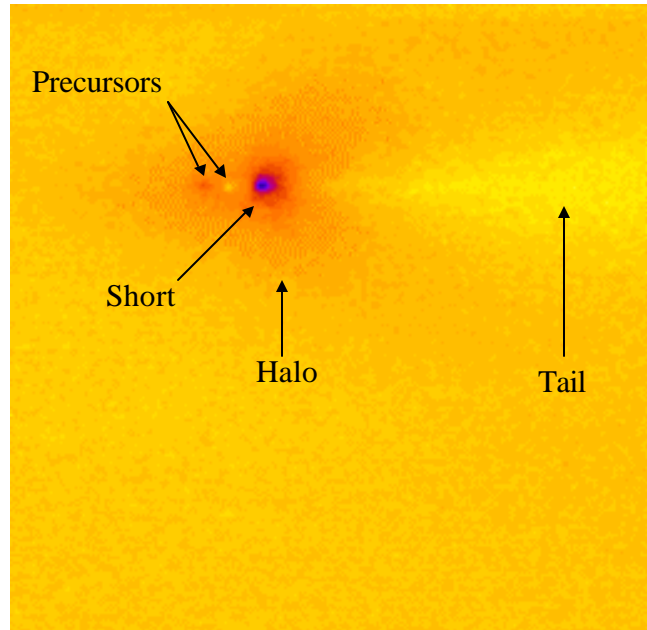


Backside image of Level 3 short and associated structures using thermal XIVA imaging



Backside image of Level 5 short obtained with thermal XIVA imaging

President's Message

The purpose of this newsletter is to keep you up-to-date on the latest technical developments at OptoMetrix. I hope that you find it of value and perhaps you will pass it on to a colleague with similar interests. Feedback, both positive and negative, is always appreciated. I can be reached at rafalk@optomet.com.

R. Aaron Falk

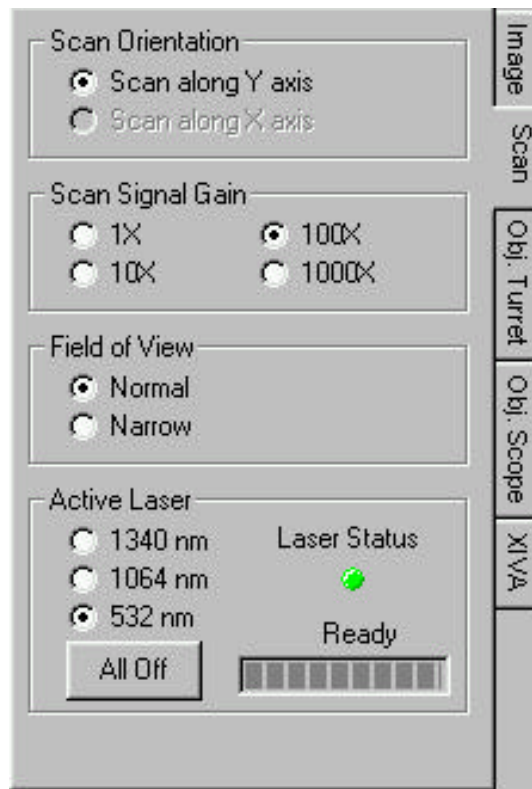
Three Laser System Delivered

OptoMetrix has delivered to a customer a laser scanning microscope failure-analysis system with three laser wavelengths built in:

- ◆ 1340 nm for backside thermal probing (TIVA and SEI)
- ◆ 1064 nm for backside photocarrier probing (LIVA and OBIC)
- ◆ 532 nm for high resolution front side thermal¹ and photocarrier probing

All lasers are diode-pumped solid-state (DPSS) for high stability and long life. Switching between lasers is as simple as clicking a mouse button. Each wavelength has an independently optimized reflected light imaging detector for crystal-clear imaging. All three wavelengths operate with our exclusive XIVA electronics (see next page) for detection and analysis of a wide range of failure types. Custom wavelengths are available.

¹ Front side thermal probing requires use of absorptive coating.



Software interface for laser selection

Computer Controlled XIVA Electronics

Our last newsletter introduced XIVA², that allows constant-voltage device biasing along with high-sensitivity constant-current sensing of laser stimulated defect signals. Order of magnitude improvements in signal sensitivity have been demonstrated with this technique³. The images shown at the top of the first page are examples of XIVA imaging with thermal stimulation at 1340 nm.

OptoMetrix now offers XIVA in a computer controlled electronics package as part of its laser scanning microscope failure-analysis system. The XIVA electronics is placed into a compact package, that can be positioned close to the test



Photo of XIVA electronics front panel

device to minimize electronic noise pickup. Touch panel switches allow rapid selection of operational parameters. A pair of meters indicates device voltage and current.

A simulation of the front panel buttons is also located on the computer monitor through our OptoVision software. Pressing a switch on the electronics front panel is immediately reflected on the computer simulation. In reverse, a mouse click on the simulation produces an immediate change in the front panel settings. Completely hands free operation is achieved.

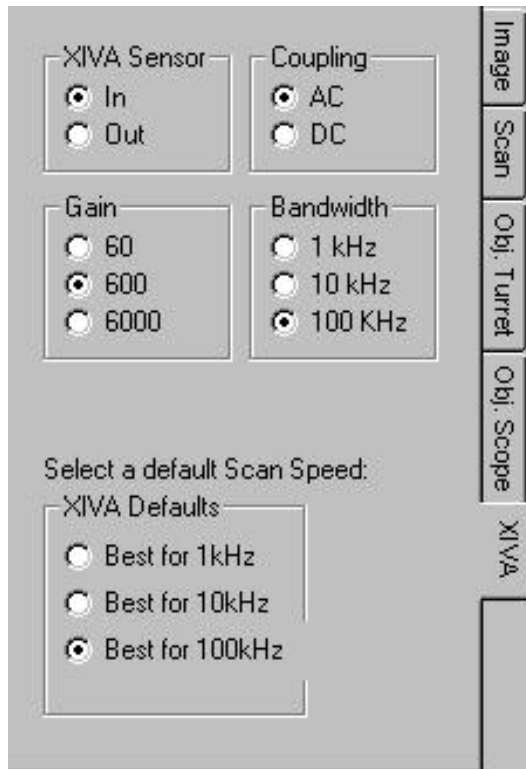
The XIVA electronics package allows device bias voltages up to 12 volts and currents up to 20 amperes. User selected operational parameters include:

- ◆ XIVA Sensor - ON/OFF
- ◆ Amplifier Gain - 60, 600, 6000
- ◆ Bandwidth - 100 KHz, 10 KHz, 1 KHz
- ◆ Amplifier Coupling - AC/DC

The laser scan rate is also automatically adjusted to the amplifier bandwidth through the OptoVision software. This feature maintains optimal XIVA imaging performance.

² Externally Induced Voltage Alterations

³ "Advanced LIVA/TIVA Techniques," R. A. Falk, ISTFA 2001, 59-65



Software display and control interface for XIVA electronics.

Software Integration with Suss Probe Stations

OptoMetrix partnered with Suss Microtech (formerly Karl Suss America) to supply a complete hardware system, combining our optical head with a Suss probe station. We have now added software integration with the Suss probe station to produce a range of exciting new features:

- ◆ Automatic position readout in both pixels and stage coordinates
- ◆ Position readout in IC coordinates after performing three point calibration
- ◆ Mosaic images
- ◆ Auto-centering of point-of-interest
- ◆ XY offset correction when changing objectives
- ◆ Macro language functions for Suss stage control

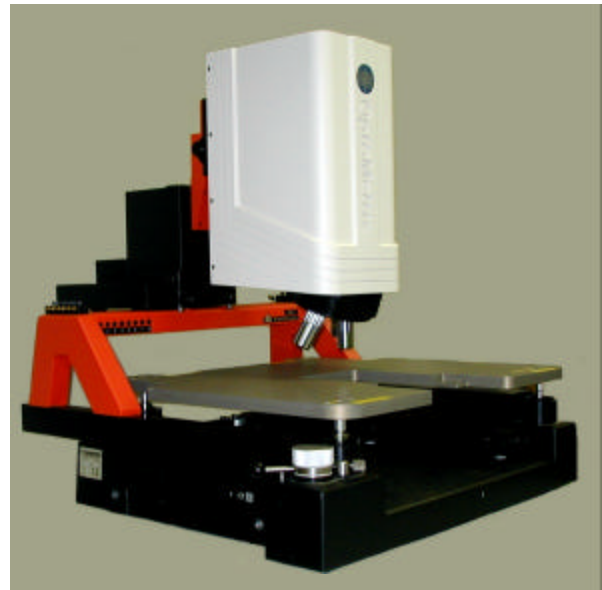
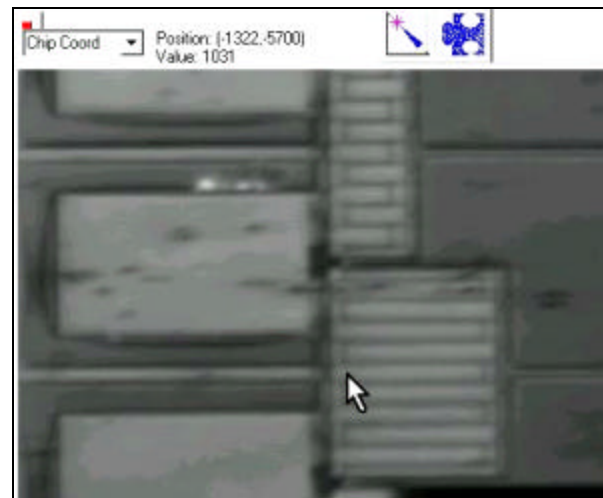


Photo of optical head mounted on Suss PM8 probe station

A defect image overlaid onto a reflected light image is good for locating a defect. The addition of position coordinates is even better. Software integration and calibration of the probe-station position sensors allows automatic position readout in stage coordinates. The addition of a three-point calibration yields automatic readout of IC coordinates, including correction for rotation and flip (backside/topside) of the IC image.

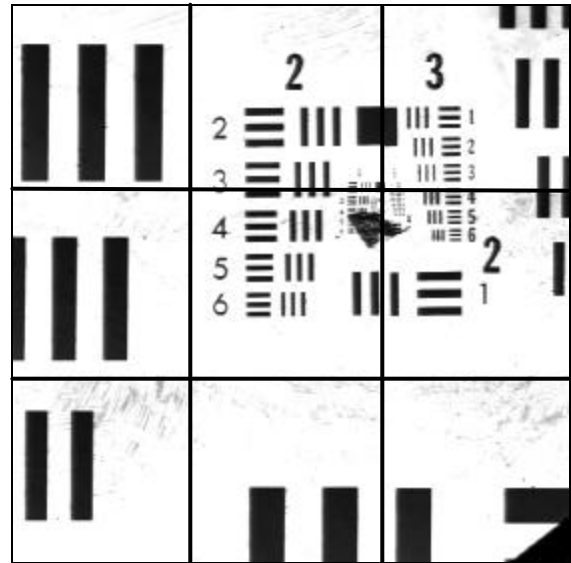


Position readout in IC coordinates of mouse pointer

Need high resolution imaging over a large area?
Mosaic imaging comes to the rescue. Our
OptoVision software controls the Suss stage to
produce step and repeat images to produce a single
large mosaic image. Mosaic images are extremely
useful for defect searching of large areas at high
resolution.

Is the point-of-interest off in the corner of your
image? A single mouse click will move the stages to
auto-center that point in the image. Do you get lost
every time you change from low to high
magnification? OptoVision can automatically re-
center the image as objectives are changed.
Combine these two features and you will never get
lost again.

All of these features and direct control of the Suss
stages are available in our macro-language for full
automation of your application needs.



3x3 mosaic image of resolution target

**For more information on OptoMetrix products,
contact us at sales@optomet.com or 425-251-
6363 x18.**

```

Macro1 * (macro) - New Macro [design]
File Edit View Macro Debug Help
[Icons]
Object: [General] Proc: Main
Option Explicit

Sub Main
  Dim bRet As Boolean 'Boolean return
  Dim PosX As Long 'Scope X position
  Dim PosY As Long 'Scope Y position

  'Read current scope position
  PosX = ProbeStage.ReadScopePositionX(MICRON, HOME)
  PosY = ProbeStage.ReadScopePositionX(MICRON, HOME)

  'This block of code performs of moving scope
  'to the new position then takes an image.
  'Pressing ESC, CTRL, or SHIFF key will stop the macro..
  Do Until OptoVision.Keydown(ESC_CTRL_SHFT_MLC) = True
    'Move scope to the new position
    bRet = ProbeStage.MoveScope(PosX + 3000, PosY + 3000, MICRON, HOME)
    'Get an image by running navigation
    Run.RunNavigation SIZE_HALF_SQUARE_MLC, REFLECTED_LIGHT_MLC
    Wait 1 'Wait 1 second ...
    'Move scope to previous position
    bRet = ProbeStage.MoveScope(PosX, PosY, MICRON, HOME)
    'Get an image by running navigation
    Run.RunNavigation SIZE_HALF_SQUARE_MLC, REFLECTED_LIGHT_MLC
    Wait 1
  Loop
End Sub

```

Not an object reference. 26

Example stage control functions available in macro-language