Raman Reflex
Last Updated: 6/25/2020
(Under Construction)

You must be a "Qualified Self-User" to operate this instrument independently.
You must be on the labs "Instrument Reservation Schedule" before touching the instrument for any reason.
Any problems, STOP, Post a note on the instrument and send an email to mtim@mit.edu immediately.
Do not perform any maintenance.
Do not adjust any optics.

Instrument Hazards:
Lasers, Cryogenic Liquids Chemicals & Electricity.

Laser Safety:
Anyone operating the laser must have attended the MIT Radiation Protection Offices Laser Safety Training. Call X2-EHSS to schedule a class.
Lasers: Class 3B, Interlocked system (No exposed laser beams).
Wavelength and Power: 785nm 100mw, 533nm 50mw, 437nm 25mw.

Required Apparel:
Safety Glasses, Laser Safety Glasses when interlocks are disabled.
Wear clean gloves when handling optics.

Check out the system when you arrive:
If you encounter any problems: Stop work and send Tim (mtim@mit.edu) an email immediately.

1. Lasers, Spectrometer and Microscope Laser Safety Enclosures – Closed.
2. Computer – On
3. Software - Closed.
4. Spectrometer Power – Always On

Tim McClure
mtim@mit.edu
(617) 258-6470
77 Massachusetts Avenue, 13-4149
Cambridge, MA 02139

Operation:

Logon to computer:

User name: Admin
Password: 134139

Open the software - "Wire".
Turn the Lasers on (Key).
785nm laser must warmup ~60 seconds before performing health check.

Verify Performance:

Run the Health Check
On the machine status toolbar:
Choose your desired Laser Wavelength & Grating.

473nm & 532nm – Regular or Confocal
785nm – Line Focus Only

Perform your work:

Save your data:

Walk away with a copy of your data if it is important to you.

Use a USB or the computers internet connection to transfer your data.

Data Analysis:

Wire software is available to users.

Available on the desktop of the Raman computer.

Shutdown:

Close the Software
Turn off the Lasers (Key)

Cleanup.
Disengage CORAL.
Lab Door Closed.

Problems?
Send mtim@mit.edu an email immediately.
It is OK to try to resolve the problem by restarting the system.

Note: If laser interlock is tripped the system will have to be shutdown and restarted.

Shutdown the system:
Close the shutter in the software.
Close the software.
Turn the Main Power Off.
Turn the Lasers (Key) Off.

Restart The System After Power Was Shutoff:
After a power outage or a tripped laser interlock you will have to restart the system.
Turn the Main Power ON.
Open the software (Wire).
Choose the top option (initialize Motors).
Turn on the Lasers (Key).

Raman Polarization Measurement Configuration Modes

Polarized – ½ lambda waveplate - Linear
Depolarized – ¼ lambda waveplate - Circular

Isotropic Samples
Depolarized Raman
- Incident – Depolarized
- Analyzer – Polarized X or Y

Anisotropic Samples
Polarized Raman
- Incident – Polarized X and Y
- Analyzer – Polarized X and Y
- Rotatable Sample Stage

Angle Resolved Polarized Raman
- Incident – Linear Polarized (1/2 waveplate) X and Y
- Analyzer – Linear Polarized (1/2 Waveplate) 0-190 degrees
- Rotatable Sample Stage

Vendor Contacts:

http://www.renishaw.com/en/invia-performance--9452

Sample info:

Other Instruments:

Kaiser Hololab 5000 Modular Research Raman Microscope & Spectrometer
785nm Excitation

Harvard CNS

MIT Institute for Soldier Nanotechnology

ACKNOWLEDGMENT OF SUPPORT:

CMSE requires that all publications and patents resulting from work done under this project or with the assistance of the CMSE Facilities, be acknowledged. Please be certain that one (or a combination) of the following statements is included in papers with support from CMSE:

"This work was supported primarily by the MRSEC Program of the National Science Foundation under award number DMR - 1419807."

-or-

"This work was supported in part by the MRSEC Program of the National Science Foundation under award number DMR - 1419807."

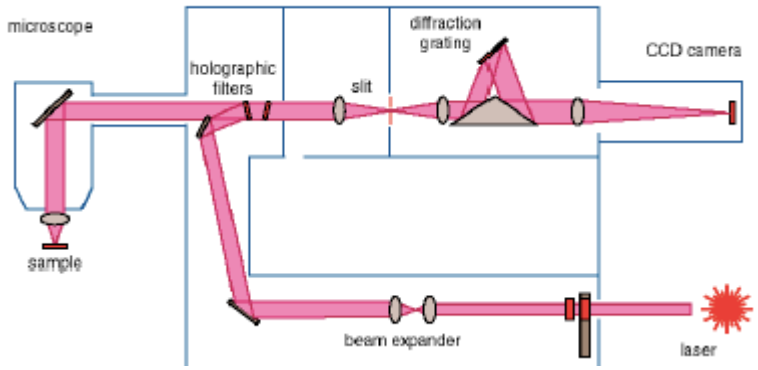
-or-

"This work made use of the Shared Experimental Facilities supported in part by the MRSEC Program of the National Science Foundation under award number DMR - 1419807."

Instrument Specifics:
Renishaw Invia Reflex Raman Confocal Microscope

This is a fully automated confocal Raman microscope system with three laser excitation lines a motorized stage and open sample compartment to accommodate cryostats.
A Temperature controlled microscope stage is available for temperature dependent measurements.

Raman Reflex Beampath



Data Acquisition Modes:
Point Mapping
Imaging - Stream HR fast imaging
Depth Profiling
Polarization
Time Dependent
Temperature Dependent
Photoluminescence

Laser Sources:

473nm	25mw Linear & Circular
532nm	50mw automated rotate linear
785nm	100mw Linear & Circular

Detector:
1" CCD array, Deep Depletion for enhanced IR Range
400-1050nm, 1024 X 256 pixel

Gratings:
600l/mm, 1200l/mm, 2400l/mm

Rayleigh Filters:

473nm edge	10%@150cm-1 shift, for Photoluminescence measurements

532nm eclipse <15cm-1 shift, Stokes & Antistokes
532nm edge ~100cm-1,
785nm edge 10%@50cm-1 Rectangle w/o aperture

Microscope:

Leica Optical Microscope
Infinity Corrected, 200mm Tube Length
Free Space with enclosure

Objectives:

Semi par-focal

Objective	Opening	WD	NA
10X	4mm	12mm	0.25
LWD50X	2mm	8mm	0.50
50X	4mm	350um	0.75
LWD100X	2mm	~3mm	0.75
100X	2mm	0.1mm	0.90

Reflected Light Polarization

Microscope Stages:

Renishaw HSES motorized stage
Step Size: 100nm
Stage Travel: 112mm x 76mm
Rotating Microscope stage - polarization experiments
Temperature controlled microscope stage
Linkam THMS600 (-196deg C to 600deg C).
Macro Sampling Set:
Cuvettes, Powders , Capillaries, Etc.
Computer & Monitor
HP Computer
Monitor 22”
Reference Spectra:
Organic Polymers, Inorganic materials, Sample substrates
Features:
Data Analysis Software available to users.
*******End*******