



Single pyro altimeter AltiUno SMT operating instructions

Version	date	Author	Comments
1.0	09/03/2014	Boris du Reau	Initial version
1.1	11/03/2014	Boris du Reau	Updated version
1.2	27/03/2014	Boris du Reau	Added import info regarding batteries

Rocket Type

Micro-max	Model Rocket	Mid power	High power
No	yes	yes	yes

Category

Construction technic	Ground Support	Electronic	Other
		X	X

Goal	2
Related documentation	2
What is apogee detection?.....	2
Choosing the power supply	3
Installing the altimeter in the electronic bay	3
Powering on the altimeter	6
Testing the altimeter on the ground.....	6
AltiUno characteristics	7



Single output Altimeter “AltiUno” SMT– operating instructions

Goal

The goal of this document is to explain how to use the AltiUno SMT altimeter that you just bought. The document assumes that you have already installed altimeters in a rocket payload bay.

Before your start

Remember that it is a rocket altimeter be sure that you know what you are doing and use with caution.

The country where you live might not even allow the use of such device. You have to assume total legal responsibility for any damages or claims including personal injury that results from the use of this device. I shall not be responsible for the above. If you disagree with that, please do not buy it or use it.

Related documentation

This altimeter is an SMD/SMT version of the AltiUno kit. It is also a lot more compact and can be used in model rockets. If you want know more details on how it works read the kit programs, schematics and documentation on my website. This will not cover things such as flashing the altimeter which is not possible with this model.

What is apogee detection?

The AltiUno detect flight apogee and fire a pyro charge to eject the parachute. This replaces the motor ejection. This is more precise than the motor ejection which is a pyro delay and can fire the pyro charge exactly at apogee.



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Choosing the power supply

The altimeter has been designed to use a battery between 4.5V to 7.4Volts typically a 2 cells lipo battery with a voltage around 7 volts.

Using a poor quality battery may result in an ejection failure which could cause a ballistic crash!!!! Remember that when you power on the altimeter it is doing continuity test and beeping which is discharging the battery.

My recommendation would be to use a 2 cell lipo or li-ion battery. You can get 7.4Volts ones 200 or 300mA should be enough



but be careful you will need a special charger.

I am using 2 x 3.7V rechargeable li-ion batteries. They are about few dollars each and you can use a coupler. Just be careful because they are identical to the standard 1.2V AA batteries.



Do not use 9 volts batteries. Unlike the kits, the SMT versions are working internally in a lower voltage. Using 9 volts batteries will shorten their life.

Installing the altimeter in the electronic bay

You need to install and maintain the altimeter using 4 screws inside the electronic bay. I use 3mm allen screw because it has a smaller head.

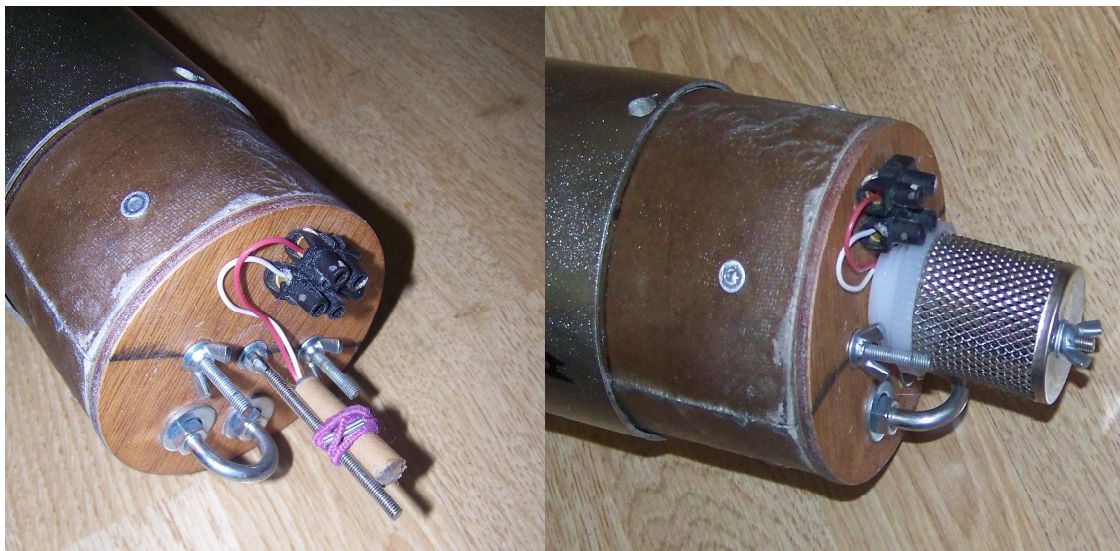
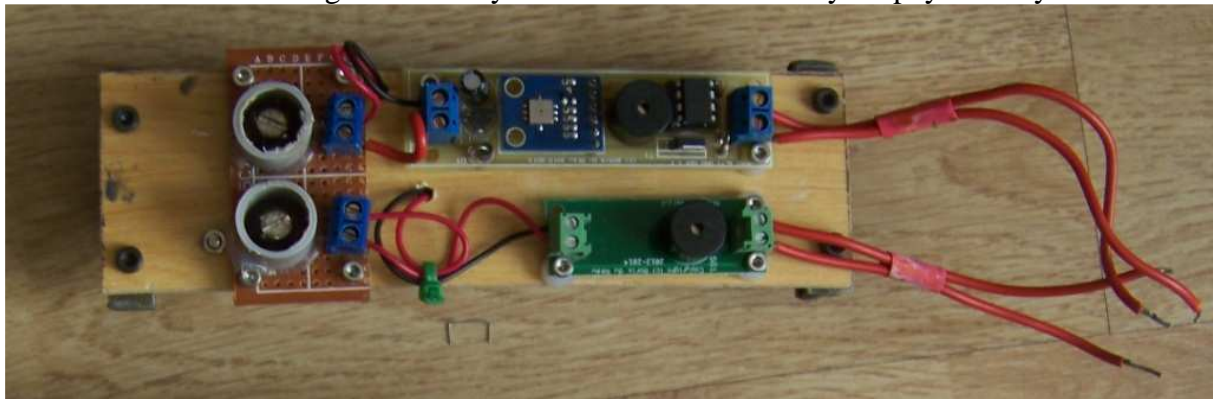


Single output Altimeter “AltiUno” SMT– operating instructions



Make sure that the electronic is protected from ejection smokes which are very corrosives and could damage the altimeter board very quickly.

However remember that you have a pressure sensor which needs to measure pressure changes to work out altitude changes... hence you need to drill a hole in your payload bay.





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In my rockets what I do is use screw switches to turn on my altimeter so the hole for the screw switch is also used for exchanging pressures.



Double check yours and make sure all components have been correctly positioned. One mistake and the altimeter will not work and the components could be damaged.

Connect the **left** terminal bloc to the ejection charge that will push out your parachute.
Connect the **right** terminal bloc to the power supply.





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Powering on the altimeter

Now that you have everything installed in your rocket you can turn it on. It will then initiate, beep the version and then continuously beep. Beeps are for the continuity test (ie: to make sure that your electric match is ok); basically if you get a long beep that mean that the circuit is open for your charge. This means that the charge is either not connected or bad. If you get one short beep that means your charge is fine.

The altimeter will continuously beep until lift off is detected. Lift off being reference altitude + 20 meters.

After the altimeter has fired its charge then it will beep the apogee altitude. Beep resolution is 10 meters so it will round up the results.

1 long beep = 100m
1 short beep = 10 m

Note that the altimeter will keep on beeping the altitude of the apogee until it is switch off. It does not save the altitude when powered off.

Testing the altimeter on the ground

As it is a kit obviously unlike any other altimeter than you buy it has not been tested. I suggest that you build a very basic pressure chamber. It will cost you a couple of dollar and you will make sure that your altimeter is working before you fly your rocket.

Should you need additional help do not hesitate to ask, my contact details are on <http://rocket.payload.free.fr/>



Single output Altimeter “AltiUno” SMT– operating instructions

AltiUno characteristics

The altimeter is quite robust it has a protection diode which prevents polarity mistakes. It also uses a Kalman filter to prevent premature ejections.

Altimeter model	AltiUno SMT
Picture	
Size in mm	44x16 mm
Weight	5.5 grams
Number of pyro output	1
Micro controller	ATtiny 85
USB interface connector	no
power supply	4.5V to 7.4V
Max Output Current	9A
Pressure sensor	BMP180
Memory	no
Pressure range	300-1100hPa
Altitude range	-500 to 9000m
Kit	no
Current software version	1.3 (stable)
Front end version	none
Software update	Impossible unless you have microcontroller dev tools
Unit	Metrics (imperial on demand)