

# Veris P4000 Vis-NIR-EC-Force Spectrophotometer

## QUICK REFERENCE CARD

(Refer to Operations Manual for complete instructions, including software installation, safety, maintenance, and troubleshooting.)

1. Start up spectrometers 20 minutes before using. Leave vehicle running to keep battery charged. (amperage draw is 10 amps if cooler is running; 1 amp otherwise)
2. Start software. Refer to Operating Instructions for software installation procedure.

3. Select field folder
4. Set port order (if changed)

The screenshot shows the software's port configuration window. On the left, there are dropdown menus for 'Spare Port', 'GPS Port Number', 'Temperature Port Number', 'Control Port Number', and 'Spectrometer Port Number', each with a corresponding 'baud rate' field. On the right, there is a 'Mode' selector with a red indicator light, and a vertical stack of seven buttons: '1. System Check', '2. Acquisition', '3. Extraction', '4. Filter', '5. Cluster', '6. Sample', and '7. Interpolation'. Arrows from the numbered list above point to the 'Working Directory' field, the 'Spare Port' dropdown, the 'Mode' selector, and the '1. System Check' button.

5. Toggle to Probe mode

6. Press System Check button

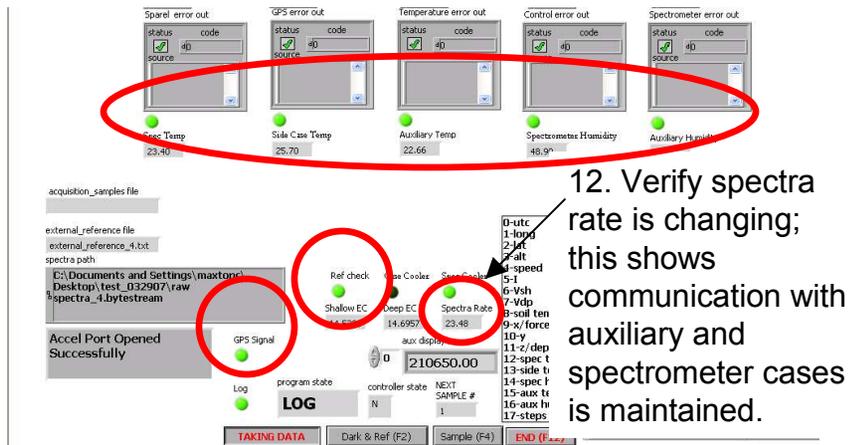
7. Clean window, and place reference block against window. Press Dark and Reference button (F2). Multiple Dark and Reference readings may need to be collected
8. Press external references (ER) against window. Press corresponding button when Program State reads REST. Continue until all ER lights are green or yellow.
9. Press End (F12) to transform.

The screenshot shows the software in 'SYSTEM CHECK MODE'. It features a central panel with various status indicators and a 'REST' indicator. At the bottom, there are buttons for 'Dark & Ref (F2)' (circled in red), 'Sample (F4)', and 'END (F12)'. A 'WARNING: latitude and longitude not obtained from GPS.' message is visible on the left. A 'dark spectra display' plot is shown on the right, and an 'absorbance spectrum' plot is at the bottom left.

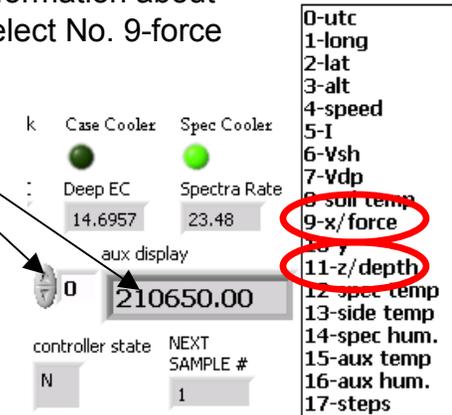
The screenshot shows the software interface with four data plots: 'Raw', 'Standardized', 'Slope', and 'Offset'. The 'Raw' plot shows absorbance vs wavelength. The 'Standardized' plot shows absorbance vs wavelength. The 'Slope' plot shows slope vs wavelength. The 'Offset' plot shows offset vs wavelength. A 'READY TO MOVE TO NEXT STEP—DATA ACQUISITION.' message is displayed on the right. At the bottom, there is a 'RMSE' indicator and a 'CLOSE WINDOW (F12)' button.

10. Green light indicates when transform is complete. READY TO MOVE TO NEXT STEP—DATA ACQUISITION. Press Close Window/F12 to move back to main interface screen.

11. Before probing complete all steps above. Make sure Reference Check (Ref Check) and GPS signal lights are green, and all Auxiliary Case lights are green. Additional Dark and References may need to be collected. Ref check light will turn green when sufficient references have been collected.



13. The Auxiliary (Aux display) window provides user-selectable information about the system. For Probing, select No. 9-force or No. 11-depth



14. Begin probing: with probe mast vertical, insert probe into soil until top of window is not visible.



15. Pressing Probe button begins storing spectrum data and auxiliary data until probe is stopped or raised. Once insertion is initiated, do not stop or reverse unless problem has occurred or desired depth is achieved. Data recording stops when probe is raised. GPS and Log lights must be green for data to be recorded.

16. While probing: watch display for following:

- Log light must be green while collecting data; if not green stop immediately and determine problem
- GPS data light is green
- auxiliary case information—green lights and data
- system will ask to collect a dark and reference every 10 minutes—several dark and references may be required
- if system fails to respond, inspect spectra window (see Step 12) to check if system has lost communication with auxiliary and spectrometer cases. If system has locked, reboot software in the following sequence: 1) exit software, 2) turn off power to cases, 3) disconnect USB's from computer then reconnect, 4) turn on power to cases, 5) restart software. If restarting computer is required, exit software, shut down computer and follow steps 2-5.

### 17. Operational tips:

- Use side-shift function to move probe to new, adjacent probing location
- Don't let stringpot cable snap back into spool; factory stringpot repair will be required if cable retracts too rapidly
- For best results, clear plant residue from probe insertion area

-In sticky clay soils, it may be necessary to remove soil from window before reinserting.



### 18. Safety



## WARNING

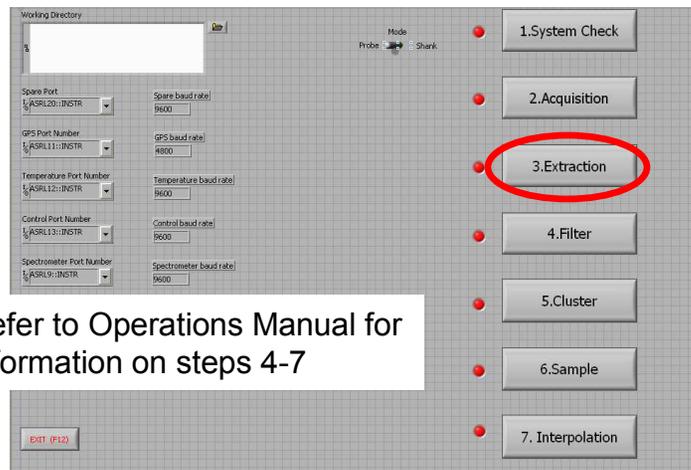
- Keep hands and feet from underneath probe and sideshift track area.
- Do not probe where utility lines or other underground hazards may be present. Use 'Call before you dig' services.
- Wear protective gloves and safety glasses or goggles when working with hydraulic systems.



## CAUTION

- Be careful when touching the probe after use; the sapphire window temperature may cause burns.
- Watch probe deflection and stop probe insertion before damage occurs. Maximum pressure varies, but can be as high as 15 mPa. This may occur suddenly if a rock or other restriction is encountered.

19. When all data have been acquired press F12 or End to return to the main interface screen, shown below. The extraction routine (button #3) will extract all the bytestream files and output the data into a single text file.



Refer to Operations Manual for information on steps 4-7

20. After each bytestream file has been extracted, the message "EOF" will appear. Press enter to continue on to the next file. Once all the data have been processed, indicated by a green complete light, click on close window or F12 to return to main interface.

