



Engineering Note

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Title:	Hydro-Mix and Hydro-Probe cable shield earthing
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Summary:	This engineering note describes problems that may be caused by inadequate shield grounding and details how to avoid such problems.

Electrical interference

Large motors and variable frequency drives create a large amount of electrical interference which may sometimes interfere with the signal from a Hydronix moisture sensor.

This interference may take the form of intermittent voltage spikes superimposed on the signal, or it may cause the signal to fluctuate. The latter form is very difficult to diagnose as it simply causes the probe to signal that any material is wetter than it actually is.

The best way to see if a problem you have is caused by interference is to place material in front of the sensor and switch on the various motors and other equipment to see if any of them cause a deviation in the voltage from the sensor. An oscilloscope may be useful to spot voltage spikes, but remember that the oscilloscope itself may be picking up noise spikes.

Ground loops

Ground loops are caused when the ground connections of different parts of an installation are at different potentials. If two grounds at different potentials are connected together by a piece of wire then a current will flow in the wire and noise will then be superimposed on the signal.

Avoiding problems

Avoiding problems due to electrical interference and ground loops is simply a matter of following a few simple guidelines...

1. Always connect the cable shield to a good ground. A large piece of metal is not always a good ground. A long metal spike driven into wet earth is probably a good ground.
2. Only connect the shield to ground at one end - leave the shield unconnected at the other. Hydronix moisture sensors assume that the metalwork (mixer, bin etc.) to which they are fixed is a good ground and hence the shield is terminated to the metal body of the sensor. If the mounting location is not connected to a good ground then disconnect the shield in the Bulgin connector and ensure that the shield is properly grounded at the other end.