

Residential Power Optimizer For North America

S440 / S500B / S650B



POWER OPTIMIZER

PV power optimization at the module level

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

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For North America

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| | S440 | S500B | S650B | |
|--|---|-------------------------------------|-----------|---------|
| INPUT | | | | |
| Rated Input DC Power ⁽¹⁾ | 440 ⁽²⁾ | 500 ⁽³⁾ | 650 | W |
| Absolute Maximum Input Voltage (Voc) | 60 | 125 | 85 | Vdc |
| MPPT Operating Range | 8 – 60 | 12.5 – 105 | 12.5 – 85 | Vdc |
| Maximum Input Current (Maximum Isc of Connected PV Module) ⁽²⁾ | 14.5 | 15 | | Adc |
| Maximum Input Short Circuit Current ⁽⁴⁾ | 18.75 | | | Adc |
| Maximum Efficiency | 99.5 | | | % |
| Weighted Efficiency | 98.6 | | | % |
| Overvoltage Category | II | | | |
| OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER) | | | | |
| Maximum Output Current | 15 | | | Adc |
| Maximum Output Voltage | 60 | 80 | | Vdc |
| OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR INVERTER OFF) | | | | |
| Safety Output Voltage per Power Optimizer | 1 ± 0.1 | | | Vdc |
| STANDARD COMPLIANCE | | | | |
| Photovoltaic Rapid Shutdown System | CSA C22.2#330, NEC 2014 – 2023 | | | |
| EMC | FCC Part 15 Class B; IEC 61000-6-2; IEC 61000-6-3 | | | |
| Safety | CSA C22.2#107.1; IEC 62109-1 (Class II Safety); UL 1741 | | | |
| Material | UL 94 V-0, UV Resistant | | | |
| RoHS | Yes | | | |
| Fire Safety | VDE-AR-E 2100-712:2013-05 | | | |
| INSTALLATION SPECIFICATIONS | | | | |
| Maximum Allowed System Voltage | 1000 | | | Vdc |
| Dimensions (W x L x H) | 129 x 155 x 30 / 5.07 x 6.10 x 1.18 | 129 x 165 x 45 / 5.07 x 6.49 x 1.77 | | mm / in |
| Weight | 720 / 1.6 | 790 / 1.74 | | gr / lb |
| Input Connector | MC4 | | | |
| Input Wire Length | 0.1 / 0.32 | | | m / ft |
| Output Connector | MC4 | | | |
| Output Wire Length | (+) 2.3, (-) 0.10 / (+) 7.54, (-) 0.32 | | | m / ft |
| Operating Temperature Range ⁽⁵⁾ | -40 to +85 | | | °C |
| Protection Rating | IP68 / NEMA6P | | | |
| 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 S440 with part number S440-1GM4MRMP, the Rated Input DC Power is 650W, and the Maximum Input Current is 15A.

(3) For installations after Aug 1st, 2024, the Rated Input DC Power for S500B is 650W.

(4) The Maximum Input Short Circuit Current is adjusted for worst case conditions of ambient temperature, irradiance, bifacial gain, and so on, in accordance with NEC and CSA.

(5) Power derating is applied for ambient temperatures above +85°C / +185°F for S440, and for ambient temperatures above +75°C / 167°F for S500B and S650B. Refer to the [Power Optimizers Temperature Derating](#) technical note for more details.

| PV System Design Using a SolarEdge Inverter ⁽⁶⁾ | | SolarEdge Home Wave/Hub Single Phase | Three Phase for 208V Grid | Three Phase for 277/480V Grid | |
|--|--|--|---------------------------|-------------------------------|---|
| Minimum String Length (Power Optimizers) | S440 | 8 | 10 | 18 | |
| | S500B, S650B | 6 | 8 | 14 | |
| Maximum String Length (Power Optimizers) | 25 | | | 50 ⁽⁷⁾ | |
| Maximum Usable Power Delivered per String | 5700 | | 6000 | 12,750 | W |
| Maximum Allowed Connected Power per String ^{(9),(10)} | Inverters with Rated AC Power ≤ 5700W | Per the inverter's maximum input DC power ⁽⁸⁾ | | 15,000 | W |
| | Inverters with Rated AC Power of 6000W | 5700 | | | |
| | Inverters with Rated AC Power ≥ 7600W | 6800, only when connected to at least two strings | | | |
| Parallel Strings of Different Lengths or Orientations | | | Yes | | |

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

(7) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement.

(8) Refer to the [Single String Design Guidelines](#) application note for details.

(9) For the 208V grid, the maximum is permitted only when the difference in connected power between strings is 1,000W or less.

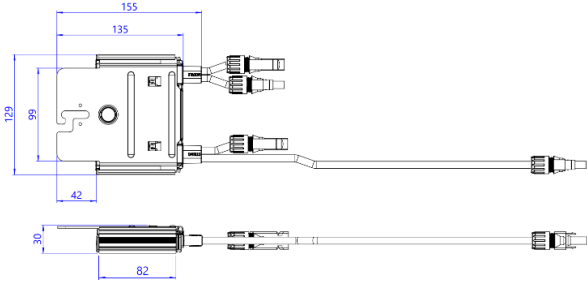
(10) For the 240V or 277/480V grids, the maximum is permitted only when the difference in connected power between strings 2,000W or less.

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S440 (Flat Bracket)



S500B, S650B (Bent Bracket)

