Taming Run-on or Creep on Your Coil Feed Line

Occasionally, Coiltek users will find that their decoiling line cycle on and off or creep slowly when it shouldn't. Here are the causes and what you can do to fix the problem

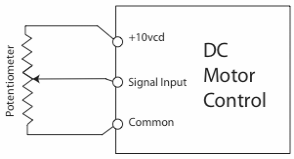
Coiltek's ultrasonic controls provide either a 0-10 DC voltage signal or a 4-20 mA current signal. This signal is fed to a variable speed motor control: either

- A DC (SCR) control for DC motors, or
- An AC control (Inverter) for AC motors.

DC Drives

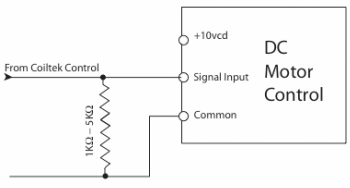
Most DC motor controls accept a voltage input signal into a very high impedance circuit. You can compare the motor control to a PA system. Touch the high-impedance input terminal with an antenna and you hear a loud buzz. But motor controls drive motors, not loudspeakers. What happens when you put an antenna on the input terminal? The motor creeps.

With a potentiometer on the input circuit there is no problem. The high impedance input terminal is tamed, tied down to common through a resistor.



The wire from a Coiltek unit to the input terminal can be long and it can pass through an "electrically noisy" environment: an efficient antenna. Any residual voltage 'standing' at the high-impedance input to the drive may cause the motor to creep.

We always recommend a resistor (1 kΩ to 5 kΩ) wired directly from signal input to the common terminals at the drive. The resistor shunts any residual voltage that might cause the motor to creep.



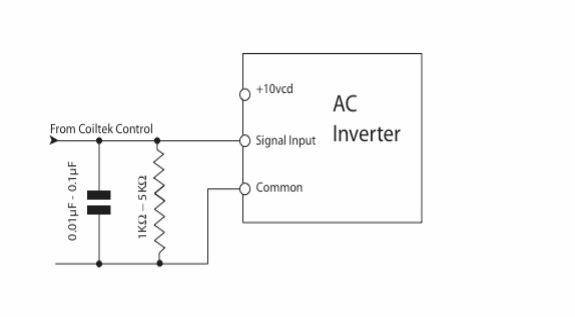
Some of the more expensive DC motor controls accommodate a 4 – 20 mA input: a low-impedance input. If available, choose this input with the 4 – 20 mA output from the Coiltek unit.

AC Drives

AC Variable Speed drives (Inverters) generate variable frequency 3-Ø power to drive standard 3-Ø AC motors. The power is created by electronically switching DC current. As a result, the magnetic fields in the motor are created with a square wave rather than the usual sine wave. This is rather like hitting a piano with a hammer. It creates noise. The motors actually sing. There is also considerable electrical noise.

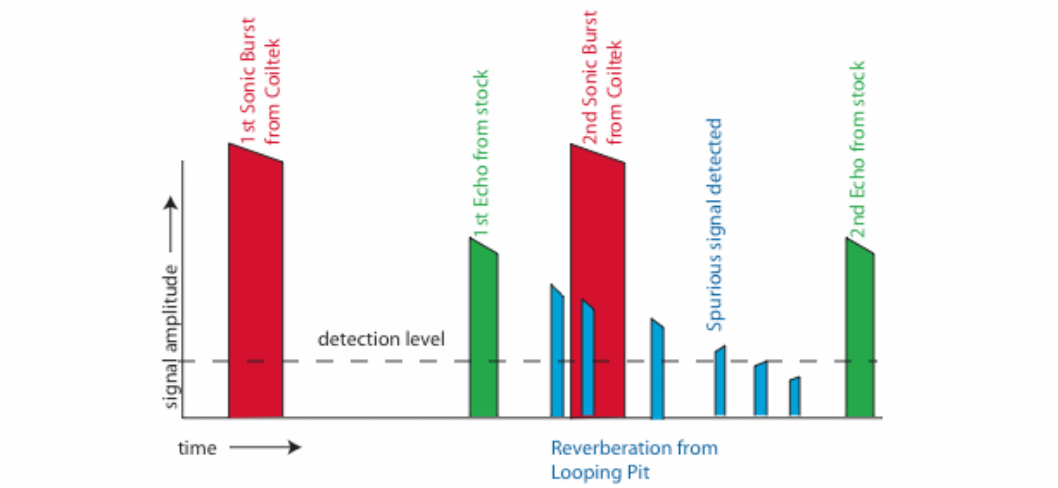
Sometimes this noise is present at the input terminals of the drive. Since there is finite impedance associated with the loop control, the AC noise can actually cause random ON-OFF motor operation or creep. Nearly all AC drives accept 4-20 mA control signals. We suggest using the 4-20 mA option if creep is a problem for you.

The same shunt resistor recommended for the DC drive may cure the problem, but it may not be the whole answer. We've found that an additional 0.01 μF to 0.1 μF capacitor across the input may be necessary.

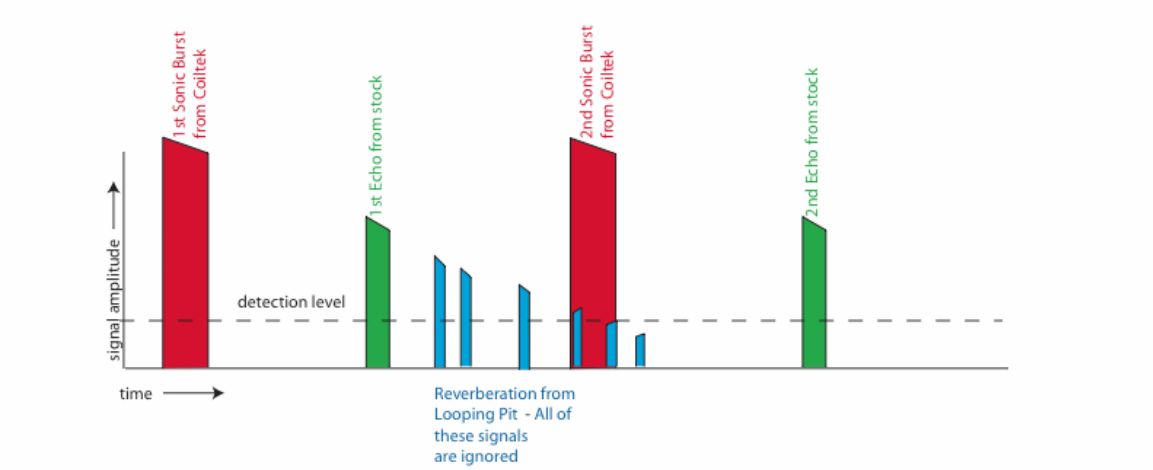


Looping Pit Operation *(Second echo syndrome)*

Sometimes the CS- 5000 or CS-6100 will cause feed machinery to creep when feeding stock into a looping pit. A looping pit is an echo chamber, so the acoustic signal can bounce around and return several times. The CS-5000 is sensitive and will pick up these echoes.

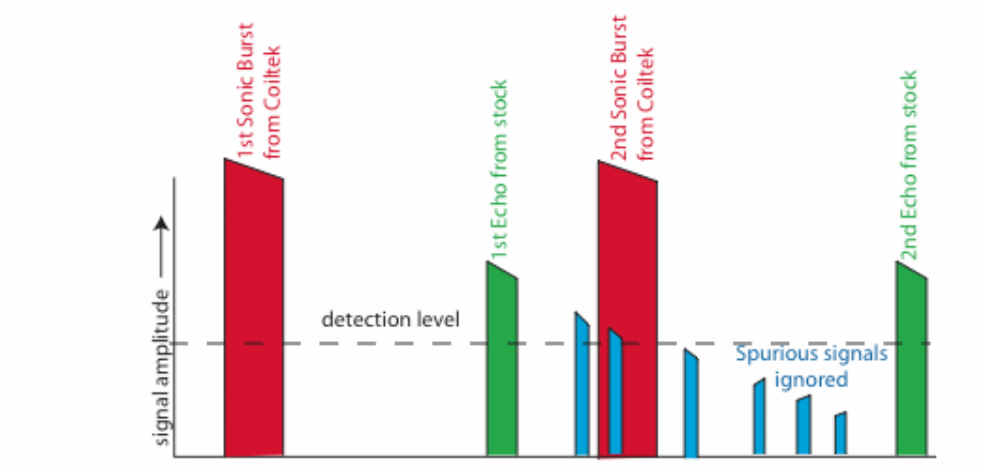


There are two solutions to this problem. The best method is to lengthen the time between sonic bursts. The default timing is 50 mseconds - the compromise between response and noise rejection when operating in what acoustician call "a free field condition." But a looping pit creates a "reverberant field condition," so the 50 msec compromise doesn't work.



As the interval increases, the delayed echoes die and fall below the detection threshold. Looping pits give more slack material and allow slower control response. The slight reduction in control response caused by changing the timing will be insignificant.

The second solution is to reduce the sensitivity of the control; that is, raise the detection level so as to ignore the echoes.



While this solution will work, you run the risk of making the control too numb: unable to "see" smaller stock or stock running deeper in the pit.