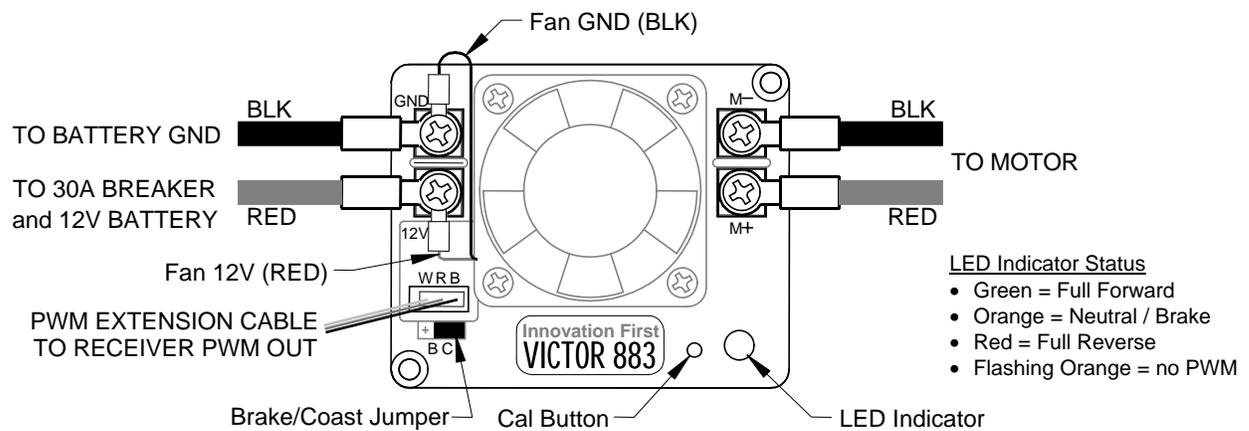


The Victor 883 is a speed controller specifically engineered for robotic applications. The high current capacity, low voltage drop, and peak surge capacity make the Victor 883 ideal for drive systems while its braking options and precise control meet the demanding needs of arms and lift systems. This controller safely handles the high continuous current draws and extreme current surges

produced by FIRST Competition robots. Innovative FET switching architecture and an integral cooling fan ensures cool FET junction temperatures. The low voltage drop and high switching speed ensures the motor receives maximum power, providing significant improvements in acceleration, direction changes, and lifting torque.



## Wiring Guidelines

You will need (4) #6 or #8 circle lugs (yellow) for 10AWG wire and (2) #6 or #8 circle lugs (red) for 20AWG wire.

1. The fan must be wired so it is always ON when the Victor 883 is ON.
2. Attach (2) 20AWG circle lugs to the fan wires and connect to the Victor 883 input terminals 12V and GND.
3. The input and output wires should be 10AWG wire and firmly connected to ensure low voltage drop and minimal temperature rise.
4. Use circle lugs designed for 10AWG wire. The lug should have a hole designed for a #6 or #8 screw. If the center hole is too large, (#10 or larger) inadequate mechanical contact may result in excessively high resistance and temperature rise.
5. Check all lug connection after crimping. You should not be able to pull the lug off the wire with your hands.

6. Once the input and output wires are firmly connected, tie the wires using tie straps within 2" of the Victor 883. This will ensure the wires do not move and loosen the connections.

### WARNING: BEFORE APPLYING POWER:

1. **Ensure the input connections are not reversed. Connecting 12V and GND backwards will destroy the unit.**
2. **Ensure that there is not a short circuit on the output. A short circuit will destroy the unit.**
3. **Ensure there is a 30A circuit breaker inline with the 12v power input to the speed controller. This ensures that long term exposure to a stalled motor will not overheat the Victor 883.**

## **PWM Connection**

You will need (1) PWM extension cable.

1. The male connector with the shroud connects to the Victor 883. Remove shroud if necessary.
2. The PWM extension cable should be installed with the black wire towards the fan.
3. Standard Radio Controlled PWM connectors are fragile. Use caution when inserting and removing the PWM cable so the contacts on both connectors are not damaged.

## **Mounting Guidelines**

You will need (2) #4 or #6 screws.

1. The Victor 883 can be installed in any orientation.
2. The Victor 883 must have adequate space above the fan for airflow. Recommended clearance above the Victor 883 is 2 inches.
3. Do not over-tighten the mounting screws through the Victor 883. A snug connection will hold the Victor 883 in place without crushing the case.

## **Calibration Instructions**

The Victor 883 is pre-calibrated to values compatible with the FIRST control system. No calibration is required for normal operation.

NOTE: While in calibration mode, the Victor 883 will record the maximum PWM value detected as 'full forward', the minimum PWM value as 'full reverse', and 'neutral' will be the PWM value recorded at the release of the Cal button. The following steps will guide you through this process.

### **User Calibration:**

1. Power ON the speed controller.
2. Press and hold the Cal button. After a moment, the indicator will begin alternating between RED and GREEN to indicate calibration mode.
3. While continuing to hold the Cal button, move the joystick to the maximum and minimum positions. This can be done in any order and as many times as desired.
4. While continuing to hold the Cal button, return the joystick to center (neutral position).

5. Release the Cal button.
6. A flashing GREEN indicator confirms a successful calibration.
7. A flashing RED indicator denotes an unsuccessful calibration.

An unsuccessful calibration occurs when either:

- a) Insufficient joystick travel was detected in forward and/or reverse.
- b) The trim tab is too far from center.

### **Resetting Calibration to FIRST Pre-calibration:**

1. Power OFF the speed controller.
2. Press and hold the Cal button.
3. While continuing to hold the Cal button, Power ON the speed controller.
4. A flashing GREEN indicator denotes calibration is reset. Release the Cal button.

## **Brake / Coast Configuration**

The Brake / Coast jumper is used to set the Victor 883's action during a neutral condition. The Brake provides significant resistance to motor rotation and is recommended for motors driving linkages and arms that can be back-driven by gravity or other external forces.

The Victor 883 checks the status of the jumper approximately 60 times per second. This allows the user to change from brake to coast during operation. A limit switch may be connected to the jumper connector instead of the jumper. The limit switch can be triggered by various means including the use of a servo. Refer to the Application Note section on the Innovation First web site for detailed instructions.

### **Brake / Coast Guidelines:**

1. The jumper should always be installed in either the Coast or Brake position. If you lose the jumper, a standard computer jumper will work.
2. If no jumper is installed, the Victor 883 will default to a Brake condition.
3. The Coast condition sets the output to an open circuit during neutral.
4. The Brake condition sets the output to a short circuit during neutral.

## Troubleshooting

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Indication: No ORANGE indicator on power up.

Problem: Input power issue or joystick trim tab off center.

Possible Solutions:

1. Disconnect PWM cable.
  2. If indicator blinks ORANGE, the PWM value that was being received is either between 'neutral' and 'full forward', or between 'neutral' and 'full reverse'. Check joystick trim tab to ensure the controller is not in a partial forward or a partial reverse condition. If no change, check that the joystick and receiver channels match.
  3. If indicator remains off, check 12V or GND connections for voltage and proper polarity.
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Indication: Flashing ORANGE indicator on power up.

Problem: No PWM signal.

Possible Solutions:

1. Ensure the FIRST receiver is powered ON.
2. The PWM cable may be improperly connected. Check wire color-coding at each end. Check that the connector is not off a pin at the Receiver end.
3. Check for a good PWM signal by connecting a known good servo to the PWM extension cable. If the servo does not move, this can indicate either:
  - a) a blown fuse in the FIRST receiver
  - b) an improperly connected cable
  - c) a bad PWM extension cable

Note: The servo requires that 5V be present on the center pin of the PWM cable. This connection is not required for the Victor 883. Fuse F18 supplies this 5V.

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Indication: Flashing RED indicator after calibration.

Problem: Calibration Failed.

Possible Solutions:

1. Inadequate travel in forward or reverse. Repeat the calibration procedure and move the joystick further forward and/or further reverse.
  2. The joystick trim tab is NOT centered. Neutral cannot be extremely far from center.
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Indication: No power output from the speed controller although the indicator works.

Problem: Possible internal damage.

Possible Solutions:

If the indicator on the Victor 883 is operating properly and there is no output, the Victor 883 may be internally damaged. This condition is typically caused by a short circuit on the output.

Check the following:

1. Ensure the indicator is changing between ORANGE, RED and GREEN with joystick movement.
2. Disconnect the motor and check the output (M+ to M-) with a voltmeter. The meter should read between -12V and +12V.

If the indicator is working properly and the outputs are not working properly, the speed controller is probably damaged. The final test to determine if the Victor 883 is damaged is to replace it with another Victor 883.

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Indication: No power output from the speed controller and the indicator does NOT work.

Problem: Possible internal damage.

Possible Solutions:

If the indicator on the Victor 883 is not operating properly and there is no output, the Victor 883 may be internally damaged. This condition is typically caused by reverse polarity on the input.

Check the following:

1. Disconnect the output wires.
2. Ensure the indicator on the Victor 883 will not illuminate at any joystick position.
3. Check the input at the Victor 883 (+12V to GND) with a voltmeter.

If the indicator is not working properly and the input is good, the speed controller is probably damaged. The final test to determine if the Victor 883 is damaged is to replace it with another Victor 883.

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**CAUTION: Prior to replacing a potentially damaged speed controller, ensure that the wires connected to the output are not shorted and the input is not reversed. Also verify that neither of the motor output leads are shorted to the chassis of the motor and/or the robot.**