**Firetail** *UAV System*

Jun 22 (http://www.camelsoftware.com/firetail/blog/electronics/lps331-vs-bmp085-comparison-of-altimeters/)

# LPS331 VS BMP085 VS LPS25H – COMPARISON OF ALTIMETERS
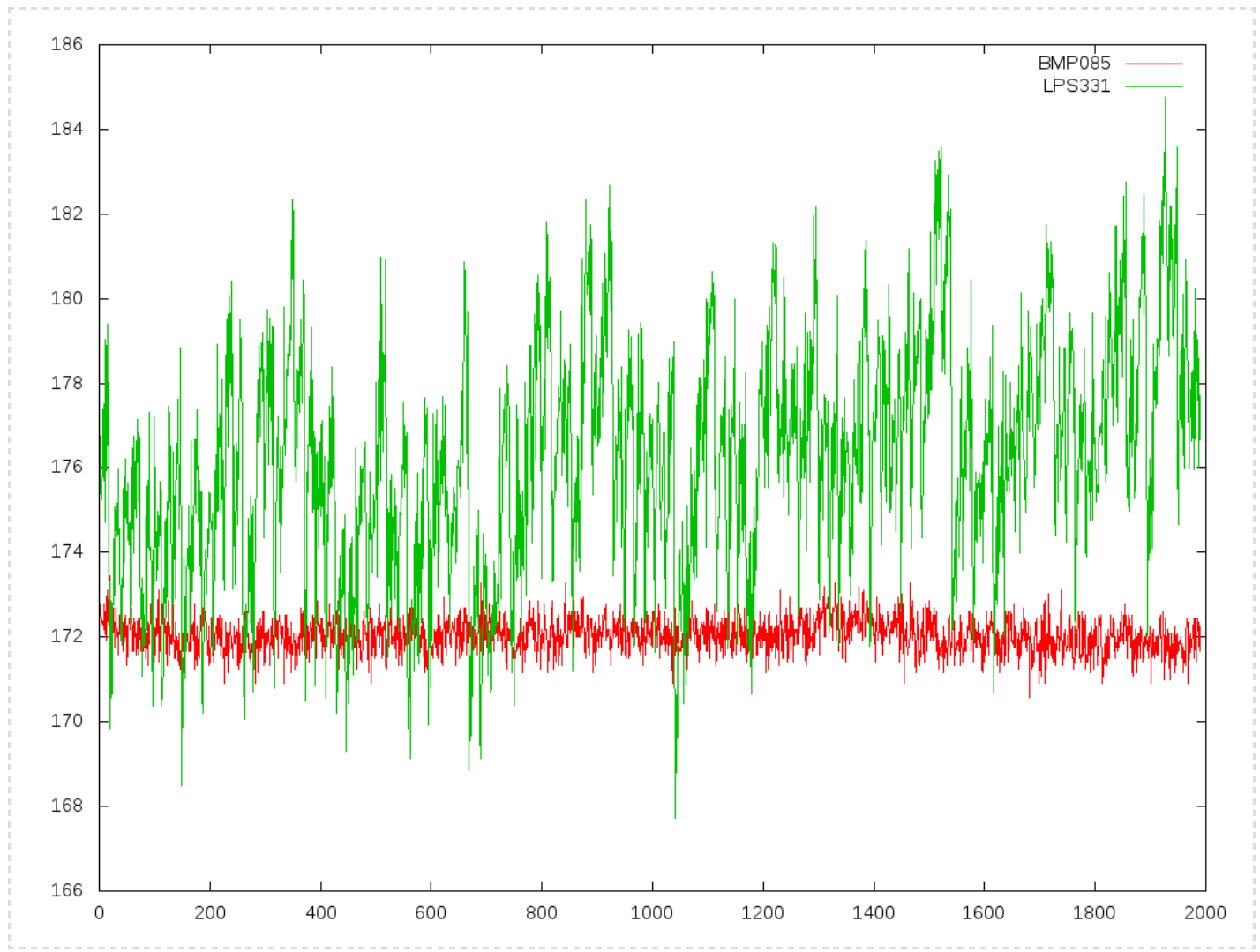
BY CAMEL          7 COMMENTS

I just did a side by side comparison for the LPS331 and BMP085 pressure sensors. I've also edited this post to add the new LPS25H. Scroll to the bottom to see that graph.

Here's the LPS331 vs BMP085 graph.



LPS331 VS BMP085

This is 512 samples taken at 20ms intervals. This graph does not give any indication of long term accuracy. If the results above were put through a low pass filter, I have no idea which one would be more accurate.

I don't believe accuracy is important for most uses. What IS important is having a reference point that doesn't drift. Imagine flying up to 1000ft and then hitting the ground at +100ft on the way down – because the sensor has drifted -100ft. What is also very important is low signal noise. What this overwhelmingly demonstrates is that the LPS331 is very noisy. This makes it hard to get accurate altitude readings in a dynamic environment (ie. a model aircraft or rocket), where the altitude can change quite rapidly. The low pass filter required to get decent readings will cause so much lag that it's basically useless. Imagine trying to derive vertical speed from that!

## torque sensor rotary

wireless temperature,force,torque, from rotating sensors

○  ○

Unfortunately for me, I don't have to image. Getting vertical speed information for Firetail using an LPS331 has been my nightmare for the past 24 hours how. I've tried using a Kalman filter to infuse some acceleration. This allows me to really filter out the noise whilst keeping it relatively responsive, but after hours of tweaking and simulations I've got it to the point where it's 'OK'. But it's not great. Even the mighty Kalman filter can't sort it out as well as I'd like.

So if you need a pressure sensor / altimeter, get a BMP085 or a MS5561. The LPS331 just doesn't cut it.

edit* OR get an LPS25H. These new sensors from STMicro are supposed to be a higher quality alternative to the LPS331. Unsurprisingly, they are.
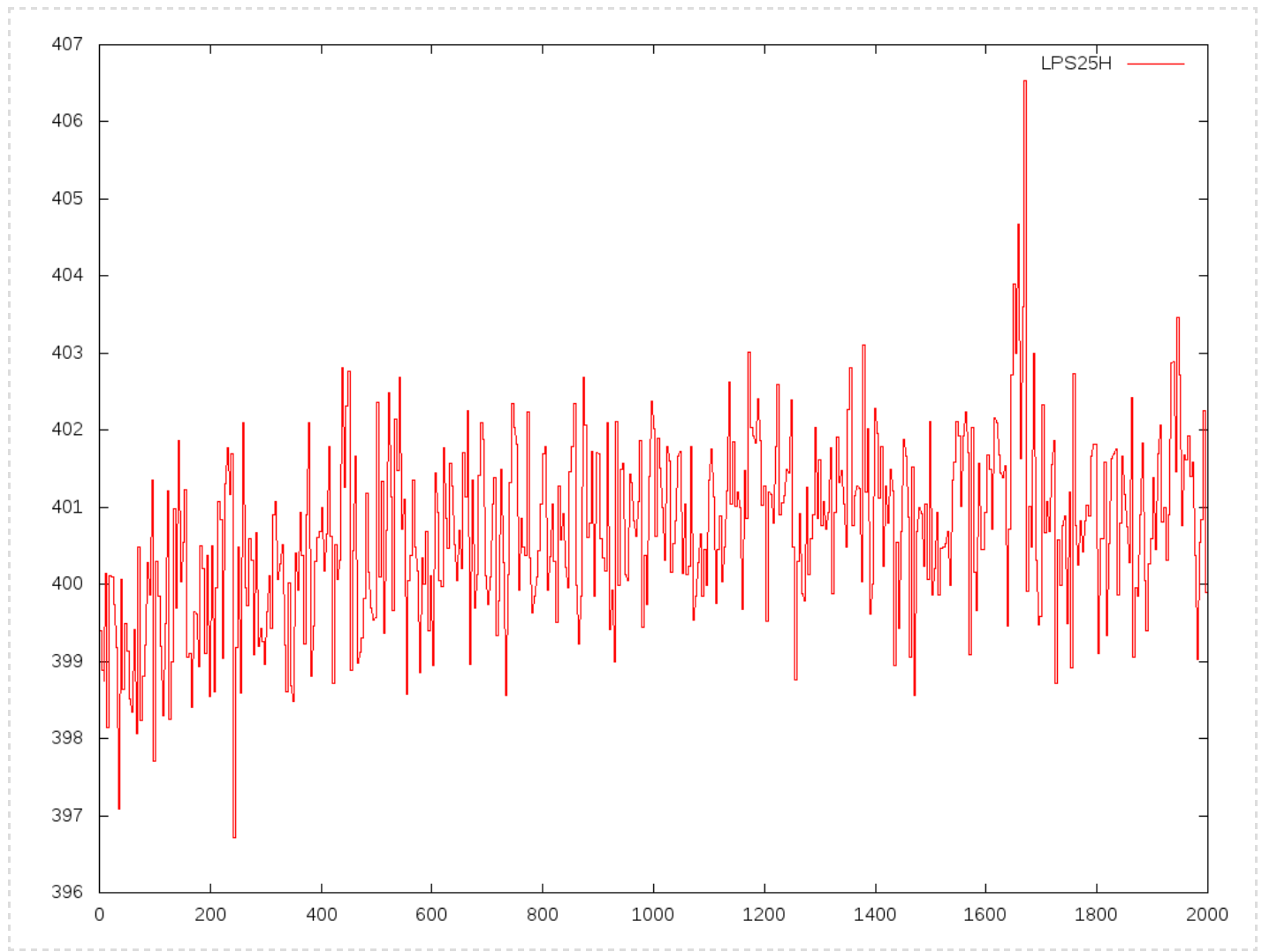
By the looks, the signal noise is about +/- 3 feet max. That makes it about 3 times LESS noisy than the LPS331 and it's now my new favourite pressure sensor. I prefer it over the BMP085 because temperature compensation is done internally in the IC, rather than in software as with the BMP085.

POSTED IN ELECTRONICS

SHARE THIS POST, LET THE WORLD KNOW

**Tweet** ⟨ 0 ⟩   **8+1** ⟨ 0 ⟩    Like ⟨ 0 ⟩

← **Prev post**      **Next post** →

# 7 COMMENTS

1. JEFF

   Posted July 30, 2014 at 12:49 pm | Permalink

   Freescale has free samples of the MPL3115A2. Would you have time to compare it to the BMP085 and LPS25H?

   Reply ↓

   > CAMEL
   >
   > Posted July 30, 2014 at 5:59 pm | Permalink
   >
   > I would be interested in trying it, and I found their sample ordering page but it looks like they only provide the I rather than a breakout board. I'd really need a breakout board to test it out.
   >
   > Reply ↓

2. ONEHORSE

   Posted August 13, 2014 at 6:44 am | Permalink

   I have tried all of these and can confirm the LPS25H is a bit noisy compared to the MS5637. The former has a FIFO a it is possible to take advantage of the internal hardware filtering as well as FIFO digital averaging to bring the noise down. It is a tradeoff between power use and noise common to all pressure sensors. I had high hopes for the LPS25H and am still learning how to use it well, but I am feeling just a tinge of disappointment so far. The LPS25H has a very small footprint, but a lot of pins and the pinout makes board design and soldering a bit more complicated than I would have liked. The small footprint, four pins, ease of reflow soldering, and relatively low jitter make the MS5637 my new favorite.

   Reply ↓

   > CAMEL
   >
   > Posted August 14, 2014 at 9:51 am | Permalink
   >
   > Thanks for your comments on the MS5637, it's one that I've never touched before. The pressure sensors from S are always dissapointing, it seems. At least they are making progress with the LPS25H. The LPS25H is still goo even if it isn't quite as excellent as the MS5637.
   >
   > Reply ↓

3. ONEHORSE

Posted August 13, 2014 at 6:50 am | Permalink

I have tried all of these and prefer the MS5637. The LPS25H has a very small footprint, a lot of pins and a pinout that makes board design and reflow soldering a bit of a challenge. The MS5637 has four pins with large land pads and is easily integrated into a sensor fusion board design. I found the LPS25H to be disappointingly noisy compared to the MS5637, but I haven't fully explored the various hardware filtering and FIFO averaging options on the former yet. Still the MS5637 has been a joy to use and provides accurate and stable pressure and temperature output. Maybe I will get the LPS25H to work well too. The MPL3115A2 is a fine sensor but it is big and relatively low resolution.

Reply ↓

> ERAY
>
> Posted October 12, 2014 at 2:00 am | Permalink
>
> What are your comments about Meas-Spec's other product, MS5611 ?
>
> Reply ↓
>
> > CAMEL
> >
> > Posted October 12, 2014 at 8:14 am | Permalink
> >
> > I've never tried it, but a lot of open source autopilot boards use it so it must be alright!
> >
> > Reply ↓

## LEAVE A REPLY

Your email address will not be published. Required fields are marked *

NAME *

EMAIL *

WEBSITE

COMMENT

You may use these HTML (HyperText Markup Language) tags and attributes: `<a href="" title=""> <abbr title=""> <acronym title=""> <b> <blockquote cite=""> <cite> <code> <del datetime=""> <em> <i> <q cite=""> <strike> <strong>`

Post Comment