

Sky Quality Meter (SQM) Usage Instructions

The Unihedron Sky Quality Meter (SQM) measures the brightness of the night sky in magnitudes per square arcsecond. It was designed by Dr. Doug Welch and Anthony Tekatch, members of the Hamilton Amateur Astronomers Club in Ontario, Canada. Thanks Unihedron for providing an SQM to TAAS at a reduced price!

Possible Uses:

- Find out how dark the night or site really is.
- Compare sky brightness at different sites.
- Document the evolution of light pollution in your area.
- Monitor changes in sky brightness through the night, night-to-night, and year-to-year.
- Calibrate the effect of sky brightness on qualitative measures (like Bortle Scale).

Usage:

- Point the meter so that the sensor (green and round, on same end as the unit's display) points toward the zenith (i.e., straight up). Press the red button to display zenith sky brightness in visual magnitudes per square arcsecond. (There will be an audible signal while measurement is in progress.) Under urban skies, the reading will be displayed almost instantly. Under the very darkest sky conditions, the meter may take more than a minute to complete its measurement. (Therefore, steady meter position needs to be maintained. If possible, the meter should be set on a firm level surface, rather than holding it.) There must be no direct illumination on the sensor by a terrestrial light source, if the reading is to be meaningful. Typical measurements for good viewing sites in the city might be 18 or 19 mags/square arcsec, versus 22 or 23 mags/square arc sec for dark rural sites.
- Temperature (in degrees C and then degrees F), as well as the meter's model number and serial number, can be displayed with an additional button press while the sky brightness measurement is still being displayed.

Specs:

- Uses TAOS TSL237S sensor with field of view of roughly 80 degrees diameter on the sky.
- Has infrared blocking filter (HOYA CM-500) restricting measurement to visual bandpass or very close to what the human eye sees.
- Operates on 9V battery, with power-saving features for maximum battery life.
- Meter was factory calibrated, but has no calibration certificate. Believed to be +/-10% accuracy (+/-0.10 mag/square arcsec).

To Keep in Mind:

According to a source that has done lots of sky brightness measurements at the national parks, the SQM is likely going to be a really useful tool, but dark sky advocates are cautioned in how complex and demanding precise quantitative measurement of the night sky is. Even with fairly sophisticated CCD cameras and reduction techniques, it has been found difficult to achieve the level of precision and accuracy necessary for tracking "progress" in light pollution. For many applications, having directional reading is absolutely necessary. Accurate tracking of light pollution will likely require a range of instruments- some inexpensive (like the SQM), and some complex and expensive - both likely necessary.

More info, including FAQ:

<http://www.unihedron.com/>

The Albuquerque Astronomical Society

Dark Sky Coordinator darksky@taas.org

David Penasa, 277-1141 (W) / 275-2480 (H)