



RR-Concepts

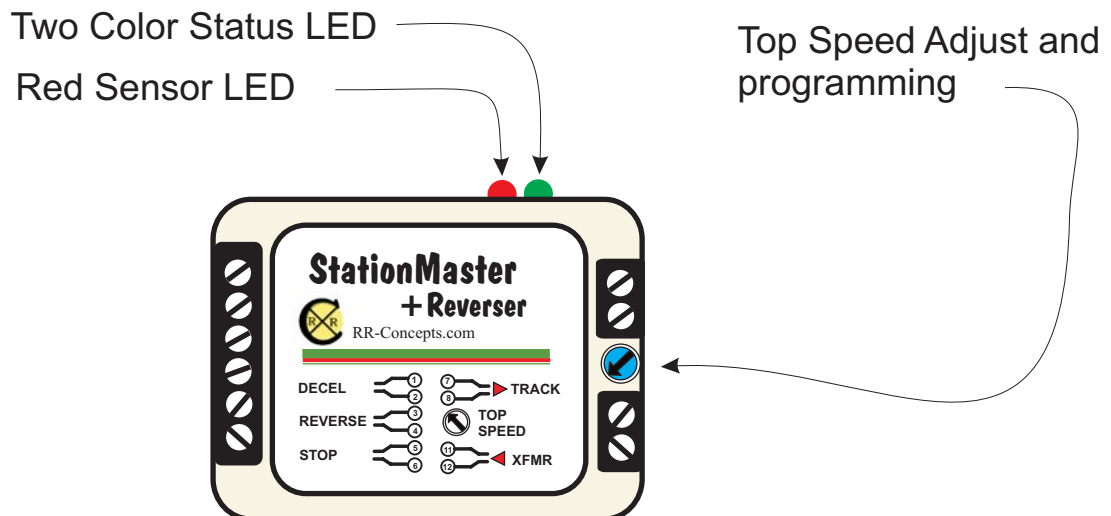
StationMaster Reverser

This manual contains detailed hookup and programming instructions for the StationMaster Decelerator Reverser.

Please download the most recent “wire-to-wire” hookup diagrams at <http://www.RR-Concepts.com>.

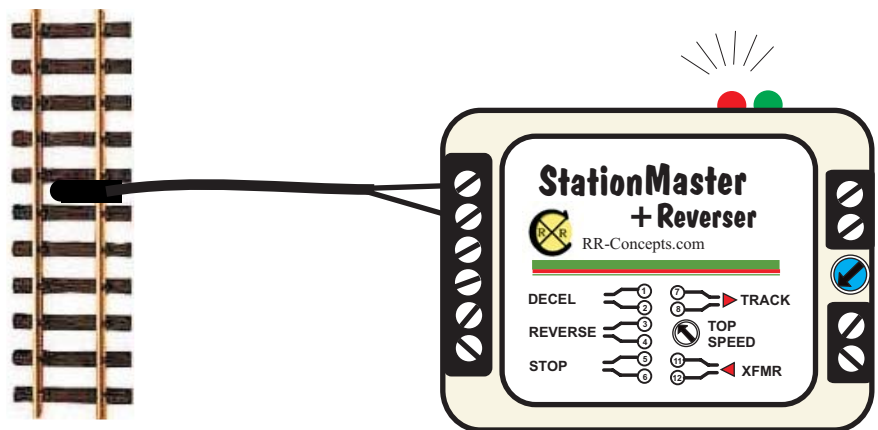
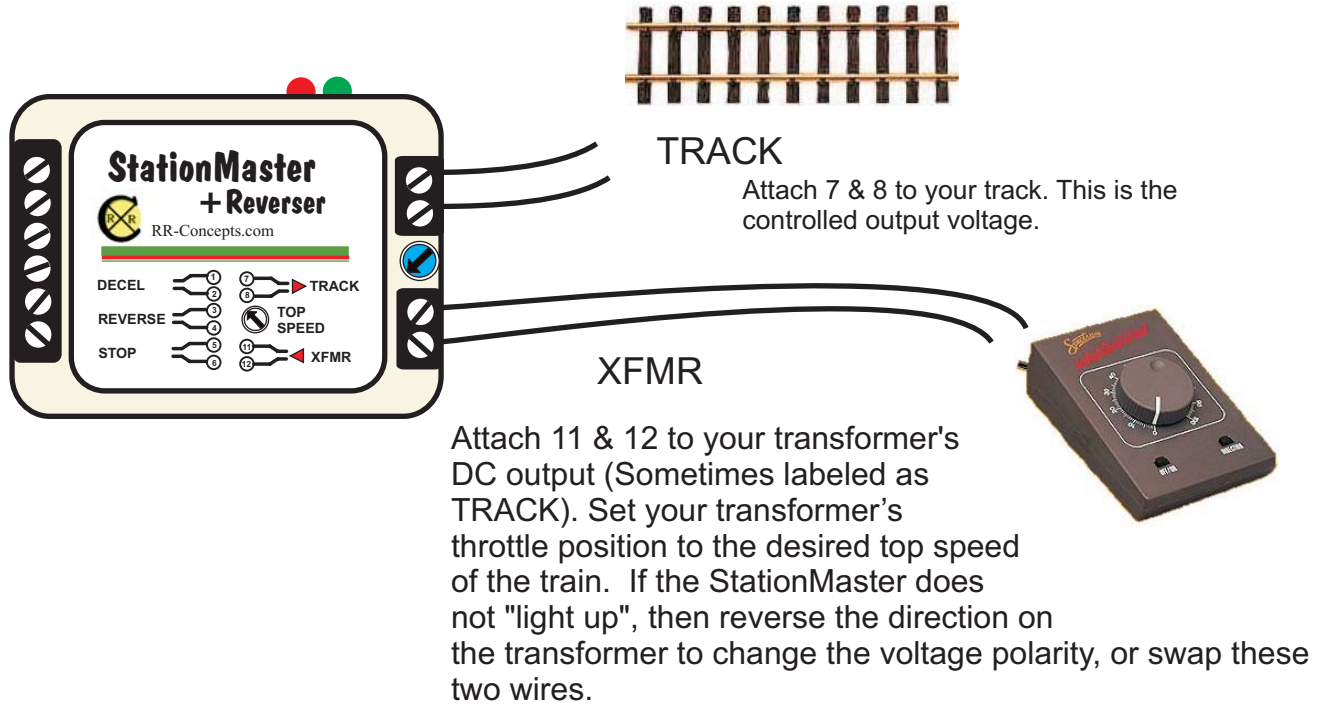
Before we Start- Please do not attach XFMR wires (from your power pack) to any other terminals except the designated transformer inputs. (XFMR) Your StationMaster will be damaged if power is put on any of the sensor terminals!!

Remember that your StationMaster contains a micro controller and can be reset by cycling the power. To do this, turn your transformer off for a few seconds, and then turn it back on.



StationMaster Basic Hookup Description

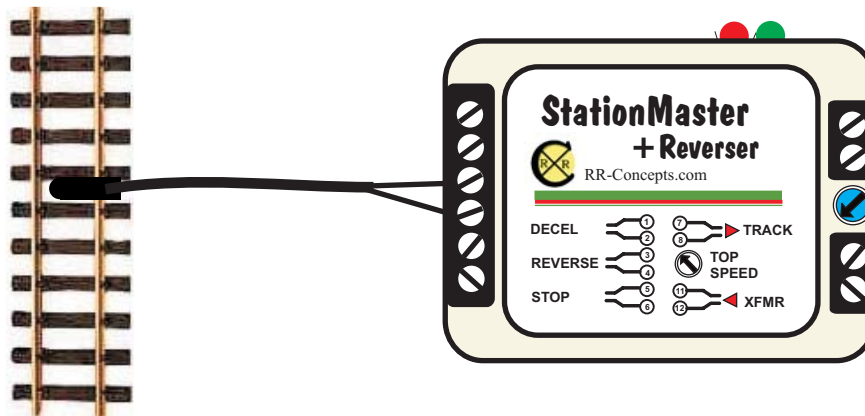
The StationMaster is designed to be installed between the train transformer, and the track.



DECEL Sensor

Terminals 1 & 2 are the start DECEL sensor.

When this sensor detects a magnet, the StationMaster will decelerate your train, pause, and then accelerate in the same direction. The RED led will light up when this sensor is detected. By placing multiple DECEL sensors wired in parallel, you can stop at multiple stations on your railroad.

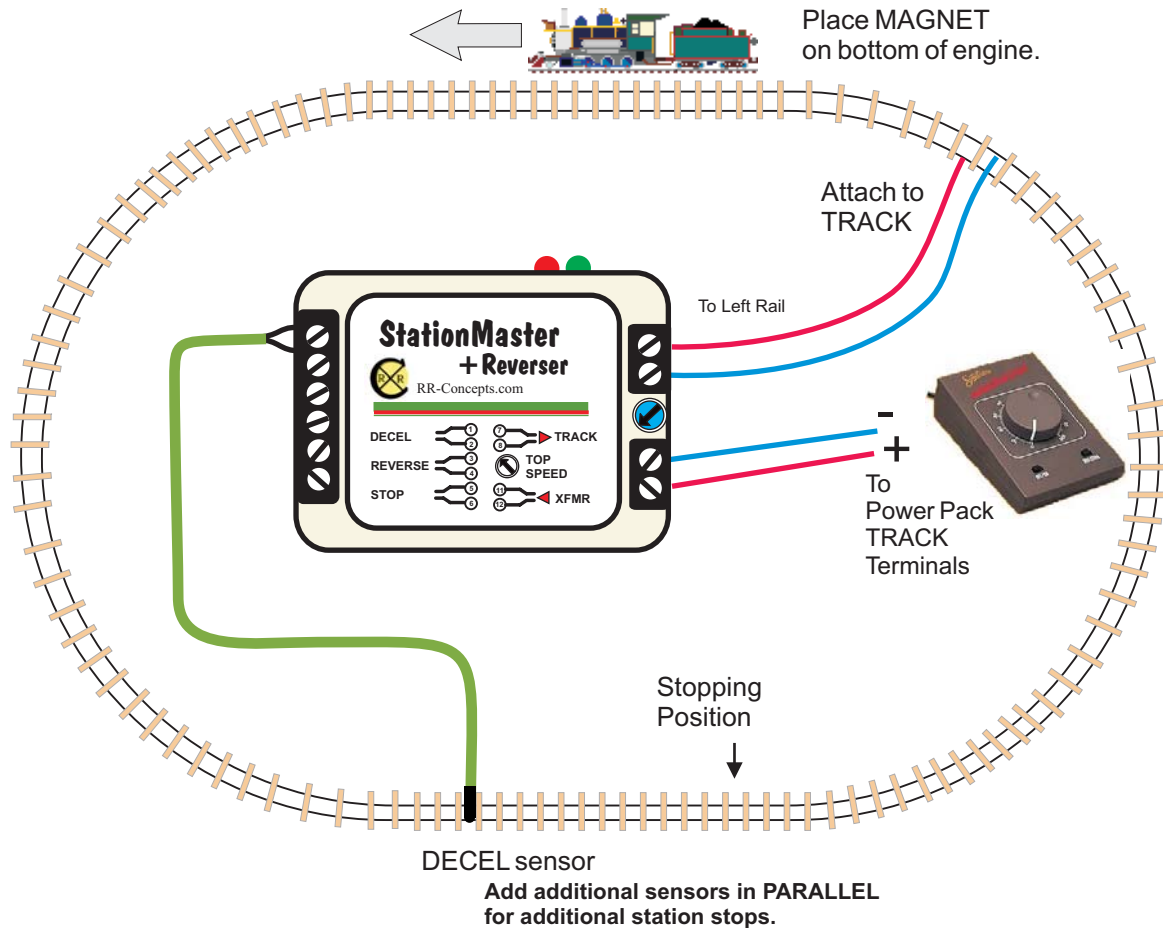


REVERSE Sensor

Terminals 3 & 4 are the REVERSE sensor.

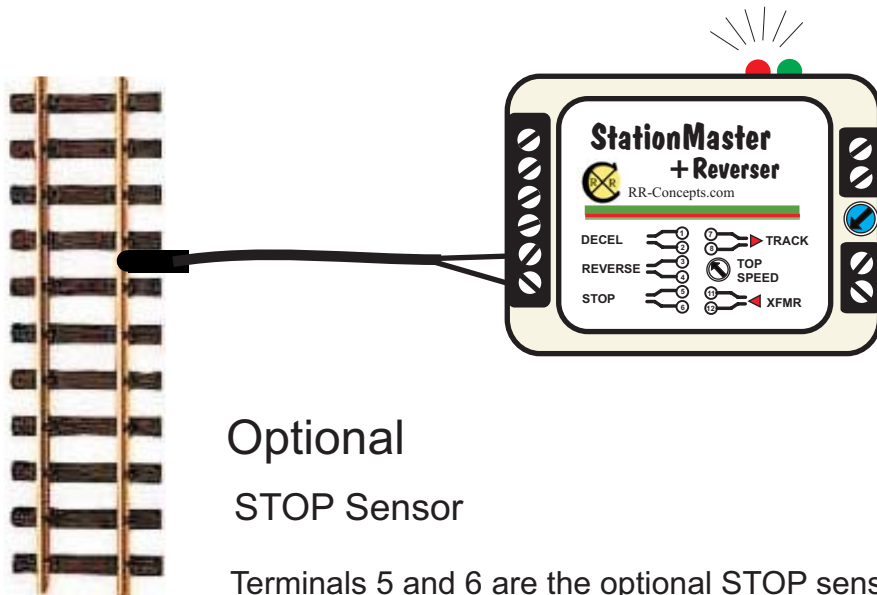
When this sensor detects a magnet, the StationMaster will decelerate your train, pause, reverse direction, and then accelerate. The RED led will light up when this sensor is detected. By placing two DECEL sensors at extreme ends wired in parallel, the train will do a simple back and forth operation. See the hookup diagram for more details.

Basic Non-Reversing Hookup Diagram for Automatic Station Stops with Deceleration/Acceleration



For a simple station stop, this is all you need to do!

StationMaster/Reverser should be programmed for non-reversing mode. See following pages for programming the deceleration, pause, and acceleration times.

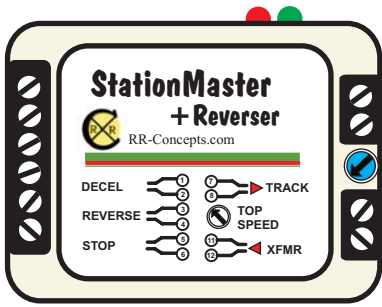


Optional STOP Sensor

Terminals 5 and 6 are the optional STOP sensor.

When the train is decelerating and this sensor detects a magnet, the train will immediately STOP. This sensor is not necessary unless a critical stop position is required.

Note that this sensor will have no effect unless the train is decelerating.



Top Speed Adjust

The top "cruising" speed of the train can be adjusted by turning the "top speed" dial.

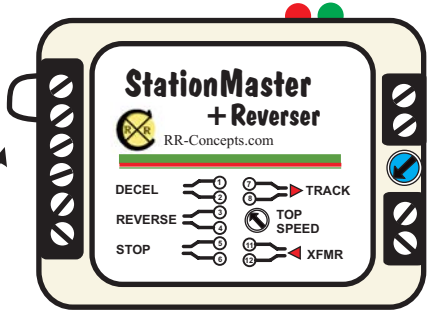
Fully clockwise is "full speed". Turn this dial down as necessary to obtain the desired speed.

Typically, this dial is set fully clockwise and the transformer is used to set the speed of the train.

If you have a fixed DC power supply, then use this dial to set the top speed of your trains.

To program your StationMaster, turn this dial fully counter-clockwise to enter "programming mode".
(See below)

Programming: Deceleration Rate



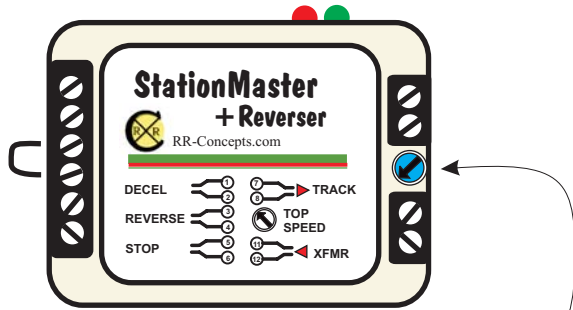
1. Make sure all three sensor inputs are open. (Red "Sensor" LED is off)
2. If the top speed dial is not already at zero, then turn the top speed dial to zero. (fully counter-clockwise.) All LED'S will turn off.
3. Close terminals 1 and 2. (Either place a magnet over the **DECEL** sensor, or touch terminals 1 and 2 together with a piece of wire or a paperclip) Keep these terminals closed.

4. Watch the TWO COLOR led. Each **RED** flash will increase the deceleration distance. ***The shortest deceleration Distance will be with one flash.*** (**TRAIN Stops fastest**) Open the terminals when the desired number of flashes have occurred. A typical number is 5. Repeat this procedure if you want a different value. The LED will blink rapidly when the longest Deceleration rate is set. After the programmed number is set the StationMaster will echo the number of blinks. Please wait until the echo has finished before programming the next number.

When finished with all programming, increase the top speed dial clockwise to MAX, and then down to a desired top speed. Notice that the dial must be set to MAX to exit programming mode.

All programming values are stored in flash memory. This means that once you program your StationMaster, it will never forget!

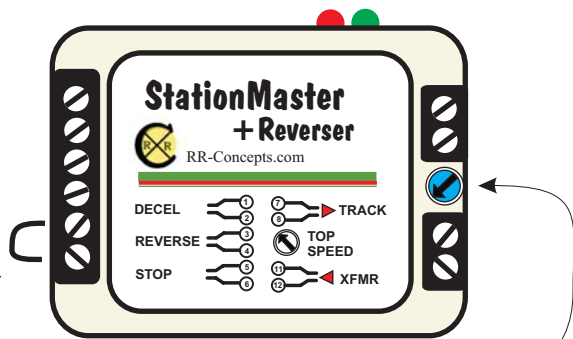
Programming: Acceleration Rate



1. Make sure all three sensor inputs are open. (Red "Sensor" LED is off)
2. If the top speed dial is not already at zero, then turn the top speed dial to zero. (fully counter-clockwise.) All LED'S will turn off.
3. Close terminals 3 and 4. (Either place a magnet over the REVERSE sensor, or touch terminals 3 and 4 together with a piece of wire or a paperclip)
Keep these terminals closed.
4. Watch the TWO COLOR led. Each GREEN flash will decrease the acceleration rate. **The fastest acceleration will be with one flash.**
Open the terminals when the desired number of flashes have occurred. A typical number is 5. Repeat this procedure if you want a different value.
The LED will blink rapidly when the longest **Acceleration** rate is set. After the programmed number is set the StationMaster will echo the number of blinks.
Please wait until the echo has finished before programming the next number.

When finished with all programming, increase the top speed dial clockwise to MAX, and then down to a desired top speed.

All programming values are stored in flash memory. This means that once you program your StationMaster, it will never forget!



Programming: Pause Time

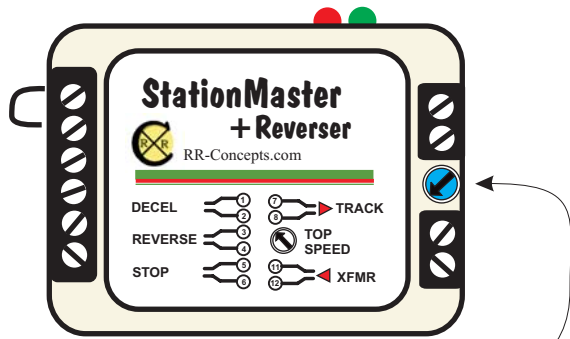
1. Make sure all three sensor inputs are open. (red "Sensor" Led is off)
2. If the top speed dial is not already at zero, then turn the top speed dial to zero. (fully counter-clockwise.) All LED'S will turn off.
3. Close terminals 5 and 6. (Either place a magnet over the **STOP** sensor, or touch terminals 5 and 6 together with a piece of wire or a paperclip) Keep these terminals closed.
4. Watch the TWO COLOR led. Each ORANGE flash will increase the waiting time. **A wait time of zero will be with one flash.** Open the terminals when the desired number of flashes have occurred. A typical number is 5. Repeat this procedure if you want a different value.

The LED will rapidly flash when an infinite delay is set (after 10 counts). **When infinite delay is set, then the ACCEL sensor is required to start up the train after a station stop.** A fun thing to do would be to connect the ACCEL terminals to a doorbell switch. Your train would patiently wait until someone pushed the button! (Note that the ACCEL function is labeled as REVERSE for the StationMaster/Reverser. When not waiting this sensor will perform a Decel+reverse operation)

When finished with all programming, increase the top speed dial clockwise to MAX, or to a desired top speed. All programming values are stored in flash memory. This means that once you program your StationMaster, it will never forget!

The number of orange FLASHES will correspond to the following time delays:

- 1: 0 seconds, no wait.
- 2: 10 seconds,
- 3: 20 seconds,
- 4: 30 seconds,
- 5: 1 minute,
- 6: 2 minutes,
- 7: 5 minutes,
- 8: 10 minutes,
- 9: 30 minutes,
- 10: Infinite, wait for GO. (Reverse sensor while waiting).



Programming:
 Non-Reversing Mode /
 Bypass Short Circuit
 Protection.

Non-Reversing mode allows the StationMaster/Reverser to behave like a StationMaster. The direction will never reverse, and the REVERSE sensor will behave like the StationMaster ACCEL sensor.

Programming:

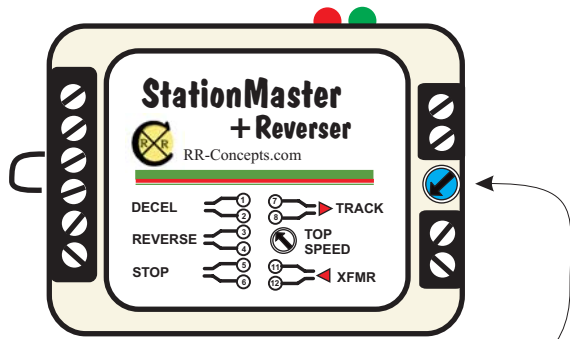
1. Make sure all three sensor inputs are open. (red "Sensor" Led is off)
2. If not already in programming mode turn the top speed dial to zero. (fully counter-clockwise.) All LED'S will turn off.
3. Turn the top speed dial to about half position. (The dial indicator points inward) This enables the secondary programming options.
4. Close terminals 1 and 2. (Either place a magnet over the DECEL sensor, or touch terminals 1 and 2 together with a piece of wire or a paperclip) Keep these terminals closed.
4. Watch the TWO COLOR led. Each flash will identify a reversing mode Use the table below to identify these modes. The LED will blink rapidly when the largest value is set.

Open the terminals when the desired number of flashes have occurred. After the programmed number is set the StationMaster will echo the number of blinks. Please wait until the echo has finished before programming the next number. Repeat this procedure if you want a different value.

When finished with all programming, increase the top speed dial clockwise to MAX, and then down to a desired top speed.

All programming values are stored in flash memory. This means that once you program your StationMaster, it will never forget!

1 flash = Reversing mode	+	Short circuit protection.
2 flash = Reversing mode	+	NO Short circuit protection.
3 flash = NON-Reversing mode	+	Short Circuit protection.
4 flash = NON-Reversing mode	+	NO Short Circuit Protection.



Programming: Output Trigger Behavior

The pigtail wires from the inside of the StationMaster/Reverser are used to trigger external devices. (YardMaster, etc.) The trigger normally happens on alternate accelerations. This is done to control a 2 track siding on one end of a reversing track. This trigger behavior can be programmed to trigger on every acceleration for other specific applications.

Programming:

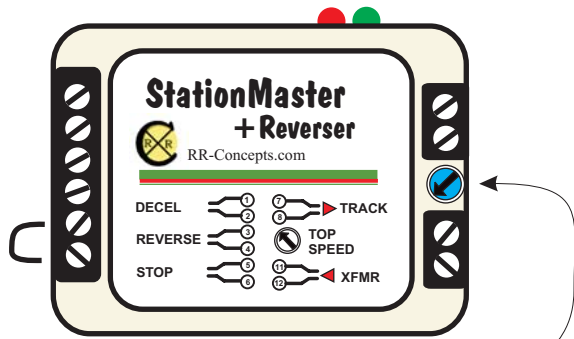
1. Make sure all three sensor inputs are open. (red "Sensor" Led is off)
2. If not already in programming mode turn the top speed dial to zero. (fully counter-clockwise.) All LED'S will turn off.
3. Turn the top speed dial to about half position. (The dial indicator points inward) This enables the secondary programming options.
4. Close terminals 3 and 4. (Either place a magnet over the REVERSE sensor, or touch terminals 3 and 4 together with a piece of wire or a paperclip) Keep these terminals closed.
4. Watch the TWO COLOR led. One RED flash indicates trigger on every 2nd acceleration and two RED flashes indicate a flash on every acceleration.

Open the terminals when the desired number of flashes have occurred. The StationMaster will echo the programmed number.
Repeat this procedure if you want a different value.

When finished with all programming, increase the top speed dial clockwise to MAX, and then down to a desired top speed.

All programming values are stored in flash memory. This means that once you program your StationMaster, it will never forget!

One flash = fire YardMaster every 2nd acceleration.
Two flashes = fire YardMaster on every acceleration.



Programming: Node Count for YardMasters

The pigtail wires from the inside of the StationMaster/Reverser are used to trigger external devices. (YardMaster, etc.) When attached to a YardMaster programmed as a Node the Reverser must know the number of nodes that are attached so that the SYNCHRONIZE command can be sent at the correct time. For example, if a 4 track siding is arranged at one end of the line, the StationMaster/Reverser will send out the signals 1, 2, 3, SYNCHRONIZE to all of the attached YardMaster nodes. YardMaster node #1 will fire when 1 is sent, Yardmaster node #2 will fire when 2 is sent, etc. When SYNCHRONIZE is sent all 3 YardMasters will fire to their upper position. This will cause a 4 track siding to ripple out trains in sequence. Up to 10 sidings can be controlled by only daisy-chaining the pigtail wires to all of the YardMasters. For this scenario the StationMaster/Reverser must be programmed for "4". (Total number of sidings)

When programmed for a node number greater than 1 the StationMaster/Reverser must be attached to a Yardmaster programmed as a node.

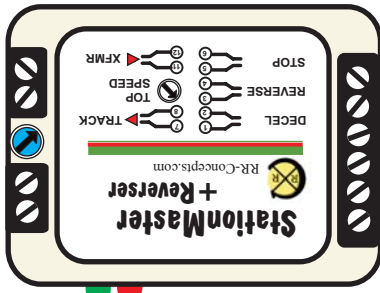
Programming:

1. Make sure all three sensor inputs are open. (red "Sensor" Led is off)
2. If not already in programming mode turn the top speed dial to zero. (fully counter-clockwise.) All LED'S will turn off.
3. Turn the top speed dial to about half position. (The dial indicator points inward) This enables the secondary programming options.
4. Close terminals 5 and 6. (Either place a magnet over the STOP sensor, or touch terminals 5 and 6 together with a piece of wire or a paperclip) Keep these terminals closed.
4. Watch the TWO COLOR led. Each flash counts the number of attached YardMasters.

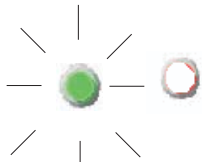
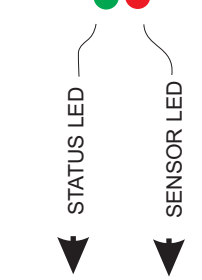
1 flash = No nodes, normal operation
 2 flash = 1 attached YardMaster nodes.
 3 flash = 2 attached YardMaster nodes.
 etc... **When watching the flashes, count 0, 1, 2, 3, 4, 5, 6, etc..**

Open the terminals when the desired number of flashes have occurred. the number will be echoed back then the terminals are opened. Repeat this procedure if you want a different value.

When finished with all programming, increase the top speed dial clockwise to MAX, and then down to a desired top speed.
 All programming values are stored in flash memory.



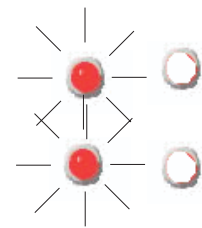
LED indicators



Green Flashing: train is **ACCELERATING**.



Green NOT flashing: Train is **AT TOP CRUISING SPEED**.



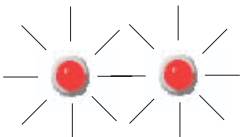
Red flashing: Train is **DECELERATING**.



Red flashing at 1 second period: **PAUSED, WAITING FOR TIME DELAY**.



RED led ON: One or more of the three sensors is detected.



Two Red Blinking LED's indicate a **SHORT CIRCUIT** or **DERAIL**. The StationMaster will resume after the condition is fixed. Note that reducing the top speed dial while the train is running could cause this. Cycle power on the StationMaster to resume operations after reducing the top speed.

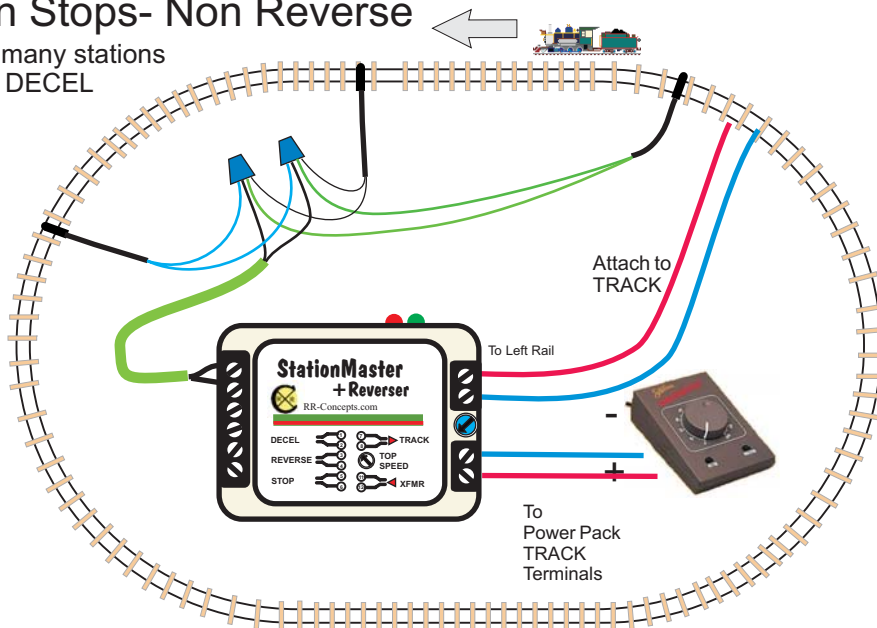
FYI - The short circuit detection is done by measuring the track voltage once the train has reached top speed. If there is a 10% voltage drop, then a short circuit is assumed and the StationMaster will cut power. Once a short is detected, the StationMaster will re-check every 5 seconds to see if the problem is corrected and then resume operations once correct. This feature can be disabled if desired.

WARRANTY

Your StationMaster is warranted, and guaranteed operational for 1 year. It will be repaired or replaced at no charge within that time period. Contact <http://www.RR-Concepts.com> for additional information.

Multiple Station Stops- Non Reverse

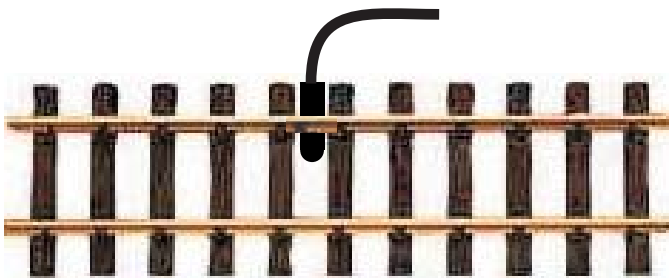
Your train can stop at many stations on the loop by adding DECEL sensors in parallel.



Every sensor that the train passes over will cause a decelerate/pause/accelerate sequence. Program for non-reversing operation.

Sensor Placement on Track

Suggested Sensor Placement on track with the magnet installed in the center of the train.



Sensor Placement for identifying a train. Offset the train's magnet to the same side.

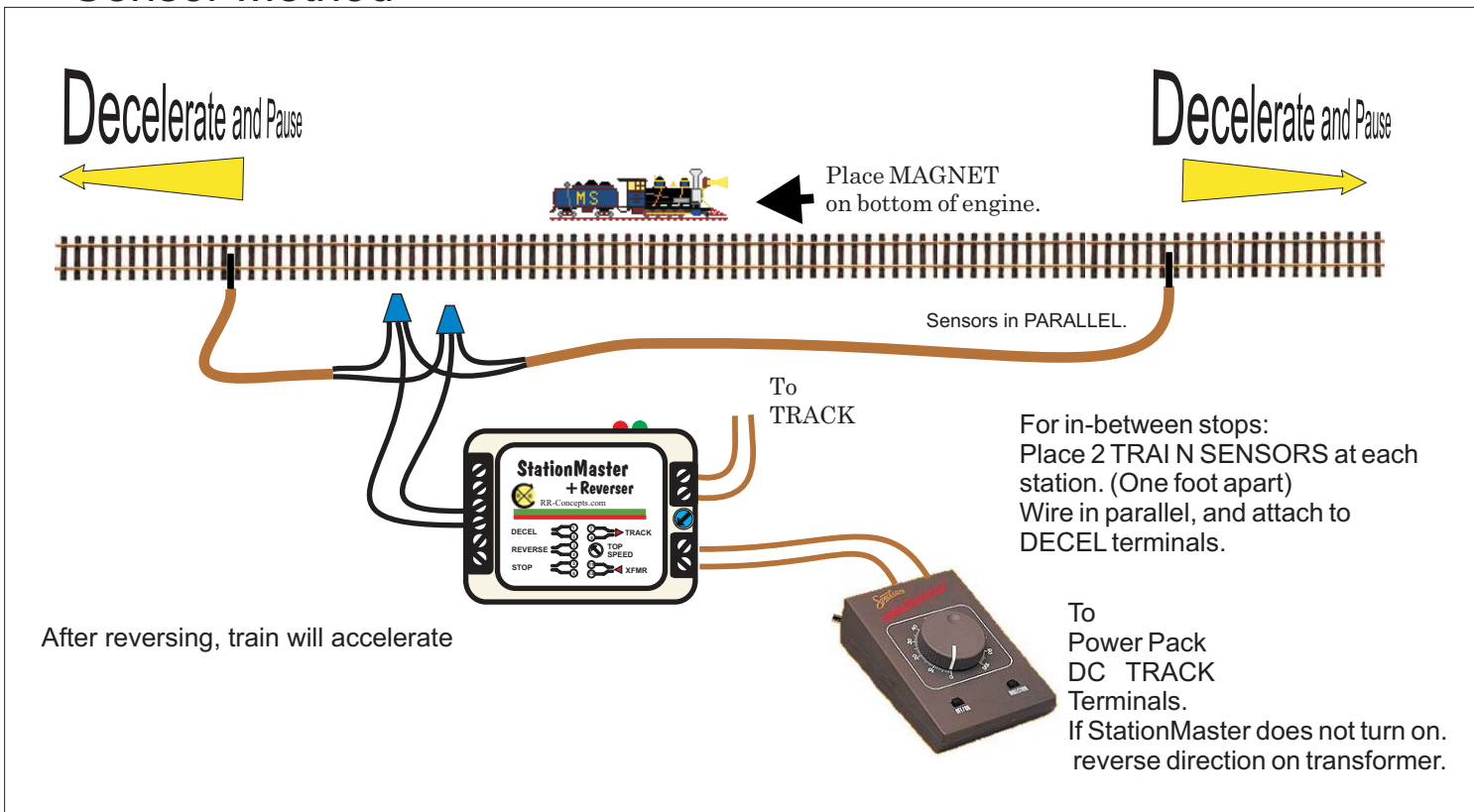


For example, passenger trains have the magnet on the right and stop at the passenger station. Freight trains have their magnet on the left and stop at the freight station.

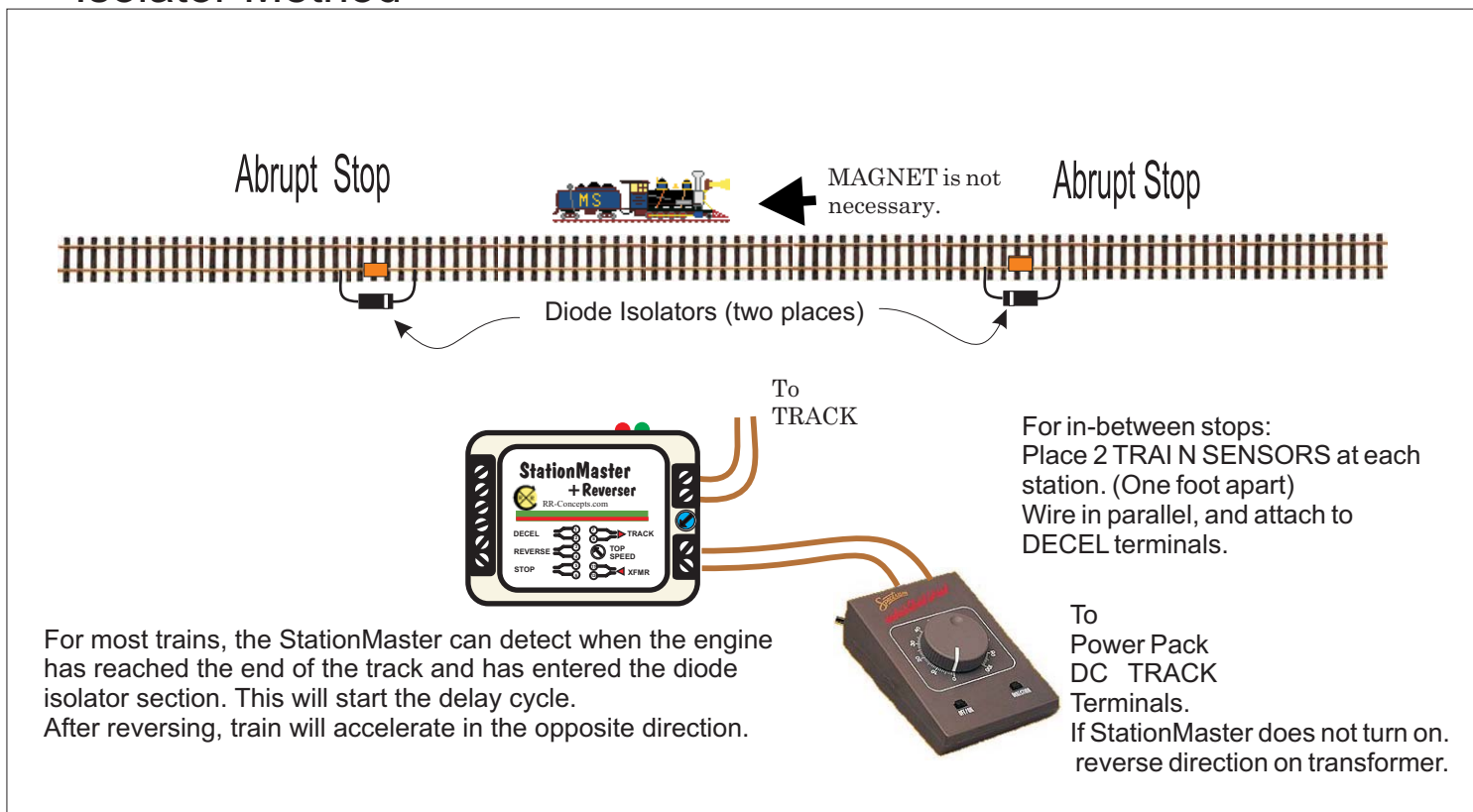
How to do... Point to Point Reversing

With a StationMaster/Reverser

Sensor Method



Isolator Method



Notes on the non-sensor train detection. (Diode section for reversing)

When the StationMaster/Reverser reaches full speed (green LED stops blinking) the voltage on the track is recorded and a timer is started. When no sensors are detected within 1 minute the Reverser assumes that the train has entered into the diode section and has stopped. At this time a second voltage is recorded and automatic operation can begin. The Reverser will now compare the sensed track voltage against the "no train" voltage. The train will be detected entering the diode section when the "no train" voltage is sensed. This value is stored in flash memory for future use.

For normal running the RED LED will be off. When in "detection mode" waiting for 1 minute to expire the RED LED will blink.

Notice that if a REVERSE sensor is sensed the automatic train detection will not occur until the next power up occurs.

What this means to you.. when the RED LED is blinking the train will reverse after 1 minute. when the RED LED is off the train will reverse when sensed at the end of the track.