Transient Absorption Spectroscopy
Standard Operating Principles

Switch On Procedure:

1. Check the water level in chiller (It should be near to the top red mark).If the water level is less fill it with distilled water.
2. Now switch on the chiller from the front panel of the chiller.
3. Wait for at least 1 hour till 25C is displayed on Vitesse (Oscillator).
4. Turn on the laptop & SDG box back panel power switch.
5. First of all the Vitesse Oscillator start-up protocol should be followed:
   a. Put the key to 'ON' condition.
   b. This will turn the FAP on.
   c. Wait for "MODE-Locked" message to be displayed on the front panel of the Vitesse.

The screen would be somewhat like this:

Vitesse power: 281.7 mw

Verdi Power: 1.44 W

Verdi FAP current: 10.77 A

Base plate temp: 25.4C

Verdi light Loop Mode.

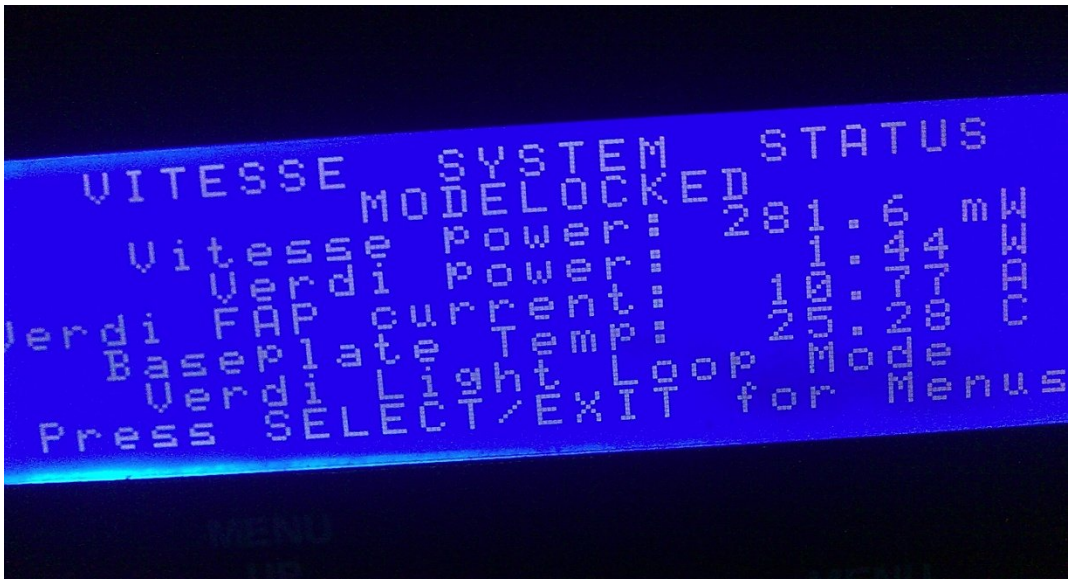


Fig 1: Picture showing front panel of the VITESSE (as Vitesse system status) indicating Mode-Locked condition

6. Now open the shutter from the front panel of the Vitesse.
7. Check SDG box: It should show **RF as 80282 KHz**

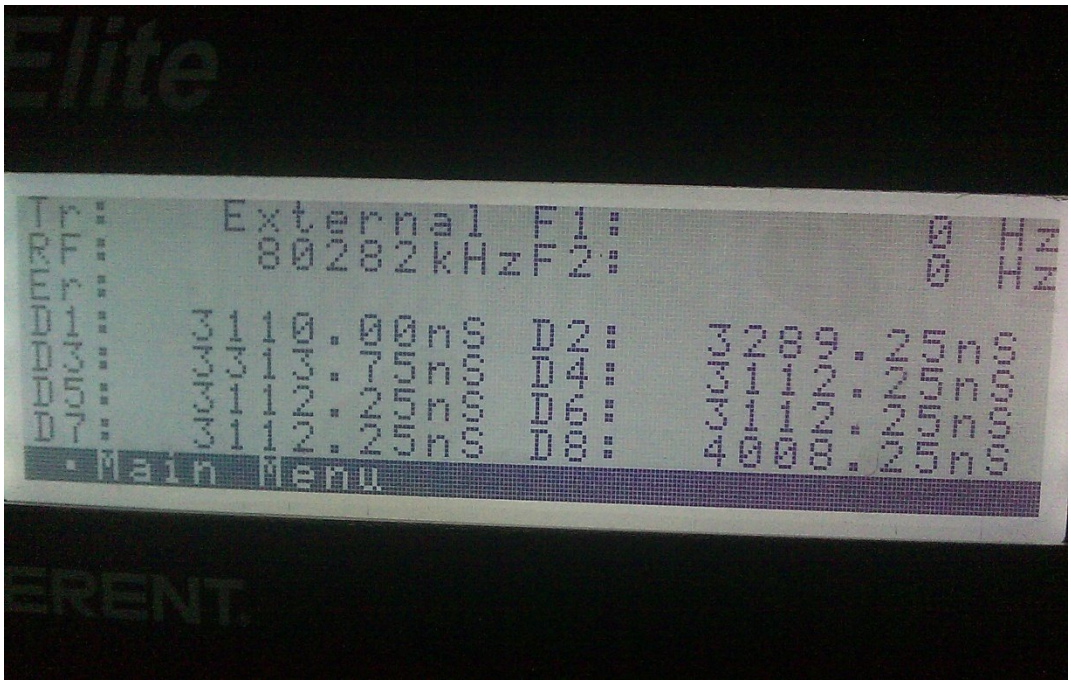


Fig 2: Picture showing the front panel of the Standard Delay Generator Box indicating the RF and delay D1-D8.

8. Power ‘ON’ the Pump (Evolution), Turn the key ‘ON’, Start the software from the laptop.
9. Now check “Evolution settings” as mentioned below:

a. <u>Q switch mode: Internal</u>

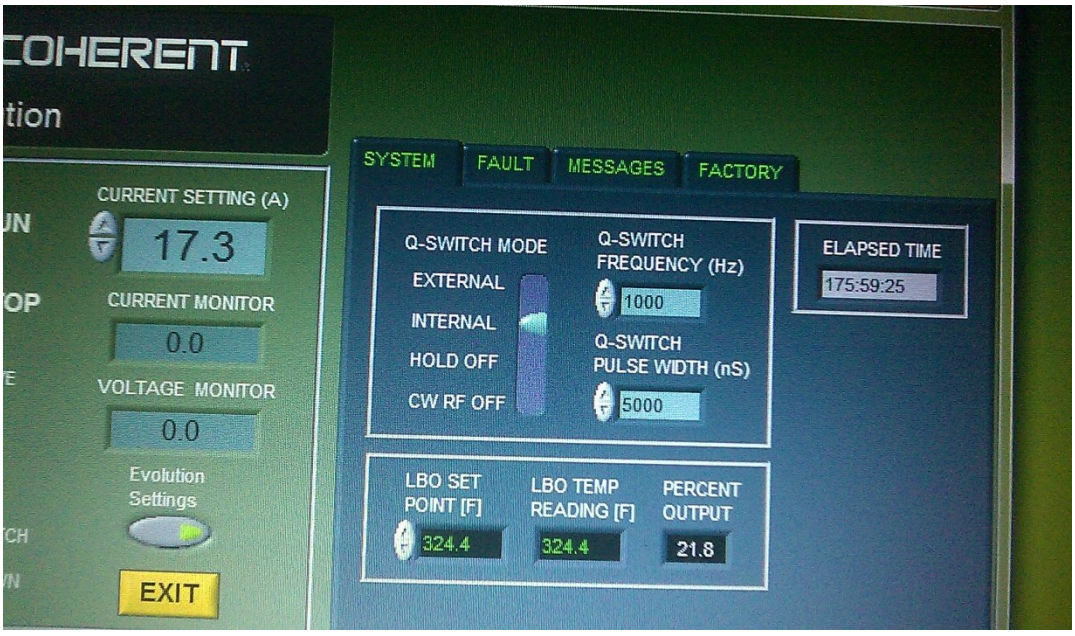
b. **<u>Elapsed Time: 176 Hrs</u>** (This is the total number of hours from the time it has been running so the number will increase each time).

c. <u>Q-Switch Freq: 1000Hz</u>

d. <u>Q-Switch Pulse width: 5000ns</u>

e. LBO set/reading: Should match the Evolution “LBO heater control” front panel readings~ 324 ^{o}C.

f. **<u>Current settings: 17.3 A</u>** (Never Increase the Current level in the starting at-once to 17.6 A, Initially start with 17.3 A as mentioned and then after some time can Increase up to 17.6 A.<u>(The current is increased to obtain greater stability of the laser beam from OPERA Solo)</u>



<u>Fig 3: Picture showing front panel of the Evolution software indicating the current, Voltage & System settings.</u>

10. Press & hold the “RUN” switch in the software till a beep sound is heard.
11. Turn on the Oscilloscope.

12. Turn on the push button switches for Delay1, Delay2&Delay3 from the front panel of the SDG Elite box.

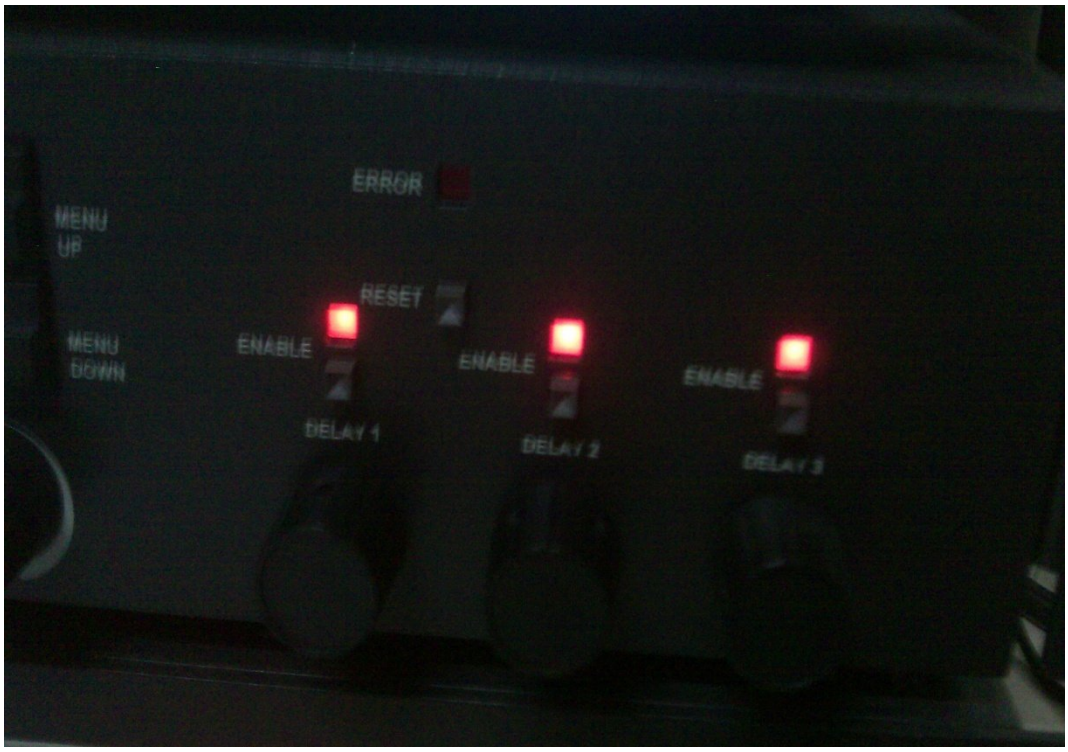


Fig: 4 Picture showing front panel display of the SDG. Red light enabled indicates the Delay 1, 2 & 3.

13. **Note:** Never change the Delay1.Change only Delay2 forgetting Maximum Power at the output of main amplifier box.
14. Delay3 triggers the CRO(There are 7 channels available in SDG Elite, so it can trigger at least 7 different devices)
    a. Channel 1 is controlling the timing of the Pockel cell 1.
    b. Channel 2 is controlling the timing of the Pockel cell 2.
    c. Channel 3 is controlling the timing of the Oscilloscope.
    d. Channel 4 is controlling the timing of the Helios.

Fig: 5 Picture showing Mode-locked beam on the CRO display.

Shut-Down Procedure

1. Reverse of the start-up procedure is to be followed for the shutdown process.
2. Press ‘STOP’ Button in Evolution software.
3. Exit from Evolution Software.
4. Shutdown Laptop.
5. Turn the Key to ‘OFF’ Position on Evolution box.
6. Power ‘OFF’ the Evolution.
7. Turn ‘OFF’ D1, D2 & D3, Switch off back panel of SDG Elite Box.
8. Close Shutter and key to ‘Stand-By’ Position on Vitesse.
9. Close Helios software, Shutdown the PC, Switch off chopper button (‘Red one’).
10. Switch off the Spectrometer main power button(Green Button on Front panel)

11. Exit Win-Topas software and shutdown PC.