END-OF-CONVERSION AND INTERRUPT PIN FUNCTIONALITY IN ABP2 SERIES I²C BOARD MOUNT PRESSURE SENSORS

Technical Note

This Technical Note addresses the EOC (End of Conversion)/INT (Interrupt) pin functionality available with the I²C versions of the ABP2 Series board mount pressure sensors.

1.0 EOC/INT PIN FUNCTIONALITY

The EOC pin may be programmed to operate either as a measurement busy, end-of-conversion indicator, or as a configurable interrupt indicator.

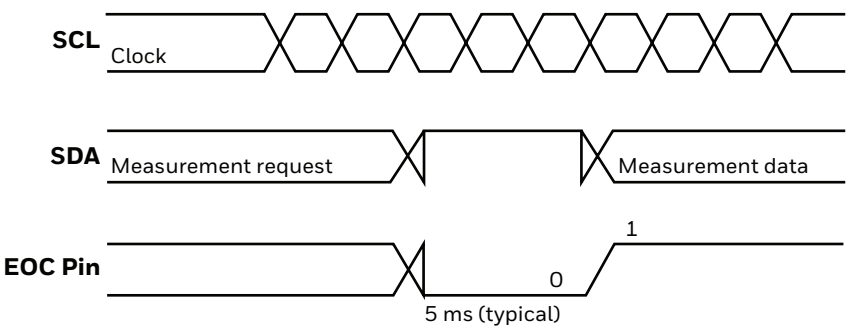
1.1 EOC INDICATOR (DEFAULT CONFIGURATION)

The EOC pin, in the default configuration, indicates the completion of a measurement cycle. It is set to "high" when a measurement and calculation have been completed and the data is ready to be clocked out. One way to use this is to periodically check the state of the EOC pin using a microcontroller.

1.2 INTERRUPT INDICATOR (CUSTOMER-SPECIFIC CONFIGURATION)

The EOC pin may also be configured as an interrupt output pin. In the interrupt mode, the now INT pin changes its logic state based on a numerical comparison between the measurement and a preset trigger threshold(s). The trigger threshold may be set with multiple modes as shown in Figure 2. Honeywell customers often use this feature as an alarm.

FIGURE 1. EOC OPERATION TIMING DIAGRAM



2.0 OPERATING MODES

The ABP2 Series I²C sensors may be operated in two modes: sleep or cyclic. The functionality of the EOC/INT pin differs depending upon the operating mode.

2.1 SLEEP MODE (DEFAULT CONFIGURATION)

In sleep mode, the state of the EOC/INT pin only updates after the completion of a measurement command. The state of the EOC output signal is reset to logical zero at the beginning of each new measurement, even though the interrupt trigger thresholds are established correctly at the end of each measurement. If configured as an EOC, the pin sets to logic state high after the conversion is complete. If configured as INT, the pin's logic state depends upon the measured value.

To obtain a true sense of whether or not the interrupt threshold has been crossed, adding a delay of several clock cycles (5 ms is typical) between sending the command and sampling the EOC/INT pin state is recommended. (See Figure 1.) The maximum possible update rate in this mode is 200 SPS.

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2.2 CYCLIC MODE (CUSTOMER-SPECIFIC CONFIGURATION)

The sensor takes periodic measurements at an interval of 125 ms to 4000 ms as shown in Table 1.

TABLE 1. CYCLIC MODE UPDATE RATE

SLEEP INTERVAL (mS)	TYPICAL UPDATE RATE (SPS)
125	7.9
250	3.9
500	1.9
1000	0.99 (1 sample in 1 s)
2000	0.49 (1 sample in 2 s)
4000	0.249 (1 sample in 4 s)

The sensor periodically wakes up and conducts another measurement according to the setting for the sleep duration. During this sleep interval, the state of the EOC/INT pin is not updated and latched to the previous state.

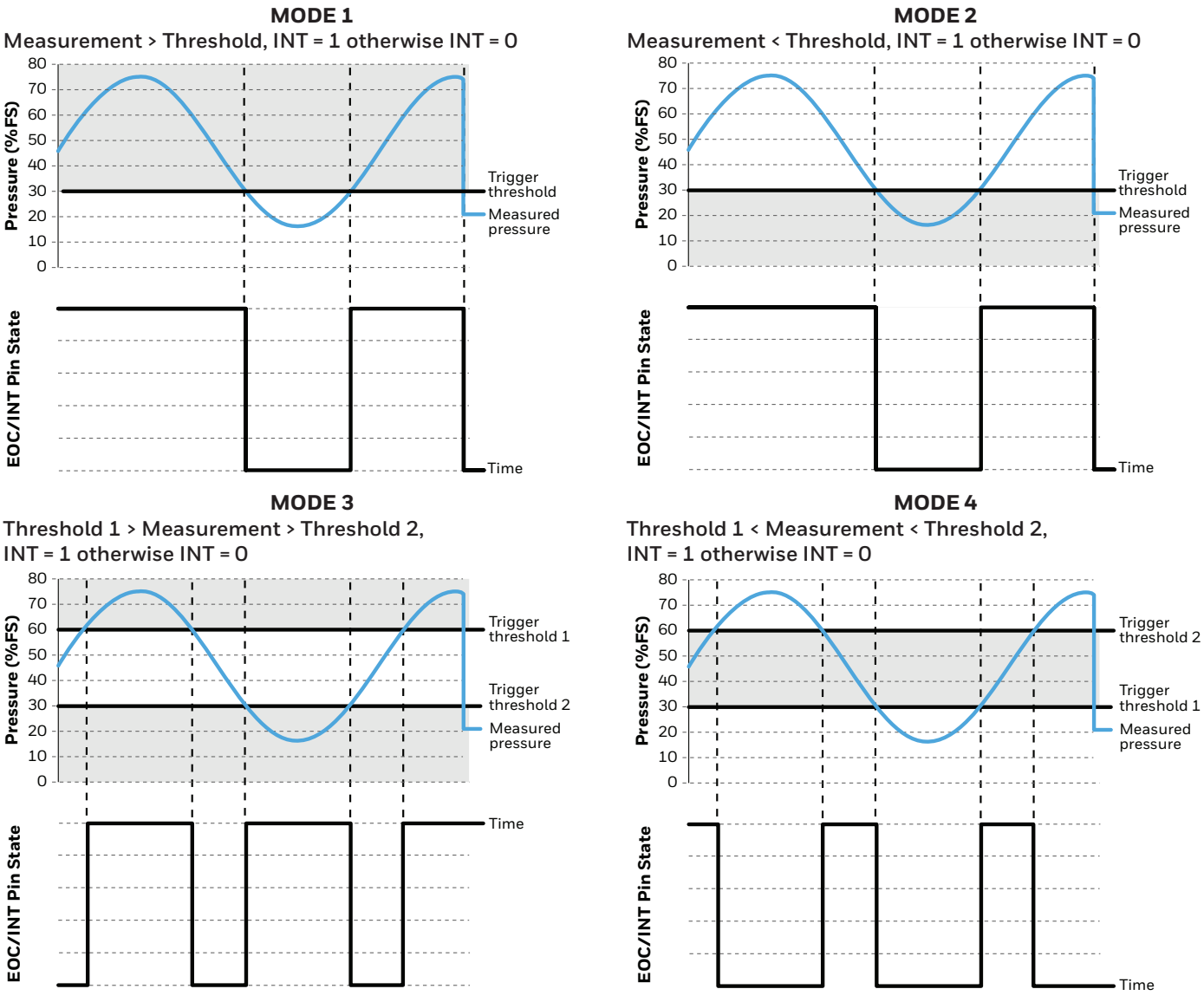
The cyclic measurement command must be sent at sensor power-up. Any power interrupt/cycling during operation will interrupt the measurement update. A cyclic measurement command must then be sent to re-initiate the measurement cycle. Once in cyclic mode, no measure command needs to be sent to the sensor for taking the measurement.

The sensor provides measurement data immediately upon request. The state of the EOC/INT pin is continuously being updated without any external intervention. There are, however, two situations when the sensor does not detect the activity:

- When, during the wait/sleep time, the pressure level momentarily exceeds the trigger threshold and returns to its previous state.
- The pressure level rapidly jumps between two trigger thresholds during a time interval that is smaller than the time interval needed to take a measurement.

The settings for threshold and sleep interval may be set at the Honeywell factory upon customer request, or may be programmed by customers themselves with a command set provided by Honeywell. Please contact Honeywell customer service for more information.

FIGURE 2: INTERRUPT MODES OF OPERATION, PROGRAMMABLE TRIGGER THRESHOLDS



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