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Diagnostics for TruStability™ HSC and SSC Series, and Basic ABP Series Board Mount Pressure Sensors; FSA Series Force Sensors

A Technical Note

1.0 INTRODUCTION

The TruStability™ HSC and SSC Series, Basic ABP Series Board Mount Pressure Sensors, and the FSA Series Force Sensors offer an optional diagnostic function on both the digital and analog output devices which the customer must select as a part of the catalog listing, if it is desired. (To view the catalog listing nomenclature, please access the product datasheets at sensing.honeywell.com).

This feature may be beneficial in applications where the sensor functionality and the need to know this is critical.

2.0 DIGITAL OUTPUT DIAGNOSTICS

The output is sent when the sensor is given a read command and is a part of the two most significant bits (S1, S0) of data in Byte 1. (See Figure 1.)

The digital output diagnostic feature consists of an EEPROM signature used to validate the EEPROM contents during start-up, loss of sense element connection and the short circuit of the sense element or internal interconnects inside the device (wirebonds). If any of the these three conditions is detected, an **11** on the Status Bits is shown in the first two bits of the most significant byte as shown in Table 1.

Table 2 shows the fault condition and resulting output when the analog diagnostic function is specified.

Figure 1. Two Byte Data Readout

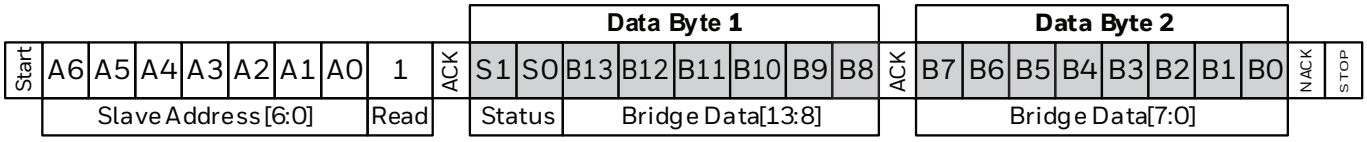

Table 1. Status Bits and Description

Status Bits		Description
S1	S0	
0	0	Normal Operation, Valid Data
0	1	Device in Command Mode (shown only during factory calibration)
1	0	Stale Data: Data that has already been fetched since the last measurement cycle, or data fetched before the first measurement has been completed
1	1	Diagnostic Condition

3.0 ANALOG OUTPUT DIAGNOSTICS

If an analog diagnostic condition is detected, the output will go to either the upper or lower rail of the device and remain, thus preventing the sensor from outputting ambiguous data. (See Figure 2.)

Figure 2. Analog Output Device with Diagnostics

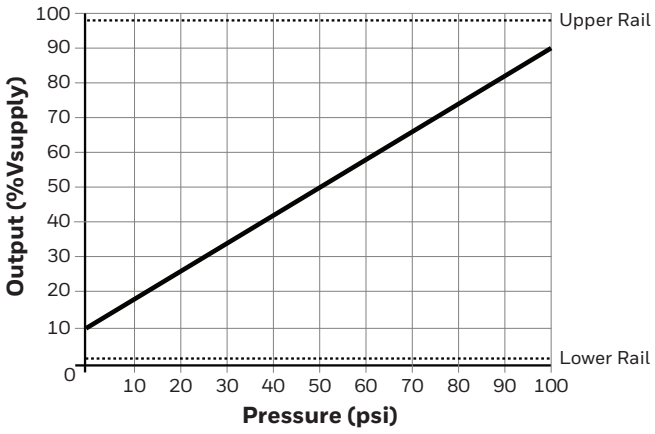

Table 2 shows the fault condition and resulting output when the analog diagnostic function is specified.

Table 2. Fault Condition and Resulting Output

Fault Condition	Analog Diagnostic Rail
EEPROM Corrupt	Lower Rail
Sensor Bridge Open (any element)	Upper Rail
Sensor Bridge Short (any element)	Upper Rail
Loss of Supply Voltage	Lower Rail
Loss of Ground Connection	Upper Rail

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