



**SOLAR  
ELECTRIC  
SUPPLY, INC.**

## 10W Photovoltaic module **410M**

Our latest generation of small area modules offers the following benefits:

### **Built to last**

From mountaintops to off-shore platforms, on weather stations in the bitter cold of Antarctica and on telephone signal repeaters in the hot Australian outback, the technology has been proven in the harshest environments.

### **Multiple mounting possibilities**

Multimount frame allows even greater flexibility in mounting. Positioned parallel to the edge and back of the module, its dual channels accept either M8 or 5/16" hex-head bolts, allowing the module to be mounted from the side or back.



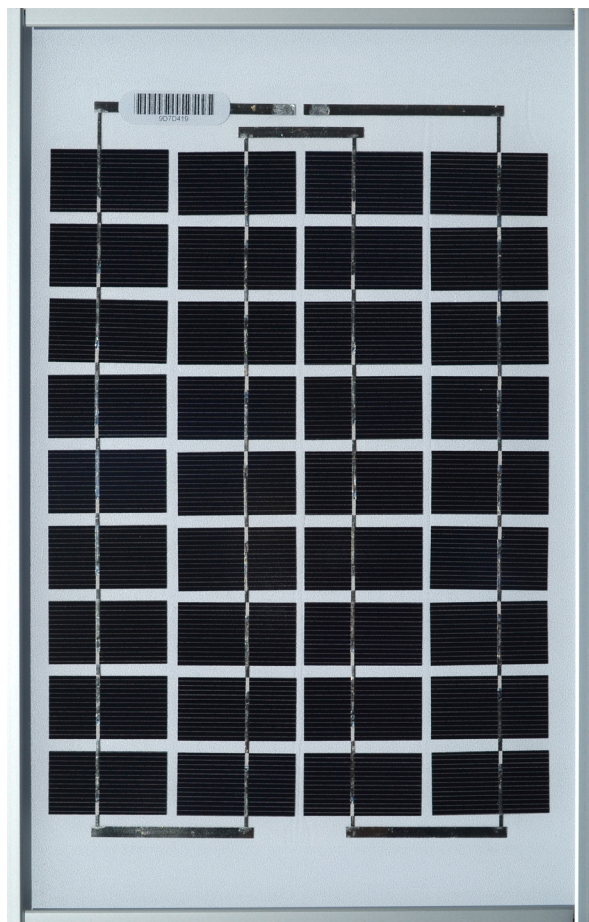
### **Easier bolt management**

Bolts may be located anywhere along the channels; the channel groove is specially designed to prevent the bolt from rotating when tightening, allowing installation with just one wrench.



### **Long cable for easier battery connections.**

A 4.6 meter PVC-jacketed AWG 18-2 polarized cable is potted into the fully sealed junction box located on the module back. The module's electrical connections are sealed for prevention against corrosion and moisture penetration.



Module appearance may vary.  
Cells have rounded corners with  
either 165 or 150mm diameter.

# 10W Photovoltaic module – 410M

## Electrical characteristics

	(1) STC 1000W/m <sup>2</sup>	(2) NOCT 800W/m <sup>2</sup>
Maximum power (P <sub>max</sub> )	10W	7.2W
Voltage at P <sub>max</sub> (V <sub>mpp</sub> )	16.8V	15.0V
Current at P <sub>max</sub> (I <sub>mpp</sub> )	.59A	.47A
Short circuit current (I <sub>sc</sub> )	.65A	.53A
Open circuit voltage (V <sub>oc</sub> )	21.0V	19.1V
Module efficiency	8.8%	
Tolerance P <sub>max</sub>	± 10%	
Nominal voltage	12V	
Efficiency reduction at 200W/m <sup>2</sup>	<5% reduction (efficiency 8.4%)	
Limiting reverse current		0.65A
Temperature coefficient of I <sub>sc</sub>		0.105%/ °C
Temperature coefficient of V <sub>oc</sub>		0.360%/ °C
Temperature coefficient of P <sub>max</sub>		-0.45%/ °C
(3) NOCT		47 ± 2 °C
Maximum series fuse rating		1A
Application class		Class C (according to IEC 61730-2007)
Maximum system voltage		50V

1: Values at Standard Test Conditions (STC): 1000W/m<sup>2</sup> irradiance, AM1.5 solar spectrum and 25°C module temperature  
 2: Values at 800W/m<sup>2</sup> irradiance, Nominal Operation Cell Temperature (NOCT) and AM1.5 solar spectrum  
 3: Nominal Operation Cell Temperature: Module operation temperature at 800W/m<sup>2</sup> irradiance, 20°C air temperature, 1m/s wind speed

All solar modules are individually tested prior to shipment; an allowance is made within our factory measurement to account for the typical power degradation (LLD effect) which occurs during the first few days of deployment.

## SES MAPPS Solar Module Mechanical characteristics

Solar cells	36 monocrystalline silicon cut cells connected in series
Front cover	High transmission 3.2mm (1/8") glass
Encapsulant	EVA
Back cover	White polyester
Frame	Silver anodized aluminum
Junction box	Lo-Pro junction box
Output cables	AWG#18 (0.75mm2) 2 core, ITC / PLTC Lengths 4572mm / 15 ft. ("+" red; "-" black)
Dimensions	421 x 269 x 23mm / 16.57 x 10.58 x 0.91in
Weight	1.5kg / 3.3lbs

All dimensional tolerances within ±1% unless otherwise stated.

## Warranty\*

- Free from defects in materials and workmanship for 2 years
- 90% Min power output for 12 years
- Optional 25 years available \*Refer to limited warranty certificate for terms and conditions

## SES MAPPS Solar Module Certification

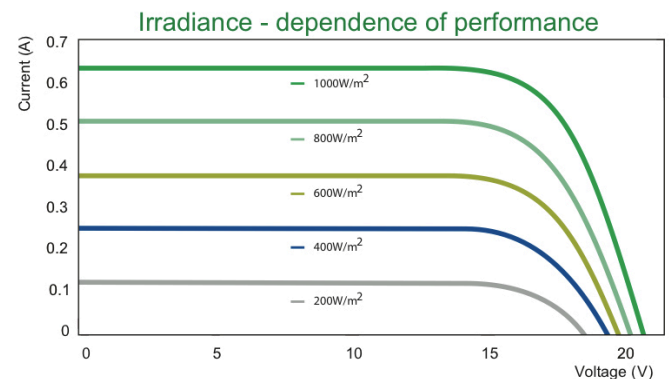
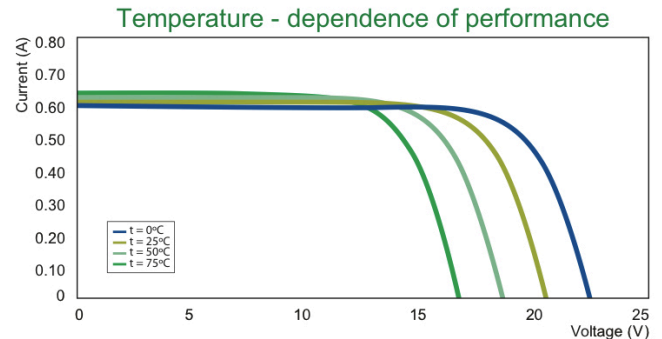
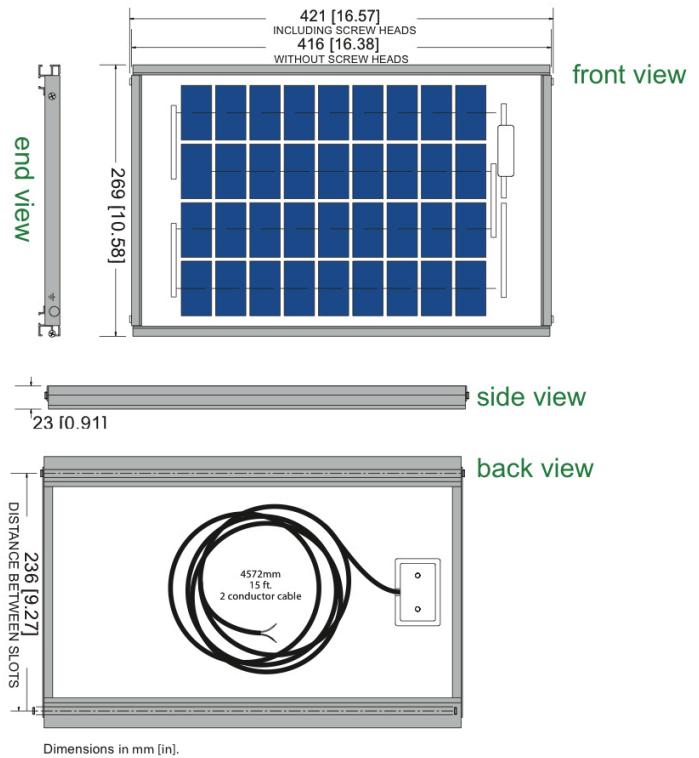
Certified according to the extended version of the IEC 61215 (ed. 2), EC 61215:2005-08 (Crystalline silicon terrestrial photovoltaic modules - Design qualification and type approval)

Certified according to IEC 61730-1 and IEC 61730-2 (ed. 1), EN 61730-1:2007-05 and EN 61730-2:2007-05. (photovoltaic module safety qualification, requirements for construction and testing).

Listed to UL 1703 & ULC ORD-C1703 Standard for Safety by Intertek ETL. Class C Fire Rating.

Approved by Intertek ETL according to FM 3611, Dec 2004, and according to CAN/CSA C22.2 No. 213-M1987, 1st Edition, Reaffirmed 2004, for use in a Class I Division 2, Group A, B, C, D Hazardous (Classified) Location.

ISO 9001 factory certification ensures that our manufacturing facilities use proven manufacturing and control processes.



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