Special Sensor Report:

CHERRY SENSOR'S
G100701 GEAR TOOTH SENSOR (HALL EFFECT)

and Interface

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Robot: Mr. Tool

Description

The GS100701's primary purpose is high speed gear sensing. Normal applications include automotive applications and machinery speed sensing. However, this hall type sensor can also be used to detect metal objects that are within close proximity to the head. In Mr. Tool, it is used to accept/reject ferrous targets.

This model is a sinking interface, i.e. negative logic.

The sensor contains internal integrated circuitry that is basically an open collector bipolar junction transistor. The BJT supplies ground on the signal output wire when a ferrous (gear) target is sensed. The only external circuitry that is needed is a pull-up resistor that is determined by input voltage. The GS100701 can operate on voltages from 5 to 24 VDC.
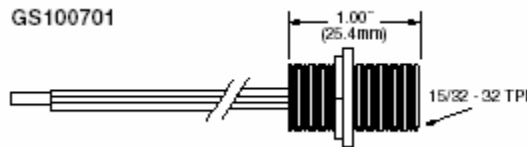

Figure 1. GS100701 Gear Tooth Sensor (Courtesy Cherry Sensor)

Advantages and Disadvantages

Advantages include easy integration into any existing design. All that is required is a simple pull up resistor. Table 1 describes possible resistor values

Volts dc	5	9	12	15	24
Ohms	470	820	1.2K	1.5K	2.2K

Table 1. Resistor Values

The main disadvantage is in the metal detection application. Any metal has to be close (<5 mm) before a logic one is output on the signal wire

Interface

Figure 2 shows the typical interface. No other external circuitry is needed.

Normal software approach would include polling or the use of external interrupts. Mr. Tool uses the previous, so no relevant software is available. Once an object is detected using an alternate means (IR/Photo Transistor), the GS100701 is used to determine whether the object is ferrous or not.
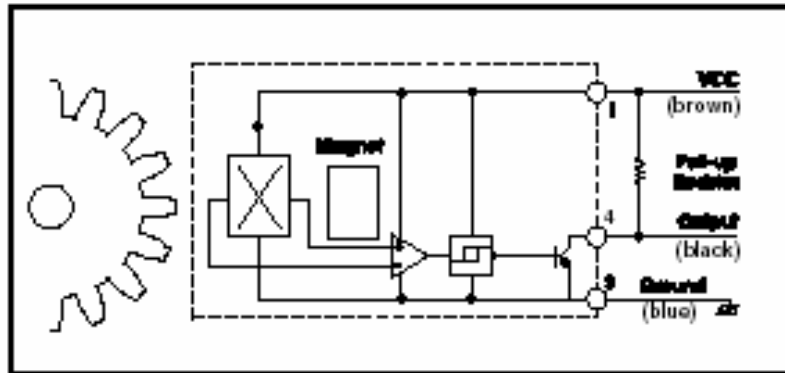

Figure 2. Interface Circuit

Availability and Cost

The GS100701 can be easily acquired online through www.cherrycorp.com as a free sample. If not, the cost is approximately $32 and it is available from major distributors like Digikey and Newark.

Sources:

"Cherry GS Sensors.pdf" Datasheet, www.cherrycorp.com