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**wAltimeter**  
TECHNICAL REPORT

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## 1. Introduction

In the absence of real-time altitude measuring devices (*altimeter*) for a rocket modeling competition, **PR-DC** engineers have developed **wAltimeter**, an atmospheric pressure based altitude measuring device with real-time radio transmission of data.

## 2. Technical characteristics

Table 1 - *Technical characteristics of device*

| <b>Main characteristics</b> |                           |
|-----------------------------|---------------------------|
| Length                      | 26.4 mm                   |
| Width                       | 13.7 mm                   |
| Thickness                   | 6.5 mm                    |
| wAltimeter weight           | 2.3 g                     |
| Battery weight              | 0.8 g                     |
| Input voltage               | 3.7V DC (1S LiPo Battery) |
| Preassure range             | 300 - 1100 hPa            |
| <b>Data transmission</b>    |                           |
| Radio frequency             | 868 MHz                   |
| Range                       | up to 5000 m              |
| Data rate                   | up to 40 Hz               |
| <b>Microcontroller</b>      |                           |
| Operating frequency         | 72 MHz                    |
| Mode signaling              | 2 LEDs                    |
| External memory type        | Flash                     |

### 3. 3D Model and photos

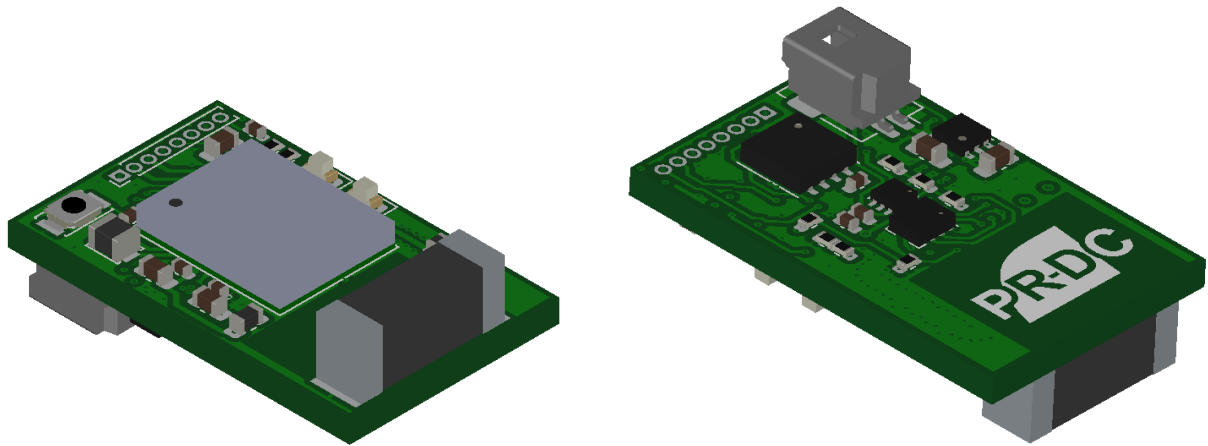


Figure 1 - *Device 3D Model*

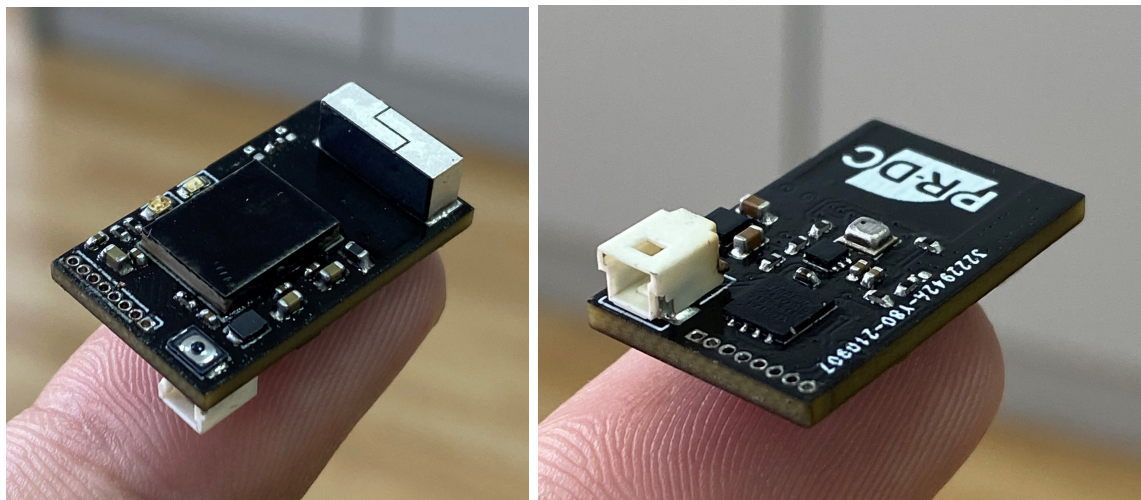


Figure 2 - *Device photos*

### 4. Device testing

At 2021 FAI S World Championships for Space Models, tests with several rocket motors were conducted. Change of altitude during rocket flights using category B and C rocket motors is shown on following diagrams.

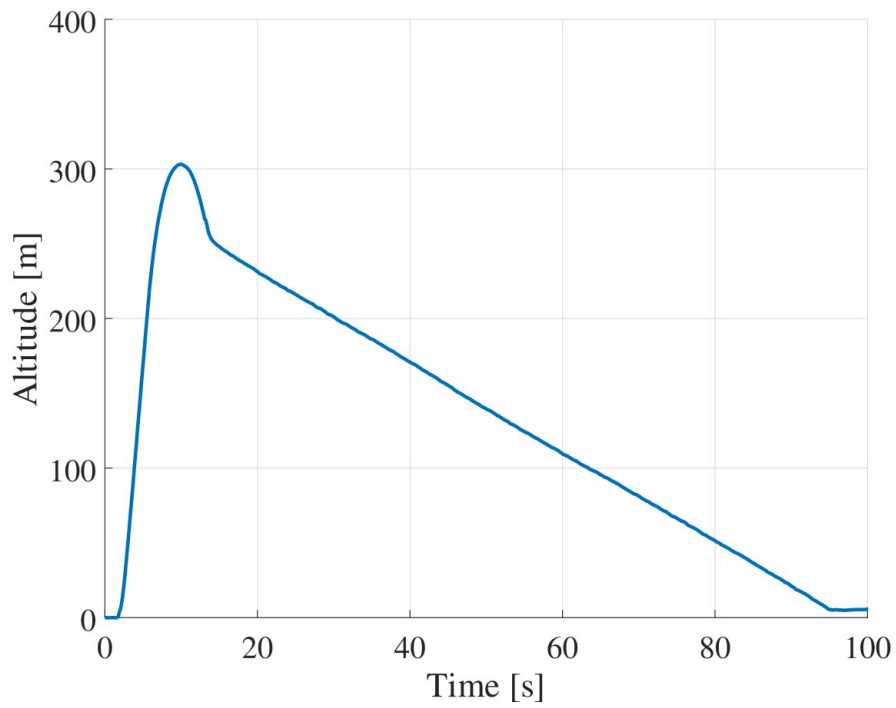


Figure 3 - *Category B rocket motor flight diagram*

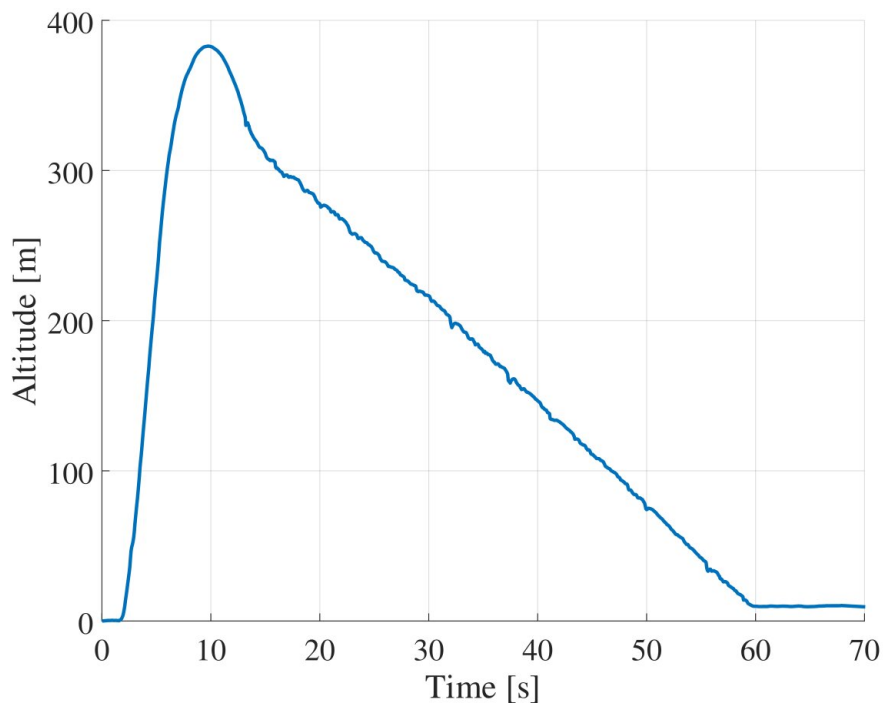


Figure 4 - *Category C rocket motor flight diagram*

## 5. Equipment

**wAltimeter** system consists of a radio receiver (base station), fast battery charger and several measuring devices. Both radio receiver and battery charger are easily connected to a PC using a standard USB type C cable. Data reading and analysis software is provided by **PR-DC**. The software plots diagrams in real-time while always showing the maximum altitude. At the end of a flight, diagrams and data logs are saved using a chosen data format.



Figure 5 - *Fast battery charger and receiver*

## 6. Calibration and verification

After the end of every round all altimeters will be tested by specially created equipment. In this way it is possible to detect whether any device has been damaged.