handling up to 300x300mm on smaller system vacuum chuck, up to 610x860mm on larger system
- Easy access sliding doors with two hand safety operation on the smaller system

Software

- Auto-import and file conversion from IPC-D-356 files and extensive DXF support
- Automatic substrate vision alignment
- Configurable part marking and serialization
- Automatic system run-time calibration
- Windows® based user interface with multi-level password protection
- All measurement data logged as part of normal operation
- Real-time system diagnostics and health logging
- Internet connection allows factory personnel to provide remote support

Options

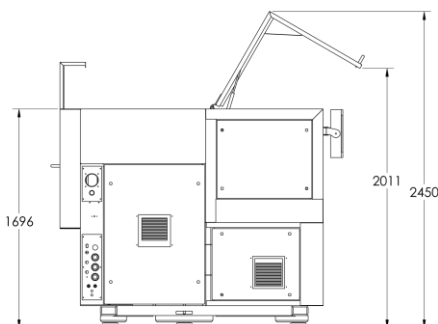
- Automatic part loader / unloader
- Automatic probe tip changer
- Optional network interfaces
- Automated barcode reading functions and job creation / loading
- Custom fixturing

Facilities Requirements

- Electrical: 208VAC, 3 ϕ , 15A, 60Hz, or 400VAC, 3 ϕ , 10A, 50Hz.
- Exhaust: ablation debris removal through 38mm diameter duct.
- Compressed air: 6 bar, 56 l/min, dry and oil-free
- Vacuum (substrate hold-down): 38 l/sec full flow; 2.4 bar at no flow.

**specifications are subject to revision

Model RT for full-size PWBs



Model RT-C for Hybrid Circuits

