



**Speed Sensing:**

- (1) Input is to be used for a magnetic pickup (MPU) sensor, alternator, or tach output.
- (2) Not required if using AC Voltage for speed sensing.
- (3) The polarity of the inputs does not matter.
- (4) Use twisted pair shielded cable. Leave one side of shield unterminated.
- (5) If using a MPU:
  - (a) A shielded MPU is recommended.
  - (b) One side of the mag. pickup also has to be connected to ground in addition to the controller.

**CAN (TG350/TG410) and RS485 (TG410):**

- (1) A 120 Ohm impedance twisted pair cable is required.
  - (a) Examples are Belden 9841 (single twisted pair) and Belden 7895A (two twisted pair).
- (2) RS485 requires an extra wire or twisted pair in the cable for RS485 common.
- (3) To prevent noise affecting controller operations bring the shielded cable within at least 6 inches of the terminal. Closer to 3 inches is better.
- (4) Terminate the bus on each end with a 120Ohm resistor.
- (5) Ground the shield on one end. Leave the other end unconnected.

**AC Current (CTs):** If current readings are unstable try connecting the CT Common's to ground. Ensure the connecting wire is as short as possible.

**Sensors:** For hardware revisions below 2.0, if using non-isolated (one-wire) sensors connect sensor common to battery negative. Make connection at the same point the main ground connection is made.

**Switched Inputs:** For runs longer than 20 feet or in noisy environments place a relay in circuit close to controller to prevent false triggering due to noise. See the autostart example in this drawing.

**Switched Outputs:** Relay drivers. When using to trigger logic a 2.2 kOhm, 1 W resistor is required to be installed from output to ground to ensure the output goes to 0 VDC in off state.

Main Connector	
J4-1	+Battery
J4-2	+Battery
J4-3	Ground
J4-4	Ground
J4-5	Switch Input A
J4-6	Switch Input B
J4-7	Switch Input C
J4-8	Switch Output A
J4-9	Switch Output C
J4-10	Switch Output B
J4-11	Sensor Ground
J4-12	Sensor Input A
J4-13	Sensor Input B
J4-14	Sensor Input C

Expansion Connector	
J3-1	Switch Input D
J3-2	Switch Input E
J3-3	Switch Output D
J3-4	Switch Output E
J3-5	Switch Output F
J3-6	Sensor Power (5V)
J3-7	Sensor Ground
J3-8	Sensor Input D

Communication Connector	
J6-1	RS485-A
J6-2	RS485-B
J6-3	Reserved
J6-4	CAN High
J6-5	CAN Low
J6-6	CAN Ground
J6-7	Speed Input
J6-8	Speed Reference
J6-9	Reserved
J6-10	RS485 Ground

Generator Connector (A)	
J5-1	Gen. Current (A)
J5-2	Gen. Current (B)
J5-3	Gen. Current (C)
J5-4	CT Common

Generator Connector (V)	
J7-1	Gen. Phase A
J7-2	Gen. Phase B
J7-3	Gen. Phase C
J7-4	Neutral