

Aerodyne Research Inc.

Turn On Procedure for CW QC Laser Instrument

Contact Information

Mark Zahniser	978-663-9500 ext.224	mz@aerodyne.com
Dave Nelson	978-663-9500 ext.231	ddn@aerodyne.com
Barry McManus	978-663-9500 ext.281	mcm Manus@aerodyne.com

Easy Turn-on procedure – Automatic Method

- Turn on the THERMOCUBE or OASIS circulating bath. There is a flow interlock to prevent the laser cooling circuit from being activated unless the cooling water is flowing. The temperature of the unit should stabilize at its set point, typically 20 C.
- Turn on the Main power switch on back of instrument.
- Turn on the switch(es) on the front panel if they are in the off position.
- Turn on the vacuum pump and open valves or orifice to sampling cell if necessary.
- Start up "TDLWintel" program. (follow shortcut on desktop to TDLWintel folder). TDLWintel will immediately begin searching for the proper spectral lines if it turns on with AutoStart active <AS>. If it does not do so, then simply turn on <AS> (do not update relock parameters), exit TDLWintel and restart TDLWintel. It will take at least several minutes for the AutoStart procedure to complete.

Back-up Turn-on procedure – Manual Method

- Turn on the THERMOCUBE or OASIS circulating bath. There is a flow interlock to prevent the laser cooling circuit from being activated unless the cooling water is flowing. The temperature of the unit should stabilize at its set point, typically 20 C.
- Turn on the Main power switch on back of instrument.
- Turn on the switch(es) on the front panel if they are in the off position.
- Wait for WINDOWS to boot (user/password: administrator/qclaser)
- If this is the first turn-on you may need to adjust the screen display settings. There is a document in the Notes and Dox folder that explains this.
- Turn on the vacuum pump and open valves or orifice to sampling cell if necessary.
- Start up "TDLWintel" program. (follow shortcut on desktop to TDLWintel folder). (TDLWINTel can be set to start running when computer starts.)
- The laser should turn on by itself. If not, then turn on the laser current for the laser(s) using the "Command\Enable Laser Current" menu. First turn on the driver(s), then the laser(s).
- Set cell pressure by clicking on the pressure lock toggle <PL> (if applicable).
- Check temperature of laser(s) that they are cooling. The temperature readout is

- displayed on the computer screen in TDLWINTEL program.
- Wait 5 minutes for the temperature of the system to stabilize. The detector signals should approach the normal values in both Field 1 (Sample Cell) and Field 2 (Power Normalization, if applicable).
 - If the detector signal levels are lower than normal then perform a quick alignment tune-up (in Current Signal Mode) to improve the signal levels. This is usually not necessary.
 - Adjust laser temperature(s) to put peaks roughly in the “right” place. If using Sample Lock, this can be done in Field 1 in Current Signal Mode. If using Reference Cell Lock, then this must be done in Field 4 in Current Signal Mode. In this case, it may be necessary to activate the Reference Cell Toggle.
 - Deactivate Reference Cell Toggle if used in previous step.
 - Go to Current Signal Mode in Field 1 and fix the peak positions (F2,a).
 - Go to Stream Mode.
 - Activate <PN> (if applicable).
 - Activate <FLK4>.
 - Activate <ABG> (optional – zero air must be attached to system).
 - Activate <WD> and <ASS>.

For ease in seeing the fits, toggle from <DS> (display signal) to <DT> (display transmission) [toggle control in lower left]. This can be done in any field.

Turn-off procedure (reverse of start up procedure)

- Close the valve between the vacuum pump and the instrument and then turn off the pump
- If the inlet flow is controlled by an electronic valve, then this valve must be opened. Do so by first turning off the pressure lock <pl> and then setting the control valve voltage to 4.5 V under the “Command/Control inlet valve” menu. Wait for the cell pressure to rise to ambient.
- Shut down TDLWintel. Shut down the computer.
- Power down the main power on the back panel.
- Turn off the THERMOCUBE or OASIS chiller.

Preparation for Shipping by Air:

- Follow normal turn off procedure but fill cell with dry nitrogen to prevent ice forming in the cell during flight
- Flow dry nitrogen through the fluid channels to remove most of the cooling fluid

Daily Procedures:

- Each day, note the light levels (in mV) of the main leg (Field 1), and the normalization leg if applicable (Field 2).
- Check zero air tank for sufficient pressure.
- Check liquid level of the Thermocube. If low, add coolant solution.