



1791 Deere Avenue
Irvine, CA 92606
Phone: (949) 863-3144
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38206

CERTIFICATION NUMBER

Certificate of Calibration

Powermeter Probe

Model 818T-10 Serial Number 0241G99

Calibration Wavelength 514 nm

| | | |
|---------------------------|---------------------------|-------------------------------|
| Voltage Responsivity (Rv) | Calibration Factor (1/Rv) | External Load (Rt) 10E10 Ohms |
| <u>1.29E-3 V/W</u> | <u>7.75E+2 W/V</u> | Uncertainty (+/-) 3% |
| <u>N/A V/W</u> | <u>N/A W/V</u> | |

Customer _____

| | | | |
|----------------------|--------------------|-------------|-------------------|
| Date Calibrated | <u>16 Sep 1999</u> | Temperature | <u>18.9 deg C</u> |
| Calibration Due Date | <u>15 Sep 2000</u> | Humidity | <u>48 %</u> |

Calibration Procedure QI-19.70, Revision C

Standards Used:

| Asset # | Mfg | Model | NIST # | Cal Date | Due Date |
|---------|-----------|--------|--------|-------------|-------------|
| 0004T97 | HP | 3478A | 136968 | 07 Oct 1998 | 07 Oct 1999 |
| 0032T97 | MOLECTRON | PM5200 | * | 16 Oct 1998 | 15 Oct 1999 |
| 0054W97 | MOLECTRON | PM10 | 813343 | 11 Nov 1998 | 11 Nov 1999 |

This document certifies that the probe referenced herein has been calibrated using test equipment and standards traceable to the National Institute of Standards and Technology (NIST), other recognized National standards laboratories using natural physical constants, or ratio calibration techniques.

Remarks:

* Test equipment used in this calibration has been calibrated and certified by an ANSI Z540 compliant calibration lab using standards which are traceable to NIST.

Technician James Nissen
Sign
James Nissen
Print

QA Inspector Vicki Watson
Sign
Vicki Watson
Print

CAL
STICKER

Please remove and apply calibration sticker to the instrument as required.



Newport Corporation
 1791 Deere Avenue, Irvine, CA 92606
 Telephone: 949-863-3144
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Detector Calibration Report

Detector Model Number: **818-IR**

Detector Serial Number: **5038**

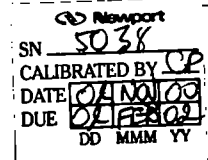
Attenuator Serial Number: **5038**

Operator: **Chau P.**

Calibration Traceable to NIST Number: **844/263553-00**

Calibration Date: **02-NOV-2000**

Calibration Temperature: **23.1 ± 0.5 °C**



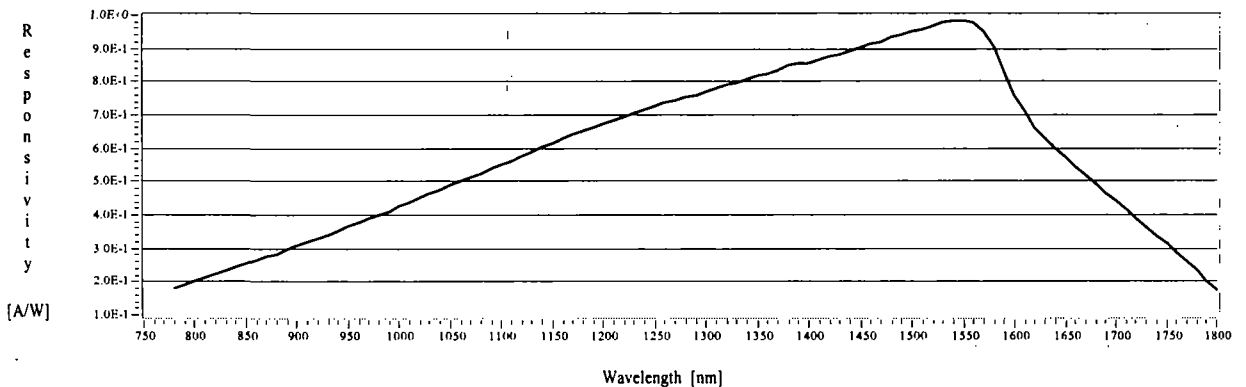
Please remove & apply calibration sticker to the instrument as required.

Complies with **ANSI/NCSL Z540-1-1994**

Table 1. Responsivity [A/W]: Detector Without Attenuator

| Lambda | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 700 | | | | | | | | | 1.8198E-1 | 1.9139E-1 |
| 800 | 2.0146E-1 | 2.1140E-1 | 2.2160E-1 | 2.3247E-1 | 2.4286E-1 | 2.5379E-1 | 2.6441E-1 | 2.7557E-1 | 2.8458E-1 | 2.9583E-1 |
| 900 | 3.0739E-1 | 3.1879E-1 | 3.3086E-1 | 3.4243E-1 | 3.5426E-1 | 3.6665E-1 | 3.7835E-1 | 3.8988E-1 | 4.0244E-1 | 4.1325E-1 |
| 1000 | 4.2593E-1 | 4.3835E-1 | 4.5146E-1 | 4.6271E-1 | 4.7670E-1 | 4.8875E-1 | 5.0146E-1 | 5.1344E-1 | 5.2585E-1 | 5.3872E-1 |
| 1100 | 5.5042E-1 | 5.6259E-1 | 5.7617E-1 | 5.8899E-1 | 6.0257E-1 | 6.1569E-1 | 6.2837E-1 | 6.4074E-1 | 6.5247E-1 | 6.6278E-1 |
| 1200 | 6.7433E-1 | 6.8341E-1 | 6.9511E-1 | 7.0430E-1 | 7.1494E-1 | 7.2560E-1 | 7.3560E-1 | 7.4221E-1 | 7.5218E-1 | 7.6156E-1 |
| 1300 | 7.7173E-1 | 7.8113E-1 | 7.9028E-1 | 7.9790E-1 | 8.0765E-1 | 8.1701E-1 | 8.2439E-1 | 8.3571E-1 | 8.4832E-1 | 8.5280E-1 |
| 1400 | 8.5633E-1 | 8.6653E-1 | 8.7734E-1 | 8.8457E-1 | 8.9478E-1 | 9.0269E-1 | 9.1170E-1 | 9.2197E-1 | 9.3442E-1 | 9.4328E-1 |
| 1500 | 9.5325E-1 | 9.5962E-1 | 9.6908E-1 | 9.7850E-1 | 9.8524E-1 | 9.8515E-1 | 9.7590E-1 | 9.5204E-1 | 9.0374E-1 | 8.3414E-1 |
| 1600 | 7.6135E-1 | 7.0888E-1 | 6.6374E-1 | 6.2965E-1 | 5.9643E-1 | 5.7079E-1 | 5.4408E-1 | 5.1937E-1 | 4.9119E-1 | 4.6471E-1 |
| 1700 | 4.4195E-1 | 4.1473E-1 | 3.9171E-1 | 3.6313E-1 | 3.3730E-1 | 3.1497E-1 | 2.8666E-1 | 2.6006E-1 | 2.3199E-1 | 2.0363E-1 |
| 1800 | 1.7523E-1 | | | | | | | | | |

**Responsivity versus Wavelength
 Detector Without Attenuator**

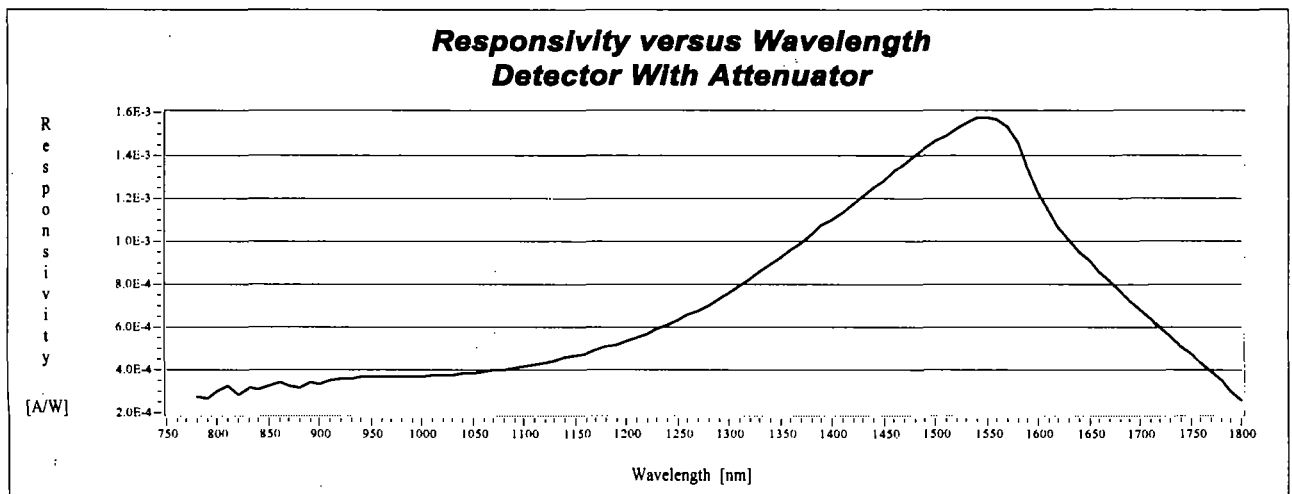


Detector Calibration Report

Detector Model Number: **818-IR**
 Detector Serial Number: **5038**
 Attenuator Serial Number: **5038**

Table 2. Responsivity [A/W]: **Detector With Attenuator**

| Lambda | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 700 | | | | | | | | | 2.7587E-4 | 2.6755E-4 |
| 800 | 2.9624E-4 | 3.2091E-4 | 2.8364E-4 | 3.1559E-4 | 3.1239E-4 | 3.2434E-4 | 3.3948E-4 | 3.2762E-4 | 3.1296E-4 | 3.4115E-4 |
| 900 | 3.3685E-4 | 3.4685E-4 | 3.5959E-4 | 3.5713E-4 | 3.6486E-4 | 3.6453E-4 | 3.6292E-4 | 3.6437E-4 | 3.6453E-4 | 3.6387E-4 |
| 1000 | 3.6897E-4 | 3.7100E-4 | 3.7513E-4 | 3.7749E-4 | 3.8295E-4 | 3.8724E-4 | 3.9012E-4 | 3.9639E-4 | 4.0228E-4 | 4.0990E-4 |
| 1100 | 4.1637E-4 | 4.2353E-4 | 4.3351E-4 | 4.4389E-4 | 4.5492E-4 | 4.6604E-4 | 4.7863E-4 | 4.9202E-4 | 5.0609E-4 | 5.1976E-4 |
| 1200 | 5.3672E-4 | 5.5228E-4 | 5.7051E-4 | 5.8795E-4 | 6.0863E-4 | 6.3095E-4 | 6.5444E-4 | 6.7676E-4 | 7.0334E-4 | 7.3234E-4 |
| 1300 | 7.6202E-4 | 7.9194E-4 | 8.2412E-4 | 8.5467E-4 | 8.8822E-4 | 9.2355E-4 | 9.5651E-4 | 9.9574E-4 | 1.0373E-3 | 1.0720E-3 |
| 1400 | 1.0988E-3 | 1.1358E-3 | 1.1751E-3 | 1.2090E-3 | 1.2500E-3 | 1.2850E-3 | 1.3243E-3 | 1.3615E-3 | 1.4003E-3 | 1.4342E-3 |
| 1500 | 1.4702E-3 | 1.4940E-3 | 1.5226E-3 | 1.5502E-3 | 1.5709E-3 | 1.5789E-3 | 1.5705E-3 | 1.5351E-3 | 1.4574E-3 | 1.3446E-3 |
| 1600 | 1.2284E-3 | 1.1421E-3 | 1.0655E-3 | 1.0069E-3 | 9.4875E-4 | 9.0747E-4 | 8.6125E-4 | 8.1666E-4 | 7.6978E-4 | 7.2306E-4 |
| 1700 | 6.8413E-4 | 6.3987E-4 | 5.9969E-4 | 5.5669E-4 | 5.1192E-4 | 4.7704E-4 | 4.2940E-4 | 3.8931E-4 | 3.4647E-4 | 3.0269E-4 |
| 1800 | 2.6184E-4 | | | | | | | | | |



Detector Calibration Report

Detector Model Number: **818-IR**
 Detector Serial Number: **5038**
 Attenuator Serial Number: **5038**

Table 3. Calibration Factors: Detector Without Attenuator

| Lambda | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|--------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 700 | | | | | | | | | 5.495E+0 | 5.225E+0 |
| 800 | 4.964E+0 | 4.730E+0 | 4.513E+0 | 4.302E+0 | 4.118E+0 | 3.940E+0 | 3.782E+0 | 3.629E+0 | 3.514E+0 | 3.380E+0 |
| 900 | 3.253E+0 | 3.137E+0 | 3.022E+0 | 2.920E+0 | 2.823E+0 | 2.727E+0 | 2.643E+0 | 2.565E+0 | 2.485E+0 | 2.420E+0 |
| 1000 | 2.348E+0 | 2.281E+0 | 2.215E+0 | 2.161E+0 | 2.098E+0 | 2.046E+0 | 1.994E+0 | 1.948E+0 | 1.902E+0 | 1.856E+0 |
| 1100 | 1.817E+0 | 1.777E+0 | 1.736E+0 | 1.698E+0 | 1.660E+0 | 1.624E+0 | 1.591E+0 | 1.561E+0 | 1.533E+0 | 1.509E+0 |
| 1200 | 1.483E+0 | 1.463E+0 | 1.439E+0 | 1.420E+0 | 1.399E+0 | 1.378E+0 | 1.359E+0 | 1.347E+0 | 1.329E+0 | 1.313E+0 |
| 1300 | 1.296E+0 | 1.280E+0 | 1.265E+0 | 1.253E+0 | 1.238E+0 | 1.224E+0 | 1.213E+0 | 1.197E+0 | 1.179E+0 | 1.173E+0 |
| 1400 | 1.168E+0 | 1.154E+0 | 1.140E+0 | 1.130E+0 | 1.118E+0 | 1.108E+0 | 1.097E+0 | 1.085E+0 | 1.070E+0 | 1.060E+0 |
| 1500 | 1.049E+0 | 1.042E+0 | 1.032E+0 | 1.022E+0 | 1.015E+0 | 1.015E+0 | 1.025E+0 | 1.050E+0 | 1.107E+0 | 1.199E+0 |
| 1600 | 1.313E+0 | 1.411E+0 | 1.507E+0 | 1.588E+0 | 1.677E+0 | 1.752E+0 | 1.838E+0 | 1.925E+0 | 2.036E+0 | 2.152E+0 |
| 1700 | 2.263E+0 | 2.411E+0 | 2.553E+0 | 2.754E+0 | 2.965E+0 | 3.175E+0 | 3.488E+0 | 3.845E+0 | 4.311E+0 | 4.911E+0 |
| 1800 | 5.707E+0 | | | | | | | | | |

Table 4. Calibration Factors: Detector With Attenuator

| Lambda | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|--------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 700 | | | | | | | | | 3.625E+3 | 3.738E+3 |
| 800 | 3.376E+3 | 3.116E+3 | 3.526E+3 | 3.169E+3 | 3.201E+3 | 3.083E+3 | 2.946E+3 | 3.052E+3 | 3.195E+3 | 2.931E+3 |
| 900 | 2.969E+3 | 2.883E+3 | 2.781E+3 | 2.800E+3 | 2.741E+3 | 2.743E+3 | 2.755E+3 | 2.744E+3 | 2.743E+3 | 2.748E+3 |
| 1000 | 2.710E+3 | 2.695E+3 | 2.666E+3 | 2.649E+3 | 2.611E+3 | 2.582E+3 | 2.563E+3 | 2.523E+3 | 2.486E+3 | 2.440E+3 |
| 1100 | 2.402E+3 | 2.361E+3 | 2.307E+3 | 2.253E+3 | 2.198E+3 | 2.146E+3 | 2.089E+3 | 2.032E+3 | 1.976E+3 | 1.924E+3 |
| 1200 | 1.863E+3 | 1.811E+3 | 1.753E+3 | 1.701E+3 | 1.643E+3 | 1.585E+3 | 1.528E+3 | 1.478E+3 | 1.422E+3 | 1.365E+3 |
| 1300 | 1.312E+3 | 1.263E+3 | 1.213E+3 | 1.170E+3 | 1.126E+3 | 1.083E+3 | 1.045E+3 | 1.004E+3 | 9.640E+2 | 9.328E+2 |
| 1400 | 9.101E+2 | 8.804E+2 | 8.510E+2 | 8.272E+2 | 8.000E+2 | 7.782E+2 | 7.551E+2 | 7.345E+2 | 7.141E+2 | 6.973E+2 |
| 1500 | 6.802E+2 | 6.693E+2 | 6.568E+2 | 6.451E+2 | 6.366E+2 | 6.334E+2 | 6.368E+2 | 6.514E+2 | 6.862E+2 | 7.437E+2 |
| 1600 | 8.141E+2 | 8.756E+2 | 9.386E+2 | 9.932E+2 | 1.054E+3 | 1.102E+3 | 1.161E+3 | 1.224E+3 | 1.299E+3 | 1.383E+3 |
| 1700 | 1.462E+3 | 1.563E+3 | 1.668E+3 | 1.796E+3 | 1.953E+3 | 2.096E+3 | 2.329E+3 | 2.569E+3 | 2.886E+3 | 3.304E+3 |
| 1800 | 3.819E+3 | | | | | | | | | |

| Wavelength Range | Accuracy Over the Range WITHOUT the Attenuator | Accuracy Over the Range WITH the Attenuator |
|------------------|---|--|
| 780 - 1700 | ± 3 % | ± 7 % |
| 1710 - 1800 | ± 5 % | ± 7 % |