

# **4990**

# Laser Trimming System

electro

# scientific

# industries



High Speed Galvanometer Design

Windows NT<sup>®</sup>-based interface for programming and operation

Fast, dual computer architecture for system test and measurement control

Diode-pumped solid state laser increases up-time

The ESI Model 4990 Laser Trimming System incorporates a number of features making it the most popular system for thick and thin-film trimming on ceramic substrates. A high speed galvanometer driver significantly reduces beam positioner move times for increased thoughput. Integrated pattern recognition automatically locates parts quickly and reliably for accurate placement of laser trims. Incremental compiling of programs eliminates the need for separate utilities and makes program debugging fast and easy.

Real-time data gathering and process control are accomplished with dual computer architectures. On the front end, ESI's graphical user interface runs at high speed on a Windows NT<sup>®</sup> operating system. An additional dedicated computer performs real time control for all laser beam positioning, test and measurement activities offering the power of multitasking without throughput degradation.

This system incorporates an industry proven diode-pumped laser, enabling higher overall system up-time. In addition, this laser design has low input power requirements, and extended diode life, with no external cooling water needed.

Overall, the system is designed for easy set-up, low maintenance and high performance trimming for today's increased production needs.

# 499



Graphical User Interface

## **SPECIFICATIONS** SUMMARY

Laser Beam Positioning Type: Closed-loop moving iron high speed XY deflection galvonometer

Trim Area: 4 in. x 4 in. (102 mm x 102 mm) Option: Other trim areas available

Point-to-Point Move Time: 5 ms, typical

Maximum cutting speed: 30 in/s (762 mm/s)

Resolution: 0.063 mil (1.6 µm)

Repeatability: 0.1 mil  $(2.5 \ \mu m)$ 

Minimum Programmable Bite Size: 0.032 mil (0.813 µm)

#### Laser

Type: Diode pumped Q-Switched Nd: YAG

Wavelength: 1064 nm (Infra Red) Option: Other wavelengths available

**Output Power:** 6 W @ 10 kHz

Pulse Rate Range: 0 - 30 kHz

Pulse Width: 120 ns @ 10 kHz

## Resistance

Measurement Type: Software-enhanced. force current/measure voltage

Range: 0.01 Ω - 280 MΩ

Full Scale Ranges: 4.1Ω - 320 MΩ

Accuracy: ± [0.035% +  $0.02\% X R(M\Omega) +$ 0.0005% / R(KΩ)]

Resolution: 0.003% of range

Repeatability:  $\pm 0.01\%$  (midrange)

Ratio 1:1: ± 0.03% (midrange)

Conversion Speed: 25 µs

Autocalibration: Yes Guard Offset: 200 µV

Guard Drive Maximum Current: 200 mA

Trim Comparator Resolution: < 60 ppm of setting

Trim Comparator Accuracy: < 0.1% of setting

**DC Voltage Measurement** 

Technique: Softwareenhanced, full-floating differential

Full Scale Ranges: 163 mV - 32 V

Accuracy:  $\pm 0.15\%$  reading Option:  $\pm 0.025\%$  of range

Offset Voltage:  $\pm$  500  $\mu$ V (measureable to  $0 \pm 100$ ppm of range)

Resolution: 30 ppm of range (5  $\mu$ V on 163 mV FS range)

Maximum Input Voltage:  $\pm$  32 V, either input to ground

#### **Resistance and DC** Voltage Matrix

Type: Four-wire, full Kelvin connection

Programmability: Any combination, including multiple high, low, and/or guard pins may be selected

Configuration: 16-pin X 3-line per card

Number of Matrix Pins: Up to 128 pins Option: 256 pins

### **System Computer**

Type: Industry Standard PC with Windows NT<sup>®</sup> **Operating System** 

Processor: Pentium based

Monitor: 17" color VGA CRT display Option: 15" flat panel display

## **Real-Time Controller**

Type: 32 - bit microprocessor Interfaces: RS - 232 communications, IEEE -**488** instrumentation

**Measurement Options** 

MilliOhm Measurement option provides capability of resistance measurement down to  $4m\Omega$  full scale

AC Voltage option allows the trim system to trim and measure components to true RMS AC parameters

Time Measurement option allows a variety of time and frequency measurements

Programmable Dual Voltage Source provides a reference voltage or power for the device under test used in active trim

### **Handler Options**

Step and Repeat handler utilizes air bearing XY linear movement of the stage with a stepping field of 5 in. x 10 in.

**Optical Bench** configuration places the laser rail and beam positioner on a mechanical structure that allows easy integration to custom handlers

Single Axis Manual Slide

Crawley, United Kingdom: 44-1293-594000

Hsinchu, Taiwan, R.O.C.: 886-3-582-9672

Portland, Oregon U.S.A.: 800-547-5746 or 503-641-4141

**Puchheim, Germany:** 49-89-149-0070

Seoul, Republic of Korea: 822-3473-9900

Shanghai, China: 86-21-6279-8300

Singapore: 65-64555-158 Tokyo, Japan: 81-3-3440-5081

Electro Scientific Industries, Inc., 13900 NW Science Park Dr, Portland, OR 97229-5497, 503-641-4141, fax 503-643-4873, www.esi.com

© 2004 Electro Scientific Industries, Inc. Printed in U.S.A. ESI reserves the right to change specifications and other product information without notice. Effective June, 2004. System and products offered by ESI and its subsidiaries are covered by issued and pending US and foreign patents. Products mentioned are for identification purposes only and may be trademarks or registered of their respective companies. ESI, the ESI logo, and Electro Scientific Industries, Inc. 01394-June 2004

# **Thick-Film Optics (IR)** Typical Spot Size<sup>1</sup>: 1.5 mil (38 μm) Depth of Focus:

L Cut

40 mil (1 mm) Thin-Film Optics (IR)

Typical Spot Size1: 0.75 mil (19 μm)

Depth of Focus: 10 mil (0.25 mm)

<sup>1</sup> Actual kerf widths are material, optics and laser wavelength dependent.

## Alignment/Viewing

Automatic Alignment: Integrated Pattern Recognition with normalized correlation

Viewing Area: Overview - Full-Field

of View Through-the-Lens -

(6.8 mm)

Diagonal 270 mil Option: Other

System Standards

CE mark

magnifications available