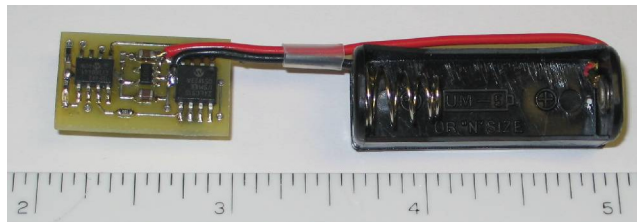


# PICO

Altimeter



PICO-LO4

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.  
And with the built in memory you can record the flight as well.

Contents:

- 1) Pico alt 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.
- 6) After a full day of flying download all flights when you get home.

### **Power Source**

This altimeter is designed to run off a 12V A23 type battery. If you have many flights to download you can spare the drain on the A23 battery by using a 9V battery and a set of alligator clip leads to connect it to the battery holder.

### **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 to secure the battery in its holder with tape.

Also install it so the spring of the battery holder is toward the nose cone.

This way the force of liftoff is not pressing down on the spring.

### **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 leading zeros.

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.

### **Battery life**

The average current consumption of this unit is 13mA.

An Energizer A23 cell has a capacity of 40mAh.

With that cell the altimeter will run for almost 4 hours.

Good enough for a full days flying.

Note the download cable is powered by the altimeter battery and the level translation circuit draws another 10mA of current.

### **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. 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.

## Data Logging

The large amount of memory and paging system were designed so that you may download the data at the most convenient time for you.

The unit stores one second of data before launch detect and 16 samples a second(16Hz) after launch detect.

The samples are stored as 16bit values. That gives you a resolution of ½ a foot in your readings.

At this time download software is only available for Microsoft Windows based PC's.

To download the data you plug the interface dongle into a serial port on your computer. Plug the altimeter into the cable that is coming off the dongle.

Now power on the altimeter because the circuitry inside the dongle is powered from the altimeter battery.

If you have trouble connecting you may need to reset the altimeter by removing its battery and reconnecting it.

Start up the PICO adjuster software and in the tools menu select 'Download DATA'.

The Data Download menu will open giving you several options to download the data.

Selecting 'Read new flights only' will ask the altimeter how many flights it has stored then prompts you with the specified number of flights to verify download.

Selecting 'Read ALL data' will make the software download all the data upto the value in the edit box labeled 'Max samples to receive'.

While downloading the Samples read counter will increment.

Once the data is transferred to the computer it will show a nice graph of the data.

In the View menu select Details and add some details about the flight.

Then from the file menu you can store it for later recall or you can export it to a CSV type file that can be loaded into any number of spreadsheet programs or even notepad.

This will save/export the currently displayed flight only.

If you have downloaded multiple flights then the current flight you are viewing will be indicated in the status bar at the bottom of the screen.

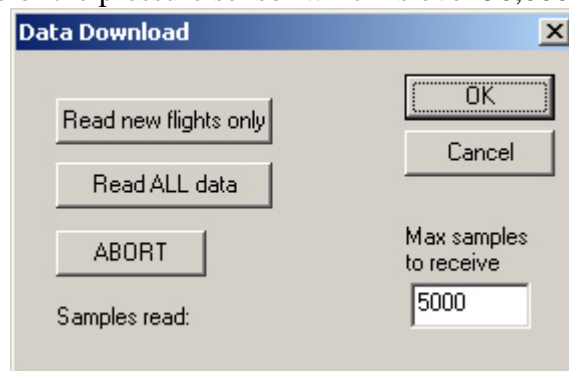
You can page through the flights with the arrows on the tool bar or using the View menu items Next and Previous.

Page through all flights you have downloaded and save each one as an individual file.

If you have not saved them then they will be lost when you open another file or close the program.

Using the data memory you are not limited to a maximum altitude of 40,000feet.

Because the unit stores the pressure readings directly to the memory it is capable of realizing the full range of the pressure sensor which is over 50,000feet.

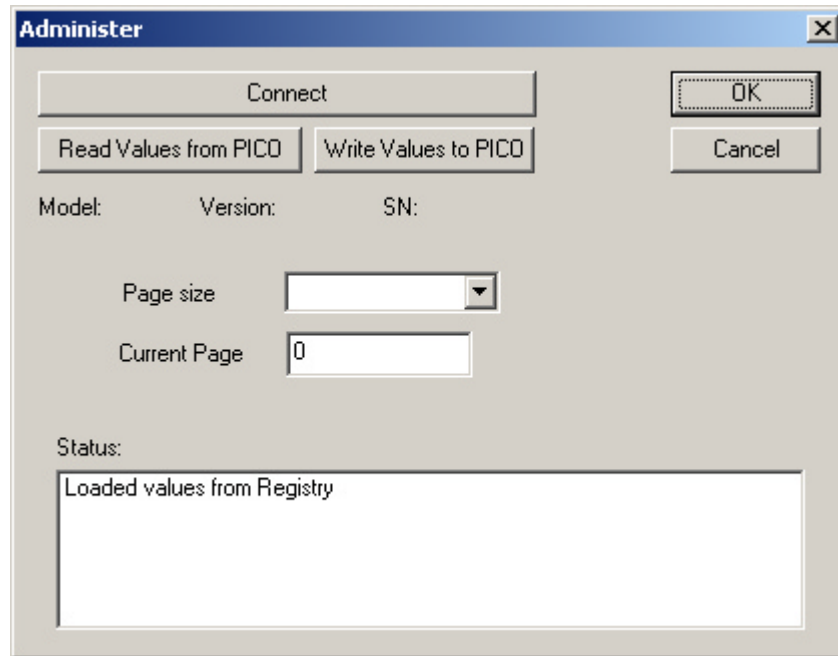


## Configuring

The altimeter is configured via software.

With the dongle connected to your computer connect the altimeter to it and power on.

In the Tools menu select Administer PICO.



Selecting the Connect button will connect to the altimeter and populate the data values on the screen. The Connect button will also be re-labeled to 'Disconnect'.

Verify the Page size and Current Page values then select Write Values to PICO to store the values.

The details of what the program is doing is displayed in the Status window.

Typically the Current Page value will be set to zero so it can record the first flight in the first location. If you want to recover old flights you can set this to some value so the download section will read the value and download that many flights.

If you have trouble connecting try resetting the altimeter by removing its power source for a few seconds.

**Specifications:**

Circuit board size	1 inch x .5inch
Weight	Under 4.5grams without battery
Maximum altitude	40,000feet ASL
Readout	Surface mount LED blinks value
Launch detect altitude	25feet
Resolution	7feet at sea level
Power requirements	Min = 5.1V, Nominal = 9, Max = 16V
Total weight	Under 12 grams with A23 battery
Battery life	Approximately 4hours on A23 cell

**Data Logging Specifications:**

Sample interval	16Hz
Samples logged	32768
Sampling time	Over 34min
Sample resolution	6inch at sea level

**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.