

Models 1835-C &amp; 2835-C

# High-Performance Optical Meters

## Key Features

- *Greatest possible versatility in a single optical meter*
- *DC optical power measurements in the 100 fW–300 W range*
- *Pulsed and integrated energy measurements*
- *Fast IEEE-488 data throughput, 50–100 Hz, depending on software interface*
- *Large variety of programmable input and output controlling triggers*
- *Sophisticated automation capabilities in testing and laboratory applications*



1835-C Single-Channel



2835-C Dual-Channel

Whether your application requires measurement of low-power, high-power or energy of continuous or pulsed light sources, Newport's **Models 1835-C and 2835-C** will do the job!

DC, peak-to-peak and pulse measurements can be displayed in units of W, dBm, dB, J, Ergs, A, and V. Simultaneous measurements of a variety of light sources operating at different power levels and wavelengths can be performed with our dual-channel **2835-C** optical meter.

Low-power measurements, in the 100 fW–2 W range, can be accomplished with any one of Newport's **818 Series** silicon, germanium or indium gallium arsenide semiconductor detectors, covering 190–1800 nm wavelengths.

High-power measurements, in the 20 mW–300 W range, can be performed with Newport's **818P and 818T Series** thermopile detectors, enabling measurements in the 0.19–11  $\mu\text{m}$  wavelength range.

Energy measurements of pulsed laser sources, from 50 mJ–1 J, can be taken with Newport's **818E and 818J Series** family of pyroelectric detectors, operating in the 0.19–20  $\mu\text{m}$  wavelength range. Pulse repetition rates from single shot to 2 kHz can be accommodated.

Advanced features include a 2500 data point storage buffer; analog and digital filtering; programmable sample rates; moving statistics; and up to 10 recallable configurations.

## Additional Benefits

- Includes both RS-232C and IEEE-488 interfaces
- Vacuum fluorescent display provides excellent legibility from any angle, in any light condition
- Analog bar graph with 10X zoom
- Audible beep on pulse arrival
- Wavelength calibration in 1 nm steps
- Trigger in/out control with alarm levels

## Specifications

Display Type	6-digit vacuum fluorescent
Sampling Resolution	20,000 count $\leq$ 25 Hz, 4096 count $\leq$ 1 kHz
Gain Ranges	7 decades
Current Sensitivity (full-scale)	2.5 nA–2.5 mA
Voltage Sensitivity (full-scale)	790 $\mu$ V–25 V
Resolution	100 fA, 125 nV
Sampling Rate	Up to 1 kHz single-channel, Up to 500 Hz dual-channel
Bandwidth (-3 dB)	DC to 1 MHz <sup>1)</sup>
Analog Output	0–2.5 V into 50 $\Omega$
DC Accuracy	$\pm$ 0.1% typical
Peak-to-Peak Accuracy	$\pm$ 1% typical
Pulse-to-Pulse Accuracy	$\pm$ 1% typical
Integration Accuracy	$\pm$ 1% typical
Power Requirements	90–240 VAC
Weight [lb (kg)]	2.5 (1.1)
Dimension (W x H x D) [in. (mm)]	8.5 (216) x 4 (102) x 14 (356)
Operating Temperature	10°C to 40°C, <80% RH
Storage Temperature	-25°C to 60°C, <90% RH

1) Gain and detector dependent

## Detector Compatibility and Performance

The 1835-C/2835-C are compatible with Newport's low-power 818-series, high-power 818P-series and energy 818E-series detectors, allowing both free-space and fiber pigtailed measurements in the 190–1800 nm range. When using one of these detectors with the 1835-C or 2835-C, a calibration module needs to be attached to the detector, assuring the correct reading at any selected wavelength.

When used with various Newport detector types, the measurement modes shown below can be accessed:

Detector Family	DC Average Power	Integrated Energy	Peak-to-Peak Power	Pulse-to-Pulse Energy
Low-Power (818 Series)	Yes	Yes	Yes	No
High-Power (818 P and 818T Series)	Yes	Yes	No	No
Energy (818E and 818J Series)	No	No	No	Yes

## Ordering Information

Model	Description
1835-C	High-Performance Optical Meter
1835-C-CAL	1835-C with test data and certificate
2835-C	High-Performance Optical Meter
2835-C-CAL	2835-C with test data and certificate

Please see page 132 thru 147 for a detailed description of Newport's semiconductor, thermopile and pyroelectric detectors, compatible with the 2835-C and 1835-C.

## System Specifications (with Low-Power 818-Series Detectors)

Model					818-IR/CM		
	818-UV/CM	818-SL/CM	818-F-SL	818-ST/CM	818-F-IR	818-IG/CM	818-IS-1
Material	Silicon	Silicon	Silicon	Silicon	Germanium	Indium Gallium Arsenide	InGaAs/Si
Diameter (cm)	1.13	1.13	0.3	1 x 1	0.3	0.3	
Wavelength (nm)	190–1100	400–1100	400–1100	400–1100	780–1800	800–1650	400–1650
Power Range (dBm)	-83 to +23	-90 to +33	-90 to +3	-70 to +33	-70 to +21.5 <sup>2)</sup>	-90 to +21.5	-70 to +23
Accuracy <sup>3)</sup>	$\pm$ 2%	$\pm$ 2%	$\pm$ 2%	$\pm$ 2%	$\pm$ 3%	$\pm$ 2%	$\pm$ 2.5%
Applicable wavelength range (nm)	200–1100	400–1100	400–1100	400–1100	780–1700	800–1650	400–1650
Linearity				$\pm$ 0.5%			
NEP @ 5 Hz and 1 A/W	50 fW/ $\sqrt$ Hz	50 fW/ $\sqrt$ Hz	50 fW/ $\sqrt$ Hz	3 pW/ $\sqrt$ Hz	4 pW/ $\sqrt$ Hz	30 fW/ $\sqrt$ Hz	3 pW/ $\sqrt$ Hz <sup>3)</sup>

1) At calibration temperature maintained to  $\pm$  0.2°C, -20 dBm level having 99% encircled energy on detector with no optical attenuator.

2) -70 to +3 dBm for 818-F-IR

3) 0.01 A/W for the 818-IS-1