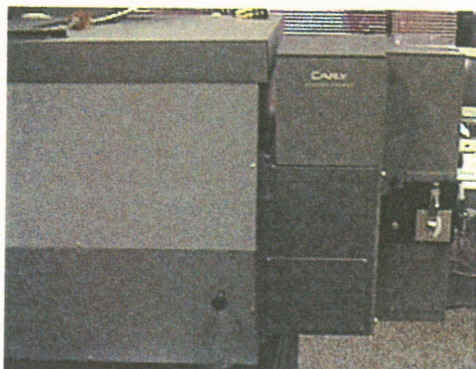


## OLIS Modernized Cary with Reflectance Accessory



An experienced Cary 14 or OLIS 14 user will immediately notice that the reflectance unit is very much less sensitive than is a normal instrument. This is due, of course, to the fact that the photodetectors are viewing only reflected light and never a direct, bright beam of light.

As a consequence of this fact, different settings of program parameters will be necessary. Specifically, a much higher HV for the PMT will be needed – often settings of 4 or 5 (normal instrument use can occur with HV=1) and the NIR gain setting will need to be 0.05 or so (normal NIR use can occur with a setting of 0.5).

There are two detectors in the reflectance module; a photomultiplier for use from UV to about 800 nanometers and a NIR PbS detector for use from about 600 to the upper limit of about 2000 nm.

When using the PMT, there are two ways the gain of the system can be altered: slit width and PMT high voltage (HV). In normal use, the HV to the PMT is constant and the slits open or close automatically to compensate for any variations in the light throughput of the system. This is called the constant gain mode since the PMT gain is held constant and the slits adjust as needed.

The gain of the system can also be altered by changing the constant HV sent to the PMT. There are seven levels of HV (PMT gain) available. Always use the lowest value possible to minimize photometric noise.

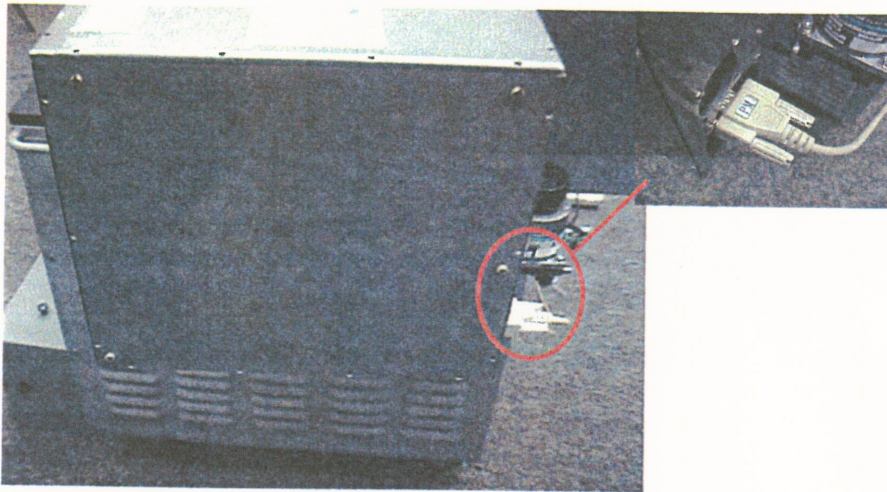
Under some circumstance, the gain provided by the PMT will be too low, so that the slits open fully, yet still there is insufficient signal. If this occurs, the program will inform you that the slits are fully open, but the signal is still too small. The only option is to increase the HV 'tap' to the next step or two – as the HV increases, the gain of the PMT increases and the slits can close a little to maintain the required signal level. However, the photometric noise from the system will increase.

The gain of the NIR detector can not be altered in the same way as the PMT. There is no equivalent to the HV setting; when using the NIR detector HV should be set to tap 1 (minimum setting).

If and when the slits open fully and still the signal is too low, the user can decrease the NIR gain setting (see menu in LIVE display). Since the gain of the NIR detector can't be increased, the program instead decreases the need for gain, i.e., the level to which the signal must go is decreased. Use as large a value for NIR gain as possible to minimize photometric noise.

## Instructions for the installation of the OLIS Modernized Cary Reflectance Attachment

1. Disconnect the PM Cable from the Detector chamber (see photos below). This is the 9-pin connector that plugs into the rightmost of the three chambers that hang off of the right side of the Cary. Just loosen the jack screws and unplug the cable.



2. Remove the Detector chamber. NOTE: You need to ask an assistant to hold the chamber while taking it off, as it is fairly heavy and you may drop it if you attempt to remove it by yourself! Using a screw driver, loosen the four long bolts that are located on the right side of the chamber; they will loosen, but can not be removed from the chamber. When the chamber is freed, lift it away from the Cary and place in a safe place.

