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Use Arduino for Wheel Encoder Counter

Have your Arduino count motor encoder rotations. Connect the Arduino to your EZ-B UART #0 port to send the encoder counts.

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Connect The Wires

There are two sets of wires which will need to be connected:

1. The Arduino to the encoder
2. The Arduino to the EZ-B

Encoder Connect the encoder wires to your Arduino pins 2 and 3. These pins are interrupt pins. The code will count the number of changes between HIGH and LOW state of these pins.

- pin 2: Encoder #1
- pin 3: Encoder #2

EZ-B Connect the Arduino's TX and RX ports to the UART #0 of the EZ-B. Consult the ez-b datasheet to locate the UART #0 port.

- Connect EZB UART 0 TX to ARDUINO RX
- Connect EZB UART 0 RX to ARDUINO TX
- Connect Arduino GND to EZ-B GND

Program Arduino

Here is the program which you will upload to your Arduino. The program has 2 interrupt counters for the pins connected to the encoders. The main program will loop until the letter 'a' i received from the EZ-B over the UART. Once the 'a' is received, the Arduino will transmit 2 bytes, which is are the two encoder values, respectively. Once the data is transmitted, the count of the 2 bytes is reset.

Resetting the values on each query will make it much easier in EZ-Builder to identify what wheel is spinning quicker/slower.

Arduino Code: ``` // just reading the encoder, nothing else.

int encoderValue_A = 0; int encoderValue_B = 0;

void setup() {

Serial.begin(9600);

pinMode(2, INPUT); pinMode(3, INPUT);

attachInterrupt(digitalPinToInterrupt(2), countA, FALLING);
attachInterrupt(digitalPinToInterrupt(3), countB, FALLING); }

void loop() {

// if there is data to read, read it if (Serial.available() > 0) {

```
// read the incoming data from the ezb
int incomingByte = Serial.read();

// command 'a' means transmit the current values and reset the counters
if (incomingByte == 'a') {

  // send the values
  Serial.write(encoderValue_A);
  Serial.write(encoderValue_B);

  // reset the values
  encoderValue_A = 0;
  encoderValue_B = 0;
}
```

}

void countA() {

encoderValue_A++;
}

void countB() {

encoderValue_B++;
} ```

EZ-Script Program

In EZ-Builder, add a new EZ-Script control.

This code will be pasted into the EZ-Script control. The code will loop and continue to request the interrupt counts of the encoders from the Arduino.

The values of the encoder are in the array $encoders[0] and $encoders[1]. You may use these two values globally within the project to identify what the encoder values are.

EZB Code ``` uartinit(0, 0, 9600)

:loop

Send a request for data to the arduino

uartwrite(0, 0, "a")

wait a bit for the data to be transmitted

sleep(50)

$dataAvail = UartAvailable(0, 0)

IF ($dataAvail != 2)

print("The arduino didn't send us anything. Exiting")

halt()

ELSE

UartReadBinary(0, 0, 2, $encoders)

print("Encoder A: " + $encoders[0]) print("Encoder B: " + $encoders[1])

ENDIF

sleep(100)

goto(loop) ```

Reference

This tutorial was inspired from this thread: http://www.ez-robot.com/Community/Forum/Thread?threadId=5603&page=3