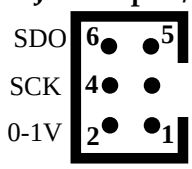
Application Note **A61**, Model 2005**SPI-2** / 2015**SPI-3** **Slave Mode**

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

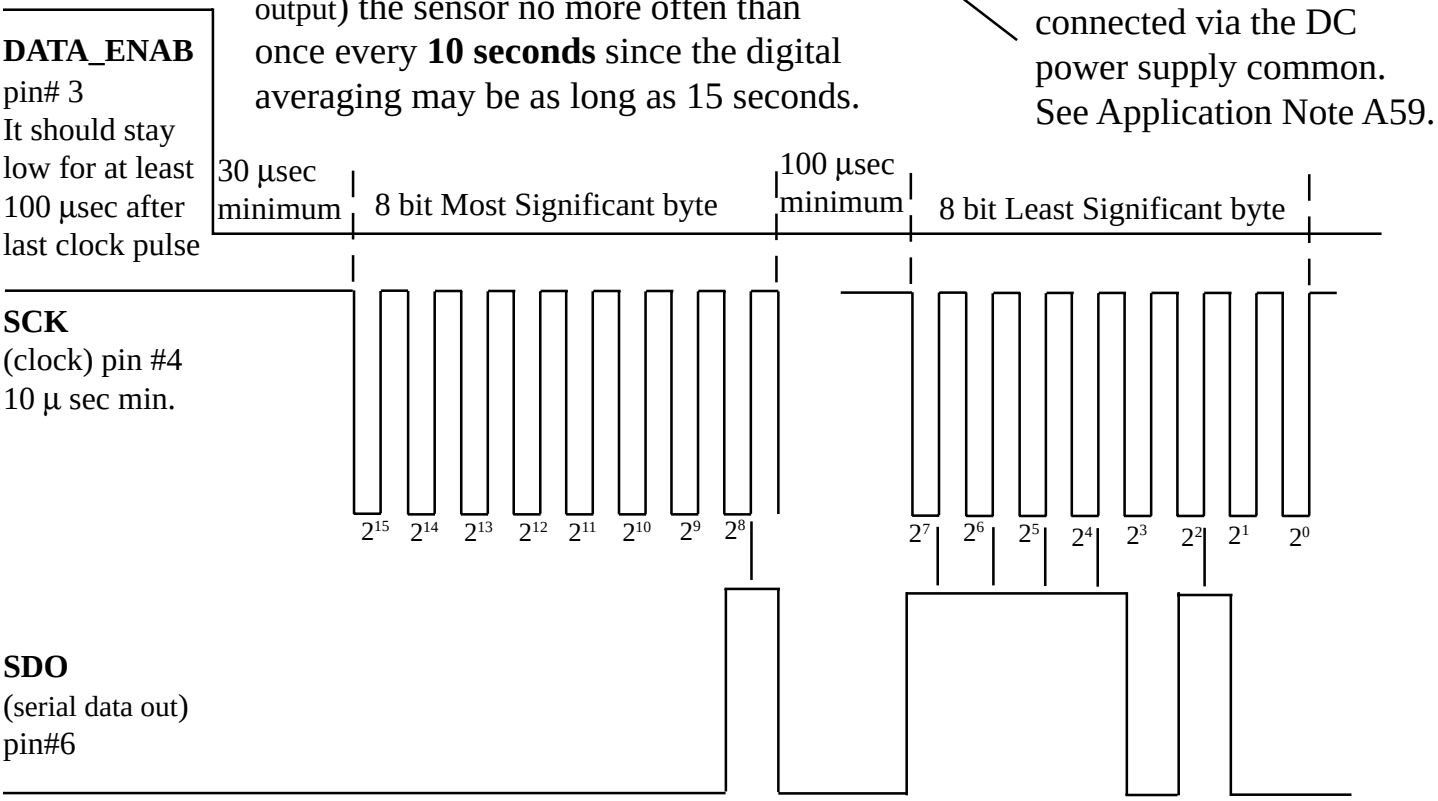
VALTRONICS

J1: Output / Input



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 **pole** (read output) the sensor no more often than once every **10 seconds** since the digital averaging may be as long as 15 seconds.



Decimal 500 = implied **5.00% gas** = binary 0000 000**1** **1111** 0**1**00 = $2^8 + 2^7 + 2^6 + 2^5 + 2^4 + 2^2$ = 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** micro-processor. 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 000**1** **1111** 0**1**00 (bits $\mathbf{2^8}$, $\mathbf{2^7}$, $\mathbf{2^6}$, $\mathbf{2^5}$, $\mathbf{2^4}$, $\mathbf{2^2}$ 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.