

RC T1000

Telemetry system for RC Altimeter with variometer function



Manual version: 1.1

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Introduction

RC T1000 was designed specifically for use with RC Altimeter. It is telemetry system to track current altitude, climb/sink speed, maximum altitude achieved in flight and battery voltage of yours radio controlled (R/C) aircraft in real time. Transmitting from your plane is done with RC TRX10 module. All flight data is displayed on high contrast LCD display.

How it works

The RC T1000 system uses an 433MHz two way link to transfer data from yours R/C plane via RC RTX10 module to ground. Data transfer is digital so there won't be any noise or wrong data reception. Vario works on principle that RC Altimeter logger detects small changes in altitude and transmits them to RC T1000 via RC TRX10, which converts them into a variable audio tone. Changes as small as 10 cm/s will be indicated by change in tone. Sinking produces a continuous tone which becomes deeper with increasing sink rate. Climbing gives a pulsed rising sound. The pulse frequency rises as the rate of climb increases. All the data is displayed on LCD display. If RC T1000 detects that battery in your R/C plane is low it generates low frequency pulsed audio alarm. If there is no reception ---- is displayed and audio is mute.

Key features

- Variometer with audio tone for lift or sink
- Mute function – train your eye for weak thermals
- Alarm signal for low battery of yours R/C plane
- Download flight data from RC Altimeter via RF link
- Sets all setting for RC Altimeter
- Onboard 350mAh LiPo battery for up to 8 hours working time
- Two way digital data transition at 10 channels
- Set RC Altimeter to zero - opening of canopy is not needed any more!
- Strong and durable casing
- Long range - more than 1 km
- Small and lightweight at only 20 grams (ready to fly with RC Altimeter).

RC T1000 module

Figure 1 shows the RC T1000 module. To turn ON the module press and hold the Left/ON button for 2s. To turn it OFF press and hold Right/OFF button for 4s. The module consists of LCD display, three pushbuttons, 3-pin connector that is used for charging, 4-pin connector used to interface to a PC for download altitude data and 3.5 jack phone connector for audio tone. For charging you will get 3-pin cable which has red wire soldered to middle pin and black wire soldered to side pins so it doesn't matter how you turn it when you charging RC T1000.

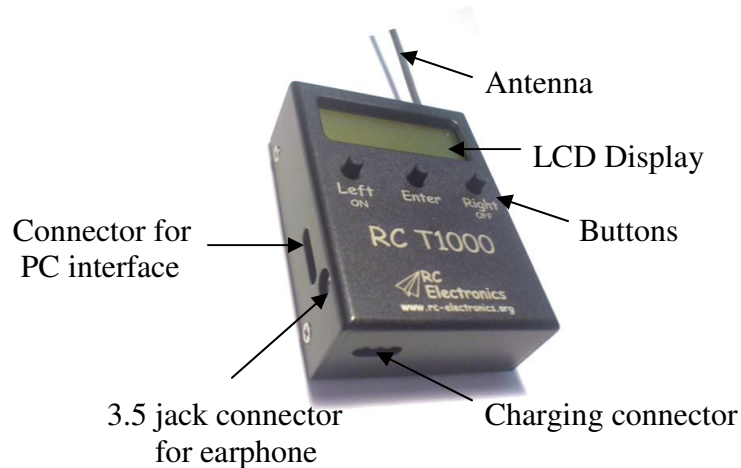


Figure 1. The RC T1000 module

Specifications

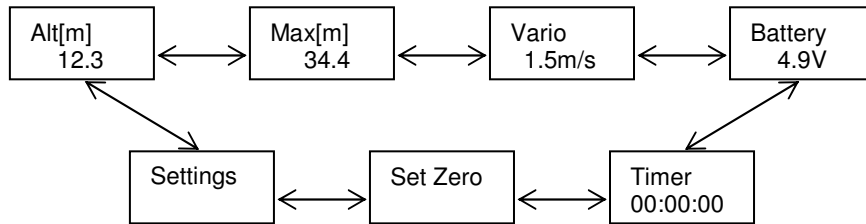
Board Dimensions	59 mm x 42 mm x 17 mm 2.32" x 1.65" x 0.67"
Weight	63 grams
Temperature Range ¹	-10°C...+60°C
Onboard battery	1 cell Kokam LiPo 3.7 V 350 mAh
Duration	8 hours
Displayed altitude resolution	0.1 meter.
Displayed battery resolution	0.1 volts.
Displayed vario resolution	0.1 m/s.

¹ Specifications are taken from component ratings and system limits and may not have been tested to the full extent of the specified ranges.

NOTE:

For charging RC T1000 set your charger for:
1 LiPo cell 3.7V, charging current max. 350mA

Main menu



Alt

Displays current altitude of your R/C plane. Displayed units are in brackets. Maximum displayed altitude: ± 3100.0 (meters, yards, feet)

Max

Displays maximum reached altitude in current flight. Displayed units are in brackets. Maximum displayed altitude: ± 3100.0 (meters, yards, feet)

Vario

Displays current lift or sink. Maximum displayed vario: ± 9.9 (m/s, y/s, f/s). If you press enter in you will select MUTE function and M will appear in right upper angle. To deselect MUTE function press enter again in this screen and letter M will disappear.

Timer

To start or to stop the stopwatch press enter. To clear it press and hold enter until it shows 00:00:00. Every time you turn on module stopwatch will reset to 00:00:00. Stopwatch has precision of 1s.

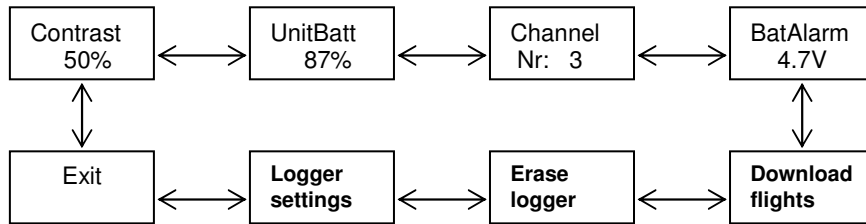
Set Zero

Press enter button and RC Altimeter will set altitude to zero, create a new flight in logger and reset maximum altitude reached in last flight. If Error! appears on screen please try it again. After setting RC Altimeter to zero you will get max menu on screen to check if it is set to 0.0

Settings

Press enter button and you will enter settings menu.

Settings menu



Contrast

Displays contrast of LCD. To change it press enter and > < markers will appear. Then change value with left/right button. To confirm it press enter button again and > < markers will disappear.

UnitBatt

Displays percentages of RC T1000 unit battery.

Channel Nr

Displays on which one of 10 available channels is telemetry operating on. To change channel number connect RC TRX10 as shown in Figure 2 to RC T1000. After that press enter and you will be able to change channel number with left/right button. To confirm the new channel number press enter. You can disconnect RC TRX10 now and you are ready to operate on new channel.

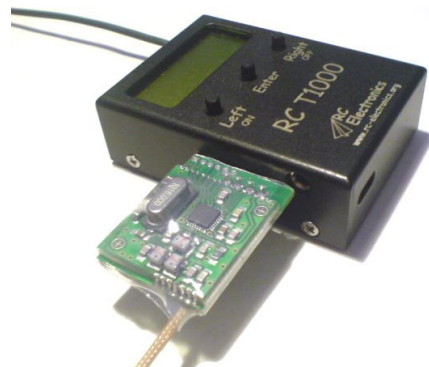


Figure 2. The RC T1000 with RC TRX10 connected on it

BatAlarm

Displays the voltage threshold to activate low battery alarm. To change the voltage press enter and > < markers will appear. Then change value with left/right button. To confirm it press enter button again and > < markers will disappear. Alarm will turn on when battery voltage in your R/C plane will reach the threshold voltage and will stay there for more than 15 seconds. It is low frequency pulse audio alarm that overrides vario tone. In battery screen appears LOW! signal.

Download flights

When pressing enter in this menu RC T1000 will start downloading flights data from RC T1000. All functions are disabled in this time until download reaches 100%. Download can last up to 3 minutes if RC Altimeter logger is full. After RC T1000 has finished downloading flight data from RC Altimeter you can connect RS232 interface to RC T1000 as shown in Figure 3 and download this data from RC T1000 to PC.



Figure 3. The RC T1000 with RC232 interface

Erase Logger

Press enter button and you will erase RC Altimeter logger. If error message appears please try it again.

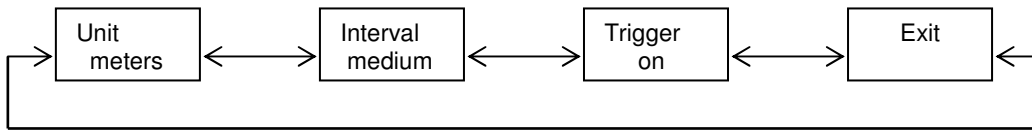
Logger Settings

Press enter button and you will enter logger settings menu.

Exit

Press enter button and you will return to main menu.

Logger settings menu



Unit

Displays altitude unit. To change it press enter and > < markers will appear. Then change unit with left/right button. You can choose between meters, yards and feet. If ---- is displayed that means that RC T1000 doesn't receive signal from RC Altimeter so you should check RC Altimeter and RC TRX10. To confirm selected unit press enter button again and > < markers will disappear. After that new flight is created in logger and flight data will be saved in new units.

Interval

Displays saving interval of RC Altimeter. To change it press enter and > < markers will appear. Then change interval with left/right button. You can choose between high, medium and low. Medium means that altitude will be saved three times per second, medium will save altitude once per second and low setting will save data once every ten seconds. If ---- is displayed that means that RC T1000 doesn't receive signal from RC Altimeter so you should check RC Altimeter and RC TRX10. To confirm selected interval press enter button again and > < markers will disappear. After that, new flight is created in logger and flight data will be saved in new interval.

Trigger

Displays RC Altimeter logger trigger. To change it press enter and > < markers will appear. Then change trigger option with left/right button. You can choose between on, off and above. On means that logging option is on and data is logging every time RC Altimeter is on. Off means that logging option is off and no flight data will be recorded. If you choose above options RC Altimeter logger will start recording flight data when your R/C plane is above 2 meters (2 yards or above 7 feet) If your plane is lower, flight data won't be recorded. If ---- is displayed that means that RC T1000 doesn't receive signal from RC Altimeter so you should check RC Altimeter and RC TRX10. To confirm selected trigger option press enter button again and > < markers will disappear. After that new flight is created in logger and flight data will be saved with selected trigger option.

RC TRX10 module

Figure 4 shows the RC TRX10 module. Connect it to RC Altimeter via 4-pin connector as shown in figure 5. RC TRX10 is based on RF module which operates at 433MHz to communicate with RC T1000. Antenna 17cm long and should hang down of fuselage to get maximum range.

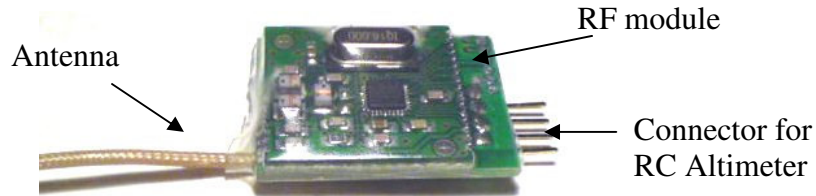


Figure 4. The RC TRX10 module

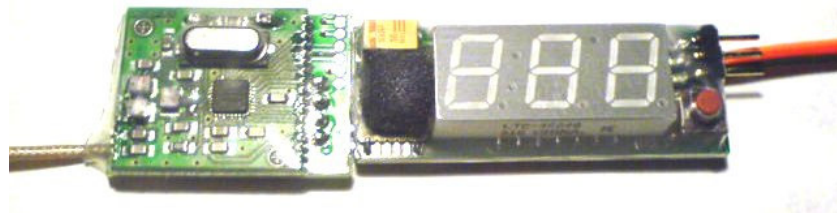


Figure 5. The RC TRX10 and RC Altimeter

Specifications

Board Dimensions	31 mm x 22 mm x 10 mm 1.22" x 0.86" x 0.39"
Weight	8 grams
Temperature Range ¹	-10°C...+60°C
Output power	Up to 10mW (10dBm) at 433MHz
Range	More than 1 km (depends on antenna installation)
Input current	26 mA

¹ Specifications are taken from component ratings and system limits and may not have been tested to the full extent of the specified ranges.