

MicroGenius[®] S2/S4

Genset Engine Start Battery Chargers
12 & 24 Volts, 20 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

SENS MicroGenius S2/S4 advanced technology genset battery chargers deliver from 20 to 100 amps at 12 or 24 volts*.

MicroGenius is the only family of genset chargers that meets all modern battery charging and energy efficiency regulations.

- UL listed to category BBHH required for "Emergency Generators"
- Legal for sale under California and Oregon energy efficiency regulations
- All units survive harsh EN 60068 standard vibration abuse at the 4G level

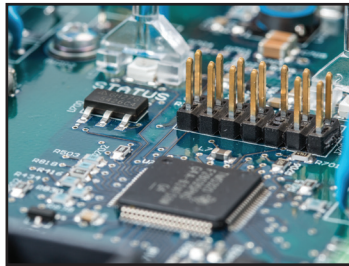
*Consult factory for higher output voltage MicroGenius chargers up to 120 volts DC nominal

Dependable modular architecture

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

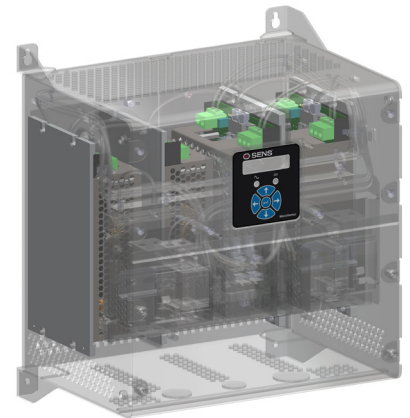
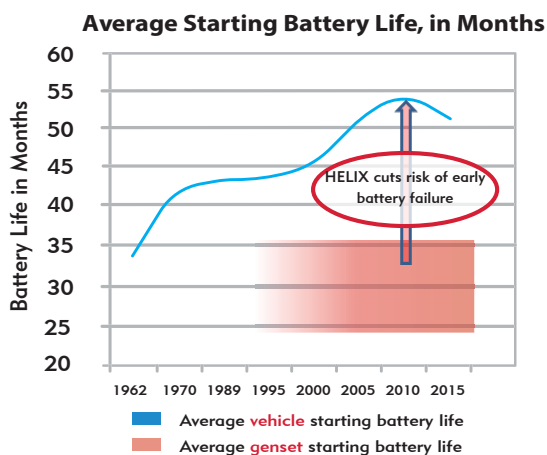
Patented Dynamic Boost™ charging

Dynamic Boost charges batteries faster and more completely than other conventional chargers, with lower risk of overcharge.



Safer, more reliable battery performance

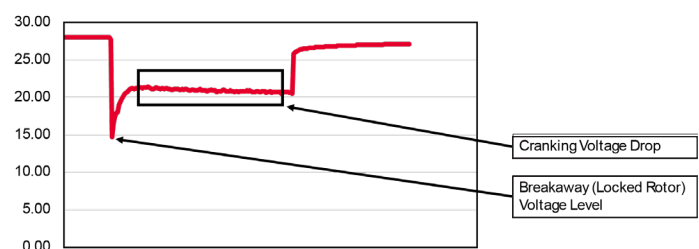
Revolutionary HELIX™ (High Efficiency, Life-eXtending) technology reduces the risk of early & catastrophic genset battery failures.



NFPA 110 approved - eliminate battery maintenance

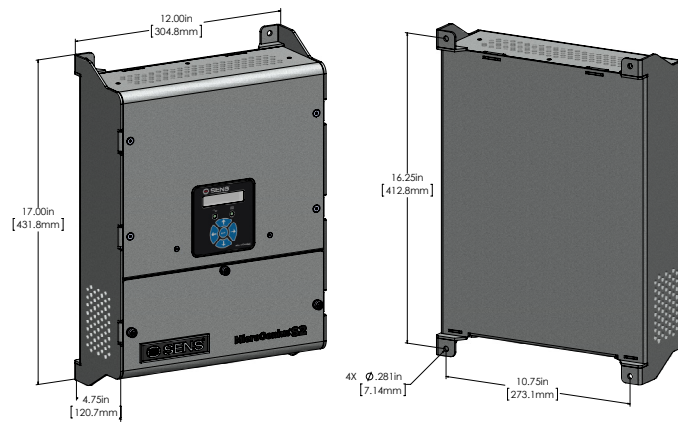
Optional engine cranking voltage drop monitoring eliminates NFPA 110 battery maintenance

CRANKING VOLTAGE DROP



MicroGenius S2

15.4 lbs. (7 kg) maximum



Specifications for MicroGenius S2: 20A to 50A Output

AC input	VAC, Hz	90-265 ¹ 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; max efficiency 93-95%; meets CEC Title 20 Efficiency Regulations;
DC output	Volts, amps	12V/24V nom. at 20A, 30A, 40A and 50A
	Charging modes	Multi-stage, including float, boost and two additional HELIX voltages in flooded lead-acid battery program
	Current limit	Factory set at 100% of rating. Field adjustable with keypad or from PC.
	Charging characteristic	Constant voltage, current limited; patented Dynamic Boost control and HELIX (when FLA battery is selected)
	Line & load regulation	±0.5%
	Output ripple	< 30mVrms with or without battery. Delivers fast-responding, stable, well-filtered DC without battery.
	Battery temp. compensation	Standard. Optional remote battery temperature probe. ³
	Output protection	Current limit, supplementary overcurrent protection fuse, transient protected. Optional DC circuit breaker.
	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 ⁴
Adjustment & Controls	Charge mode control	Fully automatic patented Dynamic Boost system. Manual boost & battery commissioning available from keypad.
	Adjustments	12 or 24-volt; battery type program; fine voltage setting; alarm setpoints; alarm relay mapping
	Battery type programs	Flooded lead-acid, AGM or NiCd for engine starting; VRLA for reserve power; ultracapacitor
	Field voltage adjustment	2 methods: from front panel keypad or from PC ²
Status display	LEDs	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 J-1939 and Modbus ports 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 low cranking volts.
Networking	J1939 communications	CAN 2.0 extended ID on RJ45 port
	Modbus communications	Modbus RS-485 on RJ45 port; Modbus TCP/IP (optional) on RJ45 port
	SENSbus/USB	Proprietary bus for connection of paralleled chargers, SENS accessories and SENS Setup Utility
Environmental	Operating temperature	-40C to +70C; full spec from -40C to +40C (convection cooled) ⁵
	Humidity	5% to 95%, non-condensing
	Ingress protection	IP 20; NEMA 1. Optional drip shield for IP 22/NEMA 2 rating. ⁶
	Vibration & shock resistance	Vib: Swept Sine (EN60068-2-6): 4G, 18-500Hz, 3 axes. Random: 20-500Hz, .01G ² /Hz. Shock: EN 60068-2-27 (15G)
	Electrical transient	ANSI/IEEE C62.41 & EN 61000-4-12 on power terminals
Abuse protection	Reverse polarity	Charger self-protects without fuse clearing. Indication via LED & LCD.
	Wrong voltage battery	Charger-battery voltage mismatch shuts down charger. Indication via LED & LCD.
	Overvoltage shutdown	Selective; shutdown only operates if charger causes the overvoltage condition
	Overtemperature protection	Gradual output power reduction if heatsink temperature becomes excessive
Regulatory compliance	North America	C-UL Listed for US & Canada: UL 1236 categories BBGQ, BBHH, BBJY and QWIR, CSA 22.2, No. 107.2. Certified to UL 1236 supplements SB (marine), SC (fire pump) and SE (emergency generator).
		NFPA-70, NFPA-110
		FCC Part 15, Class A
		Seismic: Rigid & non-structure wall mount; max S _{DS} of 2.5G. IBC 2000-2022, Calif. BC 2007-2022
	European Union (CE)	American Bureau of Shipping, type approved
		EMC: 2014/30/EU (EN 61000-6-2 & EN 61000-6-4)
		LVD: 2014/35/EU (EN 60335-1 & EN 60335-2-29)
Construction	Housing/configuration	Aluminum with powder coated finish
	Connections	AC & DC terminal blocks: 20 to 2AWG. J1939 and Modbus: RJ45. Form C alarms: 28 to 16AWG

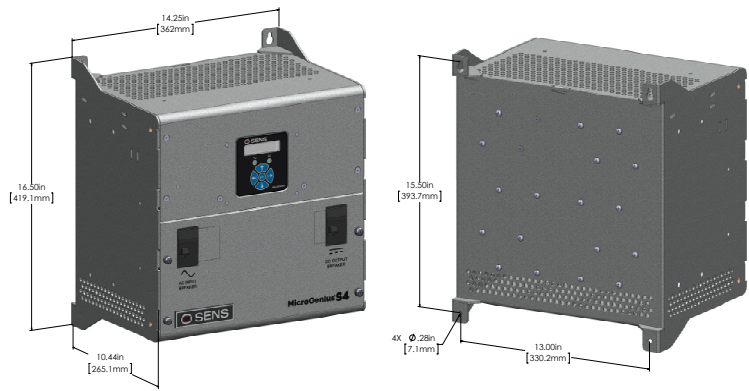
¹ Below 170 VAC input, 24V-30A model limited to 24A output and 24V-40A model limited to 37A output ² Requires free SENS software available at www.sens-usa.com ³ Remote battery temp sensor is optional. Order SENS p/n 209481 ⁴ Requires standard RJ-45 network cable to connect paralleling bus. Order SENS p/n 208118-72 (72-inch length) or 208118-180 (180-inch length) ⁵ At 65 deg. C and above the LCD display may be unreadable and display life will be reduced ⁶ 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



Specifications for MicroGenius S4: 25A to 100A Output

AC input	VAC, Hz	90-265 ¹ VAC, 47-63Hz
	Protection	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; max efficiency 93-95%; meets CEC Title 20 Efficiency Regulations;
DC output	Volts, amps	12V/24V nom. at 25A, 50A, 75A and 100A
	Charging modes	Multi-stage, including float, boost and two additional HELIX voltages in flooded lead-acid battery program
	Current limit	Factory set at 100% of rating. Field adjustable with keypad or from PC. ²
	Charging characteristic	Constant voltage, current limited; patented Dynamic Boost control and HELIX (when FLA battery is selected)
	Line & load regulation	±0.5%
	Output ripple	< 30mVrms with or without battery. Delivers fast-responding, stable, well-filtered DC without battery.
	Battery temp. compensation	Standard. Optional remote battery temperature probe. ³
	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 ⁴
Adjustment & Controls	Charge mode control	Fully automatic patented Dynamic Boost system. Manual boost & battery commissioning available from keypad.
	Adjustments	12 or 24-volt; battery type program; fine voltage setting; alarm setpoints; alarm relay mapping
	Battery type programs	Flooded lead-acid, AGM or NiCd for engine starting; VRLA for reserve power; ultracapacitor
	Field voltage adjustment	2 methods: from front panel keypad or from PC ²
Status display	LEDs	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 J1939 and Modbus ports 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 low cranking volts.
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	SENSbus/USB	Proprietary bus for connection of paralleled chargers, SENS accessories and SENS Setup Utility
Environmental	Operating temperature	-40C to +70C; full spec from -40C to +40C (convection cooled) ⁵
	Humidity	5% to 95%, non-condensing
	Ingress protection	IP 20; NEMA 1. Optional drip shield for IP 22/NEMA 2 rating. ⁶
	Vibration & shock resistance	Vib: Swept Sine (EN60068-2-6): 4G, 18-500Hz, 3 axes. Random: 20-500Hz, .01G ² /Hz. Shock: EN 60068-2-27 (15G)
	Electrical transient	ANSI/IEEE C62.41 & EN 61000-4-12 on power terminals
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	Overvoltage shutdown	Selective; shutdown only operates if charger causes the overvoltage condition
	Overtemperature protection	Gradual output power reduction if heatsink temperature becomes excessive
Regulatory compliance	North America	C-UL Listed for US & Canada: UL 1236 categories BBGQ, BBHH, BBJY and QWIR, CSA 22.2, No. 107.2. Certified to UL 1236 supplements SB (marine), SC (fire pump) and SE (emergency generator).
		NFPA-70, NFPA-110
		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)
Construction	Housing/configuration	Aluminum with powder coated finish. Rack mount brackets for 19 and 23 inch rack optional.
	Connections	AC & DC terminal blocks: 14AWG to 2/0. AC & DC breakers, <50A (optional): 14 to 2AWG. AC & DC breakers, ≥50A (optional): 12AWG to 2/0. J1939 and Modbus: RJ45. Form C alarms: 28 to 16AWG

¹ 120VAC minimum for 100A units ² Requires free SENS software available at www.sens-usa.com ³ Remote battery temp sensor is optional. Order SENS p/n 209481 ⁴ Requires standard RJ45 network cable to connect paralleling bus. Order SENS p/n 208118-72 (72-inch length) or 208118-180 (180-inch length) ⁵ At 65 deg. C and above the LCD display may be unreadable and display life will be reduced ⁶ Drip shield is optional. Order SENS p/n 209287.

How To Order **MicroGenius S2 & S4**

Product Type	Enclosure	-	Protect. Options	Comms	Config	-	Port A Code	Port A Redun.	Port B Code	Port B Redun.	Port C Code	Port C Redun.	Port D Code	Port D Redun.
S	4	-	C	1	0	-	H	0	0	0	0	0	0	0
(A)	(B)		(C)	(D)	(E)		(F)	Contact the factory to configure chargers with multiple outputs or internal redundancy.						

	Parameter	Code	Value
(A)	Product Family	S	MicroGenius S
(B)	Enclosure	2 4	S2 chassis S4 chassis
(C)	AC & DC protection configuration	A B C	Standard, no circuit breakers AC and DC circuit breakers AC and DC breakers plus supplementary surge protection (S4 only)
(D)	Communications	0 1 2 3	J1939 and Modbus RS-485 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	0 R T V	Standard 19" rack mount ears (S4 only) 23" rack mount ears (S4 only) Includes cranking voltage drop monitoring
(F)	Output Current	S2: B D E G	20A 30A 40A 50A
		S4: C G J K	25A 50A 75A 100A

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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