As the resistance of the contacts becomes comparable to
sample resistance, it becomes necessary to separate the contacts
conducting the current from the contacts between which the voltage
is measured, in order not to measure contact resistance together
with sample resistance. This is the rule when measuring resistivity
of semiconducting materials, and also when measuring very small
resistances of good conductors.

The separation of current and voltage contacts is ful-
filled in the four-point method indicated in figure 2.

Figure 2:
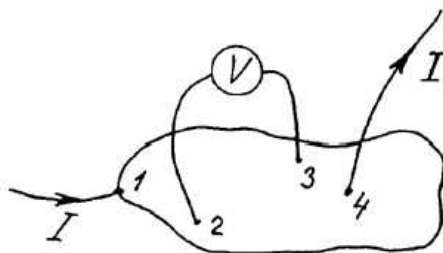
Four-point measurement.

The resistivity is given by:

$$\rho = G \frac{V_{2-3}}{I_{1-4}} \tag{2}$$

where

V_{2-3} is the voltage between contacts 2 and 3,

I_{1-4} is the current through contacts 1 and 4.

From the reciprocal theorem of electromagnetic theory
we conclude that if instead we pass the current I through con-
tacts 2 and 3, we shall get between the contacts 1 and 4 the same
voltage V as before between 2 and 3.

Thus we can extend equation (2) :

$$\rho = G \frac{V_{2-3}}{I_{1-4}} = G \frac{V_{1-4}}{I_{2-3}} \tag{3}$$