APPLICATION NOTE NUMBER 21
SAE J1939 COMMUNICATIONS (CANBUS)

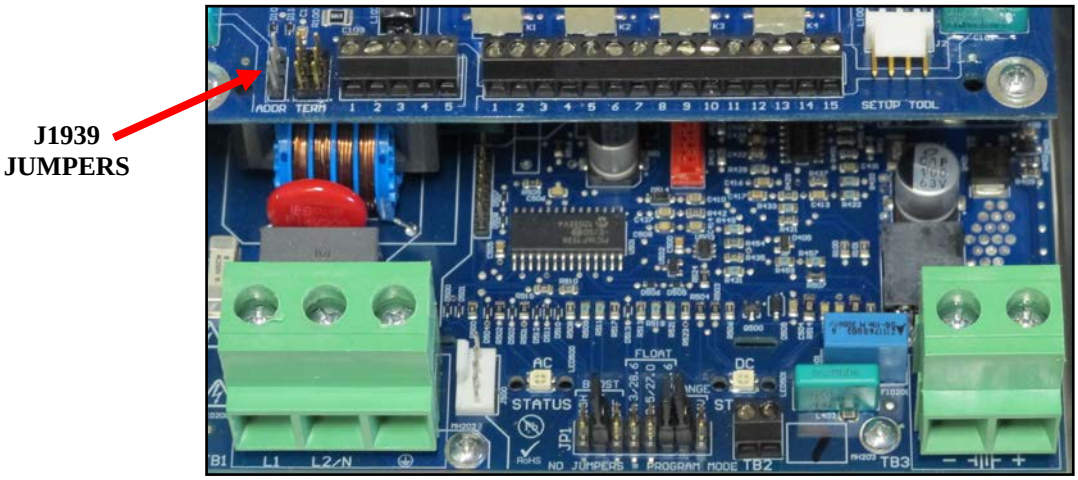
Introduction

The optional J1939 interface on the MicroGenius 150 is intended to provide genset suppliers with a highly reliable, low cost method to present all the information required by NFPA 110 to the genset controller, eliminating the need for a volt/amp display and alarm relays in the battery charger. To be operational, the genset controller must support the charger's J1939 connection.

J1939 Charger Setup

Configure the charger for J1939 operation by placing jumpers on the ADDR and TERM jumper strips as described below.

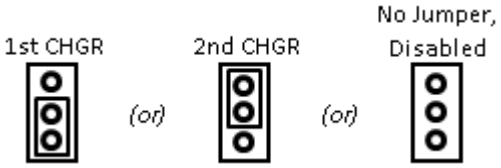
Figure 1 – J1939 Setup



ADDR Jumper

J1939 supports two battery chargers per network cable. Set the ADDR jumper on JP2 to position 1 for main charger or position 2 for auxiliary charger (see Figure 2). The jumper is set to position 1 by default. Remove the ADDR jumper to disable J1939 communications or enable PROGRAM MODE which engages settings programmed using the MicroGenius Setup Utility.

Figure 2 – J1939 ADDR Jumper Position



TERM Jumpers

Enable the TERM jumpers on JP3 if the battery charger is at the end of the J1939 cable and only if a separate terminator is not already in place (see Figure 3). Cable terminations are applied only at the ends of the bus. J1939 networks typically provide a separate termination attached to the cabling. To verify the termination status, measure DC resistance between CANL and CANH with the data cable connected ***and all devices on the J1939 CANbus powered off***. Interpret the resistance reading per Table 1. The jumpers are set in the disable position by default.

Figure 3 – J1939 TERM Jumper Positions

STORED ENERGY SYSTEMS 1840 INDUSTRIAL CIRCLE, LONGMONT, COLORADO 80501 303.678-7500 info@sens-usa.com
A LIMITED LIABILITY COMPANY www.sens-usa.com

111061 Rev B Date Issued: 9/29/14

Table 1 – J1939 Resistance Verification

Resistance (Ω)			Interpretation
Min.	Nom.	Max.	
N/A	N/A	45	More than two bus terminators; shorted or overloaded bus
46	60	80	Two bus terminations (normal reading)
81	120	140	One bus termination (connect or enable missing terminator)
141	N/A	N/A	No bus terminations; open or disconnected data cable

J1939 Connections

Connect J1939 wiring to terminal block TB4 in the charger (see Figure 1 and Figure 4). SAE J1939-11 recommends shielded twisted-pair for the CANbus cable. The terminals accept 28-16 AWG (0.08-1.5 mm^2) conductors. Tighten connections to 2.0 Lb-In (0.22 Nm). Route wiring at least ¼ inch (6 mm) away from DC wiring, AC wiring, and the circuit board. Typical installations only connect the CAN High and CAN Low wires.

Figure 4 – J1939 Connections

TB4-1: Ground*
TB4-2: CAN Data Low
TB4-3: Shield**
TB4-4: CAN Data High
TB4-5: Power*

*MicroGenius does not require this circuit. Terminals provided for power supply wires present in some installations.
**Shield terminal has a DC blocking capacitor. Connecting the shield will not produce a DC "ground loop" path.

Using J1939 Communications

See Table 2 for read-only information available using J1939. Charger operation parameters may not be configured using J1939 communications.

Table 2 – J1939 Read-only Information

J1939 Data	Details
Output Current	-1600.00 to +1612.75A in 0.05A increments, 0xFFFF = data not available
Output Voltage	0 to 3212.75V in 0.05V increments, 0xFFFF = data not available
Battery Charger State	0 = OFF, 1 = boost charge, 2 = float charge, 13 = battery failure/too hot/cold to charge, 14 = charger failure, 15 = N/A
AC Power Line State	0 = AC OFF, 1 = AC ON, 2 = sensing error, does not indicate power out of specification, 3 = N/A
Low Cranking Voltage Alarm*	0 = OK, 1 = Fail, 2 = sensor failure, 3 = N/A
Low DC Voltage Alarm*	0 = OK, 1 = Fail, 2 = sensor failure, 3 = N/A
High DC Voltage Alarm*	0 = OK, 1 = Fail, 2 = sensor failure, 3 = N/A
Battery Temperature Alarm*	0 = OK, 1 = Fail, 2 = sensor failure (open/shorted), 3 = N/A
Thermal Limit Alarm*	0 = OK, 1 = Fail, 2 = sensor failure, 3 = N/A
Invalid Settings Alarm*	0 = OK, 1 = Fail, 2 = sensor failure, 3 = N/A
Output Voltage Jumper Settings*	8 bits corresponding to JP1 output jumpers on circuit board: 0 = no jumper, 1 = jumper present

Optional, must enable SENS data extensions using MicroGenius Configuration Utility

STORED ENERGY SYSTEMS 1840 INDUSTRIAL CIRCLE, LONGMONT, COLORADO 80501 303.678-7500 info@sens-usa.com
A LIMITED LIABILITY COMPANY www.sens-usa.com

111061 Rev B Date Issued: 9/29/14