

Changes in CONTROL SIX (*alpha300R*)

THIS MANUAL IS TO BE SERVED AS A GUIDELINE FOR EXPERIENCED USERS WHO USED **CONTROL FIVE** AND PLAN TO KNOW THE DIFFERENCE (in red) BETWEEN **CONTROL FIVE** AND **CONTROL SIX**.

We now have objective lens that can only image dry flat samples. We recommend using 1 x 3 in glass slide to prepare your samples. Please discuss with facility staffs before scheduling if you have solution samples or powder samples or if you need to use coverslip or temperature stage.

PLEASE ALWAYS REMEMBER TO **ENABLE** AND **DISABLE** WITEC CONFOCAL RAMAN MICROSCOPE IN THE BADGER SYSTEM BEFORE AND AFTER YOU USE THE INSTRUMENT.

Lasers and Safety (Fig 1)

- 488 nm, 75 mW, laser class 3B
- 532 nm, 75 mW, laser class 3B, DPSS laser
- 633 nm, 70 mW, laser class 3B, Diode/solid state laser
- 785 nm, 125 mW, laser class 3B, Diode laser

Turning the key 90° to “ON” or “OFF” positions to turn on or off laser.

For stable power, lasers should be given 3-5 mins to warm up. Please only turn on the laser(s) you need. All four lasers must be off at the time you finish your session.

Microscope Tower (Fig2)

Please refer to Manual e2_2021 for part names and operation, the following lists the changes in control SIX and the new upgraded tower.

Spectrometer selection: fully automated in control SIX

Calibration source: unchanged, always push in for regular use

Polarization control: unchanged

Rayleigh filter: laser wavelength selection. New tower has two filter wheels: upper is for 488nm and 785nm, lower wheel is for 532nm and 633nm. Only one of the four lasers is selected at any given time, the other wheel should be left blank.

Visible light analyzer: fully automated and controlled in program

Brightfield/Raman selector: fully automated and controlled in program

F-stop and aperture: unchanged

Objective turret: unchanged

X-Y stage: unchanged



Figure 1

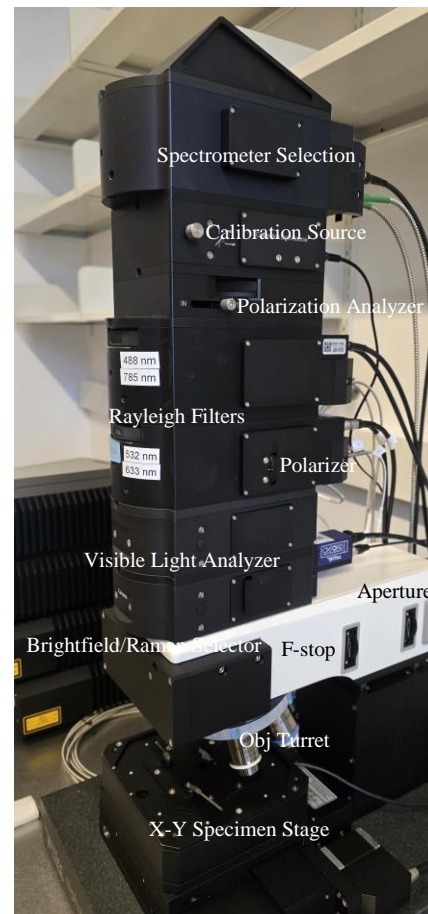


Figure 2

Objective lenses:

1. 10X: Zeiss EC Epiplan-Neofluar, WD9.3mm, NA 0.25 DIC
2. 50X: Zeiss EC Epiplan, NA 0.75 HD (darkfield only)
3. 50X: Zeiss EC Epiplan-Neofluar, WD0.58mm, NA 0.8 DIC
4. 100X: Zeiss EC Epiplan-Neofluar DIC, WD1.0mm, NA 0.9 DIC. (New)
5. Empty (compatible with Zeiss water-dip and glass-corrected lens)
6. 50X: Nikon DF Plan ELWD, WD8.7mm, NA 0.55 (heating stage only)

Software: Microscope is controlled by Control SIX, which can be started by double click on the desktop icon. Control SIX contains five major windows: Main Menu, Control, Message, WITec Video Control, Project Manager (part of Project SIX), the same as Control FIVE.

Important facts to remember before starting:

- 1) Laser selection is manual operation. You must rotate Rayleigh filter on the microscope tower to select laser and select the correct laser in the Control SIX program (WITec Video Control > Laser Control). **Only one of the four lasers is selected at any given time, the other wheel should be left blank.**
- 2) Objective lenses selection is manual operation, too. You must rotate the turret to select the proper objective and select the matching objective in Control SIX program (WITec Video Control)

System power on:

- 1) Turn on microscope control computer, wait 30s.
- 2) Log in Badger on microscope control computer and enable WITec Raman under IS tab in Badger.
- 3) Turn on lasers that you need for your session, wait 2-3 mins.
- 4) Click on "H" logo (highlighted by red circle) at the quick load zone of Windows 10 (left panel in Fig 3) to show the WITec Service monitor page (right panel in Fig 3), make sure all six items are checked with green check marks as shown in Fig 3 below before moving to next step.

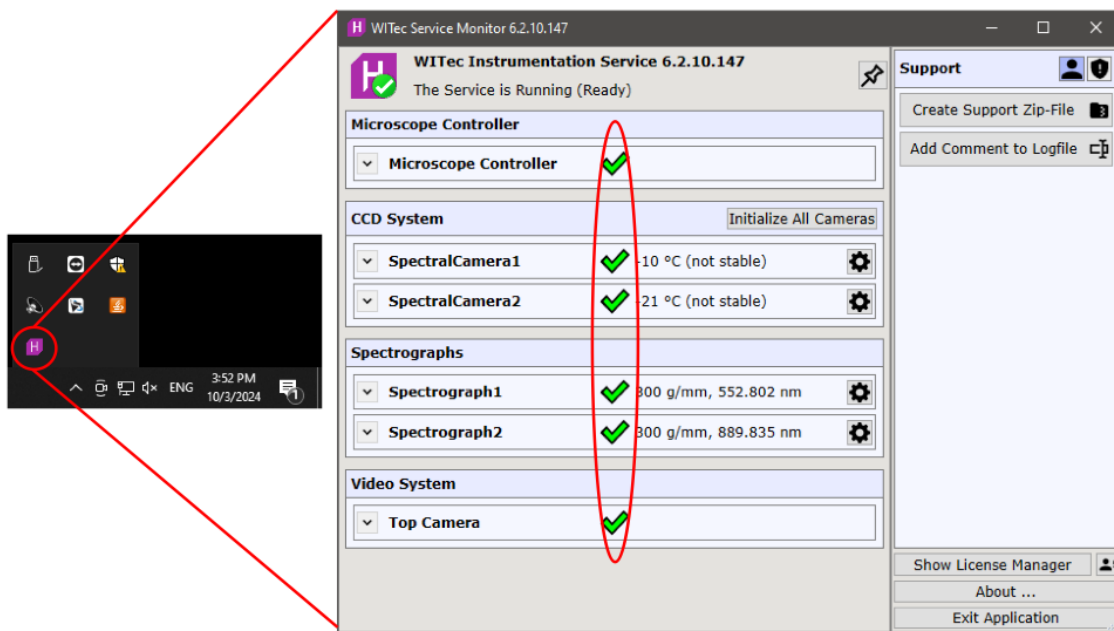


Figure 3

- 5) Double click on “Control SIX” on the desktop to start microscope control software. It contains five parts (see Fig 4): **Main Menu**, **Control**, **Messages**, **Video Control**, **Project Manager** (yellow circles).

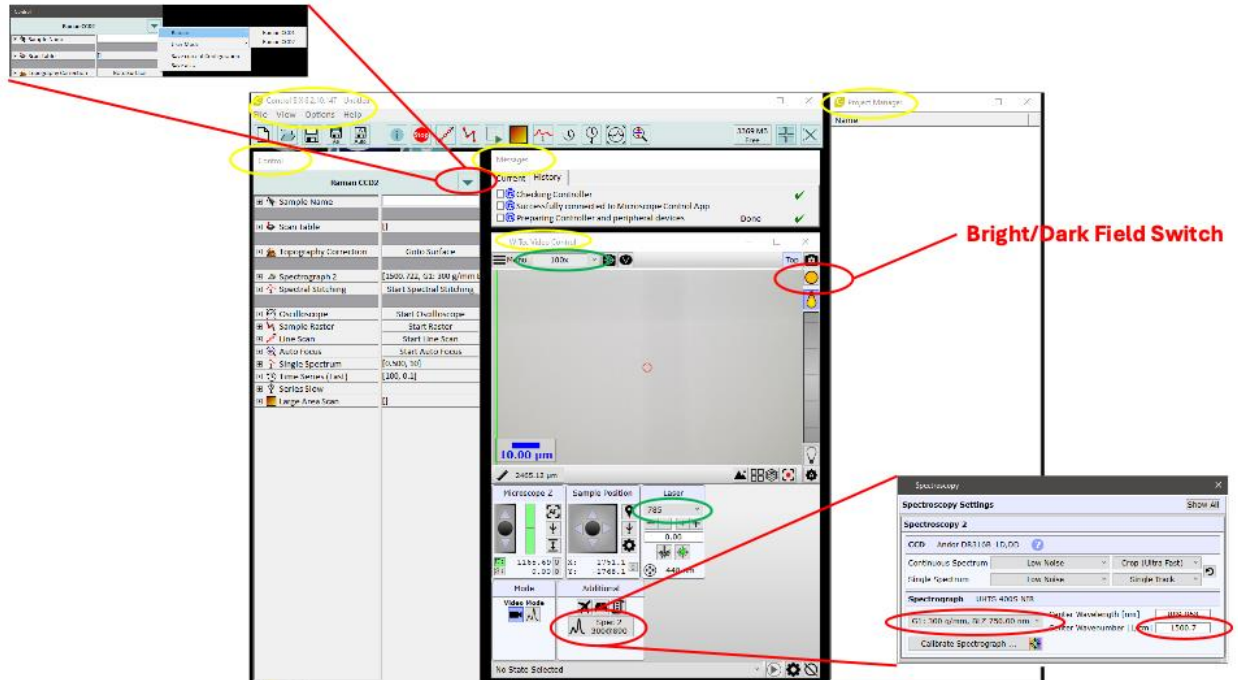


Figure 4

- 6) Control SIX also automatically enables Project SIX (**Project Manager** in Fig 4) that is used to display/process the data.
- 7) Spectral Camera status is no longer monitored in **Message**, it is monitored in WITec Service Monitor as shown in Fig 3:
- Temperatures of SpectralCamera1 and 2 are visible here. “(not stable)” means they are not ready for Raman.
 - Temperature at -60°C and disappearing of “(not stable)” indicate that they are ready for Raman.
- 8) For laser 488nm and 532nm, you must select Raman CCD1(upper left in Fig4); for laser 785nm, you must select Raman CCD2; for laser 633nm, you can select either Raman CCD, however performance of Raman CCD2 is better. Note: you should select SpectralCamera first then select laser.
- 9) Spectrum grating and center wavenumber are not in **Control>Spectrograph** anymore, they are in **Video Control>Additional** (lower right in Fig 4).
- 10) There is no more manual switch of Bright/Dark field, and of Video/Raman. The microscope always defaults in Bright Field Video mode. It will automatically switch to Dark Field Raman mode each time you enable Raman spectrum function, like Oscilloscope.
- 11) You can manually select Bright/Dark field in **Video Control** (upper right in Fig 4).

Note: “Project SIX” is data processing software and can be enabled by itself or together with Control SIX.