

MicroGenius S2/S4

Industrial Reserve Power Battery Chargers

12, 24, 36, 48 & 120 Volts, 6 to 100 Amps



Small. Powerful. Rugged.

AC & DC circuit breakers. Standard J1939 and Modbus communications.

Hardened switchmode powertrain

UL Listed and NFPA 110 approved

Designed & tested for industrial applications

Contact

Stored Energy Systems LLC Longmont, Colorado, USA

www.sens-usa.com (303) 678-7500 info@sens-usa.com

CAD drawings, firmware, certifications, and technical documentation are available on our website.















Robust reliability. More power in less space.

State-of-the-art features

MicroGenius is a family of advanced technology 12 to 120 volt nominal stationary battery chargers that deliver more power in less space. Ruggedized switchmode power conversion technology enables a rich set of standard features that are either unavailable in, or add significant cost to, competing legacy technology chargers. MicroGenius is designed and tested to survive extreme electrical transients, temperature and vibration.

Mission-critical dependability

SENS' comprehensive approach to reliability includes worst-case design, repeated stress testing and highly automated assembly, test and burn-in of every unit. The result? A lower rate of field failure than even the best legacy SCR designs – proven over six years and thousands produced.

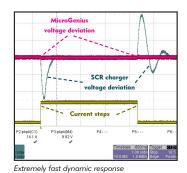


Electrical transient testing MicroGenius 2



Rich standard feature set

Standard with every charger: ripple-free output, fast dynamic response, Modbus communications, multiple alarm and communications choices, battery health check systems and global standards compliance.



State-of-the-art digital control

- Patented algorithms charge batteries faster & more safely
- Superb energy efficiency exceeds state-mandated regulations
- Comms, load sharing & other features "built-in" to every unit

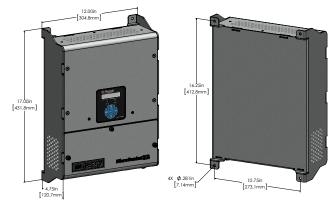


MicroGenius S2 and S4 employ multiple MicroGenius chargers that enable either higher current output, internal redundancy or multiple outputs.



MicroGenius S2

15.4lbs (7kg) maximum



		12/24V 36/48V ² 120V ³									
AC input	VAC, Hz	90-265¹ VAC. 47-63Hz									
	Protection	Supplementary overcurrent protection fuse, transient protected to EN 61000-4-5 level 4. Optional AC circuit breaker.									
	Power factor & efficiency	PF > .95 typical; efficiency to 93-95%; meets CEC Title 20 Appliance Efficiency Regulations									
DC	Volts, amps	12V/24V nom. at 20A, 30A, 40A, and 50A 36V/48V nom. at 12A and 25A 120V nom. at 6A and 12A									
DC output	Charging modes	Multi-stage, including float, boost and commissioning charge modes									
	Current limit	Factory set at 100% of rating. Field adjustable with keypad or from PC. ⁴									
	Charging characteristic	Constant voltage, current limited; patented Dynamic Boost control									
	Line & load regulation	±0.5%									
	Output ripple	< 30 mVrms with or without battery. Delivers fast-responding, stable, well-filtered DC without battery.									
	Battery temp. compensation	Standard. Optional remote battery temperature probe. 5									
	Output protection	Current limit, supplementary overcurrent protection fuse, transient protected. Optional DC circuit breaker.									
	Dead battery charge										
	Parallel operation	Starts into, and recharges zero volt battery without user intervention Two or more charges expecte with all modes synchronized for increased current or fault tolerance ⁶									
	Charge mode control	Two or more chargers operate with all modes synchronized for increased current or fault tolerance ^o									
Adjust- ment &	Adjustments	Fully automatic patented Dynamic Boost system. Manual boost & battery commissioning available from keypad.									
Controls	Battery type programs	Nominal voltage range; battery type program; fine voltage setting; alarm setpoints; alarm relay mapping									
	Field voltage adjustment	Flooded lead-acid, Ni-Cd, VRLA, ultracapacitor, lithium'									
<u> </u>	LEDs	2 methods: from front panel keypad or from PC ⁴									
Status display		Two multi-color front panel status LEDs									
	Metering & status display	Voltmeter accurate to +1%; ammeter to +1%. 20-character display of status & alarm messages.									
Alarms	Alarms	Factory set, field reconfigurable, latching or non-latching. Alarm functions announced on the Modbus port and on the LCD include summary, AC fail, charger fail, high DC volts, low DC volts, low cranking volts, overvoltage shutdown, reverse polarity battery, incompatible battery, invalid settings, I/O bus inactive, thermal fold back, no temperature probe, current limiting, ground fault and low current. Any alarm is assignable to Form C contacts.									
	Alarms: Form C contacts	Five Form C contacts, each rated 30V, 2A resistive, assignable. Standard configuration includes summary, AC fail, charger fail, high DC volts, low DC volts and discharging battery.									
Network-	J1939 communications	CAN 2.0 extended ID on RJ45 port									
ing	Modbus communications	Modbus RS-485 on RJ45 port; Modbus TCP/IP (optional) on RJ45 port									
	SENSbus/USB	Proprietary bus for connection of paralleled chargers and SENS accessories and SENS Setup Utility									
Environ-	Operating temperature	-40C to +70C; full spec from -40C to +40C (convection cooled) ⁸									
mental	Humidity	5% to 95%, non-condensing									
	Ingress protection	IP 20; NEMA 1. Optional drip shield for IP 22/NEMA 2 rating. ⁹									
	Vibration & shock resistance	Vib: Swept Sine (EN60068-2-6): 4G, 18-500Hz, 3 axes. Random: 20-500Hz, .01G²/Hz. Shock: EN 60068-2-27 (15G)									
	Electrical transient	ANSI/IEEE C62.41 & EN 61000-4-12 on power terminals									
Abuse	Reverse polarity	Charger self-protects without fuse clearing. Indication via LED & LCD.									
protec-	Wrong voltage battery	Charger-battery voltage mismatch shuts down charger. Indication via LED & LCD.									
tion	Overvoltage shutdown	Selective; shutdown only operates if charger causes the overvoltage condition									
	Overtemperature protection	Gradual output power reduction if heatsink temperature becomes excessive									
Regula-	North America	C-UL Listed for US & Canada: UL 1012 category QQIJ, CSA 22.2, No. 107.2									
tory		IEEE 2405									
compli- ance		FCC Part 15, Class A									
		Seismic: Rigid & non-structure wall mount; max S _{DS} of 2.5G. IBC 2000-2022, Calif. BC 2007-2022									
		American Bureau of Shipping, type approved, 12 - 24V only									
	European Union (CE)	EMC: 2014/30/EU (EN 61000-6-2 & EN 61000-6-4)									
	European Union (CE)	LVD: 2014/35/EU (EN 60335-1 & EN 60335-2-29)									
		RoHS: 2015/863 (EN 63000)									
Construc-	Housing/configuration	Aluminum with powder coated finish									

1 Below 170 VAC input, 24V-30A model limited to 24A output and 24V-40A model limited to 37A output 2 Output voltage & alarms adjustable down to 32V nominal battery 3 Output voltage & alarms adjustable down to 72 or 96V nominal battery 4 Requires free SENS software available at www.sens-usa.com 5 Remote battery temp sensor is optional. Order SENS p/n 209481 6 Requires standard RJ45 network cable to connect paralleling bus. Order SENS p/n 208118-72 (72-inch length) or 208118-180 (180-inch length) 7 Contact factory to determine compatibility with the battery management system (BMS) of your lithium battery. 8 At 65 deg. C and above the LCD display may be unreadable and display life will be reduced 9 Drip shield is optional. Order SENS p/n 209291.

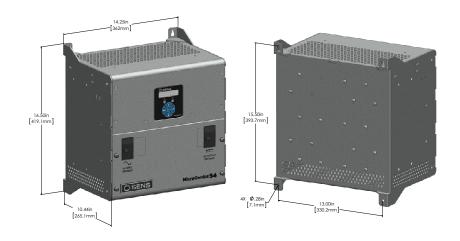


MicroGenius S4

36.8lbs (16.7kg) maximum

Choose S4 for max DC current >50A and added surge suppression

19 or 23 inch rack mount brackets optional



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		12/24V	36/48V ²	120V ³								
AC input	VAC, Hz Protection	90-265¹ VAC, 47-63Hz Supplementary overcurrent protection fuse, transient protected to EN 61000-4-5 level 4. Optional AC circuit breaker. Optional AC input surge protector with indicator.										
	Power factor & efficiency	PF >.95 typical; efficiency to 93-95%; meets CEC Title 20 Appliance Efficiency Regulations										
	Volts, amps	12V/24V nom. at 25A, 50A, 75A and 100A 36V/48V nom. at 12A, 25A, 37A and 50A 120V nom. at 6A, 12A, 18A, and 24A										
DC output	Charging modes	Multi-stage, including float, boost and commissioning charge modes										
	Current limit	Factory set at 100% of rating. Field adjustable with keypad or from PC. ⁴										
	Charging characteristic	Constant voltage, current limited; patented Dynamic Boost control										
	Line & load regulation	±0.5%										
	Output ripple	< 30 mVrms with or without battery. Delivers fast-responding, stable, well-filtered DC without battery.										
	Battery temp. compensation	Standard. Optional remote battery temperature probe. 5										
	Output protection	Current limit, supplementary overcurrent protection fuse, transient protected. Optional DC circuit breaker. Optional DC output surge protector with indicator.										
	Dead battery charge	Starts into, and recharges zero volt battery without user intervention										
	Parallel operation	Two or more chargers operate with all modes synchronized for increased current or fault tolerance ⁶										
Adjust-	Charge mode control	Fully automatic patented Dynamic Boost system. Manual boost & battery commissioning available from keypad.										
ment &	Adjustments	Nominal voltage range; battery type program; fine voltage setting; alarm setpoints; alarm relay mapping										
Controls	Battery type programs	Flooded lead-acid, NiCd, VRLA, ultracapacitor, lithium ⁷										
	Field voltage adjustment	2 methods: from front panel keypad or from PC ⁴										
Status	LEDs	Two multi-color front panel status LEDs										
display	Metering & status display	Voltmeter accurate to +1%; ammeter to +1%. 20-character display of status & alarm messages.										
Alarms	Alarms	Factory set, field reconfigurable, latching or non-latching. Alarm functions announced on the Modbus port and on the LCD include summary, AC fail, charger fail, high DC volts, low DC volts, low cranking volts, overvoltage shutdown, reverse polarity battery, incompatible battery, invalid settings, I/O bus inactive, thermal fold back, no temperature probe, current limiting, ground fault and low current. Any alarm is assignable to Form C contacts.										
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Net-	J1939 communications	CAN 2.0 extended ID on RJ45 port		•								
working	Modbus communications	Modbus RS-485 on RJ45 port; Modbus TCP/IP (optional) on RJ45 port										
	SENSbus/USB	Proprietary bus for connection of paralleled chargers and SENS accessories and SENS Setup Utility										
Environ-	Operating temperature	-40C to +70C; full spec from -40C to +40C (convection cooled) ⁸										
mental	Humidity	5% to 95%, non-condensing										
	Ingress protection	IP 20; NEMA 1. Optional drip shield for IP 22/NEMA 2 rating. ⁹										
	Vibration & shock resistance	Vib: Swept Sine (EN60068-2-6): 4G, 18-500Hz, 3 axes. Random: 20-500Hz, .01G²/Hz. Shock: EN 60068-2-27 (15G)										
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	Overtemperature protection	Gradual output power reduction if heatsink temperature becomes excessive										
Regula-	North America	C-UL Listed for US & Canada: UL 1012 category QQIJ, CSA 22.2, No. 107.2										
tory		IEEE 2405										
compli- ance		FCC Part 15, Class A										
		Seismic: Rigid & non-structure wall mount; max S _{DS} of 2.5G. IBC 2000-2022, Calif. BC 2007-2022										
		American Bureau of Shipping, type approved										
	European Union (CE)	EMC: 2014/30/EU (EN 61000-6-2 & EN 61000-6-4)										
		LVD: 2014/35/EU (EN 60335-1 & EN 60335-2-29)										
		RoHS: 2015/863 (EN 63000)										
Con-	Housing/configuration	Aluminum with powder coated finish. Rack mount brackets for 1	9 and 23 inch rack optional.									
COII-												

1 120/JAC minimum for 12/24V-100A, 36/48V-48A and 120V-25A units 2 Output voltage & alarms adjustable down to 32V nominal battery 3 Output voltage & alarms adjustable down to 72 or 96V nominal battery 4 Requires free SENS software available at www.sens-usa.com 5 Remote battery temp sensor is optional. Order SENS p/n 209481 6 Requires standard RJ45 network cable to connect paralleling bus. Order SENS p/n 208118-72 (72-inch length) or 208118-180 (180-inch length) 7 Contact factory to determine compatibility with the battery management system (BMS) of your lithium battery. 8 At 65 deg. C and above the LCD display may be unreadable and display life will be reduced 9 Drip shield is optional. Order SENS p/n 209287.



How To Order MicroGenius S2 & S4

Product	Enclo	Protect.	Comms	Config	-	Port A	Port A	Port B	Port B	Port C	Port C	Port D	Port D
Type S	sure	Options	1	0		Code	Redun.	Code 0	Redun.	Code	Redun.	Code	Redun.
<u>A</u>	B	©	D	E		3		the factory			with multipl		
	Parameter			Code		Value							
A	Product F	amily		S	!	MicroG	enius S						
B	Enclosure	!		2 4		S2 chas S4 chas							
©	AC & DC protection B C				- 1	Standard, no circuit breakers AC and DC circuit breakers AC and DC breakers plus supplementary surge protection (S4 only)							
©	Communi	0 1 2 3	j	J1939 and Modbus RS485 J1939 and Modbus TCP/IP J1939 and Modbus RS-485 with RJ45 to terminal block adapter J1939 and Modbus TCP/IP with RJ45 to terminal block adapter									
E	Configuration O Standard R 19" rack mount ears (S4 only) T 23" rack mount ears (S4 only)												
				B D E S2: G N P S T		20A @ 30A @ 40A @ 50A @ 12A @ : 25A @ : 12A @	12/24V 12/24V 12/24V 36/48V 36/48V 20V						
F	Output Current			C G J K N P Q R S T U V		25A @ 50A @ 75A @ 100A @ 12A @ 50A @ 150A @ 112A @ 112A @ 118A @ 24A @ 24A @	12/24V 12/24V 12/24V 36/48V 36/48V 36/48V 36/48V 20V 120V 120V						

Contact SENS or your local sales representative for additional specification, engineering and installation information, or visit SENS' website for latest available data. Specification subject to change without notice.

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