

# Universal Vehicle Power Supply

9007AX01

**Installation Instructions**

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# About the Universal Vehicle Power Supply

The universal vehicle power supply kit provides filtered and regulated 12 VDC output power, as well as short circuit, over-voltage, and over-temperature protection. The vehicle voltage input range for this supply is 6 to 96 VDC.

## *Universal Vehicle Power Supply Requirements*

Computer	Computer Electrical Rating
Thor™ CV31	12 V, 2.1 A or 9-36 V, 5.1 A
CV41	7-12 V, 7.5 A
CV61	12 V, 4 A

## What You Get

The universal vehicle power supply kit includes the power supply, y-cable, and all of the necessary hardware to install the power supply.

## What You Need

You need these additional parts and tools:

- Common hand tools
- Wire crimping and stripping tool
- Electric drill and drill bits
- Heat gun
- Multimeter
- One of these adapter cables:
  - P/N VE027-8024-C0 (CV31 or CV61)
  - P/N 236-294-001 (CV41)
- (Optional for CV31) CV31 ignition sensing cable (P/N 236-316-001)

# About the Vehicle Voltage

Make sure that your vehicle's electrical system is in good working condition for all types of installations. The charging circuit must work properly and vehicle generated electrical "noise" must be minimized.

Excess electrical noise can be severe enough to defeat the electrical filtering that is built into Intermec products. Defective ignition wiring, damaged insulation, or a faulty vehicle electrical component can cause electrical noise, possibly causing unpredictable behavior in printers and docks.



**Note:** If the vehicle voltage is too high or too low, the Intermec equipment may not work.

## How to Secure Cables

When you install cables, follow these installation guidelines:

- Use the cable clamps or wire-ties provided to secure the cables at least every 46 cm (18 in).
- Do not secure cables to any moving parts on the vehicle. Make sure the cable is at least 15.2 cm (6 in) away from the exhaust system.

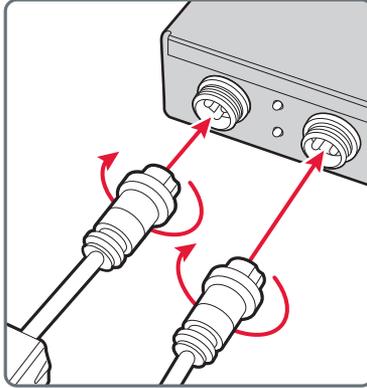
## How to Mount the Power Supply

Follow these installation guidelines:

- Select a mounting location that is convenient for the vehicle operator. Make sure that the cables can easily reach from the power source to the equipment.
- Provide 840 to 1030 sq cm (130 to 160 sq in) of metallic surface to disperse heat generated by the power supply.
- Make sure that the mounting location is thick enough to accept and retain the power supply.
- Use the provided hex bolts, lock washers, and locking nuts to mount the power supply.

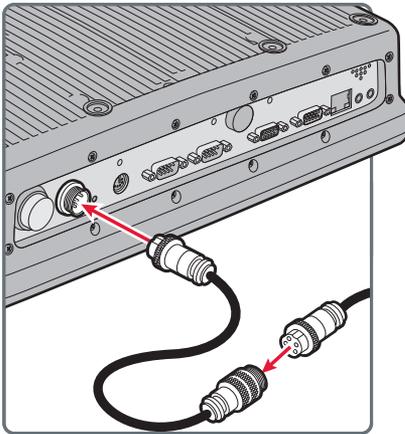
# Install the Y-Cable

- 1 Connect the 3-pin connector and the 2 -pin connector of the y-cable to the power supply.



- 2 Connect one of these adapter cables to the y-cable and the computer:

- P/N VE027-8024-C0 (CV31 or CV61)
- P/N 236-294-001 (CV41)

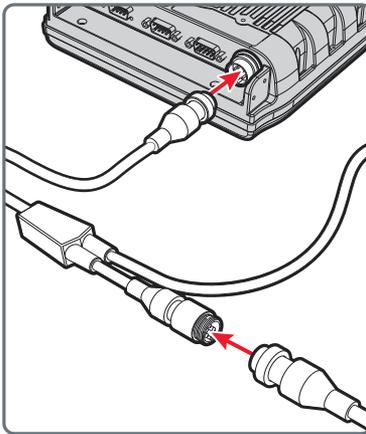


*This illustration shows connecting adapter cable P/N VE027-8024-C0 to the y-cable and a CV61.*

# Install the CV31 Ignition Sensing Cable (Optional)

Install the CV31 ignition sensing cable to automatically turn on the CV31 when the operator turns on the vehicle.

- 1 Connect the ignition (blue) wire to the ignition circuitry of the vehicle (up to 60 V).
- 2 Connect the grounding (black) wire to the vehicle chassis for electrostatic discharge (ESD) protection. If the vehicle chassis is not a suitable ground, connect the wire to the negative terminal of the power source.
- 3 Connect adapter cable P/N VE027-8024-C0 to the ignition sensing cable, and then connect the ignition sensing cable to the CV31.



# About the Vehicle Battery Cable

Follow these installation guidelines:

- The power supply can draw up to 0.25 A, even with no load. So, for gas-powered vehicles, you also need to install an On/Off switch with a minimum of 15 A DC rating or an automatic shut-off device in series with the inline fuse holder.
- Place the fuse link assembly as close to the vehicle battery as possible to protect the entire power cable and internal power supply of the computer from catastrophic short-circuit failure. If the fuse fails for any reason, replace it with a new fuse.



**Note:** If the fuse is blowing repeatedly, check the vehicle power to see if excessive voltage spikes are occurring.

## ***Replacement Fuse Specifications***

<b>Specification</b>	<b>Measure</b>
Type	3AB (0.25 x 1.25 in cartridge fuse)
Volts	250 VDC
Amps	20 A

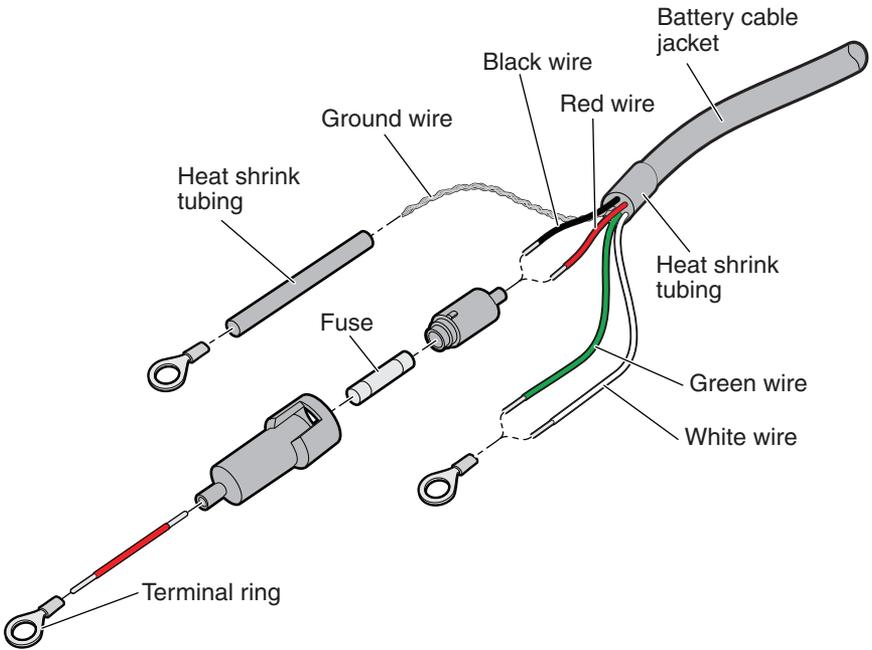
Optionally, you can also use one of these replacement fuses:

- 10 A to 14 V input
- 6 A to 36 V input
- 5 A to 48 V input or higher

# Assemble the Vehicle Battery Cable

- 1 Route the battery cable from the power supply to the vehicle battery.
- 2 Cut the battery cable near the battery leaving enough of the cable to reach the battery terminals.
- 3 Strip the battery cable jacket back 31 to 36 cm (12 to 14 in).

**4** Install heat shrink tubing on the battery cable jacket.



**5** Insert and secure the fuse in the fuse holder assembly.

**6** Assemble the negative wire:

- a** Strip 0.60 cm (0.25 in) of insulation from the green and white wires.
- b** Twist the wires together.
- c** Crimp a 3/8-inch terminal ring onto the wires.

**7** Assemble the positive wire:

- a** Cut a strip of red wire that is 5.08 cm (2 in) long.
- b** Strip 0.60 cm (0.25 in) of insulation from the red and black wires.
- c** Twist the wires together.
- d** Crimp the fuse block assembly to the wires.
- e** Crimp the red wire you cut to the other end of the fuse block assembly.

**8** Install heat shrink tubing on the braided ground wire.

- 9 Crimp a 3/8-inch terminal ring onto the braided ground wire.
- 10 Connect the 4-pin connector to the power supply.
- 11 Connect the battery cable to the vehicle battery. For more information, see the next section.

## How to Connect to the Vehicle Battery

The procedure you use to connect to the vehicle battery depends on the location of the battery terminal:

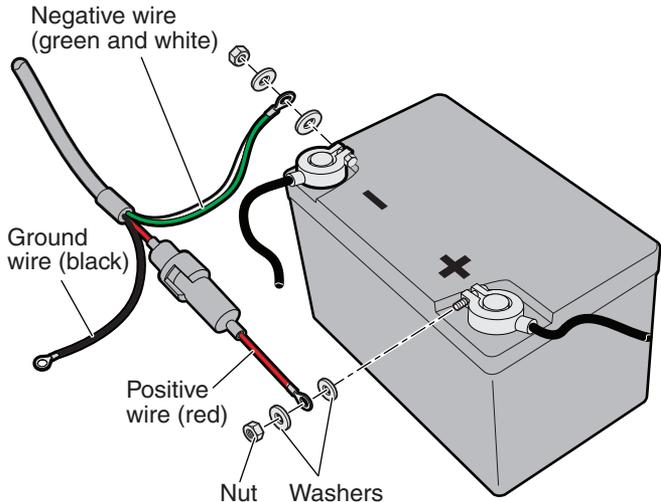
- Top
- Side



**Warning:** Verify that the cable to battery connections are correct. Electrical energy from vehicle batteries can harm equipment and people.

### Connect to the Top Battery Terminal

- 1 Remove the nuts and bolts from the positive battery terminal.



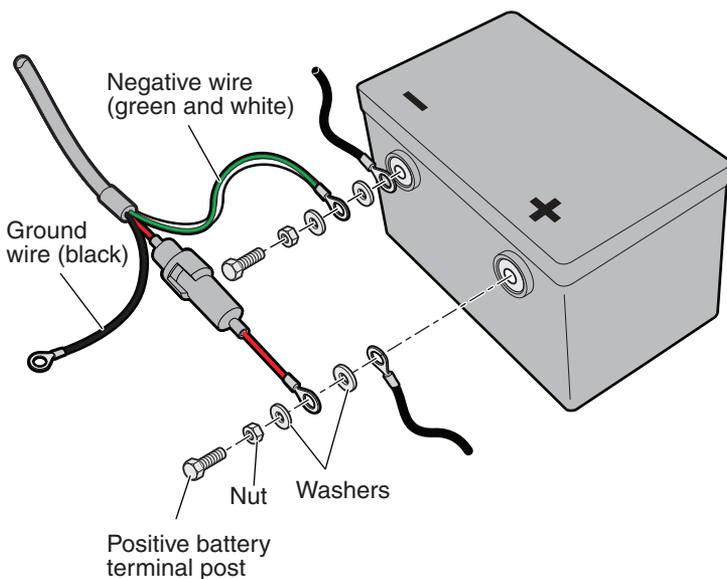
- 2 Place a 3/8-inch washer onto each end of the battery clamp bolt.

- 3 Slide the positive fuse link terminal ring from the input power cable onto positive battery clamp bolt.
- 4 Place another 3/8-inch washer onto the battery clamp.
- 5 Thread another 3/8-inch nut onto the battery clamp bolt and tighten the nut securely.
- 6 Repeat Steps 1 through 5 for the negative wire.
- 7 Connect the ground wire. For help, see [“Fasten the Ground Wire” on page 11.](#)

## Connect to the Side Battery Terminal

When you remove the battery terminal side post bolts from the vehicle battery, the vehicle computer and radio return to their default settings.

- 1 Remove positive battery terminal side post bolt from the vehicle battery.



- 2 Fasten a 3/8-inch nut to the 3/8 x 1-1/2-inch positive battery terminal post.
- 3 Place a 3/8-inch washer on the battery terminal post.
- 4 Slide the positive wire fuse link terminal ring from the power input cable onto the positive battery post.

- 5 Put another 3/8-inch washer on the battery terminal post.
- 6 Slide the positive battery cable on the post.
- 7 Insert the post assembly (Steps 2 through 6) into the positive battery terminal.
- 8 Tighten the battery terminal post securely.
- 9 Tighten the nut installed in Step 2 to secure the washers and cables firmly in place.
- 10 Repeat Steps 1 through 9 for the negative wire.
- 11 Connect the ground wire. For help, see the next section.

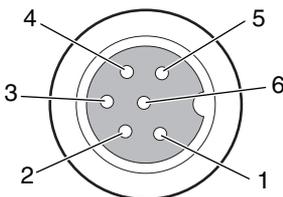
## Fasten the Ground Wire

The braided wire on the vehicle battery cable is the grounding strap. To ensure proper cable shielding, fasten the ground strap to the vehicle sheet metal.

- 1 Drill a small hole into the metal that you intend to fasten the ground wire to.
- 2 Use a punch to dimple and enlarge the hole until it is the same size as the screw.
- 3 Scrape off a small circle of paint around the hole to make sure bare metal is exposed.
- 4 Secure the wire with a #8 5/8-inch screw and flat washer.

## Power Connector Pin Assignments

The location of the pins for the CV31, CV41, and CV61 power connector are the same, but the port pin assignments are different. Non-regulated inputs require an external fuse.



**CV31, CV41, and CV61 Power Connector:** The CV41 connector is smaller in diameter than the CV31 and CV61 connectors.

### ***CV31 Power Connector Pin Assignments***

<b>Pin</b>	<b>Signal</b>	<b>Description</b>
1	GND	Chassis GND
2	Vin+	12 V regulated DC+ input
3	Vin-	DC- power return
4		Not connected
5	Ignition	Ignition sensing input
6	Vin+	9 to 36 V non-regulated DC+ input

### ***CV41 Power Connector Pin Assignments***

<b>Pin</b>	<b>Signal</b>	<b>Description</b>
1	Vin+	10 to 60 non-regulated DC+ input
2	Vin+	10 to 60 non-regulated DC+ input
3	Vin-	DC- power return
4	Vin-	DC- power return
5	GND	Chassis ground
6	Ignition	Ignition sensing input

### ***CV61 Power Connector Pin Assignments***

<b>Pin</b>	<b>Signal</b>	<b>Description</b>
1	GND	Chassis GND
2	Vin+	12 V regulated DC+ input
3	Vin-	DC- power return
4	Vin- heater	DC- power return for heated display
5	Vin+ heater	12 V regulated DC+ for heated display
6	Vin+	12 to 60 V non-regulated DC+ input

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