

Speed feedback

Speed feedback is applied to significantly improve the low speed and the load performance of your loco.

Typically speed feedback can improve the low speed performance of your loco from say, 7 mph minimum speed to less than 1 mph minimum speed scale speed.

This is specially gratifying when using a steam loco and watching it shunting along with the wheels and steam gear just moving. Like the real thing.

Speed feedback is achieved by measuring the generated voltage from motor, when the drive volts are switched off during the PWM cycle and the motor is allowed to free run and act as a generator.

The generated voltage relates directly to the speed of the motor.

By measuring the generated voltage and comparing it with the demand speed voltage set by the speed control, a difference error voltage will occur. This is then amplified and used to power the motor. This difference may be positive or negative and the amplifier will automatically apply the correction to compensate for the error. Thus if the speed reduces due to load increasing, the generated voltage will reduce and the error voltage between the generated voltage and demand speed voltage will increase thus increasing the motor speed. The reverse applies if the generated voltage is found to be too high.

The gain setting adjusts the amplification of the error voltage applied to the motor. If the gain is set to high then the speed control can become unstable producing judder. If the gain is set to low then the low speed and load performance will suffer.

The gain is adjustable (200. Number 1 to 18) we suggest a gain of 3 to 6 for n gauge and 6 to 12 for 00 gauge but simply try out different settings. The optimum setting may vary from loco to loco. Have a play and get a feel for it.

Sample time.

Sample time is the duration of time allowed to measure the generated voltage of the motor when the drive to the motor is switched off in the PWM cycle.

Too short and the motor voltage measured will be incorrect and the train will run badly. If the sample time is too long the switching noise from the motor will increase.

There are two settings:-

201 bleep 1=600 μ S

201 bleep 2 = 1000 μ S

The default setting = 600 μ S

The speed feedback can be switched off altogether by 202 bleep 2 this will stop the switching noise being produced by the motor but the slow speed performance will suffer as will load compensation.

202 bleep 1 switches on speed feedback

202 bleep 2 switches off speed feedback