Build hints

Firstly, note that the components are frangible, any resistance should be overcome with a slightly increased force. Do not over engineer a really strong solution !

Acquire the various hardware components, example sources given at end of doc

Print the components and make sure they fit, your printer may have a different tolerance to mine.

Print at 0.1 or 0.15 mm layer height, use 3 or 4 walls, use 20% or 25% infill. Adjust settings as appropriate. Use something with a higher heat resistance than PLA if you live in a warm country

Display case and display – use hot glue or double sided sticky foam pad to hold the Oled to the front case. Use some medium viscosity superglue to join the case halves

Use a tie wrap around the bearing holder to fix the bearing in place

Use a viscous superglue to mount the magnet to the flap arm

Soldering – you can solder directly to the Oled and AS5600 pins. Or you can use some Veroboard to make life easier, or you can make up some 2.54mm Pitch 4 Pin JST SM Connector Dupont Female Pin Headers

Don't solder directly to the Nano, get a screw terminal shield device to make life easier..

The sensor (AS5600) should rotate clockwise going from Land flap to Speed flap, ie, the sensor value increases as the arm rotates.

Use 4 core shielded cabling, very little current is transmitted.

Keep the Nano behind the panel for ease of access and programming

Add split ferrite cores to cabling in and out of the Nano

Pick a 3d print case for the Nano from Tinkercad or Thingiverse to suit your needs

Read these installation examples here pick a method suitable for your own installation

Order of build/install

- Print parts
- Build sensor board, bearing mount and arm
- Decide cable routing in order to avoid any control runs
- Test sensor on bench with calibrate.ino, see values alter in the Arduino IDE serial monitor pane
- Install sensor board into glider, do NOT connect the sensor arm directly to the flap handle, always attach to the drive pushrod of the flap cone/bucket
- Run Calibrate, decide if corr value is needed. CORR only necessary IF the readangle passes through zero as flaps move from Land to Speed
- Use table to record your flap POS values
- Calculate the minus and plus fudge factor
- Add values – corr and plus/minus to the Flaps.ino
- Compile and send to your nano
- Attach the display if not already done and test that Flap position display matches reality, if not debug your corr and plus/minus numbers

Power the board

If you have a good low noise USB power in the panel then use that, otherwise use the 12v glider battery. The Nano will stepdown and still provide 3.3 and 5v.

Don't power with any more than 12v as the Nano will need to dissipate more heat

Microprocessor type

Uno should work, all testing done on Nano Every

Any micro that is supported by Arduino IDE and has 3.3v, 5v and an I2C interface should be a viable target

Display

The Oled 128x64 is the target of this design and all of the case components, however a 128x32 display can be used provided is has I2C capability. In reality any display type could be used but stick to I2C interfaces. The I2C interface is very easy to wire up and to program.

Components

Oled

AS5600

Nano shield

Nano every with headers

Arduino IDE

Radio control pushrods could be used to connect