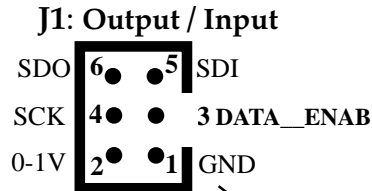


# Application Note A61, Model 2005SPI-2 / 2015SPI-3 **Slave Mode**

## Read % gas via SDO (Serial Data Out)



**Important Note:** Digital ground **Pin# 1** MUST be directly connected to the Master Microprocessor's digital ground, **NOT** just connected via the DC power supply common. See Application Note A59.

**Note:** We recommend that you **po**le (read output) the sensor no more often than once every **10 seconds** since the digital averaging may be as long as 15 seconds.

**DATA\_ENAB**

pin# 3  
It should stay low for at least 100 μsec after last clock pulse

30 μsec minimum

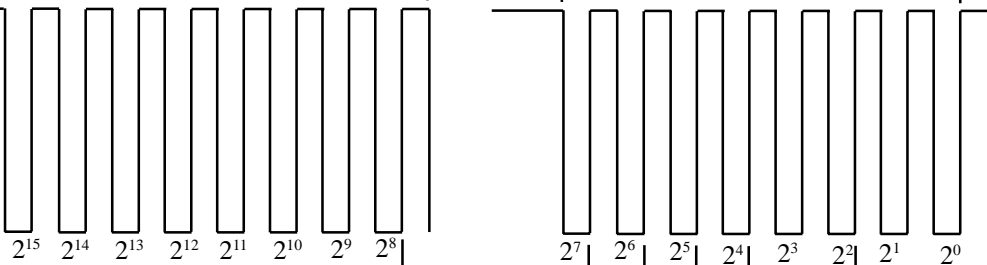
8 bit Most Significant byte

100 μsec minimum

8 bit Least Significant byte

**SCK**

(clock) pin #4  
10 μ sec min.



**SDO**

(serial data out)  
pin#6

Decimal 500 = implied **5.00% gas** = binary 0000 0001 **1111** 0100 =  $2^8 + 2^7 + 2^6 + 2^5 + 2^4 + 2^2 = 500$  decimal  
Divide decimal value by 100 to equal % gas reading on a Model 2005SPI-2 or 2015SPI-3 sensor.

The high to low transition of the clock (**SCK**) must occur at least 30 microseconds after the high to low transition of the **DATA\_ENAB** control for that sensor. The clock pulse width should not be less than 10 microseconds minimum. In **SLAVE Mode** the clock is controlled by you, the **Master** microprocessor. The **SDO** data output changes on the high to low transition of the clock (**SCK**) and the data should be read on the low to high transition of the clock (**SCK**).

The example in the timing diagram above shows a % **gas** reading of **5.00%** which is equal to a binary output of 0000 0001 **1111** 0100 (bits  $2^8, 2^7, 2^6, 2^5, 2^4, 2^2$  are high "1"). You must wait (stop the clock) a minimum of 100 microseconds between the end of the **MSB** (Most Significant 8 bits) and the beginning of the **LSB** (Least Significant 8 bits).

The **SDI** (Serial Data Input) should remain low (logic '0') while the **SDO** is being read.