**KasanaShare Power Monitoring Arduino IDE Sketch**

// Author: Aaron Masuba

// Rights reserved to @KasanaShare and Team

// Definition of Voltage Sensor parameters and variables.

#define ANALOG\_IN\_PIN A3 // Analog input pin for voltage

float adc\_voltage = 0.0; // Analog to Digital Converter [ADC] float

float in\_voltage = 0.0;  // Input Voltage float

float R1 = 30000.0; // Resistor, R1 divider float in ohms

float R2 = 7500.0;  // Resistor, R2 divider float in ohms

float ref\_voltage = 5.0; // Reference voltage float

int adc\_value = 0; // Analog to Digital Converter [ADC] Integer value

// Definition of current Sensor ACS712 30A Scale based parameters and variables.

double Vout = 0; // Measured voltage variable

double Current = 0; // Measured Current Variable

const double scale\_factor = 0.066; // Scale Factor for 30A. Note, for 5A = 0.185 and for 20A = 0.1

const double vRef = 5.00; // Reference voltage since no AREF is connected

const double resConvert = 1024; // Possible values based on Arduino 10-bit Analog to Digital Converter [ADC]

double resADC = vRef/resConvert; // Analog to Digital Converter [ADC] Resolution constant

double zeroPoint = vRef/2; // Zero point constant which is half of Reference voltage

// Definition of Power parameters and Variables

double Power = 0; // Computed Power variable

void setup() // We Setup Serial Monitor

  {

    Serial.begin(9600);

    Serial.println("\n \*\*\*KasanaShare Power Monitoring Platform\*\*\* \n");

  }

void loop()

  {

   // Determination of Voltage Sensor Analog inputs.

    adc\_value = analogRead(ANALOG\_IN\_PIN); // Read volatge analog input

    adc\_voltage  = (adc\_value \* ref\_voltage) / 1024.0; // Determine voltage at ADC input

    in\_voltage = adc\_voltage / (R2/(R1+R2)); // Calculate voltage at divider input

   // Printing the Input Voltage out

    Serial.print("Input Voltage = "); // Print line for Input Voltage results on Serial monitor

    Serial.print(in\_voltage, 2); // Correct to 2 decimal places.

    delay(500); // Short delay

   // Determination of Current Sensor Analog inputs.

   for(int i = 0; i < 1000; i++) // Read Vout 1000 Times for precision

    {

      Vout = (Vout + (resADC \* analogRead(A2)));

      delay(1);

    }

   Vout = Vout /1000; // Get Vout in mv

   Current = (Vout - zeroPoint)/ scale\_factor; // Convert Vout into Current using Scale Factor

   // Print Vout and Current to two Current = ");

   /\*Serial.print("\t\t Vout = ");

    Serial.print(Vout,2);

    Serial.print(" Volts"); \*/

    Serial.print("\t Current = ");

    Serial.print(Current,2);

    Serial.print(" Amps");

    delay(500);

    // Determination of Power Computations [eliminating time aspect] [P = I \* V]

    Power = (in\_voltage \* Current); //Power computation

    Serial.print("\t\t Power = ");

    Serial.print(Power, 2);

    Serial.println(" VA");

    delay(500);

  }