

Objective: Build A Sensitive Voltmeter

Exercise:

Use a pot and two resistors to control the voltage reading on six LEDs. Provide twelve bits of data for the reading.

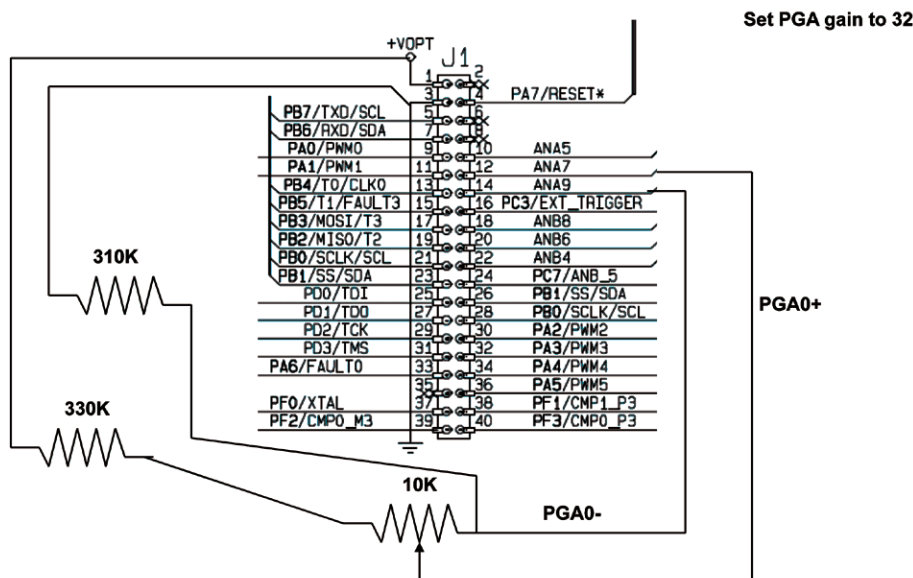
Use beans:

- PGA to boost the small signal level from a potentiometer
- ADC to read the above signal from the PGA
- PWM/Timer/Delay to drive LEDs determined by above
- LED output to see the Voltage representation

Peripheral Featured:

- Programmable Gain Amplifier (PGA)

Make the MC56F8006DEMO PGA Configuration



MC56F8006DEMO Configuration

Connect:

- JP3 to power MC56F8006
- JP4 to power J1 for voltage divider on previous slide
- RX_EN Connect 1-2 Serial Port
- TX_EN Connect 1-2 Serial Port

Voltmeter between J1 Pin 14 (PGA0-) and J1 Pin 12 (PGA0+)

The Program will display the result on the LEDs

LED1 has 1st Most Significant two Bits
 LED2 has 2nd Most Significant two Bits
 LED3 has 3rd Most Significant two Bits
 LED4 has 4th Most Significant two Bits
 LED5 has 5th Most Significant two Bits
 LED6 has 6th Most Significant two Bits

LED's have four states: off, very weak, weak, and bright.

These give two bits per LED to read the result in base 4.

Bright = 11 binary

Weak = 10 binary

Very Weak = 01 binary

OFF = 00 binary

Run the project volt_meter_leds.

Gain

Gain is set to one initially in the PGA bean.

Double click the PGA bean to see its properties, such as gain. Try changing the gain, one stage at a time. The code is set to display raw data.

The #define RAWdata

Statement may be removed and the program will calibrate offset and gain based on internal measurements.

With the statement present, the raw non-calibrated data from the ADC is directly displayed.