RR Concepts

Self-Adusting SHUTTLE V3

Back-N-Forth Controller - Version 3

The RR Concepts SHUTTLE V3 can perform hands-off, back-and-forth operations using realistic accelerations and decelerations. By using end of track sensing, no programming or adjusting is needed. Just place the train on the track and power up.

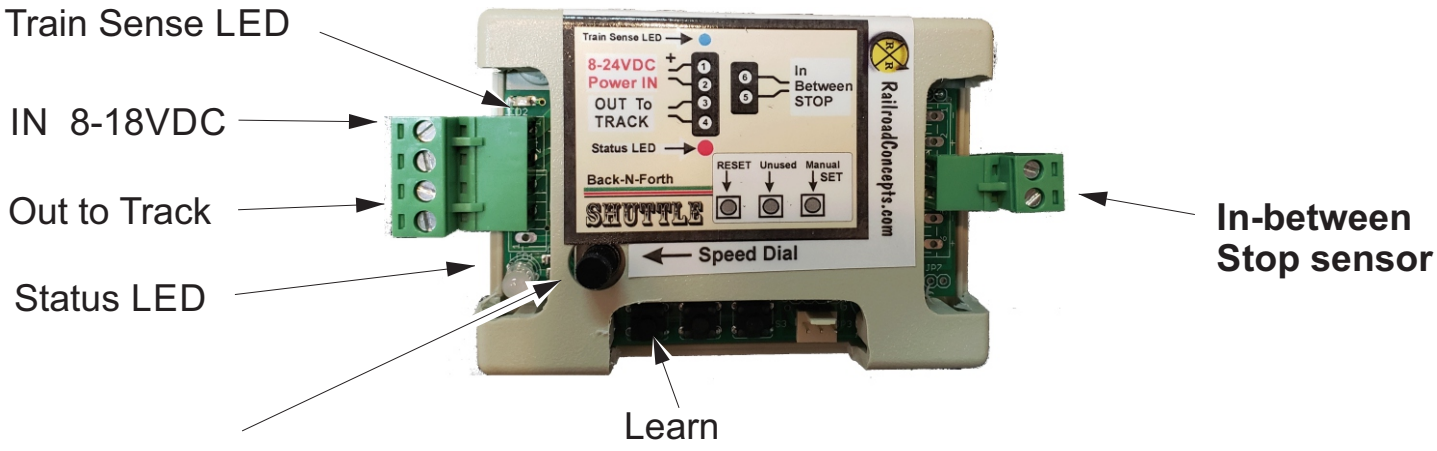
The RR Concepts SHUTTLE V3 can control DC trains or DCC trains when used with a *PWM to DC conversion unit.* The V3 Shuttle is designed for Large Scale trains, however any scale scale train from Z to G could be run with the Shuttle V2 version because it has manual mode.

Before we Start- Please do not attach power wires (from your power pack or transformer) to any other terminals except the designated input pins 1 and 2.
Your SHUTTLE will be damaged if power is put on any terminal other than 1 and 2.

ONLY ATTACH WIRES WHILE THE POWER IS OFF.

Quick-connect terminals allow easy swap-out and removal of the electronics while leaving the wires in place. The RR Concepts Magnet/Screwdriver tool is recommended for wire-up and testing.

See decal on the bottom for Instructions



The Shuttle V3 is the perfect solution for a simple Back-and-Forth operation and the self-adjusting software will provide realistic starts and stops. For more advanced users, the V2 version will provide self-adjusting in addition to more features including adjustments for acceleration/deceleration, longer time delays, multiple train operations, higher input voltage, and manual mode control for any scale train.

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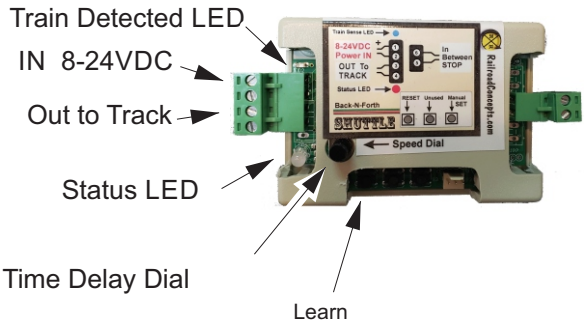
Self-Adjusting SHUTTLE V3

Hookup Instructions

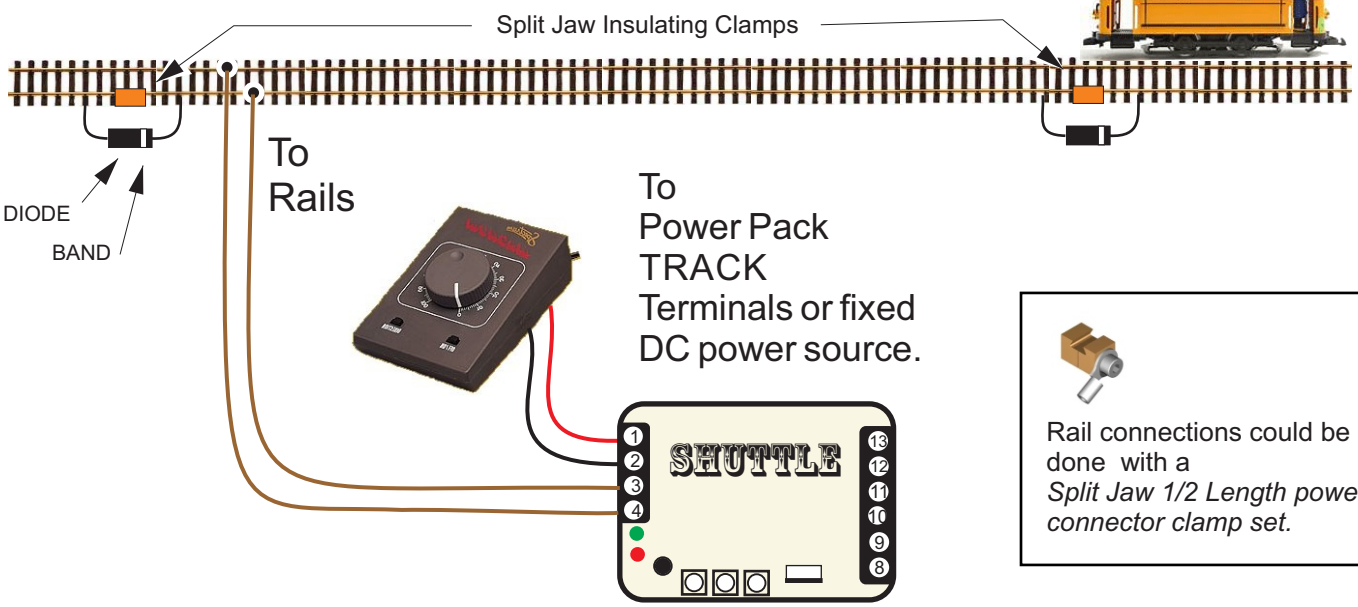
The Shuttle works with all DC trains, or DCC trains when a PWM to DC converter is installed. AC trains cannot be controlled.

Shuttle CONNECTIONS and CONTROLS



See the bottom label for operating instructions.

Hookup for Self-Adjusting Accelerations and Decelerations



Rail connections could be easily done with a *Split Jaw 1/2 Length power connector clamp set.*

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 train will stop. Replace the brass connectors with insulating clamps and diodes. Note the band 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. If the desire speed is *very* slow the Shuttle will not be able to operate. In this case, turn the transformer up to a faster speed and set the Shuttle into "Speed Mode". "Speed Mode" is also used when a fixed DC power source is used.

5) Sit back, and watch! The Shuttle will run back-and-forth, self-adjusting each time until a perfect run is obtained. It might stop short, or run too fast, but will settle into a nice run after a few cycles.

See the online manual for in-between stops, super smooth operations, fixed voltage DC power sources, and more.

manuals.RRconcepts.com

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Self-Adjusting
SHUTTLE

Operations

Fully Automatic Mode:

Instructions: Let the train run and watch!
Here's what is happening inside the box:

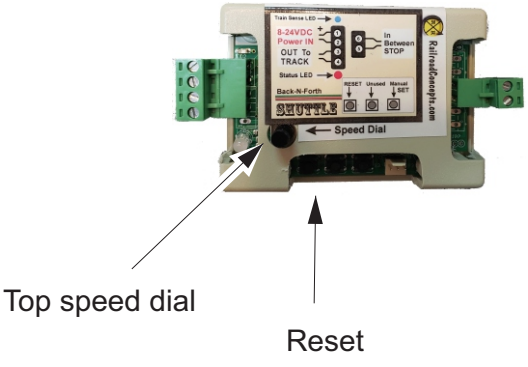
Learning Mode:
The Shuttle remembers and will resume running on each power up. The "Learn" button will restart the learn operation and look for the ends of the track. Another way to initiate a learn is to turn off power before 5 seconds. ***If the Shuttle button cannot be easily pressed, then a power up/power down sequence will simulate the button.***

When the learn starts, the LED will turn WHITE or BLUE and the Shuttle will run the train back-and-forth at full speed three times, measuring the distance between the ends. If no train is sensed for the first 10 seconds, then the Shuttle will reverse and run in the other direction. This could be the case where the train starts up inside of a diode section.

Running Mode:
After learning is complete the Shuttle will self-adjust ***each time*** until a perfect run is obtained and the train is running realistically. The self-adjusting allows anyone to change the speed of the train and the Shuttle will self-adjust to the new speed. The train may stop short a few times, or come to the ends faster than expected, but the Shuttle will eventually run perfectly and realistically.

Creeping Into the Ends:
When approaching the ends, the Shuttle will decelerate the train and then creep until reaching the end.

Top Speed Adjustment:
The top speed of the train is set by either adjusting the transformers throttle, or by setting the Shuttle into "Speed Adjust" mode described later in this manual. "Speed Adjust" mode is also used when a fixed voltage DC power source is used.



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Wiring Details

Input Power

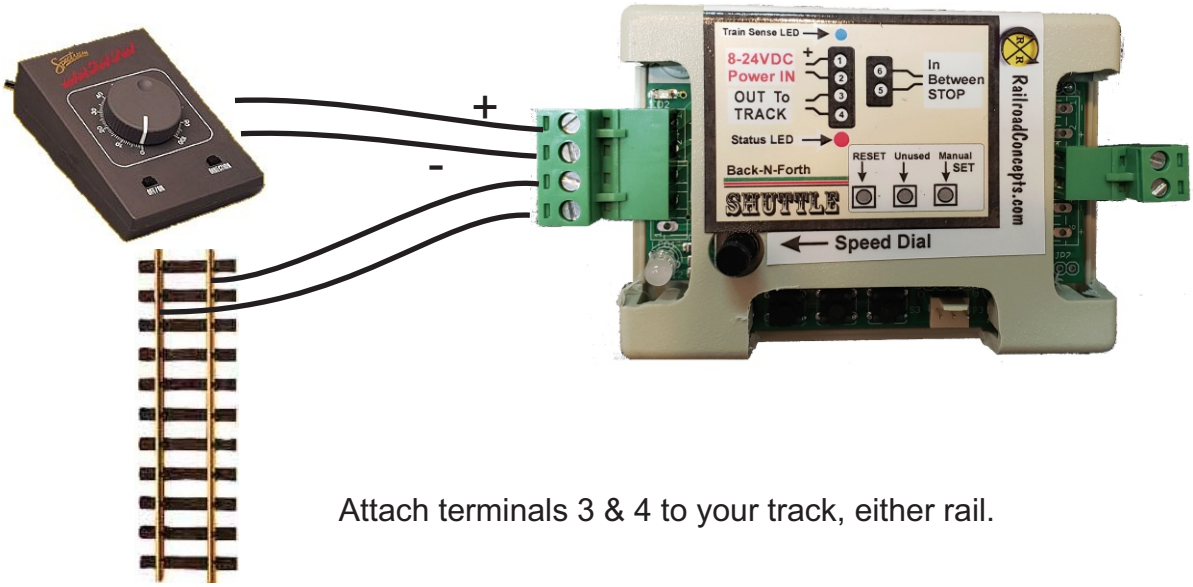
The Shuttle is usually installed between the train transformer and the track, however a fixed DC power source could also be used. The Shuttle V3 can accept voltages up to 18 volts, however the Shuttle V2 version can accept up to 24 volts.
In all cases the voltage should be pure DC and not “pulsed” or PWM. Some electronic speed controllers use pulsed voltage which may not be compatible with the Shuttle. Please use a “PWM to DC converter” if a pulsed transformer is used. If there is a momentum switch on the transformer then it is using a pulsed operation.

Variable Speed Transformer Hookup:
Attach terminals 1 & 2 to your transformer's DC output (Sometimes labeled as TRACK) and set the throttle to the running speed of the train. If the running speed of the train is very slow (under 8 volts), then turn up the throttle on the transformer and put the Shuttle into “Speed Adjust” mode.
If the Shuttle does not light up then reverse the direction on the transformer.

Fixed Voltage Source Hookup:
Since the Shuttle controls the speed of the train, a variable speed transformer is not required and a fixed DC power source could be used. Usually a 12 volt DC power source is a perfect solution and these can be obtained quite inexpensively. Attach the voltage source to pins 1 and 2 and put the Shuttle into “Speed Adjust” mode. If the Shuttle does not light up then reverse the wires on pins 1 and 2.

Output Conenction

Connect terminals 3 and 4 to the track, either rail.



Attach terminals 3 & 4 to your track, either rail.

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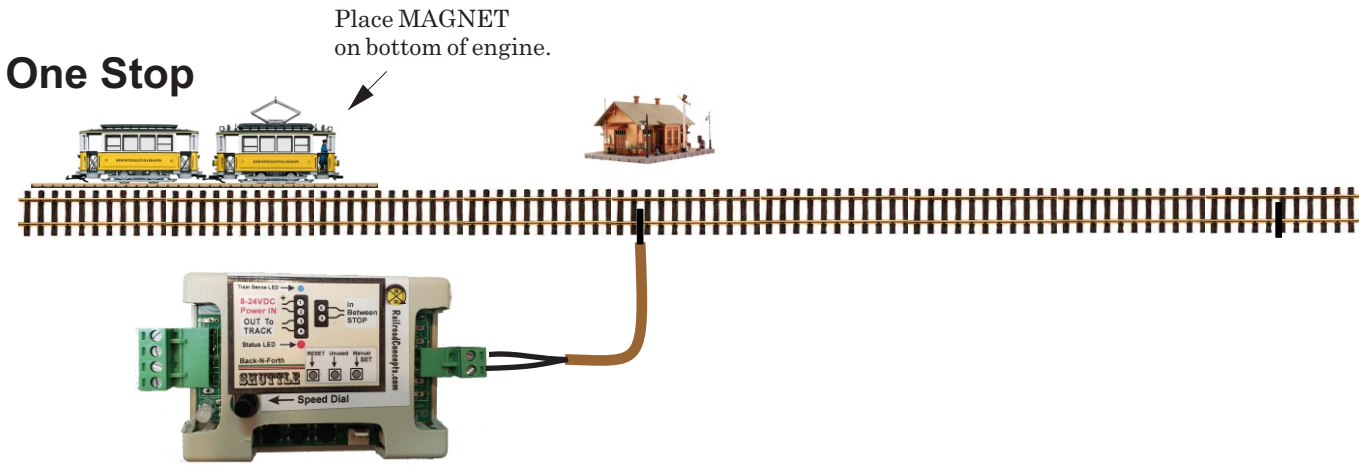
In-Between Station Stops

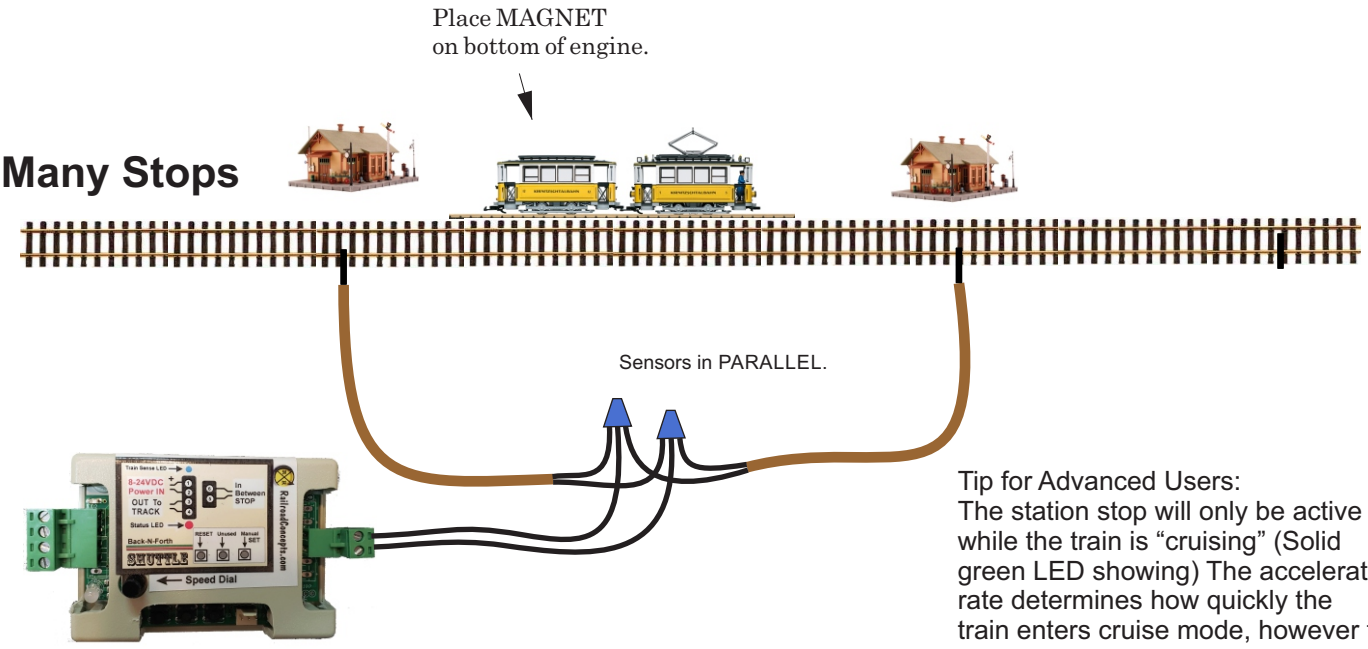
For in-between stops, attach a sensor to the in-between stop terminals. When the magnet on the train triggers the sensor the train will pause at the station.
For more than one stop add more sensors in parallel.

Note that The deceleration rate is rapid and the time duration for the stop is fixed. This allows the train to stop at approximately the same location for each direction. The acceleration will be smooth.

One Stop



Many Stops



Tip for Advanced Users:
The station stop will only be active while the train is “cruising” (Solid green LED showing) The acceleration rate determines how quickly the train enters cruise mode, however this cannot be changed in the V3 Shuttle.
If the station stops are very close together then a V2 Shuttle is recommended so the acceleration rate can be changed.

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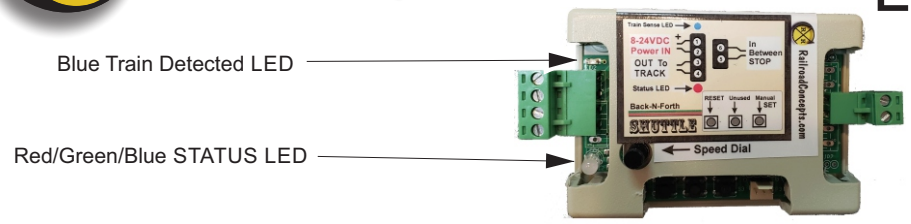
LED indicators



Status LED ○ White. Train is running to an end for the first time. In-between stops will hot happen. If a train is not sensed after 10 seconds then the Shuttle will reverse.

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Status LED ● Blue Not Flashing:
In Automatic Mode: Shuttle is performing the learn operations.
In Manual mode: button #3 must be pressed to set location where deceleration will start.

Status LED ● Green:
Flashing: Train is accelerating.
Not Flashing: train is “cruising” and an in-between stop could be done.

Status LED ✳ Red Flashing: Train is decelerating and operating normally.

Status LED ● Orange flashing: Train is creeping into the diode section. If the train is stopped it will accelerate and run to the diode after a delay, and then increase the creep speed for next time

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Status LED ✳ Red and blue blinking indicates a SHUTDOWN due to an **over-current** or **stalled t**rain.
To recover: Turn power off then back on ***or press and hold button #1.*** If the condition returns after recovery then check for a short circuit on the track or turn off the shutdown feature.

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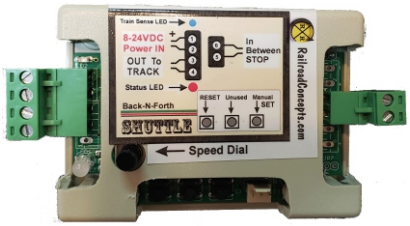

Programming:
Pause Time

After the train has entered the diode sections the pause time will start. This time is set with the dial and can be changed at any time unless the Shuttle is programmed for “Speed Mode” described later in this manual.

- When the train is running, turn the dial fully clockwise. This will set the pause for 5 minutes. Purple will flash.

- During the pause state, turn the dial counter-clockwise until the desired color flashes:

Green	**:**	**5 Seconds**
Blue	**:**	**10 seconds**
Orange	**:**	**20 Seconds**
White	**:**	**1 Minute**
Purple	**:**	**5 Minutes**

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Programming: Advanced Settings

- **Speed Mode**
- **Slow Creep**
- **Shutdown Disable**

The RR Concepts Shuttle V3 allows setting advanced features which includes "**Speed Mode**", "**Slow Creep**", and "**Shutdown Disabl**e".

Speed Mode is used when a fixed voltage DC power source is used instead of a variable speed throttle. The dial will set the top running speed of the train. This can also be used when the train needs to run very slowly.

To turn on "Speed mode":
1. Set the dial to the desired TIME DELAY setting. This time will be recorded and used when running. The dial will no longer change the time delay.
2. Press and hold button #`1 for more than 5 seconds. An **orange** LED will show.
3. After 5 seconds the time delay setting will be recorded AND the Shuttle will be set for "Speed Mode".
4. When running, turn the dial to the desired speed of the train.

"Slow Creep": will tell the Shuttle to run the train into the diodes as slow as possible. This will take more time to settle in, but will result in a very slow creep into the diodes.

T**o Turn on "Slow Creep"**
1. If not already set, turn on "Speed Mode". The dial will be used for the running speed of the train.
2. Turn the dial fully **counter-clockwise.**
3. Press and hold button #1 for 5 seconds.
4. A **blue** LED will show. Release the button.

"Shutdown Disable" will not shut down the Shuttle when an over-voltage condition is encountered. This is sometimes necessary when a very low amperage power source is used.

To Turn on "Shutdown Disable":
1. If not already set, turn on "Speed Mode". The dial will be used for the running speed of the train.
2. Turn the dial fully **Clockwise**,
3. Press and hold button #1 for 5 seconds.
4. A **red** LED will show. Release the button.

To turn these off, perform a factory reset.
To perform a factory reset, **power down, press and hold button #1**, and **power up with the button pressed**.

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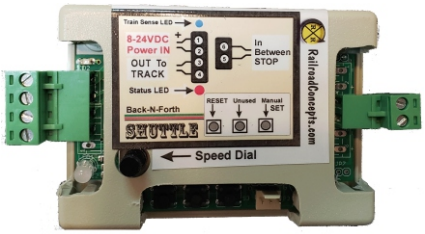
Factory Reset



To set the Shuttle back to factory defaults perform the following:

1:Turn off power

2. Press and hold button #1

3 Power up with button #1 pressed.

Sensor Placements on Track

The suggested sensor placement on track is shown below with the train magnet installed in the center of the train. Best sensing is done with the magnet passing over the tip of the sensor.