

Instrumentation Northwest, Inc. (INW)

APPLICATION NOTE

GROUNDING ISSUES WITH THE PS-9 SERIES SUBMERSIBLE PRESSURE SENSORS WHEN USED WITH THE CAMPBELL SCIENTIFIC, INC. CR10X AND CR510 April 2002

Introduction:

The purpose of this document is to provide an overview of grounding issues related to the use of the PS-9 Series submersible pressure sensors when used with the Campbell Scientific, Inc. CR10X and CR510 dataloggers.

Why Grounding is Important:

It is commonly known that when using electronic equipment, both personnel and equipment need to be protected from high power spikes that may be caused by lightning, power line surges, or faulty equipment. Without a proper grounding system, a power spike will find the path of least resistance to earth ground – whether that path is through sensitive electronic equipment or the person operating the equipment. In order to ensure safety and prevent equipment damage, a grounding system must be used to provide a low resistance path to ground.

Problems Introduced by Grounding:

When using several pieces of interconnected equipment, each of which may have its own ground, problems with noise, signal interference, and erroneous readings may be noted. This is caused by a condition known as a **Ground Loop**. Because of natural resistance in the earth between the grounding points, current can flow between the points, creating an unexpected voltage difference and resulting erroneous readings.

Minimizing the Ground Loop Effect:

The single most important step in minimizing a ground loop is to tie all equipment (sensors, dataloggers, external power sources and any other associated equipment) to a **single common grounding point**. INW recommends the following: (1) the sensor cable shield (the wrapped shield inside the cable) be attached to the power ground (G terminal) on the CR10X/CR510 and (2) the grounding lug be connected via a 12 AWG or larger wire, to a grounding rod driven into the earth. It is also recommended that if you are using an external power supply to power the CR10X/CR510 that it be tied to the same earth ground.

Instrumentation Northwest appreciates any comments you may have regarding this application note. Please call or write to:

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