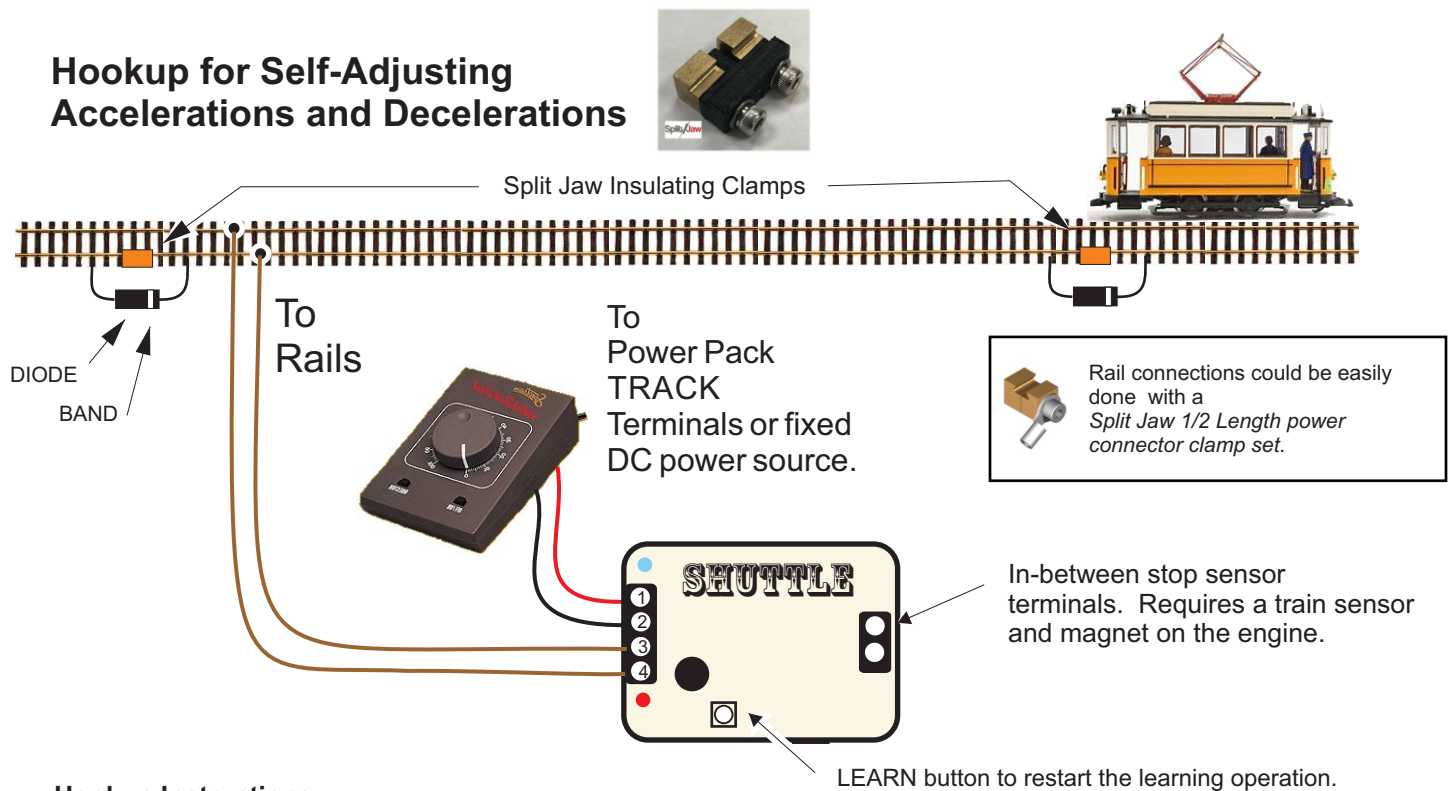


# Self-Adjusting SHUTTLE

## V3 Diode Operations

### Hookup Instructions

The Shuttle works with all DC trains, or DCC trains when a PWM to DC converter is installed. AC trains cannot be controlled.



#### Hookup Instructions:

- 1) Attach terminals 1 & 2 to the TRACK terminals on the transformer. If the Shuttle does not light up then reverse the direction on the transformer.
- 2) Attach terminals 3 & 4 to the rails. No polarity.
- 3) Attach diodes to the end sections as shown above. This is where the last wheel of the train will stop. Replace the track connectors with insulating clamps and diodes. Note the band location on the diode. There must be a gap in the rail where the isolator is located. If the train does not stop after passing the diode then reverse the diode so the band is on the other side or check that the rails are not touching.
- 4) Turn the transformer up to the desire speed of the train. This should be over 7 volts to operate. If the desire speed is very slow the Shuttle will not be able to operate. In this case, advanced programming is needed which is not covered here.
- 5) Sit back, and watch! The Shuttle will run back-and-forth, self-adjusting each time until a perfect run is obtained. It will sometimes stop short, or will run too fast, but will eventually settle into a nice run after a few cycles.

## Self-Adjusting

# SHUTTLE

## V3 Diode Operations

### *Tips and Tricks*

#### **Why doesn't the train stop after the engine crosses the diode?**

- The band on the diode is backwards. A diode is an electronic "check valve". Just install with the band on the other end.
- Lighted coaches are sensed as a "train" and prevents stopping until the last car is "not sensed".

#### **Why doesn't the train start up again after the time delay?**

*The small blue train detect LED should go on when the train is sensed. If not...*

- Dirty track. An easy fix.
- The wheel pickups are not working for all the wheels on the engine.  
This is a tricky one... if the train reverses on one side but not the other then this most likely the cause. If the engine is turned around and then the *other* side doesn't run then this could be the cause. Make sure all wheels have good electrical contact to the rails. Rubber traction tires could also cause problems if some wheels have poor contact.
- A bad motor in the engine.  
DC motors have brushes and "windings" that advance the motor. If a motor is damaged and a winding is bad, the motor will run at speed but will sometimes stall while accelerating. If the train runs after a push then this could be the issue. This would be a "sometimes" problem depending on where the motor stopped in relation to the bad winding.

#### **Why does the train stop short when running to an end?**

- This is a normal operation while the Shuttle is learning. It is trying to determine how slowly it can run to the end. The Shuttle will give up after a few seconds and then just continue, so just let it run. Each time the Shuttle is turned on the input voltage could have changed, so it has to figure out the creeping speed again. Each time this happens it knows go run a little faster on the next cycle.

#### **Why are the in-between stops fixed at 10 seconds?**

- The self-adjusting Shuttle measures the time it takes to go from end to end. If the in-between stops were adjustable then it would have to restart the learning operation every time the dial was touched. In addition, long delays would affect the learning process because the back-and-forth time could be very large.