Interface ADC and Sensors to a PC

- AD558 is configured as “write only”
- VCC range +4.5V ~ +16.5V, normally +5V
- Vout Range: 0 ~ 2.56V, or 0 ~ 10V
- Digital Input Code Output Voltage

<table>
<thead>
<tr>
<th>Binary Hex</th>
<th>Decimal</th>
<th>2.56V</th>
<th>10V</th>
</tr>
</thead>
<tbody>
<tr>
<td>00000000</td>
<td>00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>00000001</td>
<td>01</td>
<td>0.01V</td>
<td>0.039V</td>
</tr>
<tr>
<td>00001111</td>
<td>15</td>
<td>0.15V</td>
<td>0.586V</td>
</tr>
<tr>
<td>11111111</td>
<td>FF</td>
<td>2.55V</td>
<td>9.961V</td>
</tr>
</tbody>
</table>

Pin Description

- RD: active low input signal
  - RD is used to get the converted data out of the chip
  - When CS = 0, if a high-to-low pulse is applied to the RD pin, the 8-bit digital output shows up at the D0 – D7 data pins
  - Thus, RD is also referred to as output enable
- WR: active low input signal
  - WR is used to start conversion
  - In the case that the CS input is active high, and AND gate must be used
  - Using a combination of NAND and inverters, one can decode any address range
  - For example: What’s the memory chip address range?

Decoding Methods

- Simple logical gate as address decoder
  - Use NAND or other gates because the output of NAND gate is active low and that is CS is also active low
  - In the case that the CS input is active high, and AND gate must be used
  - Using a combination of NAND and inverters, one can decode any address range
  - For example: What’s the memory chip address range?
Decoding Methods

- Use 74LS138 Decoder
  - This is one of the most widely used address decoders.
  - The 3 pins A, B, C generate 8 active low outputs Y0 ~ Y7.
  - Each Yx output is connected to CS of a memory chip, allowing control of 8 memory banks by a single decoder.
  - In 74LS138, there are additional inputs G2A, G2B, and G1. G2A and G2B are both active low, and G1 is active high.
  - If any one of the inputs G2A, G2B, and G1 is not connected to an address signal, they must be activated permanently either by Vcc or Gnd.

- Example: give the range for the memory chip.