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Tutorials

Current-Sensing with Allegro ACS714 Hall-Effect-Sensor

Schematic:



```
int AnalogInputPin = 0; // Define analog input pin

//
-----

void setup(){
  Serial.begin(9600);
}

void loop(){
  double Current = currentSensor(analogRead(AnalogInputPin)); // Read analog value
  Serial.print(" VariationFromNull: ");
  printDouble(Current, 2); // display Current
  Serial.print(" A");
  Serial.println("");
  delay(1000);
}

//
-----

// Print decimal numbers

void printDouble(double val, byte precision){
  Serial.print (int(val)); // Print int part
  if( precision > 0) { // Print decimal part
    Serial.print(".");
    unsigned long frac, mult = 1;
    byte padding = precision -1;
    while(precision--) mult *=10;
    if(val >= 0) frac = (val - int(val)) * mult; else frac = (int(val) - val) * mult;
    unsigned long frac1 = frac;
    while(frac1 /= 10) padding--;
    while(padding--) Serial.print("0");
    Serial.print(frac,DEC) ;
  }
}
```

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// Read 1.1V reference against AVcc

long readInternalVcc() {

```
    long result;
    ADMUX = _BV(REFS0) | _BV(MUX3) | _BV(MUX2) | _BV(MUX1);
    delay(2); // Wait for Vref to settle
    ADCSRA |= _BV(ADSC); // Convert
    while (bit_is_set(ADCSRA,ADSC));
    result = ADCL;
    result |= ADCH<<8;
    result = 1126400L / result; // Back-calculate AVcc in mV
    return result;
}
```

// Calculate current with Allegro ACS714

double currentSensor(int RawADC) {

```
    int    Sensitivity    = 66; // mV/A
    long    InternalVcc    = readInternalVcc();
    double  ZeroCurrentVcc = InternalVcc / 2;
    double  SensedException = (RawADC * InternalVcc) / 1024;
    double  Difference      = SensedException - ZeroCurrentVcc;
    double  SensedException = Difference / Sensitivity;
    Serial.print("ADC: ");
    Serial.print(RawADC);
    Serial.print("/1024");
    Serial.print(", SensedException: ");
    printDouble(SensedException, 1);
    Serial.print("mV");
    Serial.print(", 0A at: ");
    printDouble(ZeroCurrentVcc, 1);
    Serial.print("mV");
    return SensedException; // Return the Current
}
```

by wildblue (<http://playground.arduino.cc/Profiles/Wildblue>)

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