Instrumentation Northwest, Inc.
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APPLICATION NOTE

THE PS9105 PRESSURE TRANSDUCER WITH THE CAMPBELL SCIENTIFIC, INC. CR10

Enhanced Measurement Process
November 1995

Introduction

The purpose of this document is to provide a basic overview of using the PS9105 transducer together with the Campbell Scientific CR10 and custom PROM to implement the Enhanced Measurement Process. The general use of the PS9105 transducer with the CR10 is covered in application note 9C0014A4. **This document should be considered an extension of the general application note.**

The Enhanced Measurement Process centers on an algorithm created by INW to improve the thermal performance of the PS9105 pressure transducer. This algorithm also produces a temperature measurement with no additional sensors, calibration or input channels required. The algorithm is implemented in a custom PROM available for the Campbell Scientific CR10 Measurement and Control Module.

To obtain the optimum thermal performance, every transducer is characterized over temperature and pressure in an automated production test system at the factory. This data is utilized to generate a list of mathematical parameters which the CR10 utilizes to improve the pressure measurement. An example program is located on the disk which is shipped as part of every Enhanced Measurement Process package. This program may be edited to include the transducer-specific parameters. Another option is to use the library function to copy the transducer specific P29 instruction to other user programs.

CR10 Programming

As mentioned above, to realize the Enhanced Measurement Process, the user special P29 instruction is utilized. The transducer specific parameters are given in the calibration sheet. On the following page, an example P29 instruction is given.

sample instruction

01: P29	User Special
01: 1	INPUT CHANNEL
02: 1	EXCITATION CHANNEL
03: 1	DESTINATION LOCATION
04: 5.0	PRESSURE RANGE (PSIG) (ENH. PAR. 1)
05: -.981	ENHANCED PARAMETER 2
06: 42.384	ENHANCED PARAMETER 3
07: 100.0	ENHANCED PARAMETER 4
08: 2347.7	ENHANCED PARAMETER 5

sample instruction continued

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 09: -173.9      ENHANCED PARAMETER 6
 10: 2.13        ENHANCED PARAMETER 7
 11: 7087        ENHANCED PARAMETER 8


 12: -201        ENHANCED PARAMETER 9
 13: -2.852      ENHANCED PARAMETER 10
 14: 24988       ENHANCED PARAMETER 11
 15: 4668.5      ENHANCED PARAMETER 12
 16: -35.44      ENHANCED PARAMETER 13
 17: 3572.4      ENHANCED PARAMETER 14
 18: -8.4        ENHANCED PARAMETER 15
 19: .21         ENHANCED PARAMETER 16
 20: 11617       ENHANCED PARAMETER 17
 21: 11846       ENHANCED PARAMETER 18
 22: -1.2144     ENHANCED PARAMETER 19
 23: 0.0000      ENHANCED PARAMETER 20
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Two voltage measurements are made. This instruction assumes the first channel contains the series resistor and the second channel is connected to the differential transducer output. Following the execution of this instruction, input location 1 contains the measured pressure and location 2 contains the temperature of the sensor. This instruction is consistent with the wiring scheme of application note 9C0014A4.

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

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