

## ANNOUNCING DG-4/DG-5 PLUS UPGRADES

- Built-In *SmartShutter*® Driver And Commands
- Added USB Input In Both The Virtual Com Port And The Direct USB Modes
- Enhanced Ring Buffer Controls And Triggering Options
- Direct Loading And Reading Back Of Galvanometer Settings Using A Computer
- Expanded Menu Options
- High Rates Of Filter Changing Without Suppressing The Display
- Microprocessor Reaction Time Further Reduced
- Utility Program Allows For Easy Configuration

We are pleased to introduce an improved version of the DG-4 PLUS with new control electronics. The upgraded DG-4 PLUS maintains compatibility with all software written for the prior control electronics and adds a number of useful features.

The new version adds support for USB control in addition to the existing serial and parallel controls. Serial port control is improved with three additional selectable baud rates, all of which are much faster than the original 9600 baud. The new version also allows the galvanometer settings for any filter to be written and read by the host computer.

The primary job of the control electronics is to set the command voltages for the two galvanometers as quickly as possible after the receipt of a new command or a trigger pulse. The original DG-4 required about 100 microseconds to set both command voltages. The new version reduces the time to set both voltages to only 20 microseconds. The original DG-4 required you to suppress updating of the display to obtain a high rate of filter changing. With the new control electronics, suppressing the display update is no longer required to get the fastest speed.

For applications requiring time-lapse studies, the small amount of light leakage caused by using the galvanometers as a shutter can potentially create a noticeable bleaching of dyes. This is easily solved by installing a *SmartShutter* in the optical path, which has, in the past, required an additional controller. We have now included the *SmartShutter* control electronics on the DG-4 circuit board, obviating the need to purchase an extra controller.

We have also added new triggering options to the ring buffer mode: the ability to trigger on the rising or falling edge of the trigger signal and the ability to control the shutter function via the trigger signal. In order to obtain the fastest response times in the ring buffer mode, the original DG-4 could only check for new commands or keypad input after a trigger pulse. This can be frustrating when trigger pulses are automatically generated by the control software or camera, with no means for producing a manual pulse. The new version accepts commands at any point while running the ring buffer and no longer requires a leading trigger pulse. If you have any questions, please contact Ali Mahloudji, [ali@sutter.com](mailto:ali@sutter.com) or call +1 415-883-0128.

