TQ8210
Optical Power Meter

TQ8210 is a general-purpose portable optical power meter. It uses either a silicon photodiode sensor (for short wavelengths) or an InGaAs or a germanium photodiode sensor (for long wavelengths). A compact sensor facilitates measurements in clamped places. It is suitable for use in R&D applications for optical telecommunications, laser printers, CD equipment and magneto-optical disks.

The TQ8210, in its compact body mounts full application of ADVANCEST’s measuring technology and features a wavelength sensitivity compensation function, eliminating measurement errors which usually occurs when the range is changed or a new sensor is connected.

The TQ8210 features a two-way power supply (including a chargeable Ni-Cd battery), allowing you to use it anytime and anywhere.

- Wavelength Sensitivity Compensation Function for High-Accuracy Absolute Power Measurement
The TQ8210 incorporates a wavelength sensitivity compensation function to enable accurate power measurement over a wide range of wavelengths. The desired wavelength setting can be made from front panel keys.

- 4 1/2-Digit Wide Dynamic Range Measurement
For linear measurements (watt measurement), the TQ8210 displays measured values in 4 1/2-digits, allowing measurement over a wide dynamic range. The offset can be corrected automatically by means of the offset zero function.

- -60 dBm High-Sensitivity Measurement for 1.3/1.55 µm
When use together with the Q82018A, the TQ8210 measures to -60 dBm for 1.3 and 1.55 µm wavelengths. As a result, you can measure minute optical power in the receipt section of transmission equipment with consistent high stability. Moreover, it is possible to exchange receptacles and clean ferrule touch surface.

- MAX Hold Function for Retaining Maximum Power Value
When measuring the optical power of a CD (compact disk) or a laser printer, the measured value varies depending on the position of distance from or angle of the beam light irradiated on the sensor. However, the MAX hold function makes it possible to display the maximum power thereby obtaining constant and consistent measurement results.

- Smoothing Function for Stable Measurement
For measurement in noise-prone environment or when measurement results are unstable, use the smoothing function to ensure stable measurements. You can set the desired number of smoothing times from 2 to 20. Because measurements are made based on a moving average, you can continue making a measurement without reducing the measurement speed.

- LCD with Back Light Enabling the Use on Dark Locations
Because of low power consumption, LCD is widely used for battery-powered measuring instruments. In the past, LCD cannot be used for optical power meters or other measuring instruments which may be used in dark places. Presently, with the LCD with back light, TQ8210 can be used in dark places.

- Analog Output Function
The TQ8210 is capable of analog output (output voltages 0 to 2 V) matched to the input signal. Therefore, when connected to an analog recorder, TQ8210 can be used for long-term stability testing and for other similar purposes.
**Optical Measuring Instruments and Optical Device Test Systems**

**High-Performance Portable Optical Power Meter**

**TQ8210**

### Main Unit Specifications

- **Resolution:**
  - 0.005 to 0.1% (with unit of W), 0.01 dB (with unit of dBm)
- **Display:**
  - LCD: With back light for use in dark location
  - Wavelength display: 4 digits (with unit of nm)
  - Power display: 4 1/2 digits (with unit of mW, µW, nm, dBm, and dBr)
- **Range switching:** Automatic or manual
- **Measurement speed:** 2 times/second or faster
- **MAX / dBr Functions:**
  - MAX (effective with unit of W): Holds the maximum measured value.
  - dBr (effective with unit of dBm): Displays the relative value with respect to the reference measured value.
- **Wavelength sensitivity compensation:**
  - Automatic compensation of sensor sensitivity at set wavelengths.
- **Smoothing function:**
  - Digital smoothing (moving average for 2 to 20 measurements)
- **Offset and zero:** Stores sensor offset for automatic compensation.
- **Analog output:**
  - Analog output proportional to input signal is possible.
  - Output voltage: 0 to 2 V
  - Output impedance: 10 Ω or less
  - Output connector: 2-pin mini-jack

### Optical sensors (Option)

<table>
<thead>
<tr>
<th>Model</th>
<th>TQ82014 optical sensor (for short wavelengths)</th>
<th>TQ82015 optical sensor (for long wavelengths)</th>
<th>TQ82017 thin-type optical sensor</th>
<th>QE8201A (for long wavelengths)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wavelength range</strong></td>
<td>0.4 to 1.1 µm</td>
<td>0.8 to 1.6 µm</td>
<td>0.4 to 1.1 µm</td>
<td>0.8 to 1.65 µm</td>
</tr>
<tr>
<td><strong>Power range</strong></td>
<td>-60 to +7 dBm</td>
<td>-40 to +10 dBm</td>
<td>-60 to +17 dBm</td>
<td>-60 to 0 dBm</td>
</tr>
<tr>
<td></td>
<td>(1 nW to 50 mW)</td>
<td>(100 nW to 10 mW)</td>
<td>(1 nW to 50 mW)</td>
<td>(1 W to 1 mW)</td>
</tr>
<tr>
<td><strong>Sensor element</strong></td>
<td>Si</td>
<td>Ge</td>
<td>Si</td>
<td>InGaAs Pin</td>
</tr>
<tr>
<td><strong>Light input format</strong></td>
<td>Direct</td>
<td>Direct</td>
<td>Direct</td>
<td></td>
</tr>
<tr>
<td><strong>Photoreceptive area</strong></td>
<td>Approx. 8 mm ø</td>
<td>Approx. 5 mm ø</td>
<td>Approx. 10 x 10 mm</td>
<td></td>
</tr>
<tr>
<td><strong>Measurement range</strong></td>
<td>8 ranges in 10 dB steps</td>
<td>5 ranges in 10 dB steps</td>
<td>8 ranges in 10 dB steps</td>
<td>6 ranges in 10 dB steps</td>
</tr>
<tr>
<td><strong>Measurement accuracy</strong></td>
<td>±5% (at 850 nm, -20 dBm input)</td>
<td>±5% (at 1300 nm, -20 dBm input)</td>
<td>±5% (at 850 nm, -20 dBm input)</td>
<td>±5% (at 1300 nm, -20 dBm input)</td>
</tr>
<tr>
<td><strong>Wavelength sensitivity compensation range</strong></td>
<td>0.4 to 1.1 µm</td>
<td>0.8 to 1.7 µm</td>
<td>0.4 to 1.1 µm</td>
<td>0.75 to 1.7 µm</td>
</tr>
</tbody>
</table>

*1 For other connector types, contact ADVANCEST’s sales office or sales representatives.

*2 Measured with each wavelength range. The maximum level is measured when the light is received on the entire photoreceptive area of the sensor.

### Accessory and battery specifications

- **Operating conditions:**
  - 0 to 40°C, 85%RH or less
- **Power supply:**
  - AC power (using an AC adaptor)
  - Internal Ni-Cd battery (8 hours or longer when LCD backlight is ON or 10 hours or longer when it is OFF)

**Dimensions:**
- Approx. 80 (W) × 180 (L) × 35 (H) mm
- Mass: 400 g maximum

### Power Consumption:

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Standard</th>
<th>42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Consumption</td>
<td>5 VA or less</td>
<td>6.4 VA or less (with 230 VAC adapter)</td>
</tr>
</tbody>
</table>

### Configurations

- **TQ82014**: TQ82015 optical sensor (for long wavelengths)
- **TQ82017**: Compact Optical Sensor (Short wavelength)
- **QE8201A**: Thin-type optical sensor

**Connector-to-adaptor correspondence list**

<table>
<thead>
<tr>
<th>TQ82014</th>
<th>TQ82015</th>
<th>QE8201A</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC/PC</td>
<td>A08012</td>
<td>A08012*</td>
</tr>
<tr>
<td>SC</td>
<td>A08090</td>
<td>A08090</td>
</tr>
<tr>
<td>ST</td>
<td>A08096</td>
<td>A08096</td>
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<tr>
<td>Biconical</td>
<td>A08025</td>
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<tr>
<td>D4</td>
<td>A08013</td>
<td>A08013</td>
</tr>
<tr>
<td>DIN</td>
<td>A08029</td>
<td>A08029</td>
</tr>
<tr>
<td>SMA ø 2.5</td>
<td>A08095</td>
<td>A08095</td>
</tr>
<tr>
<td>SMA ø 3.175</td>
<td>A08028</td>
<td>A08028</td>
</tr>
</tbody>
</table>

* Standard accessory