



Van der Pauw

## Ecopia HMS-3000 Hall Measurement System



The Ecopia HMS-3000 Hall Measurement System is a complete system for measuring the resistivity, carrier concentration, P/N type, and mobility of various materials including semiconductors (N Type & P Type) such as Si, Ge, SiGe, SiC, GaAs, InGaAs, InP, GaN, ZnO, TCOs, metals, oxides, etc., at both 300K and 77K. The user must supply the PC, however, all other materials needed to begin making measurements are included. The HMS-3000 includes software with I-V curve capability to check the ohmic contact of the sample "contacts".

**Characteristics** - Compact Desktop Model - Permanent magnets and an integrated meter / current source / circuit switching system are used instead of bulky electromagnets and separate constant current source and DVM, providing a very compact and easy-to-use desktop system.

**Simplicity and Accuracy** - 5 Stage current ranges reduce the error allowance to a minimum.

**Simple Operation - Speedy Data Results** - Data is input by a simple operation providing bulk/sheet carrier concentration, mobility, Hall coefficient, bulk resistivity, conductivity, magnetoresistance, and alpha (Vertical/Horizontal ratio of resistance).

Web Page: <http://www.fourpointprobes.com/ecopia.html>

Complete Brochure: [http://www.fourpointprobes.com/hms3000\\_brochure.pdf](http://www.fourpointprobes.com/hms3000_brochure.pdf)

Optional 300C Hot Stage System: <http://www.fourpointprobes.com/ht55t.pdf>

Sample Mounting Boards: <http://www.fourpointprobes.com/springclip.pdf>

**Specifications:**

**Size (W × D × H):** 320 x 300 x 105 mm (Constant Current Supply / Meter System)

**Weight:** 7.7kg (without package)

**Maximum sample size:** Small board – 6 mm x 6mm, Large Board - 20 mm x 20 mm.

**Measurement Temperature:** 300K, 77K (Liquid Nitrogen) Cool-down time: 10 sec.

**Measurement Materials:** All semiconductors including Si, SiGe, SiC, GaAs, InGaAs, InP, GaN (N Type & P Type can be measured). Data input of depth enables comprehensive measurement of the whole material.

**Resistivity Range:**  $10^{-4}$  to  $10^7$  (Ohms-cm)

**Magnet :** Permanent magnet (diameter: 50mm)

**Magnet Flux Density:** 0.55T nominal +/-1% of marked value Stability: 2% over 1 years Uniformity: +/- 1% over 20mm diameter from center Pole Gap: 26 mm

**Alternative field strengths available as options: 0.27, 0.31, 0.37T, 1.0T**

**Current source:** Range: 1nA-20mA Compliance: 12V

**Mobility:** ( $\text{cm}^2/\text{Volt}\cdot\text{sec}$ )  $1 \sim 10^7$  (including low temperature)

**Density ( $\text{cm}^{-3}$ ):**  $10^7 \sim 10^{21}$

**Voltage measurements:** Input impedance:  $2 \times 10^7$  Input voltage range: +/-12V

**Sample input:** Sample boards—3 types, i.e., Small board, Large board, Device board

**Contact switching:** Mechanical relays



Sample kit with 0.55 Tesla magnet supplied standard with the system.

**Product Specifications**

① Common Specifications.

1) General Factors

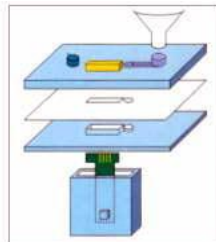
Input Current	Resistivity ( $\Omega \cdot \text{cm}$ )	Concentration ( $1/\text{cm}^3$ )	Mobility ( $\text{cm}^2/\text{Volt} \cdot \text{sec}$ )	Magnetic Flux Density(T)	Temperature (K)	Sample Measurement Board
1nA - 20mA	$10^{-4} \sim 10^7$	$10^7 \sim 10^{21}$	$1 \sim 10^7$	0.27 0.31 0.37 <b>0.55</b> 1	77 300	PCB Sample Board <b>5 wire bond type &amp; one spring clip type boards</b>



PCB Sample Holder (6mm×6mm, 20mm×20mm)



Magnetic flux density input system 0.55T, 1.0T



Low temperature measurement system (77K, 300K)

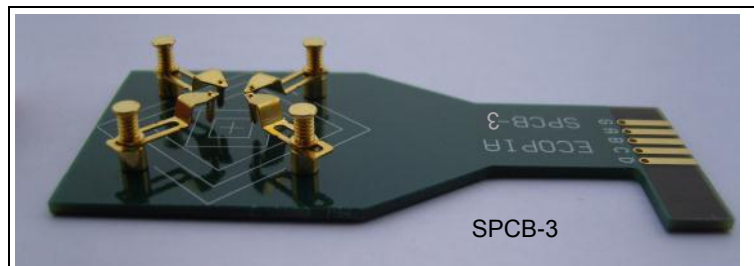


SPCB-1

The Spring Clip Board is for use with the 0.55 Tesla magnet kit (not the 1.0T) and it has spring loaded clips and tips to make contact without using bonding wires. The SPCB-1 is included with the system, however, it can be swapped for one of the other SPCB boards if preferred. (When using the Spring Clip Board, usually contacts must still be applied to the sample corners to insure good probe contact).



Optional 1.0 Tesla sample holder kit available for use in measuring low mobility samples. For use at 300K only. To use with Spring Clip Type board, please specify model SPCB-0



SPCB-3

The SPCB-3 is one of the optional boards that can be supplied in place of the SPCB-1 or purchased in addition, for mounting thicker samples.