Optical Power and Energy Meters

HIGH-PERFORMANCE BENCHTOP, 1936-C/R AND 2936-C/R

- One of the most advanced power meters in the market
- Patented self-centering zoom bar graph
- Windows 7 and XP, 32 and 64 bit compatible software
- Using state-of-the-art analog board for superb sensitivity, accuracy, and speed
- 10 fA resolution for photodiodes
- Frequency measurements of pulses up to 250 kHz
- Measurement rep-rates up to 10 kHz
- Sampling rate up to 250 kHz

Newport
Experience | Solutions

New! 1936-R and 2936-R, the RoHS compliant version, are available now!

The 1936-C/R and 2936-C/R optical power and energy meters are one of the most sophisticated optical meters available in the market. With patented methods for measuring optical signal characteristics the hugely successful 19xx-C/R power meter series has set a new level of standards in optical power and energy measurements. These new instruments are born by combining the superb femtowatt level sensitivity reached by the legacy 1931-C/2931-C series and the extreme versatility of 1935-C/2935-C series, resulting in a truly revolutionizing breed. No matter what the applications are and how demanding the measurements are, you only need one of these and Newport detectors. 918D and 818 semiconductor-based low power, 818P Series thermopile, and 818E Series pyroelectric detectors that have a DB15 connector or adapter are fully compatible with the instruments. The detectors are hot-swappable, so there is no need to cycle power when a different sensor has to be used.

Note: For compatibility with Oriel Photomultiplier Tubes and Detectors, Oriel housing 70690 and power supply 70705 will need to be purchased.

Additional Benefits

- Full software suite including Labview, C++ and CSharp samples
- 5.7" Graphical TFT LCD, ¼ VGA provides excellent legibility from any angle, in any light condition or colored eyewear
- Data storage via internal memory or USB Flash Drive
- Color plotting, statistics and on-board data post-processing
- Analog and digital filtering
- USB and RS-232 computer interfaces
- Trigger in/out control with alarm levels
- Analog Gauge display
- Analog bar graph with 10X zoom
- Advanced Programming toolkit - .NET and LabVIEW
- Accelerated thermopile based power measurements with fast prediction algorithm
- USB data transfer up to 11 Mbps
- Large variety of programmable input and output controlling triggers
- Sophisticated automation capabilities in testing and laboratory applications
- True rms measurements

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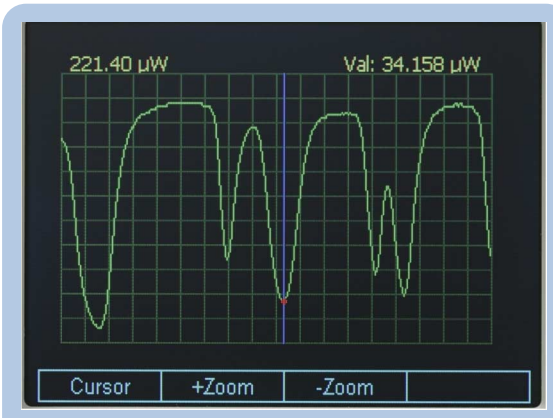
Extreme Versatility from State-of-the-Art Electronics

For applications requiring measurement of low-power, high-power or energy of continuous or pulsed light sources, Newport's 1936-C/R and 2936-C/R instruments have broken the barrier of temporal measurement performance with calibrated results. This series of power/energy meters have the ability to handle repetition-rates of up to 10 kHz at an unheard sampling rate of 250 kHz. This means that even reasonably high speed dynamical phenomena can be seen using the meter, eliminating a need for an oscilloscope in many cases.

Pulse, peak-to-peak and DC source measurements can be displayed in units of W, dBm, dB, J, A, V and Sun (depending on the detector model). Simultaneous measurements of a variety of light sources operating at different power levels and wavelengths can be performed with our Dual-Channel 2936-C/R Series Optical Meters.

The 1936-C/R and 2936-C/R also offers an Analog Gauge display mode ideal for tuning applications.



Temporal display of an optical signal

Analog Gauge display

Compatible with 818 and 918D Series Semiconductor Detectors

Low-power measurements, of pW to several Watts (detector dependent) can be accomplished with any one of Newport's 918D Series Silicon (Si), Germanium (Ge) or Indium Gallium Arsenide (InGaAs) Detectors, covering 200–1800 nm wavelengths. All 918D Series Detectors have a built-in temperature sensor utilized for sensing and actively compensating for temperature-induced measurement fluctuations.

Compatible with 818P High Power and 818E Energy Detectors

High-power measurements, in the 1 uWatt to 20 kWatt range (detector dependent) can be performed with the 1936/2936-C Series meters utilizing thermopile detectors operating in the 0.19-11um wavelength range. Energy measurements of pulsed laser sources, from 7 uJoule to 20 kJoules (detector dependent) can be taken with pyroelectric detectors operating in the 0.19–20 um wavelength range. Pulse repetition rates from single shot to 10 kHz can be measured directly with these instruments, without having to rely on oscilloscope measurements.

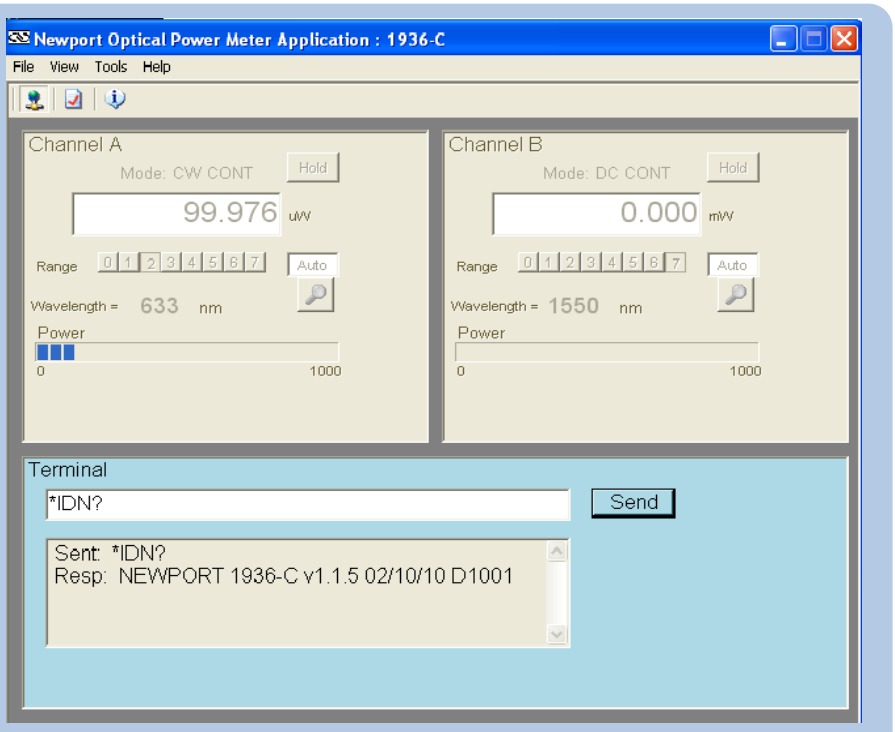
Advanced Measurement Capabilities

The 1936-R and 2936-R software gives users the flexibility of a command line environment as well as the ability to download collected data directly to a computer for analysis.

True Root-Mean-Square (rms) measurements, providing the most accurate rms value regardless of the shape of the input waveform.

Frequency measurements can be performed in the 1Hz to 250kHz range using Newport's Low Power 918D and 818 detectors and 818E Pyroelectric detectors.

Additional advanced features include a Stand-by mode for energy savings, user defined display colors, an internal 250,000 data point storage buffer, additional data storage using an external USB flash drive, analog and digital filtering, programmable sample rates, moving statistics, plotting and multiple user-configuration storage.



Software command line display

Detector Compatibility and Performance

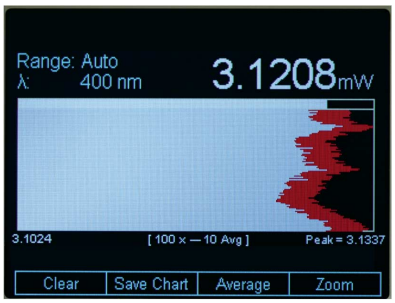
Newport's Low-Power 918D, 818, High-Power 818P and 818E Series Energy Detectors, allowing both free-space and fiber pigtailed measurements in the 190 nm – 20 µm range, are fully compatible with these instruments. Newport detectors have a built-in or external in-line EEPROM containing detector identification and NIST traceable calibration information, which are downloaded into the instrument when the detector is connected.

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 (Single or Continuous)	Frequency
Low-Power (918D and 818 Series) Photodiodes	Yes	Yes	Yes	No	Yes
High-Power (818P Series Thermopiles)	Yes	Yes	No	No	No
Energy (818E Series Pyroelectric)	No	No	No	Yes	Yes

Choose the Display Color for Your Needs

Users can select from 6 display colors to match their specific lighting conditions and colors of their laser safety eyewear. Measurements can also be displayed in various display formats, such as numeric, graphic, bar and strip charts.



Vertical strip chart display

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Specifications

1936-C/R Series Power/Energy Meter Specifications

Compatible, Hot-swappable Newport Detectors	918D, 818P, 818E, and 818 detectors with DB15 connectors
Sampling Rate (kHz)	250
Measurement Rate (kHz)	10 (CW measurements, semiconductor detectors)
Display Refresh Rate (Hz)	20
Maximum Rep Rate	10 kHz for Pyroelectric and thermopile, 20 kHz for Photodiode detectors, peak to peak power
Resolution (% of Full Scale)	0.0004
Accuracy (%)	±0.2 % for CW, ±1 % for Peak to Peak, Pulse to Pulse, and Integration Mode
Frequency Measurement Range [2]	1Hz-250kHz
Maximum Detector Input Current (mA)	25
Maximum Detector Input Voltage (V)	130
Analog Output (User Selectable)	0-1 V, 0-2 V, 0-5 V or 0-10 V (user selectable output impedance)
Analog Output Bandwidth	DC-500 kHz (Photodiode), DC-1.9 MHz (Thermo or Pyro)
Display Type	5.7" Graphical TFT LCD, ¼ VGA
Display Formats	20 mm Numeric, Analog Gauge, Bar Chart, Min/Max Bar, Statistics
Communication Interfaces	USB and RS-232
Internal Sample Storage (data points)	250,000
External Sample Storage (data points)	Defined by external USB Flash drive (user supplied)
Power Requirements	90-240 VAC
Operating Temperature	5°C to 40°C, <70% RH
Storage Temperature Range	<90% RH noncondensing, -20°C to 60°C
Weight [(kg)]	12.4 max (5.6)
Dimensions (W x H x D) [in. (mm)]	8.50 (216) x 5.25 (133) x 12 (308)

1) Instrument range is determined by detector used, please refer to our complete offering on detector types: Photodiode,Thermopile and Pyroelectric detectors.
2) Using 918D, 818 or 818E detectors.

Ordering Information

Model	Description
1936-C	High-Performance Optical Power/Energy Meter, Single Channel
2936-C	High-Performance Optical Power/Energy Meter, Dual Channel
1936-R	High-Performance Optical Power/Energy Meter, Single Channel, RoHS
2936-R	High-Performance Optical Power/Energy Meter, Dual Channel, RoHS
841-DIN[1]	8-pin DIN to DB15 Adapter, Connect 818-xx/CM Detectors to DB15 Power Meters
PM1-RACK	Rack Mount Kit, Single
PM2-RACK	Rack Mount Kit, Dual
DET-ADAP-PD[2]	BNC-to-DB15 Adapter for Third Party Detectors

(1) This adapter is required when using 818-xx/CM Series Low-power detectors.
(2) This adapter allows the Newport meters to read third party detectors in current (Amps) only.

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Newport Corporation, Irvine and Santa Clara, California and Franklin, Massachusetts; Evry and Beaune-La-Rolande, France; Stahnsdorf, Germany and Wuxi, China have all been certified compliant with ISO 9001 by the British Standards Institution.

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