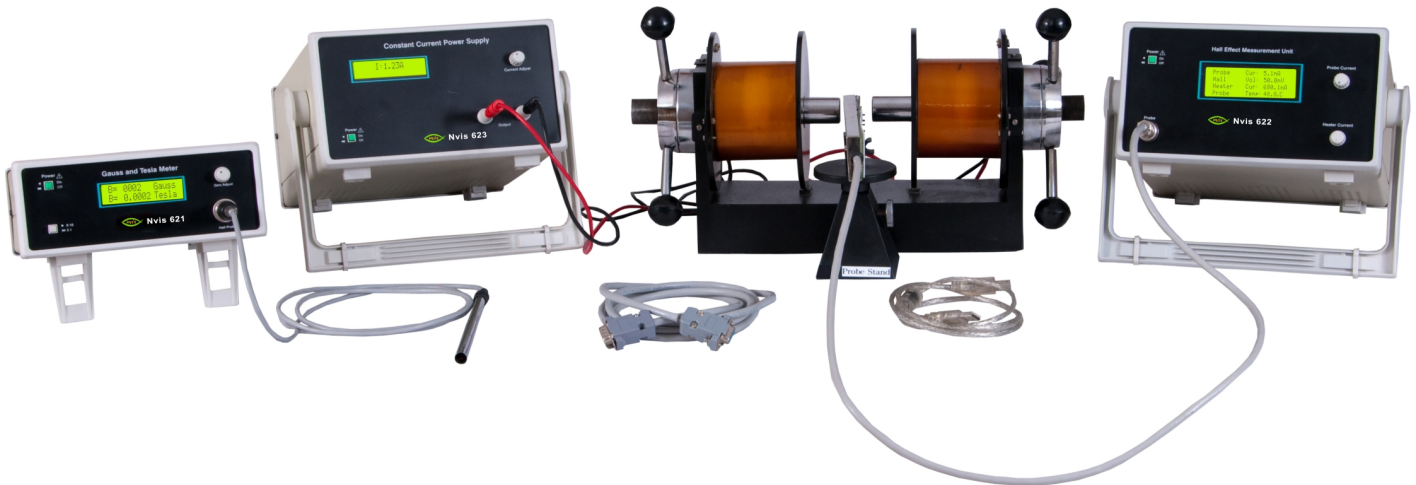




Hall Effect Setup

Nvis 6101



Nvis 6101 The Hall Effect Setup is a very useful system for the laboratory. It is used for the study of Hall Effect in semiconductors.

The Hall Effect is an important observation in material science. If electric current flows through a conductor in a magnetic field, the magnetic field exerts a transverse force on the moving charge carriers, which tends to push them to one side of the conductor, producing a measurable voltage between two sides of the conductor, this voltage is Hall Voltage.

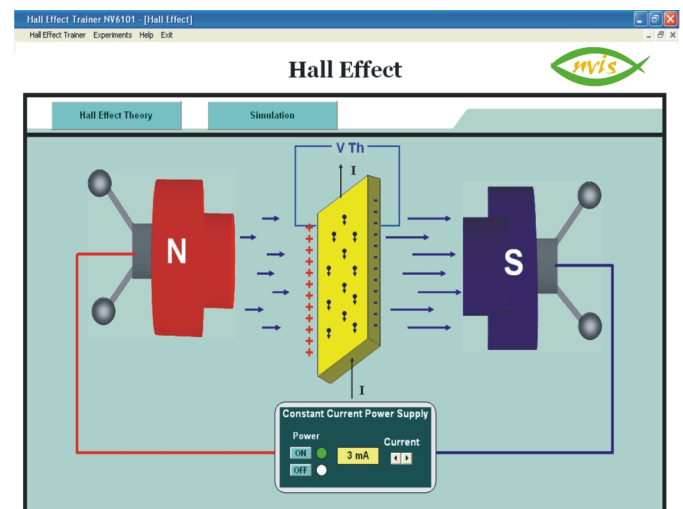
Through this setup we can determine carrier density, mobility of charge carrier, Hall coefficient, Hall voltage etc. We can study the effect of temperature in semiconductor, relation between magnetic field and Hall voltage.

Setup consists of the following :

- ◆ Gauss and Tesla Meter Nvis 621 (InAs probe)
- ◆ Measurement Unit Nvis 622
- ◆ Constant current power supply Nvis 623
- ◆ Electromagnet
- ◆ Hall probe with Oven

Features

- A complete set for the study of Hall Effect in semiconductor
- A Hall Effect probe is provided with p type germanium crystal with oven
- Measurement unit with LCD display and PC interface to measure Hall voltage and probe current
- Provided with InAs sensor for measuring magnetic field
- Constant current source provided with LCD display
- Gauss and Tesla meter for measuring magnetic field with LCD display and PC interface facility
- Provided with an Electromagnet



Simulation Software



Hall Effect Setup

Nvis 6101

Scope of Learning

- Measure the magnetic field by Gauss and Tesla meter
- Find the poles of an electromagnet with the help of Hall probe and gauss meter
- Measurement of Hall voltage
- Calculate the charge carrier concentration density of semiconductor crystal
- Calculate the Hall coefficient of Ge 'p' type crystal
- Calculate the mobility of charge carrier particles
- Study the Hall voltage as a function of current at constant magnetic field
- Study the dependence of Hall effect coefficient on temperature
- Study of Hall voltage as a function of magnetic field at constant current

Technical Specifications

1) Gauss and Tesla meter Nvis 621

Microcontroller Based LCD Display for Measurement of Magnetic Field in Gauss and Tesla, With PC Interface facility.

- Sensor : InAs for better sensitivity
 Range : 0-20kG
 Special feature : Indicate the direction of the magnetic field
 Mains : 230V AC \pm 10%, 50Hz
 PC interface : RS232

2) Measurement unit Nvis 622

- Probe current : 20mA (maximum)
 Heater current : 0-700mA
 Temperature : 0-100°C
 Hall voltage : 200mV (maximum)
 Mains : 230V AC \pm 10%, 50Hz
 PC interface : RS232 and USB

A) Hall probe

- Crystal : p-type lightly doped
 Resistivity : As on probe
 Thickness : As on probe

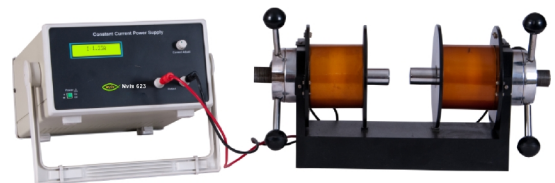
- B) Temperature Sensor** : Temperature is Measured with PT-100

3) Constant Current Power Supply Nvis 623

- Current range : 0 to 3.5A
 Output voltage : 20V
 Display : LCD, 16 x 2
 Mains : 230V AC \pm 10%, 50Hz

4) Electromagnet

- Poles : 25mm diameter
 Coils : 2 Nos.
 Resistance : 50 (approximate)
 Input current : 3.5A at 20V
 Weight : 16kg



Software Window

Designed & Manufactured in India by

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