
Power Optimizer

For Residential Installations

S440 / S500 / S500B / S650B



POWER OPTIMIZER

Enabling PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Detects abnormal PV connector behavior, preventing potential safety issues*
- Faster installations with simplified cable management and easy assembly using a single bolt
- Module-level voltage shutdown for installer and firefighter safety
- Flexible system design for maximum space utilization
- Superior efficiency (99.5%)
- Compatible with bifacial PV modules

* Functionality subject to inverter model and firmware version

/ Power Optimizer

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S440 / S500 / S500B / S650B

| | S440 | S500 | S500B | S650B | UNIT |
|---|--|---------|----------------|-----------|------|
| INPUT | | | | | |
| Rated Input DC Power ⁽¹⁾ | 440 | 500 | | 650 | W |
| Absolute Maximum Input Voltage (Voc) | 60 | | 125 | 85 | Vdc |
| MPPT Operating Range | 8 – 60 | | 12.5 – 105 | 12.5 - 85 | Vdc |
| Maximum Short Circuit Current (Isc) of Connected PV Module | 14.5 | | 15 | | Adc |
| Maximum Efficiency | | 99.5 | | | % |
| Weighted Efficiency | | 98.6 | | | % |
| Oversoltage Category | | II | | | |
| OUTPUT DURING OPERATION | | | | | |
| Maximum Output Current | | 15 | | | Adc |
| Maximum Output Voltage | 60 | | 80 | | Vdc |
| OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF) | | | | | |
| Safety Output Voltage per Power Optimizer | | 1 ± 0.1 | | | Vdc |
| STANDARD COMPLIANCE⁽²⁾ | | | | | |
| EMC | FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011 | | | | |
| Safety | IEC62109-1 (class II safety), UL1741 | | | | |
| Material | UL94 V-0, UV Resistant | | | | |
| RoHS | Yes | | | | |
| Fire Safety | VDE-AR-E 2100-712:2018-12 | | | | |
| INSTALLATION SPECIFICATIONS | | | | | |
| Maximum Allowed System Voltage | | 1000 | | | Vdc |
| Dimensions (W x L x H) | 129 x 155 x 30 | | 129 x 165 x 45 | | mm |
| Weight | 720 | | 790 | | gr |
| Input Connector | MC4 ⁽³⁾ | | | | |
| Input Wire Length | 0.1 | | | | m |
| Output Connector | MC4 | | | | |
| Output Wire Length | (+) 2.3, (-) 0.10 | | | | m |
| Operating Temperature Range ⁽⁴⁾ | -40 to +85 | | | | °C |
| Protection Rating | IP68 | | | | |
| Relative Humidity | 0 – 100 | | | | % |

(1) Rated power of the module at STC will not exceed the Power Optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed.

(2) For details about CE compliance, see Declaration of Conformity – CE.

(3) For other connector types please contact SolarEdge.

(4) Power de-rating is applied for ambient temperatures above +85°C for S440 and S500, and for ambient temperatures above +75°C for S500B. Refer to the Power Optimizers Temperature De-Rating Technical Note for details.

| PV System Design Using a SolarEdge Inverter ⁽⁵⁾ | | SolarEdge Home Wave Inverter Single Phase | SolarEdge Home Short String Inverter Three Phase | Three Phase for 230/400V Grid | Three Phase for 277/480V Grid | |
|---|--------------|---|--|-------------------------------|-------------------------------|---|
| Minimum String Length (Power Optimizers) | S440, S500 | 8 | 9 | 16 | 18 | |
| | S500B, S650B | 6 | 8 | 14 | | |
| Maximum String Length (Power Optimizers) | | 25 | 20 | 50 | | |
| Maximum Continuous Power per String | | 5700 | 5625 | 11,250 | 12,750 | W |
| Maximum Allowed Connected Power per String ⁽⁶⁾ (In multiple string designs, the maximum is permitted only when the difference in connected power between strings is 2,000W or less) | | 6800 ⁽⁷⁾ | See ⁽⁶⁾ | 13,500 | 15,000 | W |
| Parallel Strings of Different Lengths or Orientations | | Yes | | | | |

(5) It is not allowed to mix S-series and P-series Power Optimizers in new installations in the same string.

(6) If the inverter's rated AC power ≤ maximum continuous power per string, then the maximum connected power per string will be able to reach up to the inverter's maximum input DC power. Refer to the Single String Design Guidelines application note.

(7) For inverters with a rated AC power ≥ 7600W that are connected to at least two strings.

