

SIMPLE SHUTTLE SS1 TROUBLESHOOTING GUIDE

This guide covers the troubleshooting of the SS1 and SS1-R shuttle modules.

To save time, you can check the following first:

- The power supply is at least 7V DC or 9V AC and connected with the correct polarity if DC.
- The adjuster on the module is set to an appropriate time (set this before the power is switched on).
- The track wiring is correctly connected to the module and to the track and that the controller correctly sends the loco off forwards.
- That the track breaks are clear of swarf and debris and the diodes are orientated in the correct direction (and in the same rail) and are making good soldered contact with the rails.
- That the rails are clean and bright with no oily contaminants and that the loco wheels and pick-ups are in a similar condition.

If there are faults remaining, the following should help:

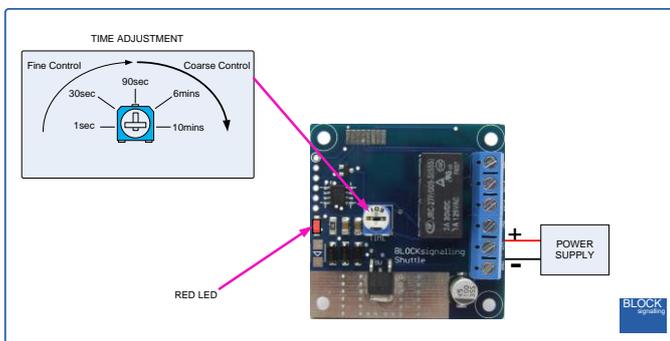
1. The red led on the board does not light, see section 1.
2. The relay cannot be heard clicking, see section 1.
3. The red led on the board stays on, see section 2.
4. The train does not move, see section 3.
5. The train does not stop at the end of the track, see section 4.
6. The train does not reverse at the end of the track, section 5.
7. The train only moves forward, see section 5.
8. The train does not move forward from the end of the track, see section 5.

Section 1: The Red led on the board does not light.

The red led lights whenever the relay is energised and is extinguished whenever the relay is de-energised.

If you have a fault, where you are not ever seeing the led light, then proceed as follows:

1. Turn off the power.
2. Remove all the wiring from the SS1, except the power connections to the first two terminals.



3. Turn the adjuster on the board fully **anticlockwise**.
4. Turn on the power.
5. The relay should be heard to click on and off at 1 second intervals and the red led should flash on and off at 1 second intervals.
6. If you do not see the module behaving this way, then check your power connections. The board requires a supply of at least 7V DC or 9V AC to function, less than this and the board will not operate.
7. If using a DC supply, the supply must be connected with the correct polarity. If the supply is connected with the incorrect polarity the module will not operate at all (although it will not be damaged).
8. With an AC supply, the polarity of the connection is not important.
9. Test with a different supply. A 9V PP3 battery is good for a quick check.
10. If the relay off for long periods, it can appear that the led and relay are not working, that is why the adjuster is set to a minimum before this test.
11. The adjuster is read at power on, that is why the adjuster is set to a minimum before the power is turned on during this test. A fully anticlockwise position is chosen so that the led flashes and the relay operates at short intervals and can easily be checked.

Section 2: The red led on the board stays on.

The red led lights whenever the relay is energised and is extinguished whenever the relay is de-energised.

If you have a fault, where led light stays lit, then proceed as follows:

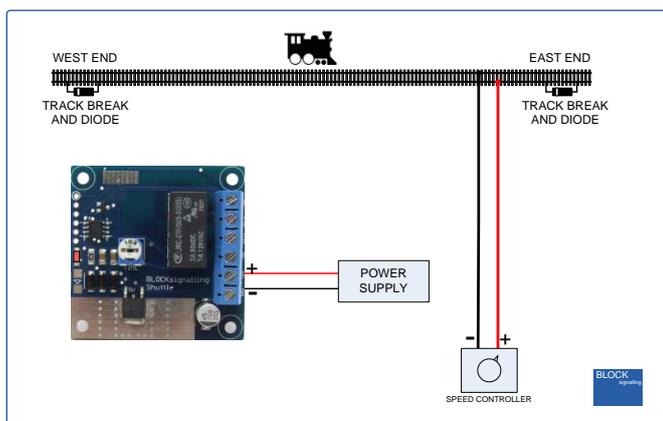
1. Turn off the power.
2. Turn the adjuster on the board fully **anticlockwise**.
3. Turn on the power.
4. The relay should be heard to click on and off at 1 second intervals and the red led should flash on and off at 1 second intervals.
5. When the adjuster is set in a clockwise position, the relay can be denegised for up to 10 minutes. In this case it can appear that the module is not working. Turn off the power and set it fully anticlockwise before repowering the module.
6. The adjuster is read at power on, that is why the adjuster is set to a minimum before the power is turned on during this test. A fully anticlockwise position is chosen so that the led flashes at short intervals and can easily be checked.

Section 3: The train does not move.

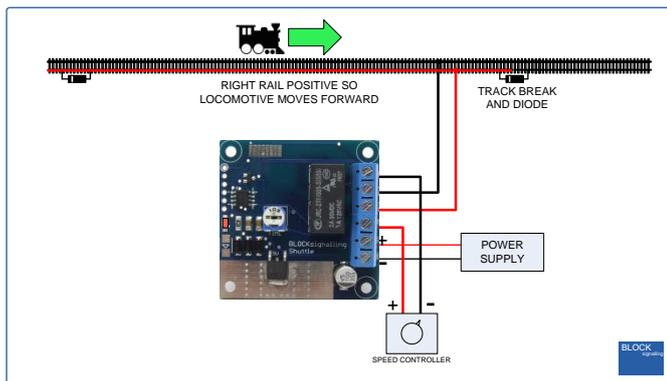
The module switches the polarity of the feed at regular intervals to change the direction of the train.

If the train does not move, it can be checked as follows:

1. Turn off the power.
2. Remove the track wiring from the module and connect the ends, so that power from the Train Controller runs direct to the track.



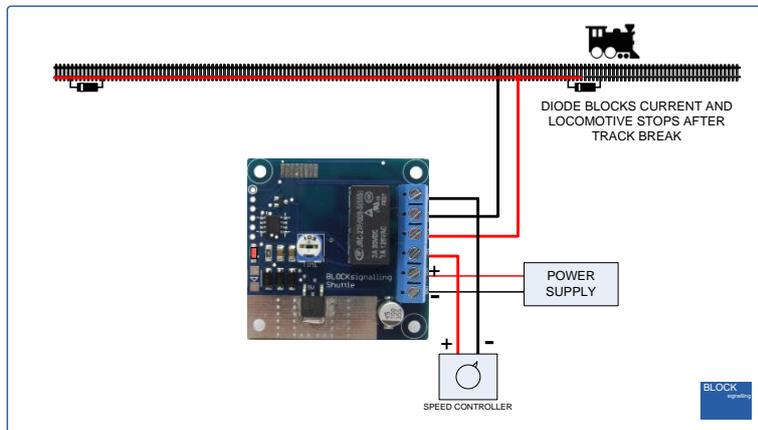
3. Set the loco on the centre of the track run, pointing in the desired running direction.
4. Turn on the controller and set a suitable running speed in the **forward** direction.
5. If the loco does not move in the forward direction, when the controller is set to forward, the swap the wiring connections at the track.
6. If you have to turn the controller up to get the train moving, and then reduce it to the desired running speed, it is likely that it will not start when operated by the shuttle module.
7. When you have selected the speed. Turn off the controller (remember the speed setting).
8. Rewire the controller through the shuttle module and switch on the power to the shuttle module.



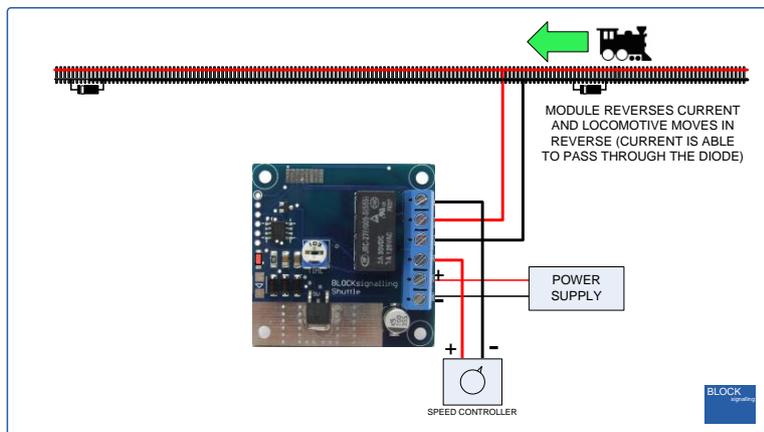
9. Turn the controller back on (set to the same speed setting) and turn on the module.
10. When the train sets off, it should move forwards first. If not, check the wiring carefully at the module carefully, and correct it before continuing.
11. If the loco does not set-off, give it a gentle push. If it then starts, it is likely that the track, loco wheels or both have some contamination and should be cleaned. This may also result in difficulty with setting off after changing directions at the end of the line.
12. Turning up the controller setting slightly will probably help in the short term.

Section 4: The train does not stop at the end of the track.

When the train first reaches the end of the track, passing the track break diode, it should stop. The diode only lets current flow in one direction, and now blocks the current from reaching the loco.



The loco will remain stationary until the shuttle module reverses the polarity. The current is able to flow through the diode now, as the current direction has changed, and can reach the motor in the loco which then travels in the opposite direction.



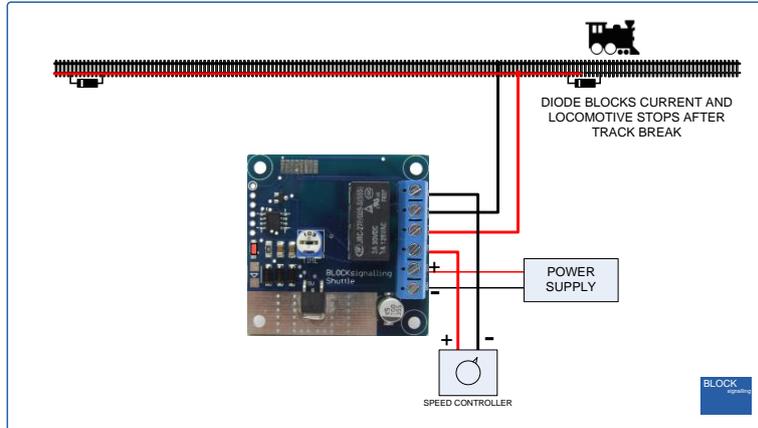
If the train does not stop after passing the diode, it can be checked as follows:

1. Turn off the power.
2. Remove the track wiring from the module and connect the ends, so that power from the Train Controller runs direct to the track.
3. Set the loco on the centre of the track run, pointing in the desired running direction.
4. Turn on the controller and set a suitable running speed in the forward direction.

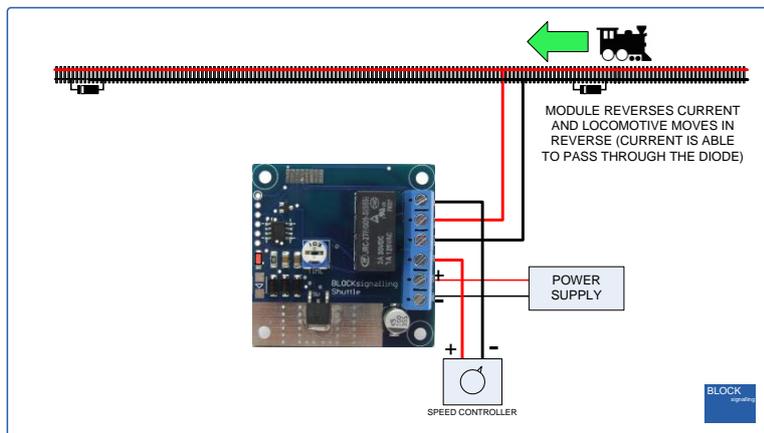
5. If you have to turn the controller up to get the train moving, and then reduce it to the desired running speed, it is likely that it will not start when operated by the shuttle module.
6. When you have selected the speed. Turn off the controller (remember the speed setting).
7. Rewire the controller through the shuttle module and switch on the power to the shuttle module.
8. Turn the controller back on (set to the same speed setting) and turn on the module.
9. The train should set off forwards. If not check the wiring at the module carefully.
10. When the whole of the loco passes the track break and diode, the loco should stop.
11. If it does not stop, check the break in the track is clean and unobstructed by swarf or other debris which could short out the gap. Check that the diode is facing the correct way. If the break is in the right rail (as seen by the train driver), the end of the diode with white ring on the diode casing should be attached to the main section of track, with the other end connected to the track end section.
12. If the locomotive is miswired, so it actually runs forwards when you set the speed controller to reverse, the train will not stop past the diode as should be expected. Try another loco. All locos should move forward when the right rail is positive and the left rail is negative. Take extra care when the loco does not have a clear front and rear.

Section 5: The train does not change direction at the end of the track.

When the train first reaches the end of the track, passing the track break diode, it should stop. The diode only lets current flow in one direction, and now blocks the current from reaching the loco.



The loco will remain stationary until the shuttle module reverses the polarity. The current is able to flow through the diode now, as the current direction has changed, and can reach the motor in the loco which then travels in the opposite direction.



If the train does not restart, and run in the reverse direction, then first complete all the tests in Section 4, to make sure that the track polarity is correct and that the loco wiring is correct.

1. Complete all the tests in Section 4 first.
2. If the train, having stopped correctly at the end of the line, does not set off in the opposite direction when the shuttle relay is heard to click, then it is likely that the track or loco wheels are dirty or contaminated.
3. If the train does not set off, give it a gentle push. If it then starts, it is likely that the track, loco wheels or both have some contamination and should be cleaned.
4. Turning up the controller setting slightly will probably help in the short term.

5. If, even after cleaning, the loco does not move in reverse, then turn off the Train Controller and supply to the shuttle module. Move the loco to the centre of the track. Turn the adjuster fully anticlockwise on the module and switch on the power to the module.
6. The relay should be heard to click on and off at 1 second intervals and the red led should flash on and off at 1 second intervals.
7. Turn the adjuster slightly clockwise until the relay can be heard to operate at 5 second intervals. Now turn up the speed controller setting until the loco moves forwards for 5 seconds, then reverses for 5 seconds. Gradually increase the setting until the loco reaches the end of the track and stop before reversing.
8. Note that the diode which stops the loco has a slight voltage drop, so the speed controller may need to be turned up slightly to allow the loco to exit the end sections.