



# Gooch & Housego



## OL 730D Programmable DSP Radiometer

- Characterize light sources and materials over all or part of the entire UV/VIS/IR region (200 nm to 30  $\mu\text{m}$ )
- Measure true RMS intensities of AC, pulsed or modulated sources
- Measure total, peak, average, apparent intensities and time profiles of pulsed and navigation lights
- Eliminate noise from sources and detectors
- Attain the ultimate in sensitivity, down to and including counting individual photons
- Computer control for integration into existing measurement procedures or custom data analysis

The OL 730D is an extremely versatile radiometer utilizing state-of-the-art digital signal processing (DSP) technology. When used with a wide range of optional photodetectors and input optics, a multitude of high accuracy radiometric and photometric measurements can be made over all or part of the entire ultraviolet, visible and infrared spectrum.

The OL 730D features several modes of operation. It can be operated as:

- ***a high sensitivity DC amplifier, typically used in photometric or radiometric measurements in the UV/VIS/NIR regions***
- ***an AC lock-in amplifier, typically used for measurements in the IR (1.8  $\mu\text{m}$  to 30  $\mu\text{m}$ ) and highly modulated source applications***
- ***a photon counter for extremely low-light-level measurements.***

Ultra high-speed data acquisition is another important feature of DSP technology. This means that the OL 730D can measure the output of pulsed or rapidly changing sources in addition to performing source profiling.

The OL 730D is a completely microprocessor-controlled, multi-functional radiometer/photometer, which can be programmed to read directly in any user specified radiometric or photometric optical quantity. The OL 730D is virtually ideal for all types of measurement and features high sensitivity, autoranging, auto-zeroing, highly accurate readout and range-to-range linearity, 4½ digit (6½ digit via computer) plus exponent display, user variable response time, an extremely large dynamic range and RS-232-Interface (IEEE-488 optional) for computer control.

Multiple calibration factors for different detector/filter/input optic configurations can be stored in memory. Once the desired configuration and associated calibration factor is selected, the OL 730D will measure and read directly in the designated optical units.

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*As part of our policy of continuous product improvement, we reserve the right to change specifications at any time*

### **OL 730D APPLICATIONS**

**DC Radiometer/ Photometer Mode** – The high accuracy and high conversion rate of the OL 730D electronics combined with DSP low-pass filtering enables the OL 730D to accurately measure the current generated by DC operated detectors. Thus, when configured with the appropriate detector/ filter/ input optics, the OL 730D operates as an extremely sensitive radiometer or photometer capable of measuring detector signals from  $1 \times 10^{-14}$  to  $2 \times 10^{-3}$  amperes. The actual photometric and radiometric sensitivities are, of course, dependant on the choice of detector, filter(s), and input optics.

**AC Radiometer/ Photometer Mode** – When used in the AC Mode, the OL 730D is a complete dual-phase lock-in amplifier that uses DSP to perform the “synchronous rectification” that is central to the operation of all lock-in amplifiers. The digital techniques employed in the OL 730D significantly reduce errors such as non-linearity, offset and drift, harmonic distortion, and temperature effects that are inherent in classical analog lock-in amplifiers. However, the greatest benefit to the user is the performance enhancement at the lower signal levels.

The OL 730D features a built-in, variable frequency optical chopper controller. The OL 730D-CH Programmable Variable Speed Optical Chopper is available as a stand-alone option.

### **OL 730D OPTIONS**

The basic OL 730D is furnished with DC and AC lock-in capabilities. The following features are available as options:

**OL 730D-PC Photon Counting Option** – When used with the appropriate photon counting photodetector, the OL 730D-PC provides the ultimate sensitivity with excellent linearity from 1 to 1,000,000 counts per second.

**The OL 730D-HV High Voltage DC Power Supply** – A programmable, high voltage DC power supply for use with photomultiplier detectors. DC voltage can be varied from ) to -1500 VDC with ultra low ripple and drift.

**OL 730D0CH Optical Chopper** – The OL 730D-CH consists of integrated control electronics and chopper enclosure along with a control cable. A precision DC motor assembly with an integrated optical encoder is mounted in a machined, metal enclosure that can easily be mounted to an optical bench. The standard 4-slot blade provides chopper frequencies from 10 to 350 Hz. An optional 18-slot blade extends the frequency range from 180 to 1200 Hz.

**OL 730D-IEEE488 Communications Interface** – An IEEE-488 Interface supplements the standard RS232.

**Photon Counting Radiometer/ Photometer Mode** – By utilizing and enhancing some rarely used inherent features of the DSP chip, the OL 730D can be used with photon counting photomultipliers to achieve the ultimate photometric or radiometric sensitivity. The photon counting option provides excellent sensitivity and linearity in the count range of 1 to 1,000,000 counts per second.

### **OL 730D ACCESSORIES**

A large selection of accessories is available for use with the OL 730D, including:

**Detectors** – A wide range of high sensitivity detectors is available for use with the OL 730D. These detectors allow the user to measure over all or a portion of the entire wavelength range of 200 nm in the ultraviolet to 30  $\mu$ m in the infrared. Each detector is mounted in a rugged, metal housing and low noise connectors and components are used to maximize sensitivity.

**Optical filters** – A range of filters to provide single wavelength isolation, radiometric and photopic correction to the responses of our detectors is available. Contact us for specific requirements.

**Input optics** – A wide range of telescopes, microscopes, integrating spheres, transmissive diffusers, baffle tubes, etc. are available to make any type of measurement. Contact us for details.

### **SPECIFICATIONS**

|                           |   |
|---------------------------|---|
| Readout (units).....      | user programmable                         |
| Display .....             | 4½ igits plus exponent                    |
| Response time .....       | user selectable for each gain             |
| Range.....                | from 0.0033 to 4096 seconds               |
| Zero control .....        | automatically subtracted when pressed     |
| Range selector.....       | auto/ manual                              |
| PMT DC bias voltage ..... | -200 to -1100 VDC (optional)              |
| Computer interface.....   | RS-232C (standard), IEEE-488 (optional)   |
| Size .....                | 3.5” x 17” x 20” (9 cm x 43 cm x 25.5 cm) |
| Power requirements .....  | 115 VAC 60 Hz/ 220 VAC 50 Hz              |
| Warranty .....            | 1 year, parts and labor                   |

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