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(http://playground.arduino.cc/Main/ArduinoCoreHardware)
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(http://playground.arduino.cc/Main/DevelopmentTools)
Arduino on other Atmel Chips
(http://playground.arduino.cc/Main/ArduinoOnOtherAtmelChips)
Interfacing With Hardware
(http://playground.arduino.cc/Main/InterfacingWithHardware)

- Output
  (http://playground.arduino.cc/Main/InterfacingWithHardware#Output)
- Input
  (http://playground.arduino.cc/Main/InterfacingWithHardware#InputTOC)
- User Interface
  (http://playground.arduino.cc/Main/InterfacingWithHardware#ui)
- Storage
  (http://playground.arduino.cc/Main/InterfacingWithHardware#Storage)
- Communication
  (http://playground.arduino.cc/Main/InterfacingWithHardware#Communication)
- Power supplies
  (http://playground.arduino.cc/Main/IntWithHW
  -PwrSup)
- General
  (http://playground.arduino.cc/Main/InterfacingWithHardware#General)

Interfacing with Software
(http://playground.arduino.cc/Main/InterfacingWithSoftware)
User Code Library
(http://playground.arduino.cc/Main/GeneralCodeLibrary)

- Snippets and Sketches
  (http://playground.arduino.cc/Main/SketchList)
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  (http://playground.arduino.cc/Main/LibraryList)
- Tutorials
  (http://playground.arduino.cc/Main/TutorialList)

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(http://code.google.com/p/arduino/issues/list)
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(http://playground.arduino.cc/Main/ElectroInfoResources)
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(http://playground.arduino.cc/Main/Resources)

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(http://playground.arduino.cc/Main/SimilarBoards)
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(http://playground.arduino.cc/Main/People)
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(http://playground.arduino.cc/Projects/ArduinoUsers)
Project Ideas
(http://playground.arduino.cc/Projects/Ideas)
Languages
(http://playground.arduino.cc/Main/Languages)

PARTICIPATE
(http://playground.arduino.cc/Main/Participate)

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  (http://code.google.com/p/arduino/issues/list)
- Formatting guidelines
  (http://playground.arduino.cc/Main/Participate#contribrules)
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  (http://playground.arduino.cc/Site/AllRecentChanges)
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  (http://playground.arduino.cc/PmWiki/PmWiki)
- WikiSandBox training
  (http://playground.arduino.cc/Main/WikiSandbox)
- Basic Editing
  (http://playground.arduino.cc/PmWiki/BasicEditing)
- Cookbook (addons)
  (http://www.pmwiki.org/wiki/Cookbook/CookbookBasics)
- Documentation index
  (http://www.pmwiki.org/wiki/PmWiki/DocumentationIndex)
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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) ;
  }
}

// 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 SensedVoltage  = (RawADC * InternalVcc) / 1024;
  double Difference     = SensedVoltage - ZeroCurrentVcc;
  double SensedCurrent  = Difference / Sensitivity;
  Serial.print("ADC: ");
  Serial.print(RawADC);
  Serial.print("/1024");
  Serial.print(", Sensed Voltage: ");
  printDouble(SensedVoltage, 1);
  Serial.print("mV");
  Serial.print(", 0A at: ");
  printDouble(ZeroCurrentVcc, 1);
  Serial.print("mV");
  return SensedCurrent;                                       // Return the Current
```

```
}
```

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

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