Sheet Resistance & Resistivity Measuring System

4-Point probe system for wafer

Model ***CMT-SR2000N-PV***

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1. Introduction

The CMT-SR2000N-PV is a full automatic system to measure Sheet resistance and Resistivity for max. 230mm wafer or 162x162mm square sample like Photovoltaic Solar cell, etc. This system can be operated by itself (stand-alone), furthermore, perfect remote control is available by using a PC and exclusive software, and it provides a various data analysis functions.

2. Features

- X, Y, Z axis full automatic system.
- Automatic & Manual measurement range selection.
- Up to 230mm wafer or 162x162mm square sample capability.
- Single and Dual measurement method.
- Temperature sensing sensor for Temperature correction factor. (Option)
- Data analysis functions - 2D, 3D map, Data map, etc.
- ASTM, SEMI standard measurement mode by software.

3. Configuration

The system consists of following components.

- 4-point probe head unit.
- Automatic contact unit. (Z axis)
- Rotation sample stage (X axis) & Straight-line motion arm. (Y axis)
- Temperature sensing sensor for Temperature correction factor. (Option)
- Remote control communication port. (USB port)
- Vacuum input port. (one-touch fitting connector)
- Operating Software. (Microsoft Windows XP SP3 / 7 Ver.)
- Standard accessories
  - Power cable
  - Remote control communication cable. (USB cable)
  - Operating & service manual.

4. Specifications

- Sheet resistance measurement
  - Measuring method : Contacted by four point probe
  - Measuring range : 1 mohm/sq ~ 2 Mohm/sq

- Resistivity measurement
  - Measuring method : Contacted by four point probe (Input thickness)
  - Measuring range : 10.0 μ ohm·cm ~ 200.0 Kohm·cm

- Current Source
  - Range : 5nA to 160mA

- Measurement Accuracy
  - ±0.5 % (Precision Resistor)

- Measurement Repeatability (2σ)
  - ±0.15 % (Precision Resistor)

- Measurement time : Approx. 2 ± 1 sec/point

- Four point probe (JANDEL ENG.)

  - Spacing between tips : 0.635mm, 1.0mm, 1.27mm, 1.591mm
  - Tolerance ± 0.01 mm
  - Load on each tips : fixed between 10g and 250g
  - Tip radius : 12.5, 25, 40, 100, 150, 200, 300, 500 microns
  - Tip material : TC(tungsten carbide), 50% Osmium alloy

  Ref)
  - A type : 40 micron, 100g, 1mm
  - B type : 100 micron, 100g, 1mm
  - C type : 200 micron, 100g, 1mm
  - D type : 500 micron, 100g, 1mm
  - E type : 40 micron, 200g, 1.59mm

5. Measuring specimen

- Maximum 230mm wafer or 162x162mm square sample.

6. Outside dimensions

- 330mm(W) x 670mm(D) x 330mm(H)

Note) The outside dimensions take to change by maker in case of need.

7. Operating software

- General Personal computer.
- Operating system : Microsoft Windows XP SP3 / 7 Ver.
- Remote control communication method : USB port
- Measurement Data management
  - Data save & load, export.
  - NFS transfer via LAN
- Various Measurement Mode
  - Recipe measurement : Recipe point designation by user.
  - Standard measurement : ASTM & SEMI mode.
  - Pattern measurement : 49, 81, 121, 225 point, etc.
  - Step measurement : Point interval designation by user.
  - Manual measurement : Point by inputting coordinate values
- Data Analysis functions : 2D, 3D map, Data map, Statistics, etc.
- User management
  - User register, selectable security level user, Login, etc.

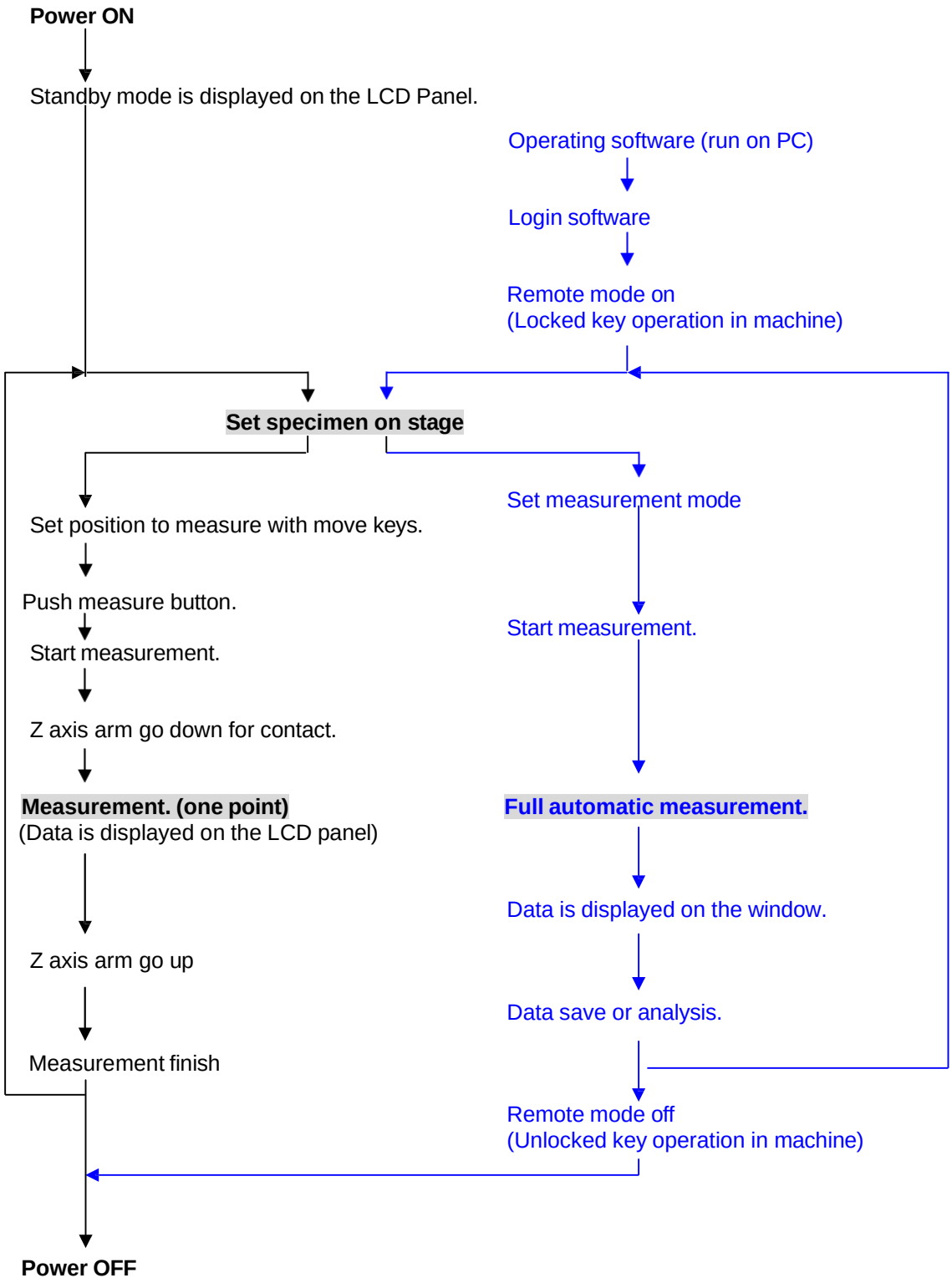
8. Operating environment

- Temperature range : 23℃±1℃
- Relative humidity : 30% ~ 70%
- Avoid placing the system near a source of RFI, vibration and sources of gas.
- Avoid large changes in temperature.

9. Utility requirements

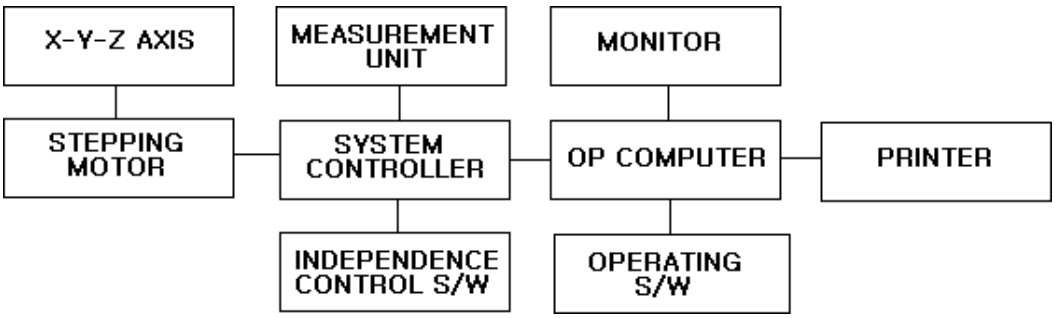
- Power requirements (1 Line)
  - Line voltage : AC 220V or 110V ± 10%
  - Electric power : 100W, 500mA
  - Line frequency : 50/60 Hz
- Vacuum requirements (1 Line)
  - Vacuum : About 200mmHg.
  - Connection method : Urethane tube Dia. 4mm. (outside diameter)

10. Measuring flow

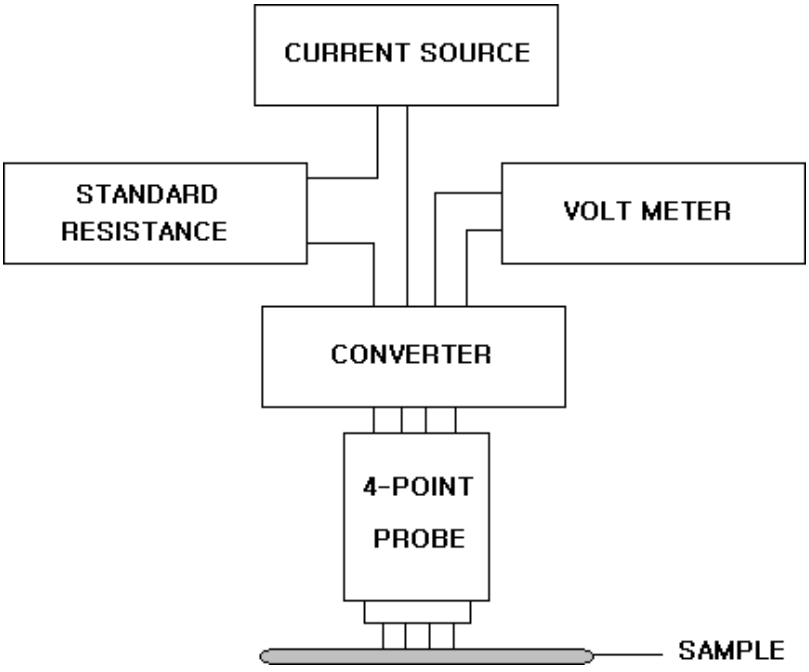


Note)
- Black color (left) is flow for standalone operation.
- Blue color (right) is flow for remote controls by software.

11. System construction diagram



12. Measurement construction diagram



13. 2D(Contour) & 3D Map (example)