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**17.01.2011
at
01:11:37**

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Arduino Forum › Hardware › Interfacing › MMA7260 3axis accelerometer

‹ Previous Topic | Next Topic ›

📄 **Pages: 1**

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📂 **MMA7260 3axis accelerometer (Read 1028 times)**

bullethole
Junior Member
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Offline
Arduino rocks

Posts: 63

📄 **MMA7260 3axis accelerometer**
12.08.2010 at 22:31:51

I have the sparkfun breakout board for the subject accelerometer. I've tried all the various code bits I can find, and frankly am not sure that the darn thing is even working (first time with this).
On my arduino mega I have (Pins are as silkscrened on the mega)
VCC to the 3V3 pin on the Mega
GND to the Mega GND pin
g1 Digital Pin 52(Set to high with digital write)
g2 Digitla Pin 53 (set to high with digital write)
Sleep to Digital 51 (set high)
X analog Pin 0
Y analog Pin 1
Z analog Pin 2

I have a very simple sketch which loops reading the inputs, and prints them to the serial monitor. I'm getting values like
x=327 y=333 z=338 with the device resting.   They vary slightly by one or 2 on each, but are pretty consistent.

Moving the board around does give some changes in the values.

Is the device working. How do I convert the read values to G's (or even angle for that matter.

Back to top

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📄 **Re: MMA7260 3axis accelerometer**
Reply #1 - 12.08.2010 at 22:32:38

This is my code

```
int xpin = 0;              // x-axis of the accelerometer
int ypin = 1;              // y-axis
int zpin = 2;              // z-axis (only on 3-axis models)
int  g1 = 52;
int  g2 = 53;
int  slp = 51;
int xinit,yinit,zinit;
void setup()
{
Serial.begin(9600);

// Provide ground and power by using the analog inputs as normal
// digital pins.  This makes it possible to directly connect the
// breakout board to the Arduino.  If you use the normal 5V and
// GND pins on the Arduino, you can remove these lines.

Serial.println("enter 0 for write, any other for read");
 while (!Serial.available());
 int inByte = Serial.read();

pinMode(g1, OUTPUT);
pinMode(g2, OUTPUT);
pinMode(slp,OUTPUT);
pinMode(xpin,INPUT);
pinMode(ypin,INPUT);
pinMode(zpin,INPUT);

digitalWrite(g1, HIGH);
digitalWrite(g2, HIGH);
digitalWrite(slp, HIGH);

xinit=analogRead(xpin);
yinit=analogRead(ypin);
zinit=analogRead(zpin);
 Serial.println("Initial Values");
 Serial.print(xinit);Serial.print(" ");
 Serial.print(yinit);Serial.print(" ");
 Serial.print(zinit);Serial.print(" ");
 Serial.println();
 Serial.println("Measured");
 Serial.flush();
 while (!Serial.available()){;}
}

void loop()
{

int x,y,z;

x = analogRead(xpin);
y = analogRead(ypin);
z = analogRead(zpin);

if ( (x != xinit) || (y != yinit) || (z != zinit)){
    Serial.print(x);
    Serial.print(" ");
    Serial.print(y);
    Serial.print(" ");
```

Back to top

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ruggedcircuits.com

Posts: 1334

Re: MMA7260 3axis accelerometer
Reply #2 - 12.08.2010 at 23:35:20

Quote:

> g1 Digital Pin 52(Set to high with digital write)
> g2 Digitla Pin 53 (set to high with digital write)

I'd begin with these set to 0 for maximum sensitivity (1.5g, or 0.8V/g).

Quote:

> I have a very simple sketch which loops reading the inputs, and prints
> them to the serial monitor. I'm getting values like
> x=327 y=333 z=338 with the device resting. They vary slightly by
> one or 2 on each, but are pretty consistent.

That's good. At rest, the output voltage should be about half the supply, or 1.65V. Referenced to the 5V analog reference voltage of the arduino I would expect a reading of 1.65/5 * 1024 ==> 338. So far so good.

Now at your sensitivity setting (both G1 and G2 high) the change is 200mV/g. The Z-axis is feeling the force of gravity thus we would expect this to be higher (or lower) by 0.2V from the center 1.65V value. This gives a reading of either 1.85/5*1024==>379 or 1.45/5*1024==>297, depending on which way is "up".

Now that's a bit of a concern because none of your values are 379/297. The Z axis reading should be this different from the rest when it's just sitting on your desk.

A good way to test it, then, is to put the accelerometer in different orientations (portrait, landscape, upside down, etc.) and have the gravity acceleration vector affect the three axes in sequence.

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Back to top

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Re: MMA7260 3axis accelerometer
Reply #3 - 13.08.2010 at 00:06:04

Thanks. Would the ref voltage not.be 3.3 since that is the input voltage

Back to top

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Posts: 1334

Re: MMA7260 3axis accelerometer
Reply #4 - 13.08.2010 at 00:08:49

The reference voltage is determined by the Arduino. The default is the Arduino's supply voltage, or 5V. You can apply 3.3V to the AREF pin and reconfigure the A/D converter to use this, but this is potentially dangerous as misconfiguration can damage your 3.3V supply.

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Re: MMA7260 3axis accelerometer
Reply #5 - 13.08.2010 at 01:14:49

thanks. So that means its referenced to the Arduino, not the voltage into the sensor.. that makes sense

Back to top   View Profile   IP Logged

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Posts: 63

Re: MMA7260 3axis accelerometer
Reply #6 - 13.08.2010 at 15:33:36

Sorry for all the bonehead questions. I changed the sensitivity to 1.5G (0,0 on the G1/G2 pins). Measuring Static. With the device "level" on a bench, X=274,y=297,z=528.   Since its static, Z should be measuring 1G.

If I do the math. Converting the measurement to V should be 5*(528/1024) = 2.573V Which is 2573MV Divide that by sensitivity of 800MV/G gives me 3.2G which seems to be incorrect

So clearly my math is wrong.

If I turn the unit over (negative 1G), I get a calculated value of 1.19G which is probably close due to tollerances

Same thing for the X axis. If I stand the board so the arrow for X points down. I should get 1G measured.   The value there is 441

V=5*(441/1024) gives me 2.15V, which converts to 2.69G

I'm wondering if I have to calibrate the device somehow

At 800mV/G 1G should be an additional 164 from the center value of 1.65

Back to top   View Profile   IP Logged

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Posts: 1334

Re: MMA7260 3axis accelerometer
Reply #7 - 13.08.2010 at 17:34:12

Quote:

> If I do the math. Converting the measurement to V should be 5*(528/1024) = 2.573V Which is 2573MV Divide that by sensitivity of 800MV/G gives me 3.2G which seems to be incorrect

You forgot to subtract out the 0g reference which is 1.65V (approximately...should be 3.3V/2). This allows for both positive g's (above 1.65V) and negative g's (below 1.65V).

So the math should be 2.573V - 1.65V -->0.923V / 0.8V/g --> 1.15g. Much more reasonable.

See if that reasoning makes the remaining numbers reasonable.

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Back to top

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Posts: 63

Re: MMA7260 3axis accelerometer
Reply #8 - 13.08.2010 at 22:34:49

yep.. that makes sense and the values seem correct.

now to write a log to a file on the ST card and see what I get.

Back to top

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Posts: 9

Re: MMA7260 3axis accelerometer
Reply #9 - 15.11.2010 at 17:10:44

Hey,

I tried the same sketch as you, cause I also have some problems with my MMA7260. Now after printing 'Measured', nothing happens. Which means that my serial is not available? How to solve this?

Thx

Back to top

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Posts: 9

Re: MMA7260 3axis accelerometer
Reply #10 - 20.11.2010 at 10:52:44

The MMA7260 is connected the right way.. I don't think the accelerometer is fried, cause it is the first time I'm using it since I've ordered it.

Can someone help?

Back to top

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Posts: 63

Re: MMA7260 3axis accelerometer
Reply #11 - 22.11.2010 at 13:39:24

I gave up on the MMA7260 and am using the ADXL320 (yes its only 2 axis, but for what I'm doing 2 is fine for now).

Back to top

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Ildefonso Martínez
Marchena
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Posts: 1

Good MMA7260 3axis accelerometer calibration
Reply #12 - 20.12.2010 at 10:50:19

Here you can see my Sketch, with an auto configuration section at first.

In rest you can see de g-force near 1 with good results!!! In the configuration step keep the accelerometer quiet in horizontal position

```
x,y,z
-0.03 0.05 1.05
-0.05 0.06 1.06
-0.04 0.01 1.06
-0.07 0.09 1.04
-0.04 0.06 1.06
-0.08 0.09 1.05
```

the code here

```
#define DEBUGMODE

const float RESOLUTION=800; //0.8 v/g -> resolucion de 1.5g -> 800mV/g
const float VOLTAGE=3.3;  //voltage al que está conectado el acelerómetro

const float ZOUT1G = 2450;   // mv Voltage en Zout a 1G
const float ZOUT0G = 1650;   // mv Voltage en Zout a 1G
const float ZOUT_1G = 850;   // mv Voltage en Zout a 1G

const float XOUT1G = 2450;   // mv Voltage en Zout a 1G
const float XOUT0G = 1650;   // mv Voltage en Zout a 1G

const float YOUT1G = 2450;   // mv Voltage en Zout a 1G
const float YOUT0G = 1650;   // mv Voltage en Zout a 1G

const int NADJ  = 50;

// Entradas analógicas donde van los sensores
const int xaxis = 0;
const int yaxis = 1;
const int zaxis = 2;

// Salida digital del led de la placa
const int LEDPIN = 13;

float XError,YError,ZError;
float zero_g_reference, ZRes, XRes, YRes;
float xd,yd,zd,z,x,y;

float AccelAdjust(int axis)
{
 float acc = 0,lectura = 0;
 int j;

 for (j=0;j<NADJ;j++)
 {
   lectura=analogRead(axis);
   acc = acc + ((lectura*5000)/1024.0);
   delay(11); //número primo para evitar ciclos de lectura
 }

 return acc/NADJ;
}
```

Back to top

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IP Logged

Pages: 1

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‹ Previous Topic | Next Topic ›

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