



Users Manual

SES-CAMM User Interface (HEX-RM)



System requirements

- Window based operating system (XP, Window7, 8, 10, Vista).
- Installation space required <100 Mb
- .NET Framework 4 (included in package)
- Visual Basic Power Pack 10 (included in package)

Main Window



The screenshot shows the main window of the HEX-RM software. The interface includes a menu bar (File, Edit, View, Setting, Contact, Help), a toolbar, and several data panels. Callouts 1 through 13 point to various elements: 1 (File menu), 2 (Edit menu), 3 (CONNECT button), 4 (DISCONNECT button), 5 (Sample Detail panel), 6 (Live Data panel), 7 (SES-CAMM logo), 8 (Date display), 9 (Set Temp. slider), 10 (Mag. Current slider), 11 (RECORD, CALCULATE, SAVE, CLEAR buttons), 12 (Data table), and 13 (Large empty plot area).

Connect
COM22
DISCONNECTED

Sample Detail
Sample : Ge(n-type)
Thickness (t) : 0.05 cm
Resistivity (ρ) : 10 ohm.cm
Conductivity (σ) : 0.1 C/volt.sec.cm

Live Data
Magnetic Field - 0 Gauss
Hall Current - 0 mA
Hall Voltage - 0 mV
Temp - 000 °C

SES-CAMM
Computer Aided Measurement Module
Hall Effect Experiment, HEX-RM
22 February 2021

Set Temp. (°C) 000
Mag. Current (A) 000

	S.No.	Temp(°C)	Hall Voltage (mV)	Offset Hall Voltage (mV)	Correct Hall Voltage (mV)	Hall coefficient*10 ⁴ (cm ² 3.C ⁻¹)
*						



1 . Menu Bar

File :

- * New Experiment
- * Export File to Excel
- * Exit

Edit :

- * Clear : Clear Table and Graph
- * Reset : Reset the Software

View :

- * View COM Port : Click to check connected COM port in Computer

Setting : Settings of the software

Contact : Contacts and Link to contact page of SES website

Help : Includes product manual, software operation and About the Software

2. COM PORT : Select connected COM port

3. CONNECT : Click to Connect SES-CAMM 2 Unit

4. DISCONNECT : Click to Disconnect SES-CAMM 2 Unit

5. Displays **RED** when a module is not connected and **GREEN** when a module is connected

6. Sample Detail : Show Thickness, Resistivity and Conductivity of the Sample

7. Live Data : Show live value of Magnetic Field, Hall current, Hall Voltage and Temperature

8. Experiment name and product code

9. Set Temperature in degree centigrade

10. Set Magnet Current in Ampere

11. RECORD: Click to Record data in the table

CALCULATE: Click to calculate final results

SAVE : Click to save the recorded data to excel file

CLEAR : Click to clear table and graph

12. Space for displaying the data in tabular form

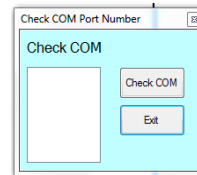
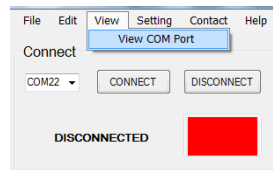
13. Space for displaying the graph

14. Display **CONNECTED** and **DISCONNECTED** Status of SES-CAMM 2 unit

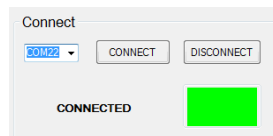


Connect Unit

- Open SES-CAMM by selecting the tool icon SES-CAMM(HEX-RM) from Desktop or start-up.
- A start window will be seen where a fresh experiment may be preformed.
- Go to MENU bar and click on View ➤ View COM Port. Check COM Port window will open



- Click on 'Check COM' button, Connected COM Port number will be displayed in in box
- Select COM Port and then wait, unit will connect automatically.

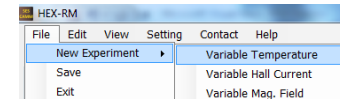


- Click on DISCONNECT Button to disconnect the SES CAMM unit.
- Click on CONNECT Button to connect the SES CAMM unit.

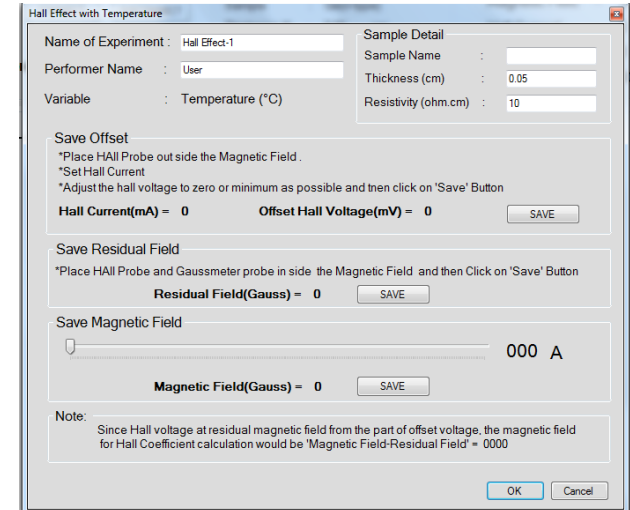
Hall Effect with variable Temperature



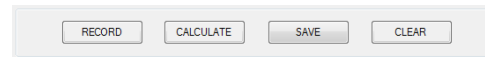
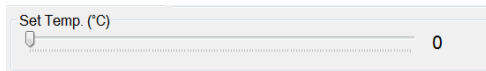
- Select File ➤ New Experiment ➤ Variable Temperature
- 'Hall Effect with Temperature' window will open. Fill all the Fields



- 1) **Name of Experiment** :- Enter the name of experiment.
- 2) **Performer Name** :- Name of person performing the experiment.
- 3) **Sample Detail**:- Enter Name, Thickness, Resistivity and Conductivity of Sample.
- 4) **Save Offset**:-Place Hall Probe outside the Magnetic Field and then set Hall Current Manually. Now adjust the hall voltage to zero or minimum as possible and then click on 'Save' Button
- 5) **Save Residual Field**:-Place Hall Probe and Gaussmeter probe inside the Magnetic Field and then Click on 'Save' Button
- 6) **Save Magnetic Field**:-Slide the Bar to set Magnetic Field and then then Click on 'Save' Button
- 7) Click on 'OK' Button



- Set temperature by scrolling bar or by click on Track bar and then use Right and Left keys on keyboard



- Wait until measure temperature become close to set temperature and then Click 'RECORD' button to record data in table.
- Repeat this step for different values of temperature. Click on 'CALCULATE' button to find result at the end of experiment.
- Click on 'SAVE' button to save recorded data in Excel format.



HEX-RM

File Edit View Setting Contact Help

Connect

COM22


CONNECTED

Sample Detail

Sample : Ge(n-type)
 Thickness (t) : 0.05 cm
 Resistivity (ρ) : 10 ohm.cm
 Conductivity (σ) : 0.1 C/volt.sec.cm

Live Data

Magnetic Field - 3130 Gauss
 Hall Current - 4 mA
 Hall Voltage - 54.6 mV
 Temp - 27 °C



SES-CAMM
Computer Aided Measurement Module

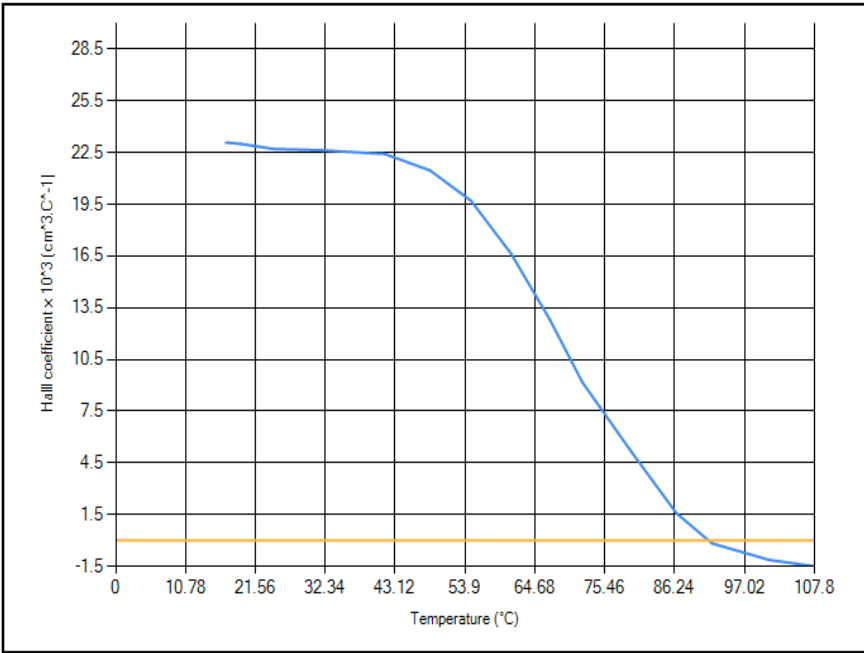
Hall Effect Experiment, HEX-RM

26 February 2021

Set Temp. (°C)

Mag. Current (A)

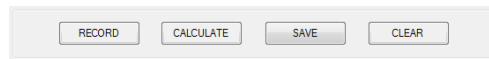
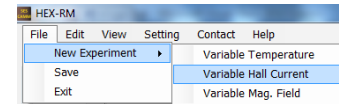
S.No.	Temp(°C)	Hall Voltage (mV)	Offset Hall Voltage (mV)	Correct Hall Voltage (mV)	Hall coefficient* (cm ³ C ⁻¹)
1	17	54.6	-0.8	55.4	23.08
2	19.3	54.3	-0.9	55.2	23
3	24.3	54.8	0.29	54.5	22.71
4	31.8	53.1	-1.2	54.3	22.63
5	41.5	56.6	2.8	53.8	22.42
6	48.5	54.7	3.2	51.5	21.46
7	54.8	49.9	2.6	47.3	19.71
8	61	41.9	2	39.9	16.63
9	67	22	-8.7	30.7	12.79
10	72	14.4	-7.6	22	9.17



Hall Effect with variable Hall Current



- Select File ➤ New Experiment ➤ Variable Hall Current
- 'Hall Effect with Hall Current' window will open. Fill all the Fields
 - 1) **Name of Experiment** :- Enter the name of experiment.
 - 2) **Performer Name** :- Name of person performing the experiment.
 - 3) **Sample Detail**:- Enter Name, Thickness, Resistivity and Conductivity of Sample.
 - 4) **Save Offset**:-Place Hall Probe outside the Magnetic Field and then set Hall Current to Zero Manually. Now adjust the hall voltage to zero or minimum as possible and then click on 'Save' Button
 - 5) **Save Magnetic Field**:-Slide the Bar to set Magnetic Field and then then Click on 'Save' Button
 - 6) Click on 'OK' Button
- Set Hall Current by rotating Current knob on the panel of DHE-RM-150 unit
- Click 'RECORD' button to record the data in table.



- Repeat this step for different values of Current. Click on 'CALCULATE' button to find result at the end of experiment.
- Click on 'SAVE' button to save recorded data in Excel format.



Connect

COM22 [Dropdown] [CONNECT] [DISCONNECT]

CONNECTED [Green Status Box]

Sample Detail

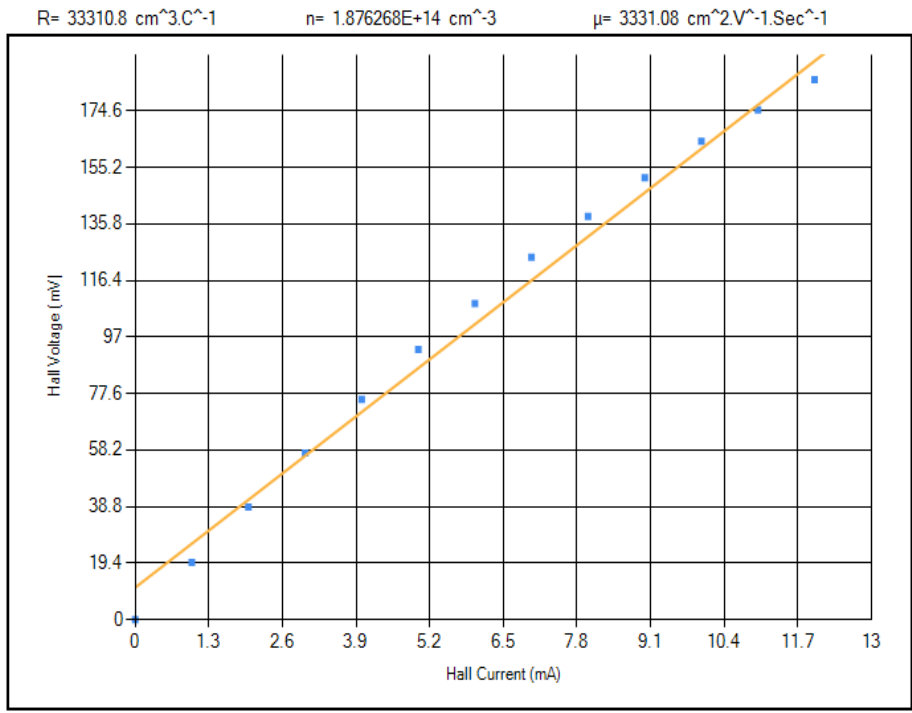
Sample : Ge. Crystal (n-type)
 Thickness (t) : 0.05 cm
 Resistivity (ρ) : 10 ohm.cm
 Conductivity (σ) : 0.100 C/volt.sec.cm

Live Data

Magnetic Field - 2250 Gauss
 Hall Current - 13.06 mA
 Hall Voltage - 124.1 mV
 Temp - 28 °C

Hall Effect Experiment, HEX-RM

26 February 2021 [Calendar Icon]



Set Temp. (°C) [Slider] 0

Mag. Current (A) [Slider] 0

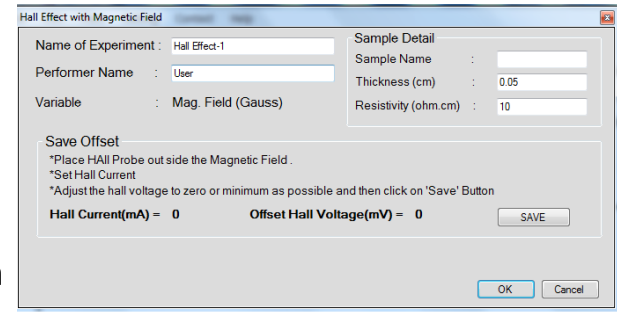
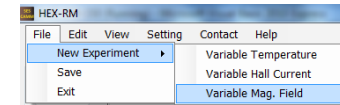
[RECORD] [CALCULATE] [SAVE] [CLEAR]

S.No.	Hall Current (mA)	Hall Voltage (mV)	Offset Hall Voltage (mV)	Correct Hall Voltage (mV)
1	0	0	0	0
2	1	19.6	0	19.6
3	2	38.6	0	38.6
4	3	57.2	0	57.2
5	4	75.5	0	75.5
6	5	92.7	0	92.7
7	6	108.4	0	108.4
8	7	124.4	0	124.4
9	8	138.4	0	138.4
10	9	151.6	0	151.6
11	10	164.1	0	164.1

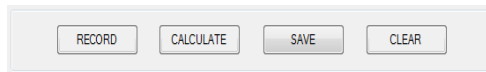
Hall Effect with variable Magnetic Field



- Select File ➤ New Experiment ➤ Variable Mag. Field
- 'Hall Effect with Magnetic Field' window will open. Fill all the Fields
 - 1) **Name of Experiment** :- Enter the name of experiment.
 - 2) **Performer Name** :- Name of person performing the experiment.
 - 3) **Sample Detail**:- Enter Name, Thickness, Resistivity and Conductivity of Sample.
 - 4) **Save Offset**:-Place Hall Probe outside the Magnetic Field and then set Hall Current Manually. Now adjust the hall voltage to zero or minimum as possible and then click on 'Save' Button
 - 5) Click on 'OK' Button
- Set Magnetic Field by scrolling bar or by click on Track bar and then use Right and Left keys on keyboard.



- Click 'RECORD' button to record the data in table.



- Repeat this step for different values of Magnetic Field. Click on 'CALCULATE' button to find result at the end of experiment.
- Click on 'SAVE' button to save recorded data in Excel format.



HEX-RM [Minimized] [Maximized] [Close]

File Edit View Setting Contact Help

Connect

COM22

CONNECTED

Sample Detail

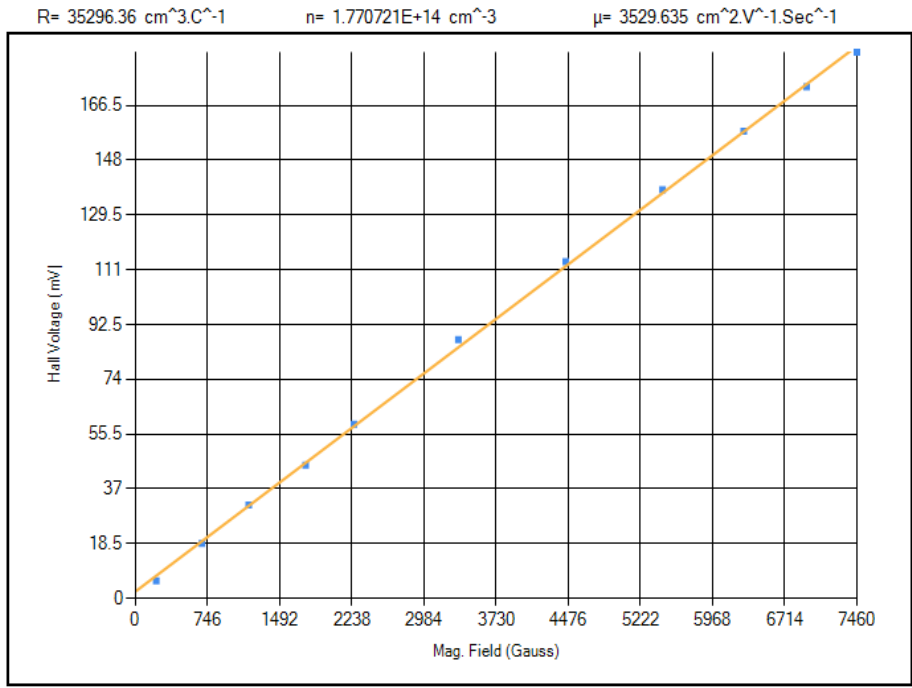
Sample : Ge crystal n-type
 Thickness (t) : 0.05 cm
 Resistivity (ρ) : 10 ohm.cm
 Conductivity (σ) : 0.100 C/volt.sec.cm

Live Data

Magnetic Field - 217 Gauss
 Hall Current - 3.5 mA
 Hall Voltage - 5.9 mV
 Temp - 26 °C

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Hall Effect Experiment, HEX-RM

26 February 2021



Set Temp. (°C)

Mag. Current (A)

S.No.	Mag. Field (Gauss)	Hall Voltage (mV)	Offset Hall Voltage (mV)	Correct Hall Voltage (mV)
1	217	5.9	0	5.9
2	689	18.5	0	18.5
3	1173	31.5	0	31.5
4	1762	45	0	45
5	2260	58.8	0	58.8
6	3340	87.4	0	87.4
7	4450	113.7	0	113.7
8	5450	138.1	0	138.1
9	6290	157.8	0	157.8
10	6940	172.8	0	172.8
11	7460	184.5	0	184.5



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