



DAYBREAK NUCLEAR AND MEDICAL SYSTEMS, INC.
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MODEL 1020 SINGLE SAMPLE TL/OSL READER

The all new 1020 single sample TL/OSL reader re-visits the idea Daybreak pioneered in 1979 when we introduced the original basic TL reader system. That original system cut price --and weight-- to 40 per cent of the competition's by means of simple, elegant design and economical production methods. Since that time our 1100-series automated systems have become the standard of excellence, but their cost may be beyond many budgets. Daybreak has developed a surprisingly economical full-featured reader system equal in performance to any existing system, limited only by lack of automation. The 1020 is intended as an entry level system for the research lab and for the academic teaching laboratory, and as a supplement to the automated system in an established luminescence dating laboratory, where instrument time for graduate student proof-of-concept experiments is often scarce.

The 1020 comes standard with an IR LED OSL light source. A blue OSL source is available as a option.

We have taken full advantage of the latest developments in detector and electronic technology. We are combining the successful system architecture and control language of the 1100-series automated system with a very highly integrated microcontroller and a new integrated single photon counter. This new technology, together with a simplified mechanical design, allows us to make a dramatic reduction in price. We are also including software for data taking and simple data reduction, which allows upward compatibility with TLAPPLIC and FirstLight. Data taking is presently done with a DOS-based program running under Windows, but this will be updated to a completely Windows-based program in 2001. The front end of FirstLight, comprising the data viewer/editor and such utilities as region of interest integration and export to spreadsheets will included as well. Computation modules for geochronology and age determination are available at extra cost with the full FirstLight license. An IBM-compatible PC running Windows 95/98 is required, together with your choice of printer, to run this software.

Although the 1020 has an irradiator controller built in, we are developing an independent alpha/beta single sample irradiator, permitting irradiations during measurement. This unit has a motor-driven sample holder that rotates the sample disk to a position under either the alpha or beta source as desired. This makes it possible to dispense with shutter mechanisms entirely, and makes it simpler to shield and secure to a bench than the hand-movable irradiators from the modular system era.

SPECIFICATIONS

SYSTEM CONTROLLER

- Fast integrated microcontroller with 32K bytes RAM for data storage (up to 10K data points)
- Eight 10-bit ADC channels for monitoring status
- Simple but powerful ASCII command language identical to 1100-series systems
- Continuous transmission of status information with data for virtual front panel at computer
- Simple front panel status display (detailed display on host computer)
- Serial interface, RS-232 up to 38.6k baud

TEMPERATURE CONTROL

- Chromel-alumel thermocouple welded to heating plate
- Icepoint compensation
- TC open and overtemp alarms lock out heater power supply
- Ramp rate 1-25C/sec, with generalized ramp profile including preheat and hold
- Endpoint software settable 0-600C

DETECTOR

- Electron Tubes P30CWAD5A-41 photon counter (bialkali photocathode, UV glass window)
- Easily changeable detector filter pack (7-59 and BG39 standard), space for up to 15 mm of filters
- Advanced UV fresnel lens for improved detection efficiency
- Simple mechanism lifts and slides the captive PMT/OSL/filter housing away from glow oven for a safe harbor while loading (impossible to drop PMT!)

OVEN ATMOSPHERE

- Solenoid vacuum and purge valves
- 16mm vacuum connection
- Thermocouple vacuum gauge
- Low volume for fast evacuation
- Needle valve for purge gas
- 1/4 inch standard Swagelok connector for purge gas

OSL

- Timebase for OSL 10msec, 100 msec, 1 sec, 10 sec; may be mixed
- IR OSL exciter: 880nm intensity servoed, 40 mW/cm²
- Optional blue LED OSL exciter: intensity-servoed, 25 mW/cm²

IRRADIATOR CONTROL

- Irradiator power output pulsewidth modulated for low power consumption during use

PHYSICAL

- Power supply: external desktop CE-marked DC supply, universal AC input voltage
- Physical: 30 cm x 30 cm, 7 cm high plus 20 cm height of detector and OSL exciter, weight 5 kg