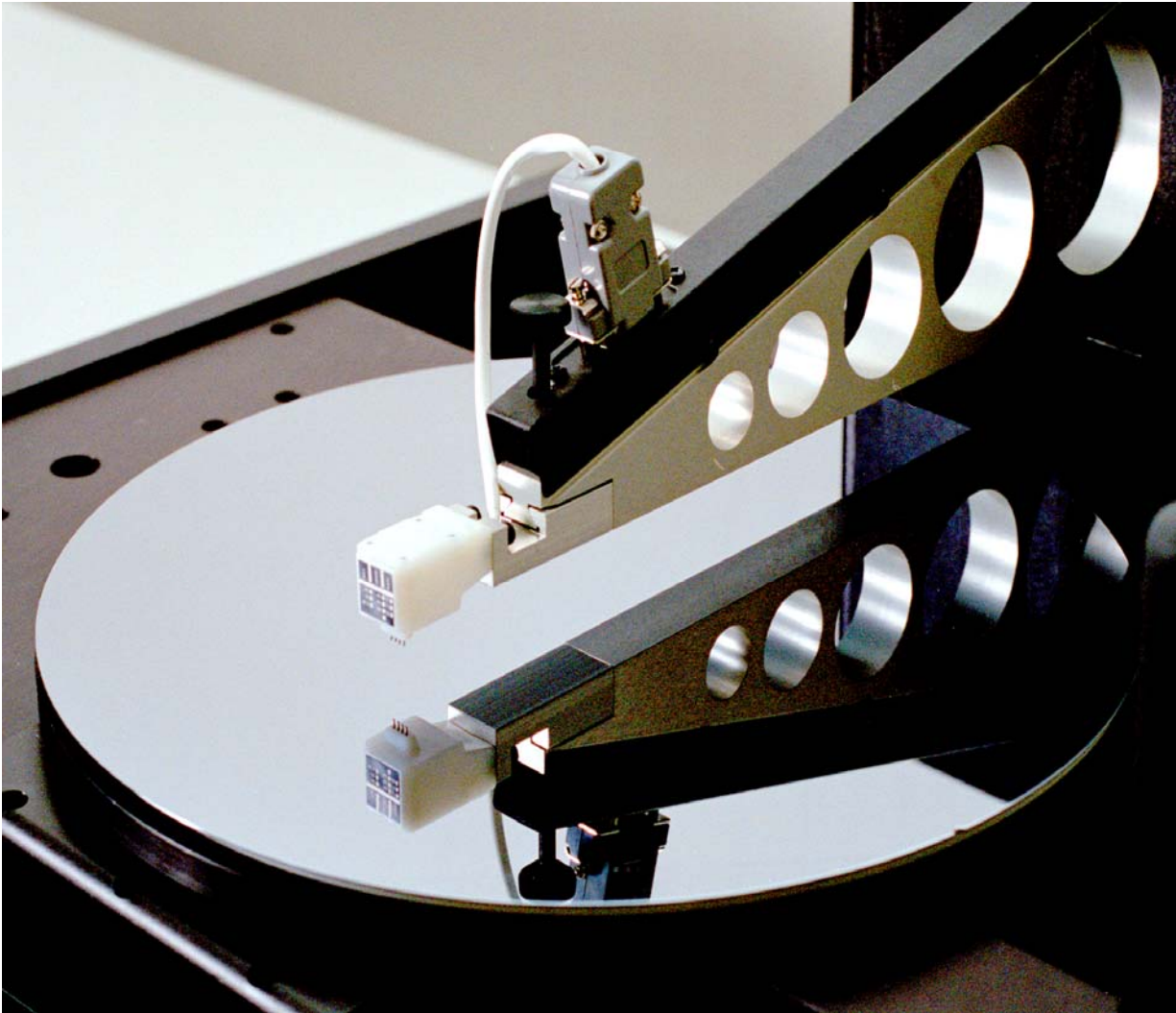




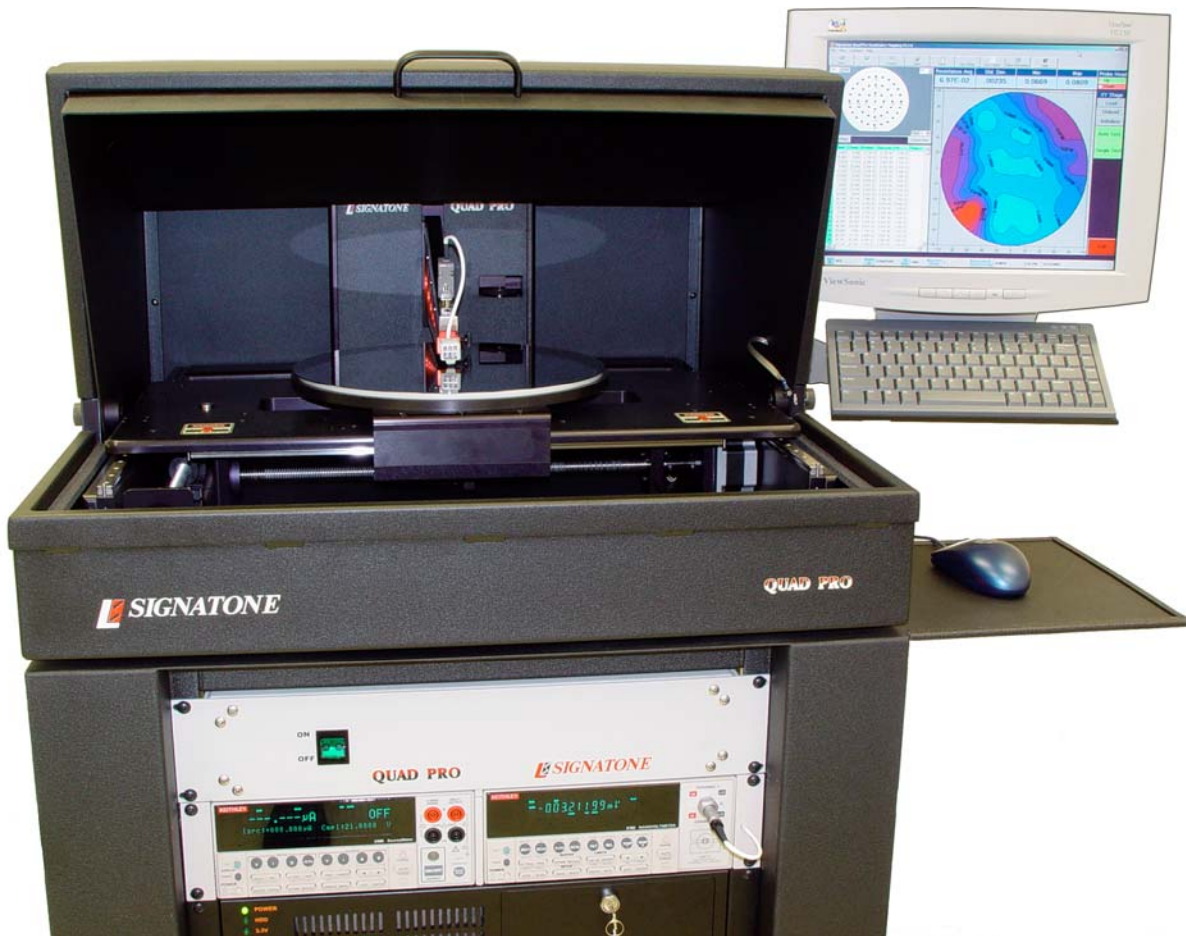
Lucas Labs Division

QuadPro Resistivity System



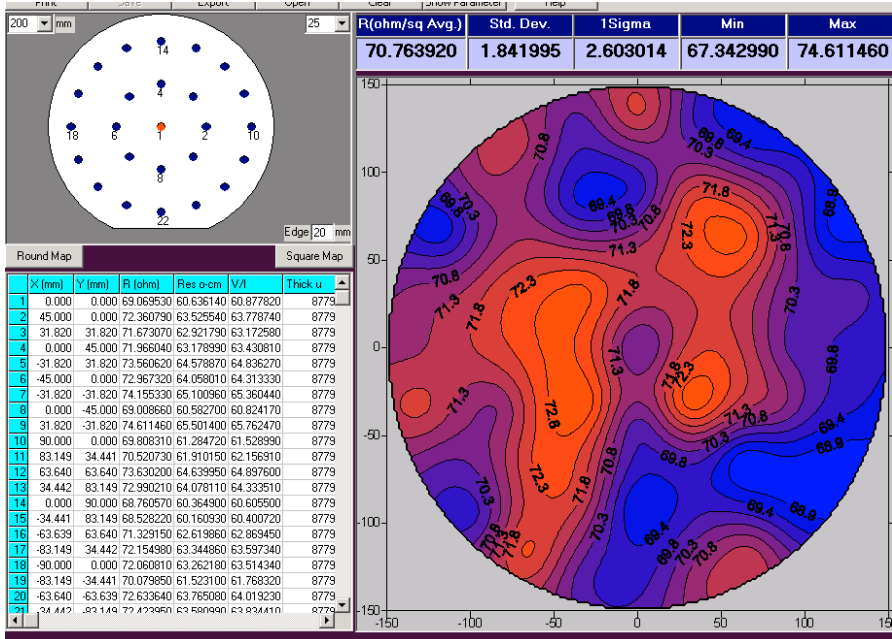
- Measures V/I, Sheet Resistance, Resistivity or Thickness
- Reports Average, Standard Deviation, Minimum, Maximum and 1Sigma for the data set
- Temperature Coefficient of Resistance (TCR) measurements integrated with automated temperature chuck and source meter. (Optional)
- Automated 2D Color Contour mapping, 3D and Cross section mapping
- Employs the Dual Configuration Testing method for improved accuracy and repeatability
- Tests samples 10 to 300mm
- 1 to 49 (121 on 300mm) NIST traceable automated measurements per sample

QuadPro Automatic System



The QuadPro automatic includes a computer, stepper controller, and base station with either a 200 or 300mm diameter isolated chuck. The software allows for selecting 1, 5, 9, 25 or 49 (121 on 300mm) points for automated testing and mapping of the test sample. Positioning patterns may be set to either round or square configuration. The edge exclusion is also defined.

On the first measurement, the QuadPro auto ranges the meters current setting finding the best current for testing the sample under test. All subsequent test use the same current setting. At each site, 4 different measurements are made applying the dual configuration (ASTM Standard F84-99) assuring that errors introduced by the probe head and edge proximity are eliminated, thus increasing the repeatability and accuracy of measurements. Also, the QuadPro automatically steps to each position and records the X-Y position, Sheet Resistance, Resistivity, Thickness and V/I measurement in a visible table. Upon completion of the test points, a wafer contour map is displayed. The contour map may be toggled between 2D color, 3D full scale and 3D cross section viewing. The average, standard deviation, 1Sigma, maximum and minimum measurement results display prominently above the contour map. The results may then be printed or exported to an Excel file for further analysis.

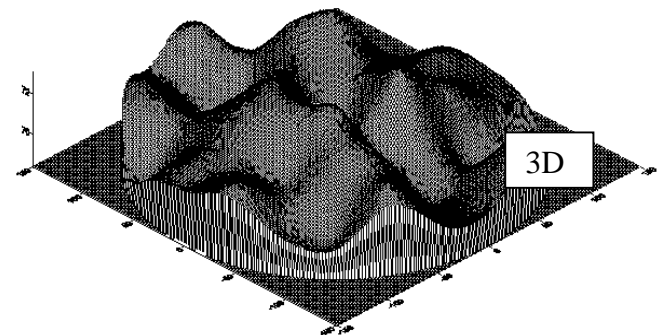
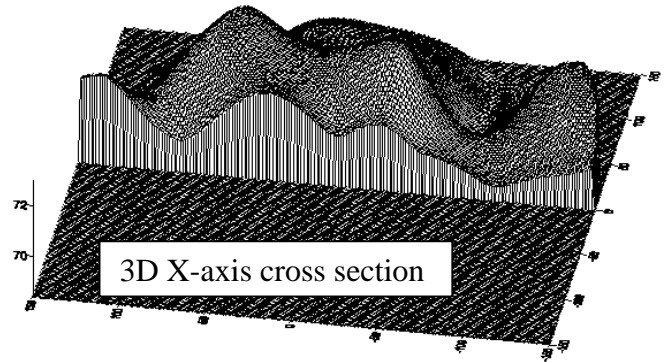


After the automated testing, the contour maps are displayed. The 2D contour maps are displayed in black and white or colored regions. 3D graphs may be plotted in full scale or a cross section. Cross section maps may be defined on the X or Y axis. When the QuadPro is connected to a printer, the user selects the desired maps and summary to print.

The data table may be printed or exported as a delimited ascii file. Printing provides a choice of graphs and the data table.

Summary Report
Signatone Resistivity Mapping System 6/13/2005
Lot ID: W-308
Wafer ID: 0279
Wafer Size: 200 mm
Current Source: 0.00002 A

#	Resistance	Resistivity	V/I
Average:	70.763920	62.123650	62.371260
StdDev:	1.841995	1.617087	1.623532
1Sigma:	2.603014	2.603014	2.603014
Max:	74.611460	65.501400	65.762470
Min:	67.342990	59.120410	59.356050
1	69.069530	60.636140	60.877820
2	72.360790	63.525540	63.778740
3	71.673070	62.921790	63.172580
4	71.966040	63.178990	63.430810
5	73.560620	64.578870	64.836270
6	72.967320	64.058010	64.313330
7	74.155330	65.100960	65.360440
8	69.008660	60.582700	60.824170
9	74.611460	65.501400	65.762470
10	69.808310	61.284720	61.528990
11	70.520730	61.910150	62.156910
12	73.630200	64.639950	64.897600
13	72.990210	64.078110	64.333510
14	68.760570	60.364900	60.605500
15	68.528220	60.160930	60.400720
16	71.329150	62.619860	62.869450
17	72.154980	63.344860	63.597340
18	72.060810	63.262180	63.514340
19	70.079850	61.523100	61.768320
20	72.633640	63.765080	64.019230
21	72.423950	63.580990	63.834410
22	68.163350	59.840600	60.079120
23	69.659240	61.153850	61.397600
24	67.342990	59.120410	59.356050
25	71.676320	62.924640	63.175450



QuadPro and Manual systems

Since 1968, Signatone has offered a simple manual resistivity measurement stand. This simple stand may be incorporated with QuadPro computer and source meter for easy accurate measurements. Of course, the sample is positioned by hand. A lever lowers the probe head into contact with the sample. The auto ranging, dual configuration and data collection features do the calculations accounting for edge error and probe head error assuring repeatable NIST traceable accurate results.



QuadProS-302-4

Four Point Probe heads

Signatone offers two probe heads to choose from; the SP4 and the HT4. The SP4 is an inline probe made of delrin and used in most applications. Several choices are available for configuration to your specific application. The three spacings are .040, .050 and .0625 inches. The three pressures available are 45, 85, and 180 grams. Tips are made of Tungsten Carbide or Osmium and offer a choice of .0016, .005, .010 inches radius.



The HT4 inline four point probe head is made of ceramic and designed for high temperature and high resistance measurements. The HT4 accurately collects data at temperatures up to 650°C.

QuadPro Test & Calibration

The system uses the Dual Configuration test method of ASTM Standard F84-99 to compensate for errors in probe spacing and errors caused by proximity to the edge of the conducting layer. NIST traceable calibration standards are available for purchase with the system. Proper use of the standards and the calibration procedure insures the specified system accuracy of better than 1%.



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