

JANDEL ENGINEERING LTD.
HM21-SRM Four Point Probe
General Purpose Portable Four Point
Probing System for Measuring
Sheet Resistance or Volume Resistivity



Shown with
coiled cable

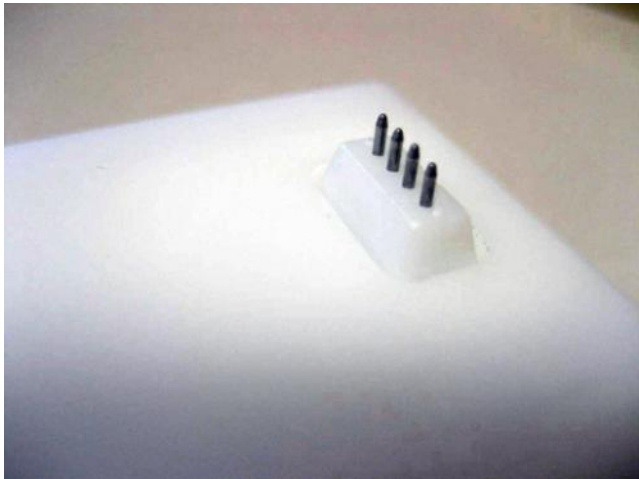
About the HM21 Hand Held Meter

The Jandel HM21 Hand Held Meter is a battery powered four point probe meter which includes a universal AC power adaptor so that it does not have to run on batteries when portability is not important. The Jandel HM21 is a portable current source / meter specifically designed for the four point probe measurement technique. For successful measurements the HM21 supplies a constant current and displays either the resultant voltage or the sheet resistance in ohms/square depending which function has been chosen. The sheet resistance measurement range is 1 ohm/square up to 10 Megohms/square (in practice you can measure down to around 0.01 ohms/square, but the accuracy may be compromised slightly). This equates to a bulk (or volume) resistivity range of approx. 0.01 ohm.cm to 100 Kohm.cm. The current is changeable in 6 steps - 100nA, 1uA, 10uA, 100uA, 1mA, 10mA. The compliance voltage is above 8.5V but slightly reduces to 7.5V at 10mA, however 10mA would usually only be used with more conductive samples where the compliance voltage is not so critical. Overall accuracy is better than 0.5% where the DVM receives greater than 1mV. For the mid ranges the accuracy is better than 0.3% The DVM has two ranges - high sensitivity up to 150mV and low range up to 1.25V. The unit is push button operated. The current is increased with the 'INC' button and decreased with the 'DEC' button. Forward and reverse current

can be selected using the 'FWD' and 'REV' buttons, which is a common way to check the validity of a measurement by checking the forward and reverse voltage values for consistency. When the battery mode is used, the unit returns to standby automatically to save power and turns off altogether after some period of inactivity. The automatic time to return to standby is 70 seconds with low current and with the 3 highest currents 40 seconds. This is because the lower current ranges are used with higher impedance which can take longer to settle, and the higher currents drain the power faster. The unit can be zeroed to remove any offset by pressing the Standby button when the unit is already in Standby. The HM21 includes on-board non-volatile memory so that fifty measurements can be stored in the unit and then downloaded to a PC later. When connected to a PC using the included software, the HM21 can save the data, or bulk resistivity values (ohms-cm) can be calculated. If the HM21 is connected to a PC using the software, the unit can be operated via the user interface which is an illustration of the HM21 on the computer screen. Clicking the "save" button on the computer screen saves the data to the PC. Files are stored in the CSV format which opens automatically in Excel. The HM21 reads-out directly in sheet resistance (ohms-per-square) without using a PC or the software. The **instruction manual for the HM21 software** can be downloaded here: http://www.fourpointprobes.com/hm20_software.pdf

About the SRM Probe

The SRM probe is a reasonably priced plastic bodied probe that is suitable for use in measuring a wide range of materials including various conductive coatings, ITO on glass, silicon wafers, ingots, potscrap, conductive paints, and various thin films. The connection to the probe head is made via a female RJ45 connector which is the same type of connector used for Ethernet connections. The HM21 is supplied with a 1 meter long cable that plugs directly into the SRM probe head.



The SRM probe heads are available in three choices of tip spacing, three choices of spring load, two choices of tip material, and three choices of tip radii.



Jandel HM21 1.2
Standby

FWD STBY REV

INC DEC Ω/□

Hi/Lo STORE On/Off

JANDEL
MODEL HM21