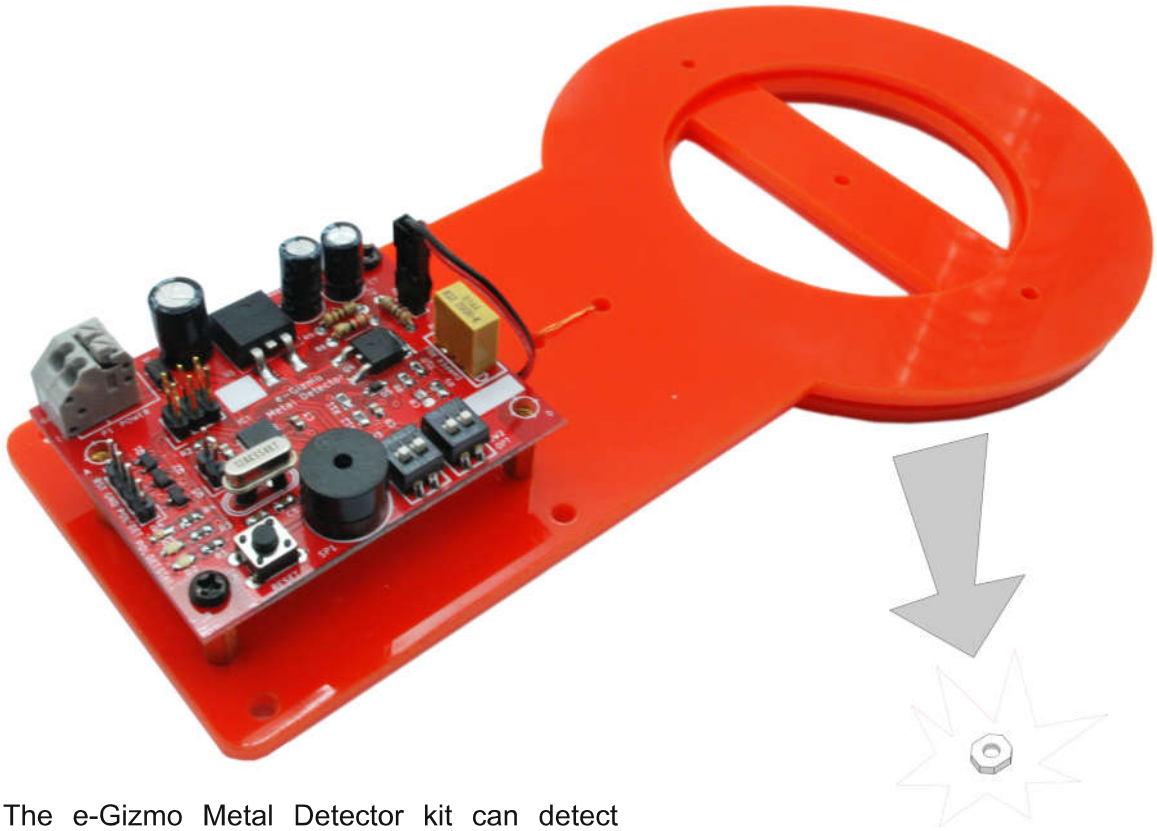
Metal Detector

Technical Manual Rev 1r0



The e-Gizmo Metal Detector kit can detect metallic object as small as 2x2 mm (tested object - screw) located about 2 cm above the plane and center of the sensing coil. Larger objects can be sensed at a longer distance.

Note: Polarity outout may be used to distinguish if the detected metal has paramagnetic or diamagnetic properties (e.g Iron and Aluminium). This function is not 100 % reliable but can be useful in many cases.

FEATURES:
- Compatible in all gizDuino Boards.
- With Reset button for "no detect" calibration.
- With Dip switch sensistivity setting (0 - 2)
  where: 0 - High Sensitivity
  2 - Low Sensitivity
- "Detect" and "Polarity" open collector digital output readily interface with any MCU.
- "Reset" input allows the host MCU to re-calibrate the kit under software control.
- You can add 1k ohms pull-up resistor for stable output results.

GENERAL SPECIFICATION:

Supply Input: 9 - 12V DC

On board IC: ATTiny261

PCB Dimension: 61 mm x 52 mm

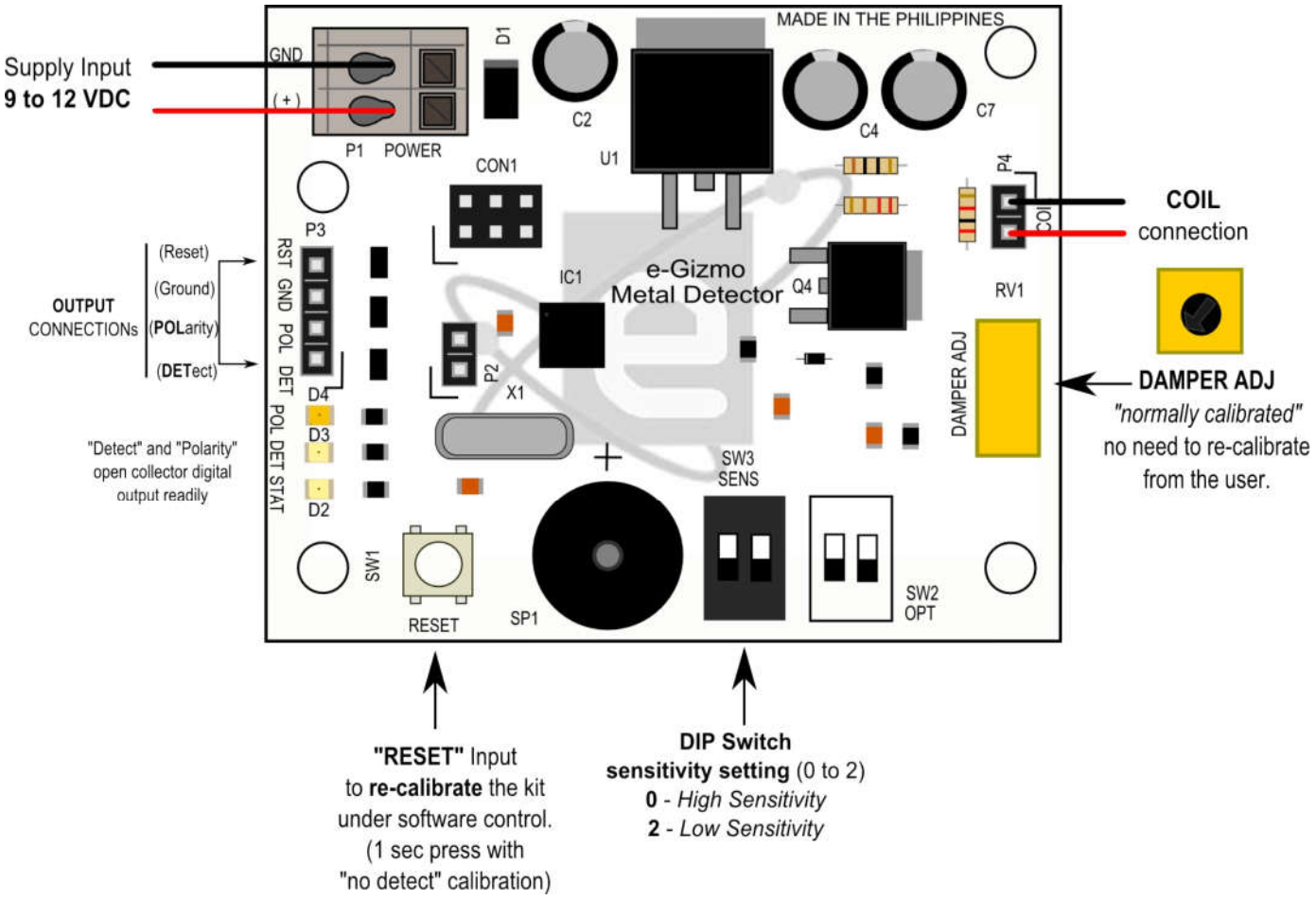


Figure 1. *e-Gizmo Metal Detector Major Parts Presentation.*

Table 1. ***P1*** Power Connection

PIN I.D	Descriptions
P1	For battery wire connections

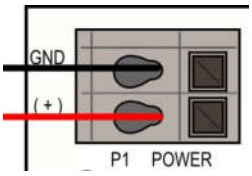


Figure 2. *P1 Illustration*

Table 2. ***P3*** Output Connections

Pin I.D	Descriptions
RST	Reset I/O Connection
GND	Ground Connection
POL	"Polarity" Output Connnection
DET	"Detect" Output Connection

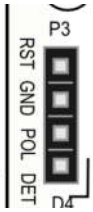


Figure 3. *P3 Illustration*

Table 3. ***P4*** Coil connection

PIN I.D	Descriptions
P4	For coil connections

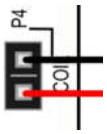


Figure 4. *P4 Illustration*

Table 3. ***D2 - D4*** LED Indicators

Pin I.D	Pin Name	Descriptions
D2	STAT	Status Indicator (always "ON")
D3	DET	"Detect" Indicator
D4	POL	"Polarity" Indicator

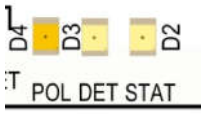


Figure 5. *D2-D4 Illustration*

Table 4. ***SW1 - SW3*** Calibration Switches

Pin I.D	Pin Name	Descriptions
SW1	RESET	"Reset" Input to re-calibrate the kit
SW2	SENS	DIP Switch sensitivity setting (0 -2) **0** - *High Sensitivity* **2** - *Low Sensitivity*
SW3	OPT	Optional Switch NC

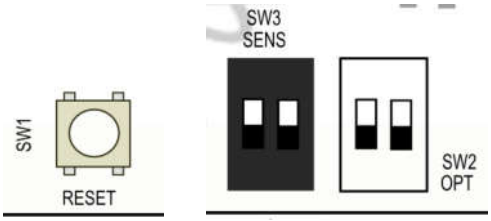


Figure 6. *SW1-SW3 Illustration*

Table 5 . ***RV1*** Damper Adjustment

Pin I.D	Pin Name	Descriptions
RV1	DAMPER ADJ	"normally calibrated"

Figure 7. *RV1 Illustration*

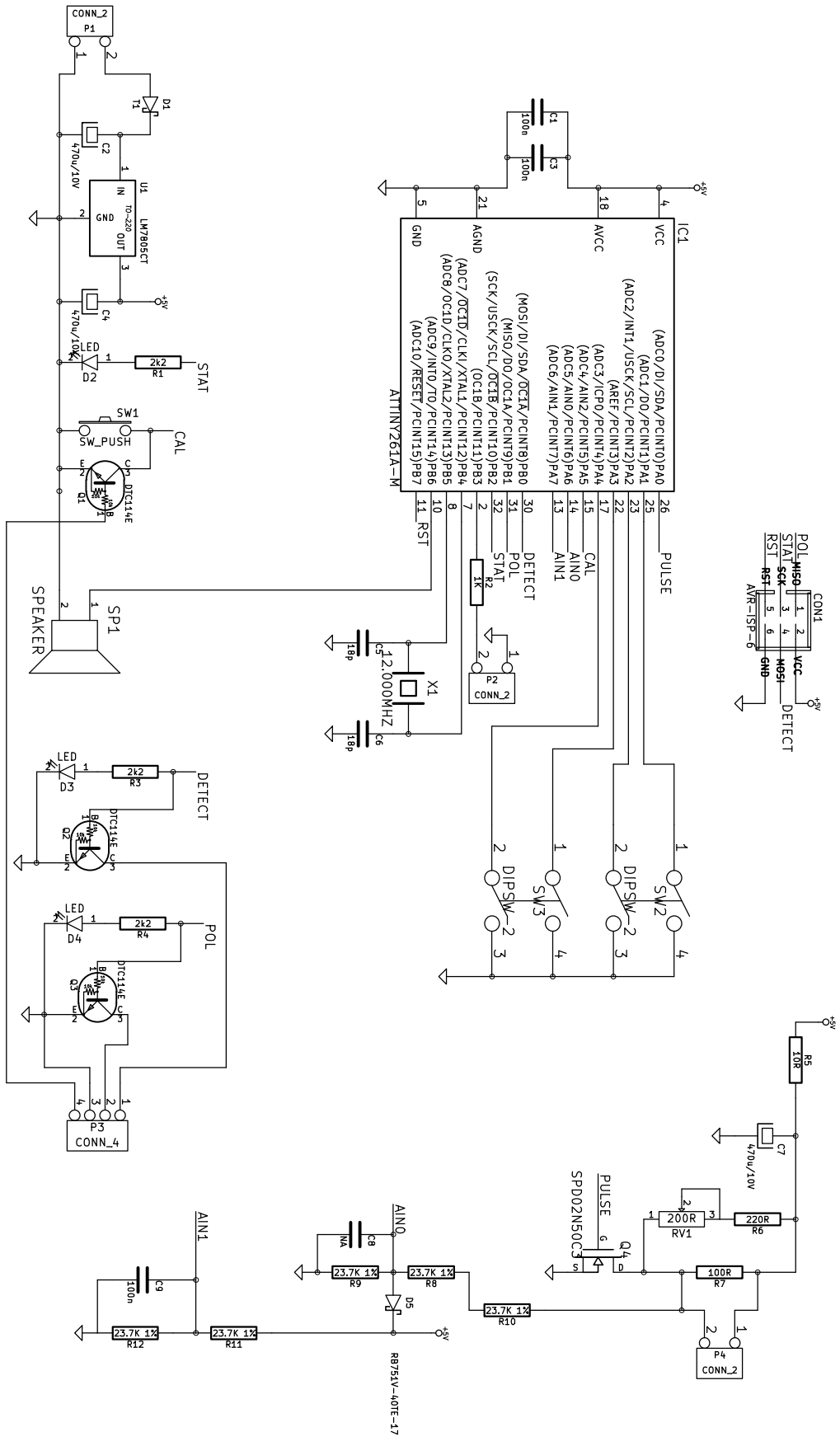


Figure 8. *Schematic Diagram of e-Gizmo Metal Detector kit*

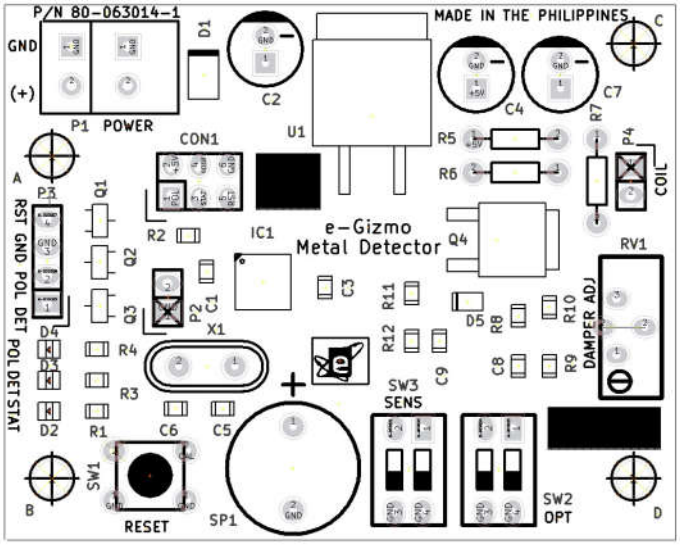


Figure 9. *Parts Placement*

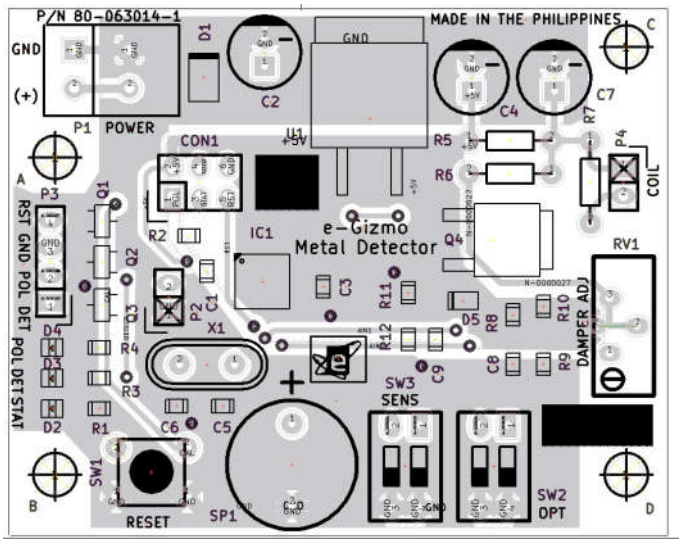


Figure 10. *Metal Detector - BottomGuide*

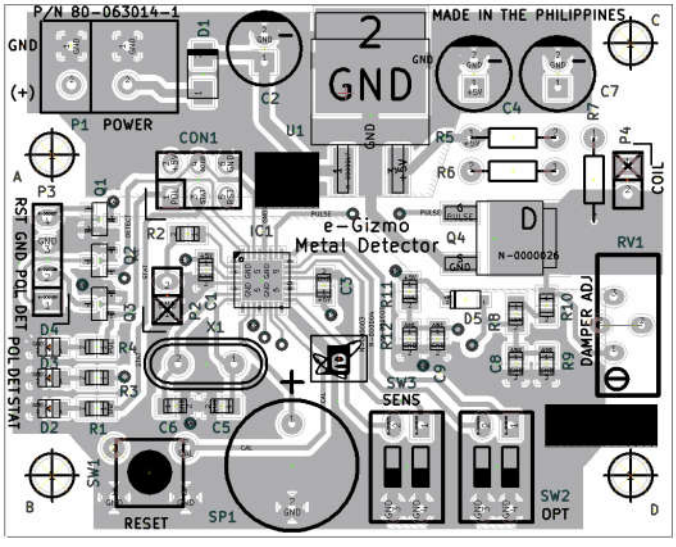


Figure 11. *Metal Detector - TopGuide*

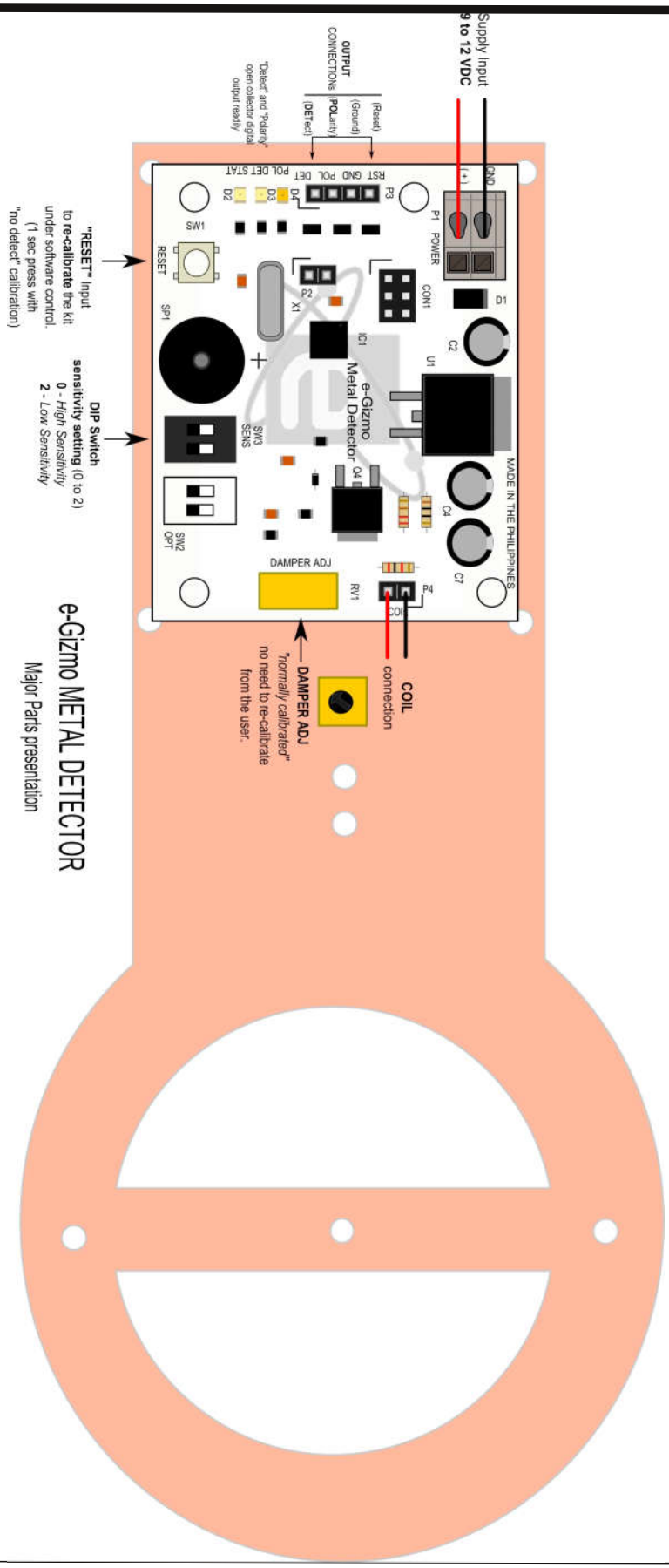


Figure 12. *Sample Application of e-Gizmo Metal Detector*

```
/*
  e-Gizmo Metal Detector Sample sketch

  This sample code is for the metal detector kit.
  It can shows you the output on the serial monitor
  "Detect" and "Polarity"  are open collector
  digital output readily. DET is 0 when there is a
  metallic object detected, then buzzer will sound.


  Output connections:
  Metal Detector      Gizduino board
     RST        ---    RESET/Digital or Analog I
     GND        ---    GND
     POL        ---    Digital pin 5
     DET        ---    Digital pin 4


Note: Polarity output may be used to distinguish
if the detected metal has paramagnetic or
diamagnetic properties (e.g Iron and Aluminium).
This function is not 100% reliable but can be
useful in many cases.

  This example code is in the public domain.

  by
  e-Gizmo Mechatronix Central
  http://www.e-gizmo.com
  August 9, 2014

 */

// the setup routine runs once when you press
reset:
void setup() {
  // initialize serial communication at 9600 bits per
second:
  Serial.begin(9600);
}

// the loop routine runs over and over again
forever:
void loop() {
  // read the input on analog pin 0:
  int DET = digitalRead(4);
  int POL = digitalRead(5);

  Serial.print("DETECT: ");
  Serial.print(DET);
  Serial.print("  POL: ");
  Serial.println(POL);


  delay(10);
}
```