

Market Study of Hall Effect Sensors

To find the right Hall effect sensor for the Anti-Puzzle, we must consider the following requirements:

- Analog output
- Compatibility with Arduino Nano
- Affordable price
- Highest possible nominal range compared to competitors.
- Correctly reads conventional "neodymium" magnets.

Considering these requirements, we conclude that the Honeywell SS49E sensor is the best fit for our needs.

SS49E Sensor Description:

The SS49E is a magnetic Hall effect sensor that detects the presence of a nearby magnetic field. It has an analog output that can be read by a microcontroller such as the Arduino Nano.

SS49E Sensor Specifications:

- Supply voltage: 4.5V to 24V
- Current consumption: 8mA
- Analog output: 0V to Vcc (proportional to the magnetic field intensity)
- Sensitivity: 2.5mV/mT
- Operating temperature: -40°C to 125°C

Compatibility with Arduino Nano:

The SS49E is compatible with the Arduino Nano for the following reasons:

- Supply voltage: The SS49E can be powered by the 5V provided by the Vcc pin of the Arduino Nano.
- Current consumption: The current consumption of the SS49E is low (8mA), therefore it will not overload the Vcc pin of the Arduino Nano.
- Analog output: The analog output of the SS49E can be read by one of the analog pins of the Arduino Nano.

Connecting the SS49E Sensor to the Arduino Nano:

The SS49E can be connected to the Arduino Nano as follows:

- Vcc pin of the SS49E to the Vcc pin of the Arduino Nano.
- GND pin of the SS49E to the GND pin of the Arduino Nano.
- Analog output pin of the SS49E to an analog pin of the Arduino Nano.

Reading the SS49E Sensor Value:

To read the value of the SS49E sensor, you can use the "analogRead()" function of the Arduino IDE. The value read will be a numerical value between 0 and 1023, which will be proportional to the intensity of the magnetic field detected by the sensor.

Datasheet Link: <https://docs.rs-online.com/11cc/A700000008414540.pdf>