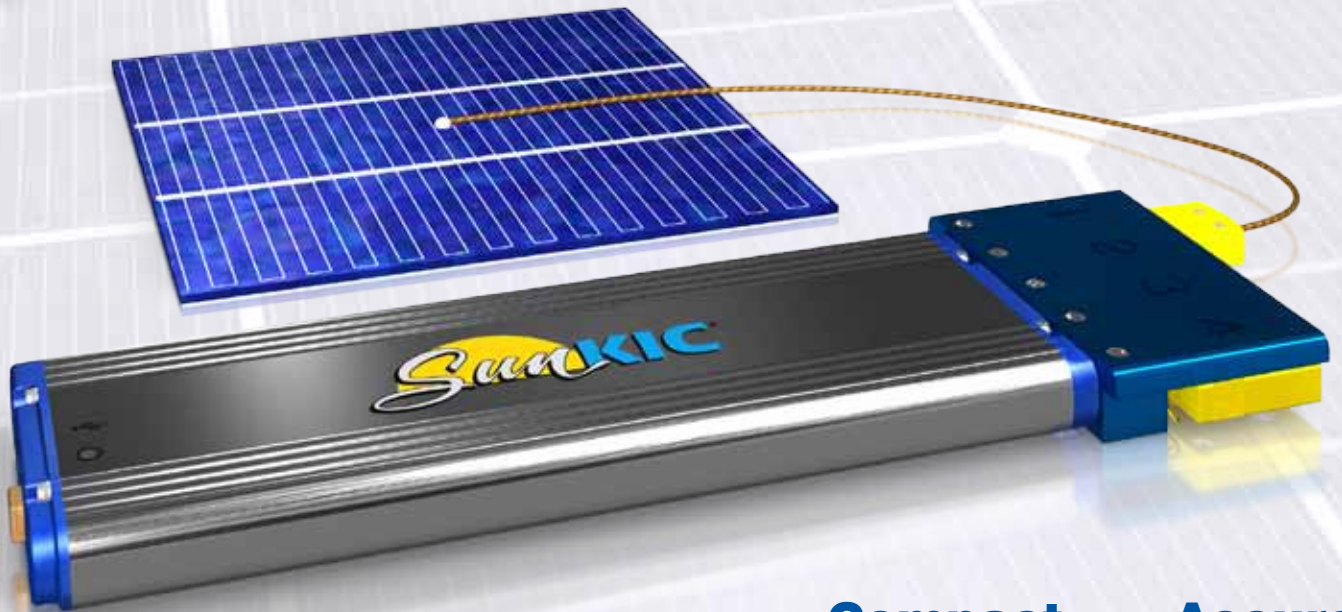




Thermal Profiler for Solar Cell Manufacturing



**Compact — Accurate
Ease of Use Graphical Interface**

SunKIC™ Thermal Profiler
Specifically Designed for the PV Industry
Hardware

The compact profiler is designed to accommodate height restrictions of metallization furnace tunnels. The hardware and thermal shields are designed to protect the profiler while riding through a metallization furnace with a solar wafer. A single run in a standard wafer firing application will typically increase the SunKIC's internal temperature by less than 10°C. Repeated runs with brief cool down periods are therefore acceptable. The SunKIC can also be used in other solar applications. Please check with KIC on guidelines for heat protection. The longer duration applications will require the use of trailing TC wires while the profiler stays outside of the heated areas.

The SunKIC provides 20 readings per second for more accurate readings. This is particularly critical in peak zone of the firing profile.

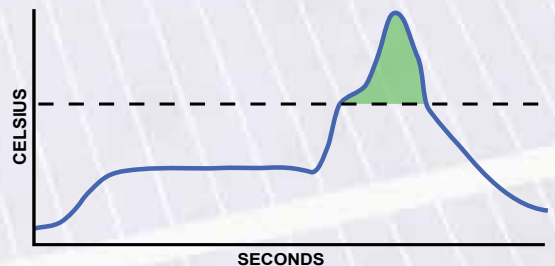
The 4 channel SunKIC utilizes standard type K thermocouple connectors. Standard AAA batteries provide power to the SunKIC. Easy access to the battery compartment allows for quick replacements to ensure availability of your profiler when you need it.

Software

The SunKIC graphically based software automates many of the measurement requirements of older generation profilers. This results in more convenient and quicker profile runs. The software is designed to provide an instant analysis of the profile data.

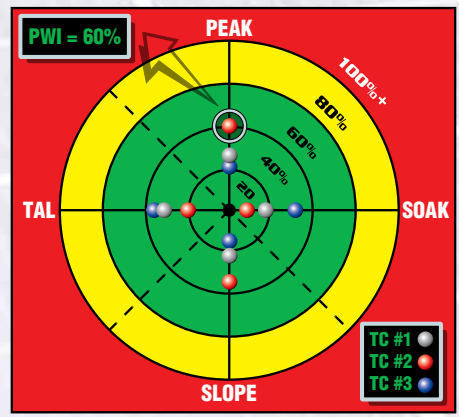
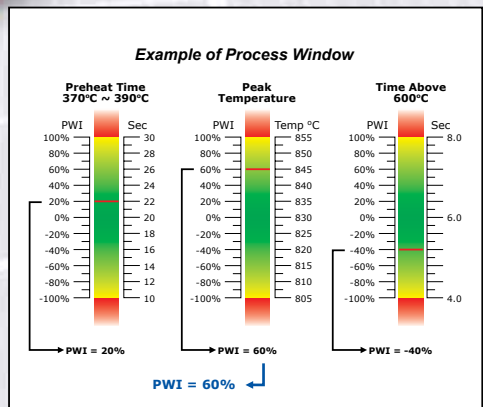
- Multiple profile overlays
- Zoom-in function
- "Area under the curve" measurements
- Delta measurements between the coldest and hottest TCs
- All statistics displayed on a single page (peak, time above measurements, etc.)

Should the furnace setpoints need to change for whatever reason, the SunKIC software comes standard with a prediction feature that instantly shows the expected change in the wafer profile to changes in the setpoints. This tool can significantly reduce the time it takes an engineer to adjust the furnace setpoints in order to achieve the desired wafer profile.





Technical Specifications



The Process Window Index is calculated using a formula that includes all statistics for all thermocouples. The formula for the PWI is calculated as follows:

- $i=1$ to N (number of thermocouples)
- $j=1$ to M (number of statistics per thermocouple)
- $measured_value_{[i,j]}$ = the $[i,j]$ th statistic's value
- $average_limits_{[i,j]}$ = the average of the $[i,j]$ th statistic's high and low limits
- $range_{[i,j]}$ = the $[i,j]$ th statistic's high limit minus the low limit

$$PWI = 100 \times \text{MAX}_{N,M} \left\{ \frac{(measured_value_{[i,j]} - average_limits_{[i,j]})}{(range_{[i,j]} \div 2)} \right\}$$

SunKIC

- Minimum Instrument Accuracy:±0.5°C / ±0.9°F
- Resolution:0.1°C
- Internal Operating Temp Range:0°C to 85°C
- Measurement Temp Range:-150°C to 1350°C
.....-300°F to 2400°F
- Sample Rate:20 per second
- Data Points:224,640
- PC Connection:USB 2.0 (Std-A/Mini-B)
- Power Requirements:(3) AAA batteries
- Number of Thermocouples:4
- Thermocouple Compatibility:Type K, Standard
- Dimensions (L x W x H mm):
SunKIC Profiler:212.0 x 68.0 x 14.5
Standard Thermal Shield:330.0 x 74.0 x 19.5
- Weight:
SunKIC Profiler:0.5 kg / 1.1 lbs
Standard Thermal Shield:1.07 kg / 2.36 lbs

Datalogger Model: data are downloaded to the computer through a USB cable after the run.

Risk Free Guarantee

All KIC products are designed to give maximum value and fast payback by streamlining your thermal process. Investment in a KIC product is a step toward total process control and quality management. All KIC products come with a no questions asked, 30-day money back guarantee.

The Process Window Index for a complete set of profile statistics is calculated as the worst case (highest number) in the set of statistics. For example: if you run a profile with three thermocouples, and four profile statistics are logged for each thermocouple, then there will be a set of twelve statistics for that profile. The PWI will be the worst case (highest number expressed as a percentage) in that set of profile statistics.

Computer Configuration

- Minimum System Requirements**
- Dual Core / 1 GHz Processor PC with 2 GB RAM
- 2 GB available storage
- Video 1024 x 768 resolution / 16-bit
- 1 available USB port (for data download)
- 1 available USB port (for software key)
- Microsoft Windows XP, Vista, or 7 (32-bit or 64-bit)

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