DAWN EOS & miniDAWN Tristar Instrument Setup and Troubleshooting

# Objectives:

This course will familiarize the student with:

a) the locations and functions of the hardware components

b) troubleshooting of hardware

c) setting auxiliary gains

# References:

Instrument User Guide

***Flow Cell Geometry: Scattering angles and illuminated volumes***

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| ***EOS Read Head and Laser Assembly*** | | | |
|  | | | ***LED Display*** |
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| ***TriStar Read Head and Laser Assembly*** | | | |
|  | | ***LED Display*** | |
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## Hardware Workshop Topics:

1. Description of the rear panel

1. Fuses and power cable (standard); 30 min instrument warmup
2. Nitrogen purge (HELEOS only): 30-80 psi, only when needed, e.g. operation at sub-dewpoint temp
3. Serial cable - 9 pin straight through cable
4. Fan & air filter (clean yearly)
5. Serial Tag (helpful for support calls)
6. F 🡪 AUX2 switch
7. Checking voltage settings and changing fuses (mentioned, not demonstrated)
8. Turck connectors (see instrument user guide for wiring color code)
   * 1. Autoinject
     2. AUX in
     3. 90º Out
     4. Vapor Alarm Interlock (EOS only)
     5. QELS Temperature

2. Establishing communications between the instrument and ASTRA software

a) ASTRA must be running for the laser to be on

b) Agreement between ASTRA VIEW and the Front panel readings

c) Dark currents

d) Autoinjector signal

3. Description of interior: LASER, read head, photodiodes, Rear & Forward LASER monitor

4. Changing the auxiliary gain settings

a) Why - A/D: 16 bit = 216 steps for +/- 10 V = minimum step ~ 0.3 mV

1. How - DIP switch settings
2. Implications – aux constant changes!
3. Side Panel Board (EOS only):
   1. Photodiode Gain Jumpers
   2. Rotary switch controls aux2 signal
   3. aux gain switches

5. LASER realignment is not normally required

6. Read head detector angles vs. flow cell scattering angles (see last pages)

a) Actual scattering angles depend upon refractive index of the solvent

1. Software must know the refractive index of the solvent

7. Side Panel Board (EOS only)

1. Photodiode Gain Jumpers
2. Rotary switch controls aux2 signal
3. aux gain switches

8. Removing the flow cell

1. Do not crimp the tubing between the flow cell and the chassis
2. Leave tubing connected to cell!

c) Reinstall in the same orientation - “in” towards the rear

9. Keeping the flow cell clean

a) If the flow through flow cell must be stopped - fill cell with pure water or pure solvent.

b) Occasionally flush with pure solvent, alcohol, mild detergent

c) When changing from organic (Toluene) to aqueous - flush with alcohol

1. Fill cell with 20% nitric acid, place plugs in inlet and outlet, let set from 15 minutes to overnight, flush with pure water
2. Protease rinse for protein work
3. COMET

10. QELS

1. Fiber Mount
2. Temperature Probe

11. Troubleshooting

a) 0.005" i.d. tubing is "most" prone to blockage, especially for flow batch work

b) LASER lifetime

c) Discussion of warranty, service contract, customer support