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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	S440	S500B	S650B	
INPUT				
Rated Input DC Power[1]	440 / 490[2][3]	500[4]	650	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	60	125	85	Vdc
MPPT Operating Range	8 – 60	12.5 – 105	12.5 – 85	Vdc
Maximum Continuous Input Current[2]	14.5 / 15[3]	15		Adc
Maximum Short-Circuit Current (Isc) of Connected PV Module for SolarEdge Home Hub Single Phase Inverters	16.5			Adc
Maximum Short-Circuit Current (Isc) of Connected PV Module for All Other SolarEdge Inverters	15			Adc
Maximum Short-Circuit Current (Isc) with Safety Factor[5]	21			Adc
Maximum Efficiency	99.5			%
Weighted Efficiency	98.6			%
Overvoltage Category	II			
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)				
Maximum Output Current	15			Adc
Maximum Output Voltage	60	80		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE 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[6]	-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 or S440-1GM4MRMU, the Rated Input DC Power is 650W, and the Maximum Continuous Input Current is 15A.
(3) For installations after September 1st, 2025, the Rated Input DC Power for S440 is 490W, and the Maximum Continuous Input Current is 15A.
(4) For installations after Aug 1st, 2024, the Rated Input DC Power for S500B is 650W.
(5) The Maximum Isc with Safety Factor is ≥ 1.25 x the Maximum Isc of Connected PV Module. Adjusted for worst case conditions of ambient temperature, irradiance, bifacial gain, and so on, in accordance with NEC and CSA.
(6) 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.

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Intertek RoHS

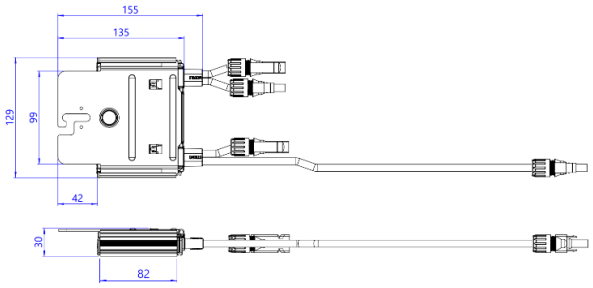
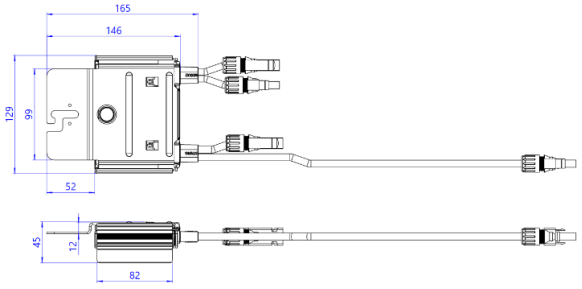
/ Residential Power Optimizer

For North America

S440 / S500B / S650B

PV System Design Using a SolarEdge Inverter[6]		SolarEdge Home Wave / Hub Single Phase / SolarEdge Nexis	Three Phase for 208V Grid	Three Phase for 277/480V Grid	
Minimum String Length (Power Optimizers)	S440	8	10[7]	18	
	S500B, S650B	6	8	14	
Maximum String Length (Power Optimizers)		25		50[8]	
Maximum Usable Power Delivered per String		5700	6000	12,750	W
Maximum Allowed Connected Power per String[10][11]	Inverters with Rated AC Power ≤ 5700W	Per the inverter's maximum input DC power[9]	One string: 7200 Two strings or more: 7800	15,000[12]	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			

(7) It is not allowed to mix S-series and P-series Power Optimizers in new installations in the same string.
(8) For the SE17.3KUS Three Phase Inverter and the SE50KUS Three Phase Inverter with Synergy Technology, the minimum string length is 11 Power Optimizers.
(9) A string with more than 27 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement.
(10) Refer to the Single String Design Guidelines application note for details.
(11) For the 208V grid, the maximum is permitted only when the difference in connected power between strings is 1,000W or less.
(12) For the 240V or 277/480V grids, the maximum is permitted only when the difference in connected power between strings 2,000W or less.

S440 (Flat Bracket)	S500B, S650B (Bent Bracket)
	

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SolarEdge is a global leader in smart energy technology. By leveraging world-class engineering capabilities and with a relentless focus on innovation, SolarEdge creates smart energy solutions that power our lives and drive future progress.

SolarEdge developed an intelligent inverter solution that changed the way power is harvested and managed in photovoltaic (PV) systems. The SolarEdge DC optimized inverter maximizes power generation while lowering the cost of energy produced by the PV system.

Continuing to advance smart energy, SolarEdge addresses a broad range of energy market segments through its PV, storage, EV charging, UPS, and grid services solutions.

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