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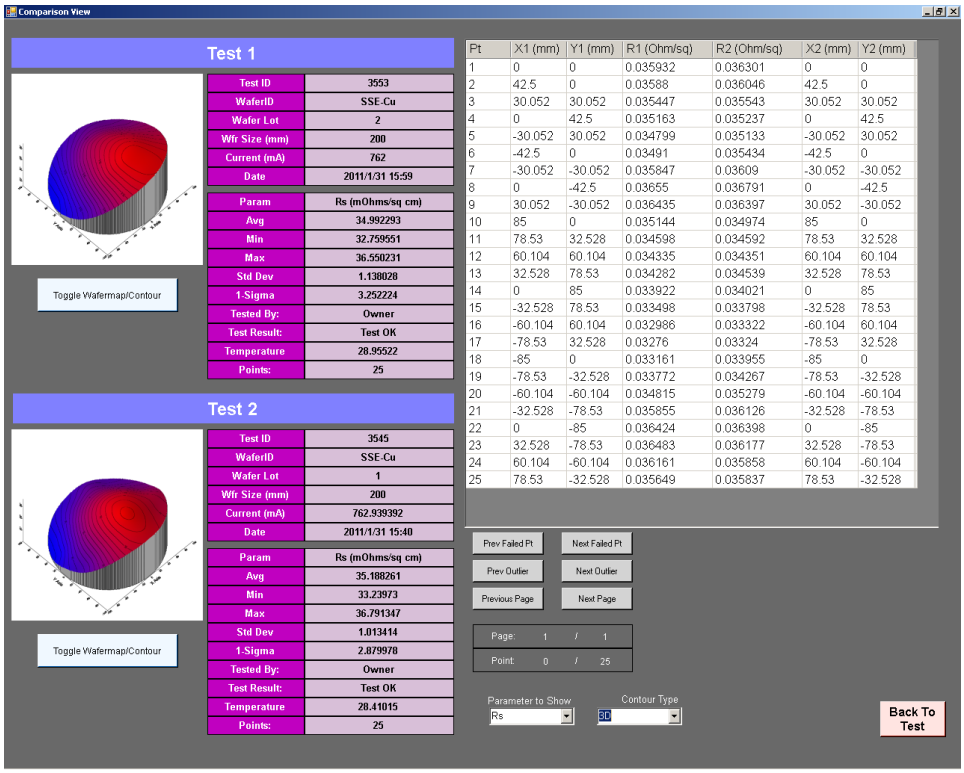
QuadProII Resistivity System

- 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 10mm to 300mm
- P/N Typing
- Comparative Mapping

QuadProII Automatic System

The QuadProII automatic includes a computer, stepper controller, and base station with either a 200 or 300mm diameter isolated chuck. The software automatically defines the points for automated testing and mapping of the test sample. The user enters the sample size, sample shape, edge exclusion, and choice of 5, 9, 25, 49 or 121 test points. The software automatically defines the best probe position for creating a uniform contour map. Users may also define their own custom positioning map with up to 14,000 test points. The user map may be defined by moving to position and recording the location or keying X-Y positions into an X-Y position table.

With AutoRange mode enabled, at the first measurement, the QuadProII steps the current source through a number of settings, finding the best current setting for testing the sample under test. All subsequent test positions use the same current setting. With Dual Configuration mode enabled, 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. This greatly increases the repeatability and accuracy of measurements. The QuadProII 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. Statistical data including 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 a spread sheet for further analysis.

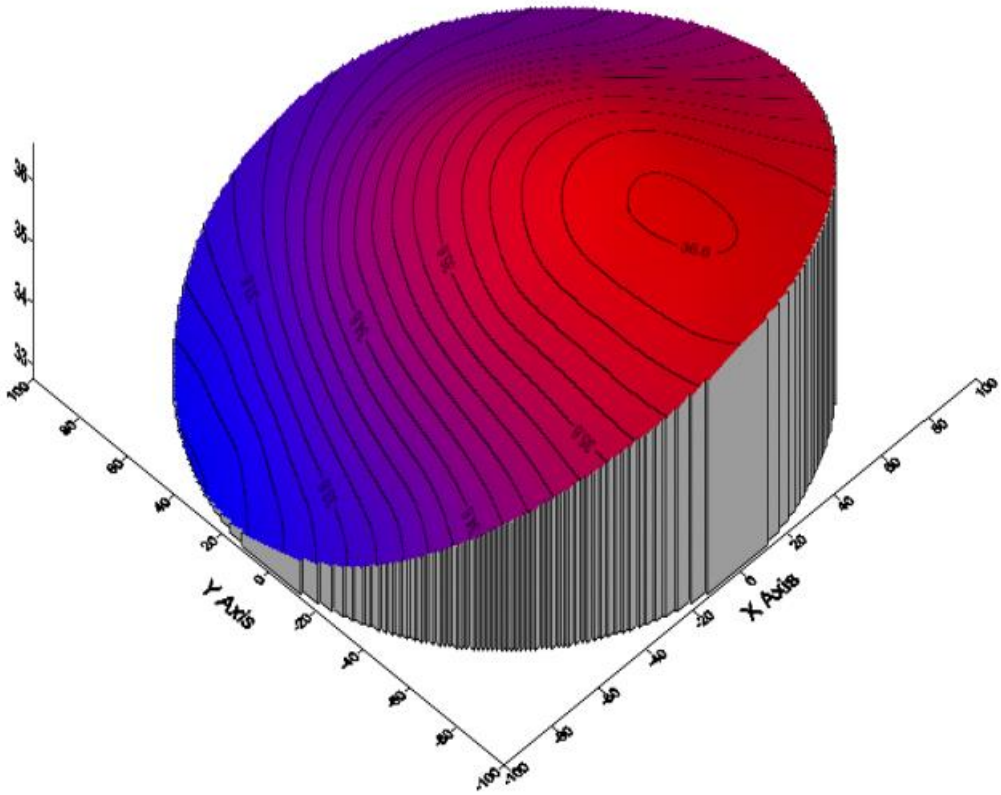


More Key features of the QuadProII:

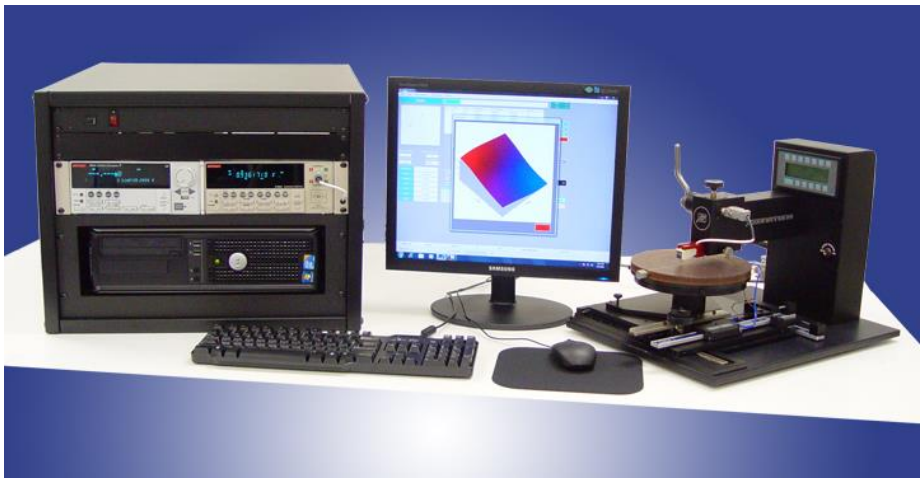
- Automatic calculation of the test site locations based on size, number of test sites and edge exclusion.
- Automatic positioning of the test sample to each test site.
- Fast through put with up to 50 measurements per minute.
- Measurement of Sheet Resistance, V/I, Resistivity or Thickness
- Auto-ranging the test meters to find the most accurate settings.
- Dual configuration to eliminate errors based on edge proximity or probe imperfections.
- Precise, repeatable mapping of the surface with selectable 5 to 1400 measurement points.

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 QuadProII 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.

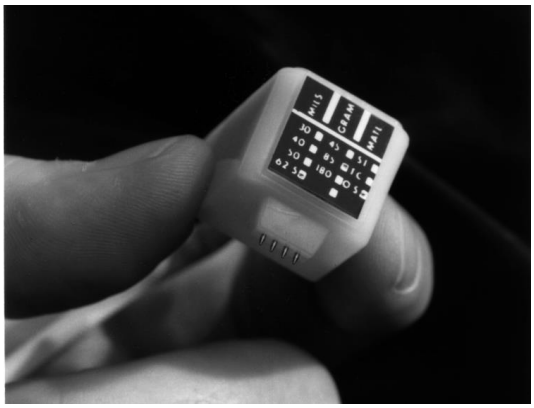


Manual QuadProII System



A bench top manual positioning stand is also available for testing and mapping. A precision knob control allows X-Y positioning with mm accuracy. A digital monitoring system sends X &Y position with 0.1mm resolution to QuadProII software. The software displays the target position and the user moves the test sample to the position by turning the knobs and watching the display. A lever lowers the probe head into contact with the sample. The auto ranging, dual configuration and data collection and mapping features function the same as the semi automatic system.

Four Point Probe heads



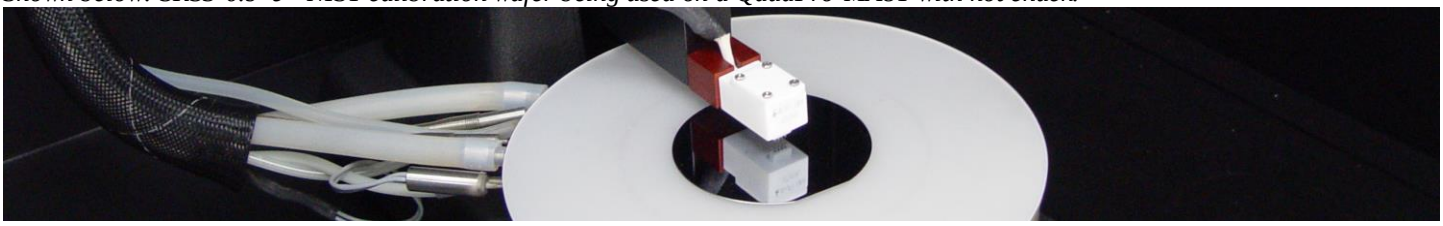
Signatone offers two probe heads to choose from; the SP4 and the HT4. The SP4 is an inline probe made of delrin and used in most applications. Several choices are available for configuration to your specific application. The three spacings are .040, .050 and .0625 inches. The three pressures available 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 600°C.

QuadProII Test & Calibration

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%. Each time the probe head is changed, the system should be recalibrated using the standards. The calibration process requires about 3 minutes and is highly automated.

Shown below: SRS3-0.9 3" NIST calibration wafer being used on a QaudPro-MA8T with hot chuck.

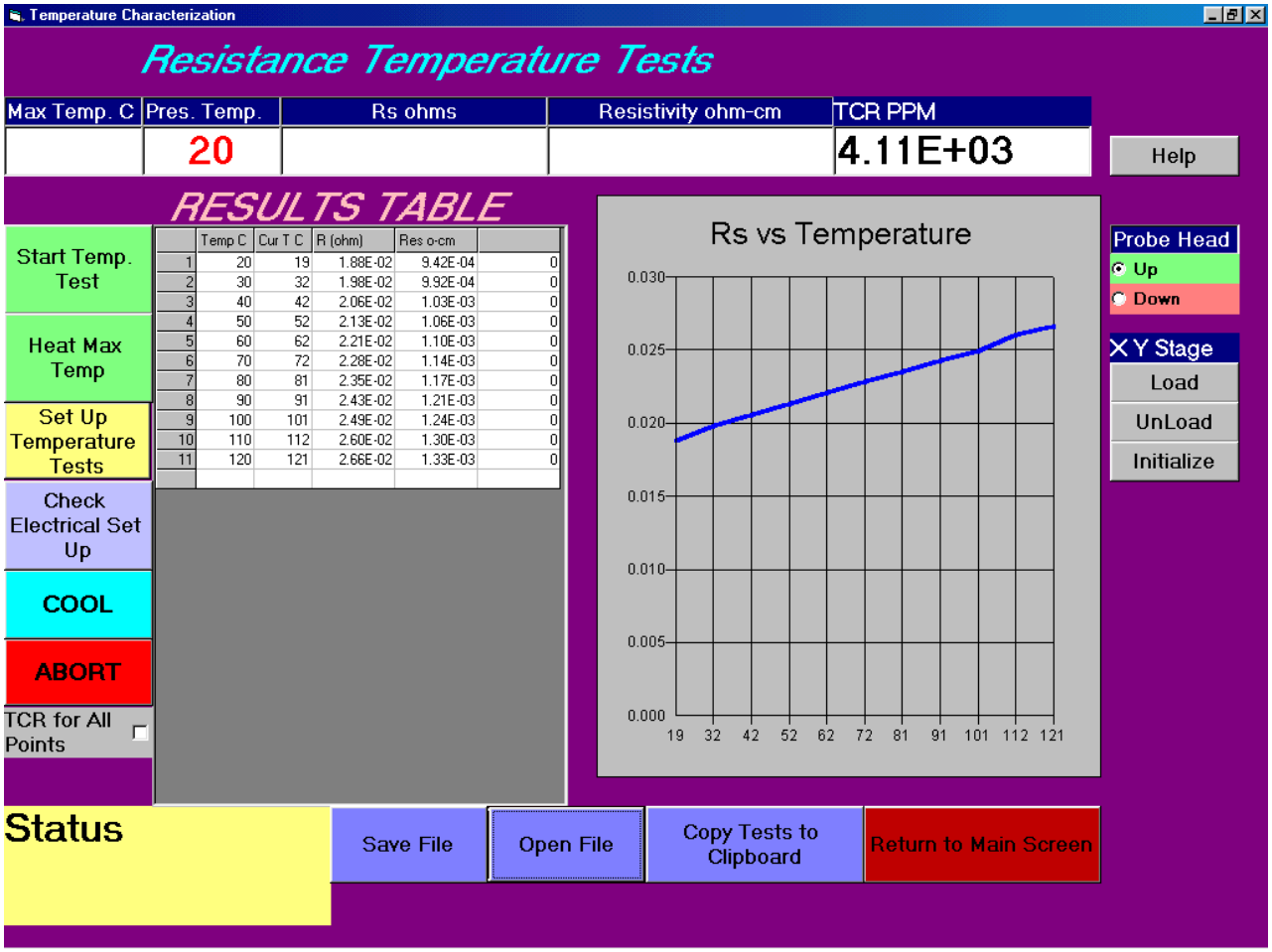


QuadProII TCR (Optional)

The Temperature Coefficient of Resistance option integrates temperature control of the test sample as well as the automated source meter control and resistance calculations. Integrated with a Signatone thermal chuck system, the test automatically steps through the test temperatures without moving the probe tips. Measurements are taken at each of the target temperatures and results plotted on the graph. TCR is reported in PPM.

Users define the temperature range, temperature steps and dwell or settling time at each temperature before making a measurement. A variety of Signatone thermal chucks are available to define range and resolution with a range of ambient to 300°C, 1° resolution.

For example, a typical test would be set at a range of 50°C to 250°C with 25° steps, dwell time of 5 minutes. The QuadProII would automatically measure the resistance at 20°C (the reference temperature) then control the chuck to heat to 50°C. After dwelling 5 minutes at 50°C, a measurement is then taken, recorded and plotted on the graph. Next, the chuck is heated up to 75°C for the next step measurement. This process repeats until the last measurement at 250°C is complete. The chuck is then automatically cooled back to ambient. Then, if so defined, additional locations may be automatically tested on the same sample. Up to 9 points on a sample may be automatically tested and graphed. The data may be printed or exported to a spread sheet for further analysis.



QuadProII ordering information

All QuadProII systems include the QuadProII software, two probe heads, necessary cabling to complete a working system and an operation manual. The QuadProII integrates Keithley Source meters for measurements. The different ranges available are directly based on the different Keithley model meters. Two SP4 probe heads with quick mounting blocks are provided with each system.

Model maker information

QuadProII-[range][type][size][TCR option]

E	Economic range: 1mΩ to 800KΩ
S	Standard range: 1mΩ to 1.2MΩ
C	Conductive range: 1μΩ to 1.2MΩ
M	Recommended range: 1μΩ to 100MΩ
G	High resistance range: 1mΩ to 10GΩ, - includes HT4 probe head
F	Full range: 1μΩ to 10GΩ, includes HT4 probe head
B	Bench top, manual motion configuration includes - computer integrated into rack with test meters - flat panel screen, keyboard and mouse - 304 test stand with manual X-Y positioning - includes 200mm Ultem Chuck - position digital readout 
U	Bench top, manual motion configuration includes - computer integrated into rack with test meters - flat panel screen, keyboard and mouse - S-305 stand with stationary DUT holder, for up to 300mm wafers - manual X-Y positioning of SP4 or HT4 four point probe head - 300mm Delrin platfrom holds 100/150/200 & 300mm wafers - not available for use with TCR option 
A	Semiautomatic stand alone configuration - latest Windows OS, moderate processor, RAM and HD, keyboard and mouse - automatic X-Y positioning stage - dark box enclosure - computer integrated into mobile rack with test meters - flat panel screen, keyboard and mouse - locking castors allowing stand alone system to roll into place 
R	Signatone S-M40 /S-M90 series micropositioners with SP4/HT4 holder for use on existing Signatone probe station platforms. *(probe station not included with this item /ask us about Signatone probe station and QuadProII integration packages)*
8	For samples 10mm - 200mm in diameter
C	For samples 10mm - 300mm in diameter
0	No TCR option
T	Standard TCR option: range of 10°C to 300°C, 1°C resolution - includes S1070 series controller and hot chuck
U	Low range, precision TCR option: range of 10°C to 125°C, 0.1°C resolution - includes F25-HL fluid chuck controller and fluid chuck *(temperatures higher than 95°C will require special coolant fluid, not included with this item and will be quoted on separately)*

Example of most popular model configuration: QuadProII-MA8T