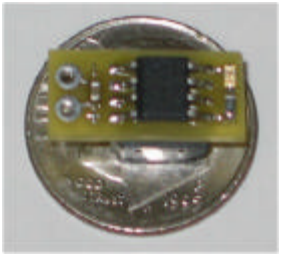
PICO

Altimeter

PICO-P1



P1 manual V1

Congratulations on your purchase of one of rocketry's smallest altimeters.

You will find that this unit is very easy to use.
Allow me to go over some of the highlights of the unit here.

This unit is a peak reporting altimeter that reports the maximum altitude reached.

Contents:
1) Altimeter unit
2) This manual

Operation:
1) Install/connect battery.
2) The previous flight will be reported though a series of flashes on the LED.
3) Install unit in electronics bay.
4) After flight remove battery to turn off.
5) Reconnect battery for altitude report.

Power Source
It is very important that you adhere to the power requirements. The altimeter will function with a supply voltage of 4.5V-5.5V.

Installing in rocket
This unit is a barometric reading unit. As such it requires a vent hole in the electronics bay so that it can read atmospheric pressure. The size of these holes is dependant upon your bay size.
This bay must also be sealed from the ejection gasses that occur during motor ejection charge firing. The altimeter must be protected from these gasses as they are corrosive and can damage the unit.

Mounting of the unit is going to be dependent upon your electronics bay design.
If you are using a small rocket then you might just slip it into the bay battery first and put some tissue lightly over the top to hold it in place.
In a larger airframe you might be able to lightly wrap some paper towel around the unit and battery and slip it into the bay.
Any design that allows the unit to measure the pressure changes as the rocket changes altitude will be fine.
Be sure your battery is secure so it wont loose power on boost.

The board itself is capable of fitting in a 10mm body tube. Plan your power source design to best make use of your available space.

Altitude readout

The altitude is read out as a series of flashes on the LED. The unit uses a high brightness LED that is easily readable in bright sunlight.
It blinks out the altitude in decimal digits starting with ten thousands then thousands, hundreds, tens and ones.
The unit will not report the ten thousands position if it is zero.
It also will not report the thousands position if it is zero.
If your rocket did not reach ten thousand or a thousand in which case these digits are zero then they will not be read out and the report will start with hundreds then tens and ones.
The number of blinks indicates the number for that decade with a zero being represented by 10 blinks.
Each decade will blink out then there will be a slight pause before the next value.
At the end of the readout there will be a quick double flash telling you the unit is preparing itself for launch detect. If you are only reading out the data then at this point just power off the altimeter.

Sensor

The sensor is sensitive to sunlight as well as pressure. The introduction of sunlight into the sensor will temporarily change the reading due to the thermal heating of the sensor element. This is only an issue if the sunlight is allowed to enter the sensor and heat the element inside it that makes the measurement. This is only temporary while the sunlight is present and will return to normal operation when the light is blocked. To prevent this from effecting the operation there is a 60second delay, after the altimeter is done reporting the last flight, before the ground altitude is read.

Misc

There is a 60sec delay after completion of the altitude report before the sensor makes its initial reading. This delay is to allow you to install the altimeter in your rocket.
Be sure that the rocket is not launched until this delay has ended or you may get a low altitude report or no altitude report.
The launch detect is set at 25feet. If the rocket does not reach the launch detect altitude it will not erase the last flight data. This means that if you rocket does not go 25 feet then the altimeter will not record the flight.

Battery selection
The selection of a power source was left to the user to decide what was best for his application.
Here are a few sample applications.

Using 3 watch batteries in series to power the altimeter as shown in Fig1.
Some batteries are not 1.5V. If using 1.22V batteries use 4 to get a total voltage of 4.88V.

Fig. 1 - Using watch batteries

Using two 3V lithium cells to power the altimeter. You will need to install a silicon diode in series to reduce the 6V down to 5.3V. A silicon diode has a forward voltage drop of .7V. This means it will always drop .7V across it regardless of current or voltage.
Wire it up as in Fig 2. Fig 3 shows a similar connection using a 6V lantern battery.

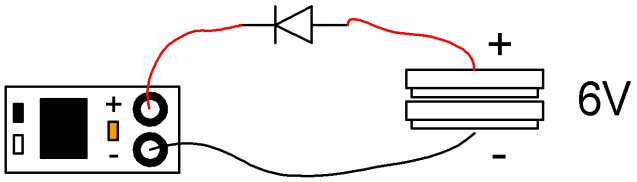


Fig. 2 - Using two lithium batteries

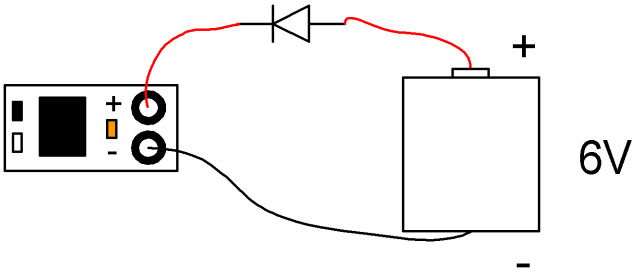


Fig. 3 - Using a single 6V battery

You could also make a rechargeable battery pack using 4 cells. Typical rechargeable cells are 1.2V each so with 4 cells you would get 4.8V as shown in Fig 4.

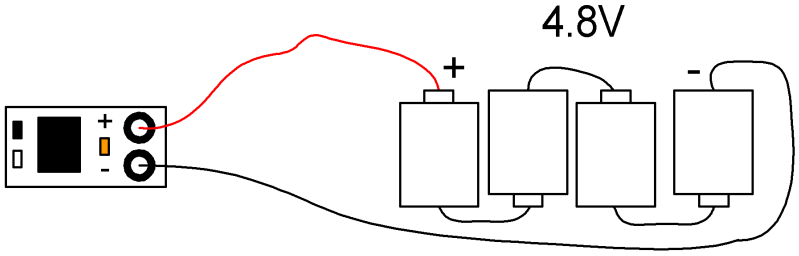


Fig. 4 - Using rechargeable cells.

Specifications:

Circuit board size	.6 inch x .3inch
Weight	.8grams without battery
Maximum altitude	40,000feet ASL
Readout	Surface mount LED blinks value
Launch detect altitude	25feet (factory default)
Resolution	7feet at sea level
Power requirements	Min = 4.5V, Typical = 5V, Max = 5.5V
Supply current	Typical 7mA

Limited warranty:
This unit is warranted against defects in workmanship for a period of one year from the date of purchase. The manufacturer will repair or replace the unit at its own discretion. Misuse of or modifications to the unit voids all warranties.

Limitation of Liability:
In no event will the manufacturer, its employees or its suppliers be liable for any incidental or consequential damages whatsoever(including, without limitation, damages for loss) arising out of the use or inability to use this product, even if the manufacturer has been advised of the possibility of such damages..
Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you.
This unit is a toy. As such no claims are made or implied as to the suitability or capability of this product in the manner in which you want to use it. The user accepts all responsibility for use of the unit.