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The final conference of the POLNOR-LEADER project

Evaluation of data from flights of UAV TS17

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SkyTech eLab

Gliwice, 26.06.2024

First flights – TS17-v1

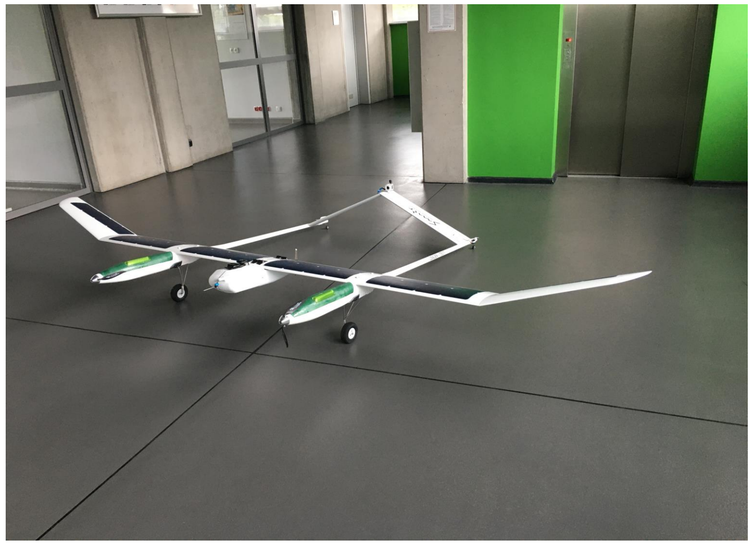
General information

- Date: January 2024
- Place: Gliwice (EPGL)
- Temp.: 4°C, Wind: up to 3-4m/s NE
- Crew: W. Moczulski (coordinator), W. Panfil (pilot), Ł.Maliszewski (communication), D. Pająk (documentation)
- TS17-v1: 10,75kg, LiPo 6S, T-Motor 4130 450KV, T-Motor NS (Ultra Light) Carbon Prop - 16 x 6.1

Flight on 21 CPL, TS17-v2

General information

- Date: June 2024
- Place: Nadarzyce (21 CPL)
- Temp.: 25°C, Wind: up to 5 m/s SE
- Crew: W. Panfil (pilot), K. Targosz (pilot), D. Pająk (documentation)
- TS17-v2: 12,00 kg, LiIon 4S6P, Dualsky XM3844EG-10 GLIDER, 13 x 6.5 Carbon Folding Propellers



Fwd/Rev thrust, turning

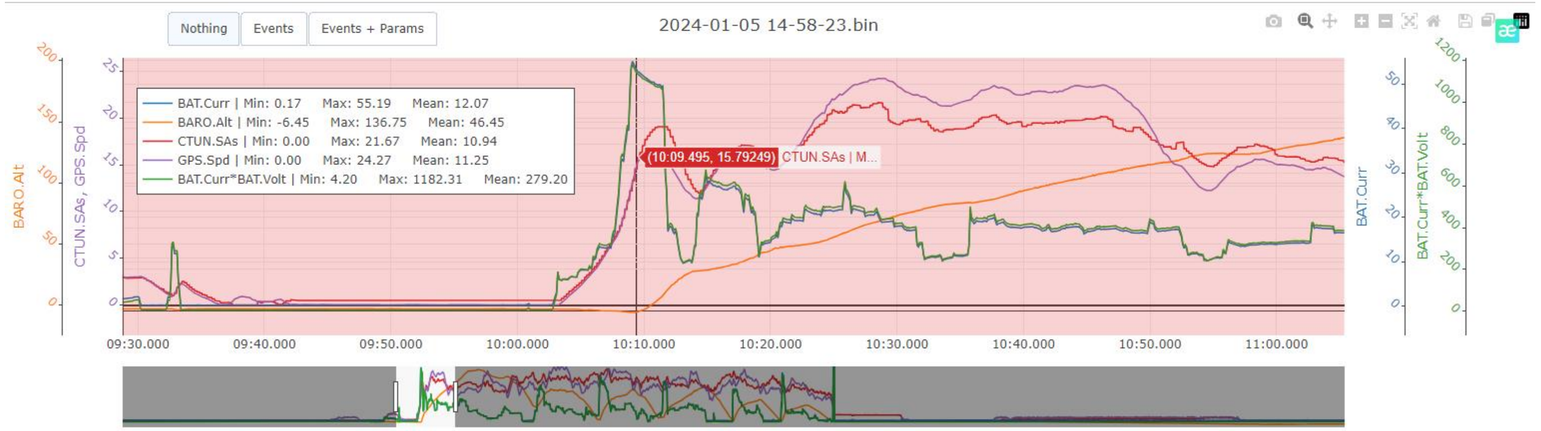
TS17-v1, Gliwice

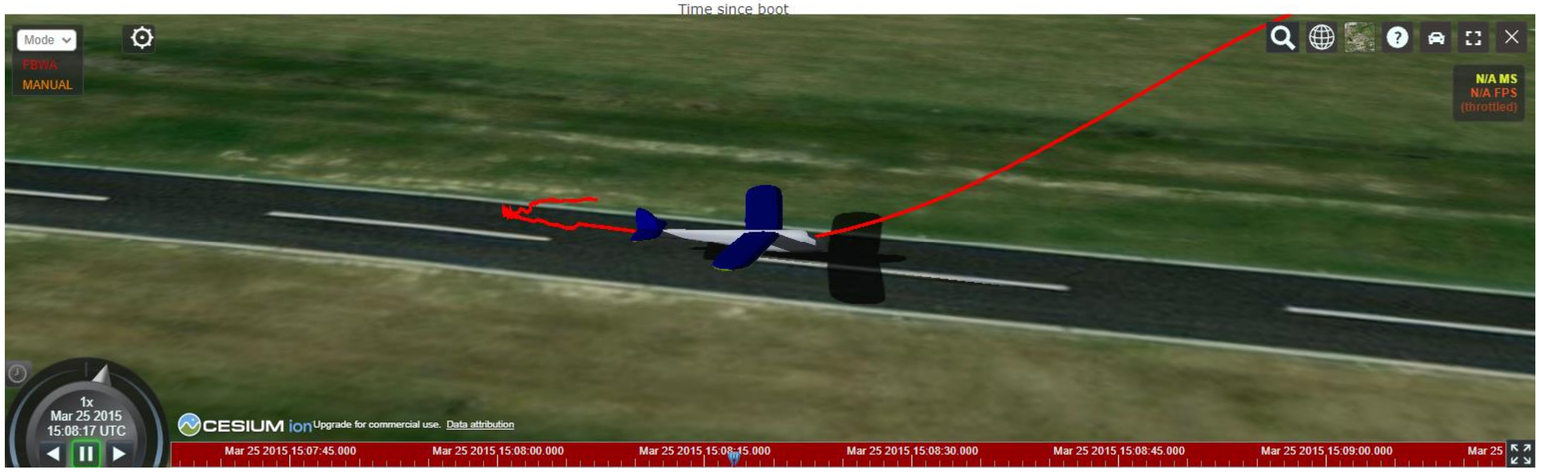
Take-off

TS17-v1, Gliwice

Take-off

TS17-v1, Gliwice





ASpd = 16m/s
Distance = ca. 25m
Current = 52A@6S *2
Power = 1130 W *2

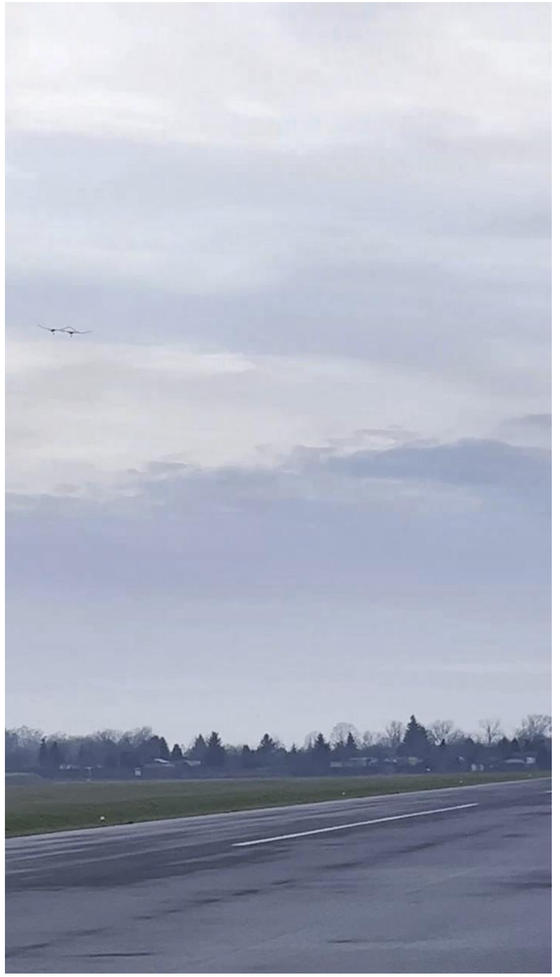
Take-off

TS17-v2, Nadarzyce

ASpd = 14m/s
Distance = 40m
Current = 40A@4S *2
Power = 640 W *2

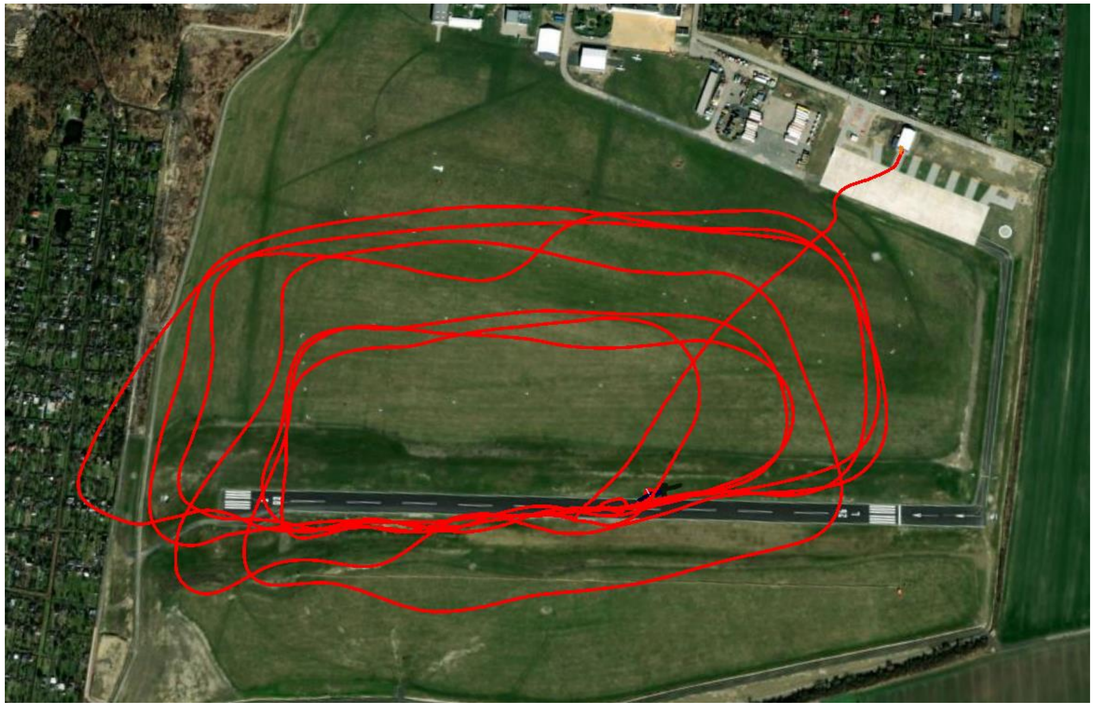
Flight along the runway

TS17-v1, Gliwice



Flight path

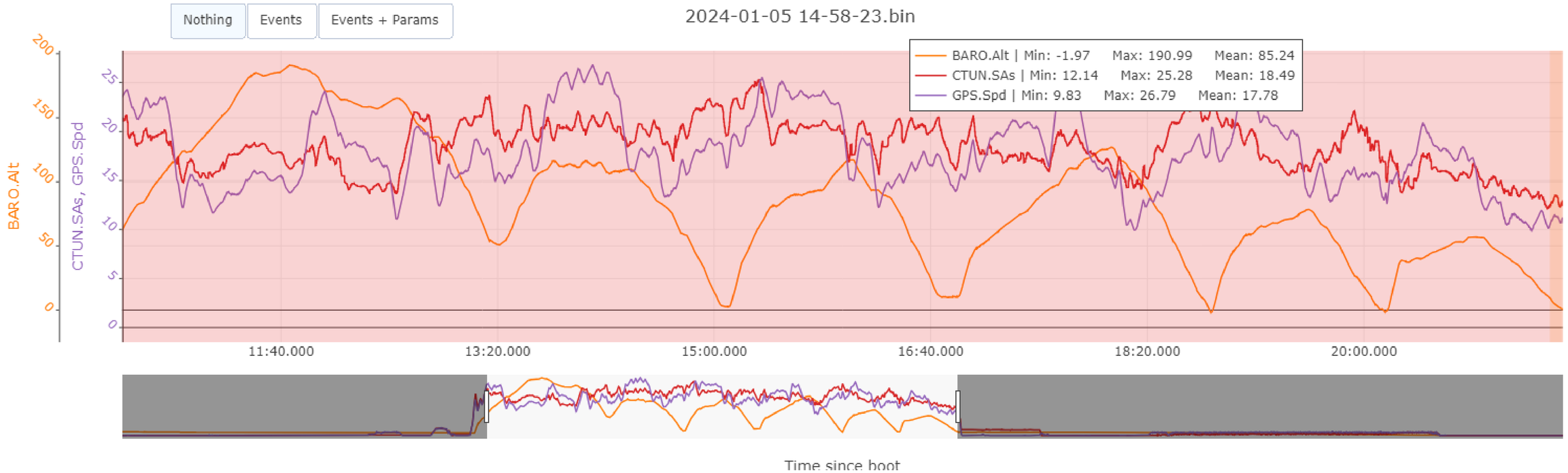
TS17-v1, Gliwice



Flight along the runway

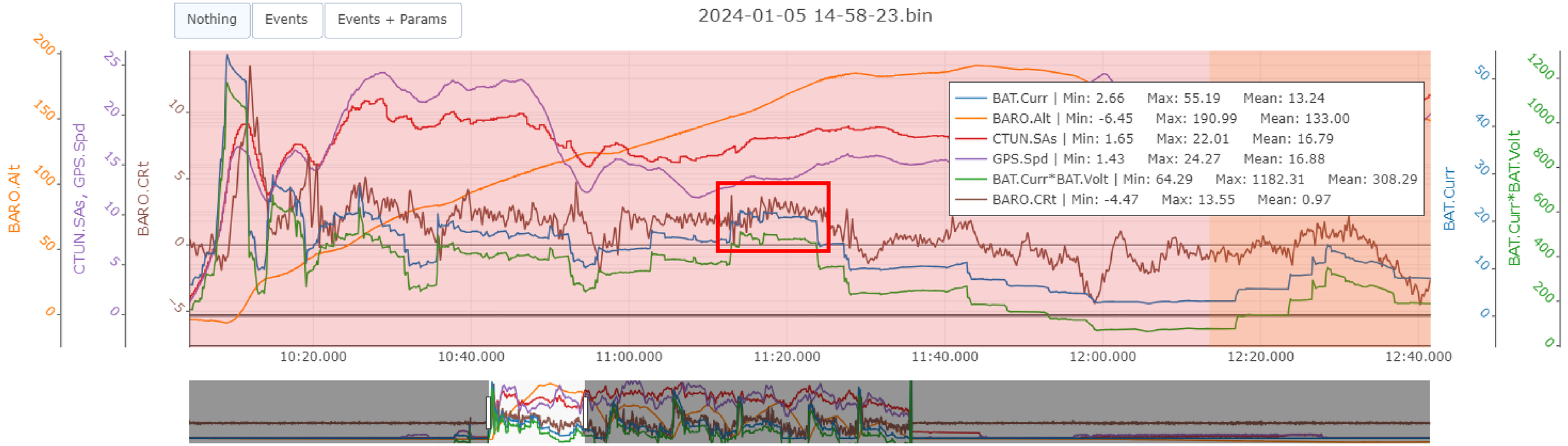
TS17-v1, Gliwice

Speed



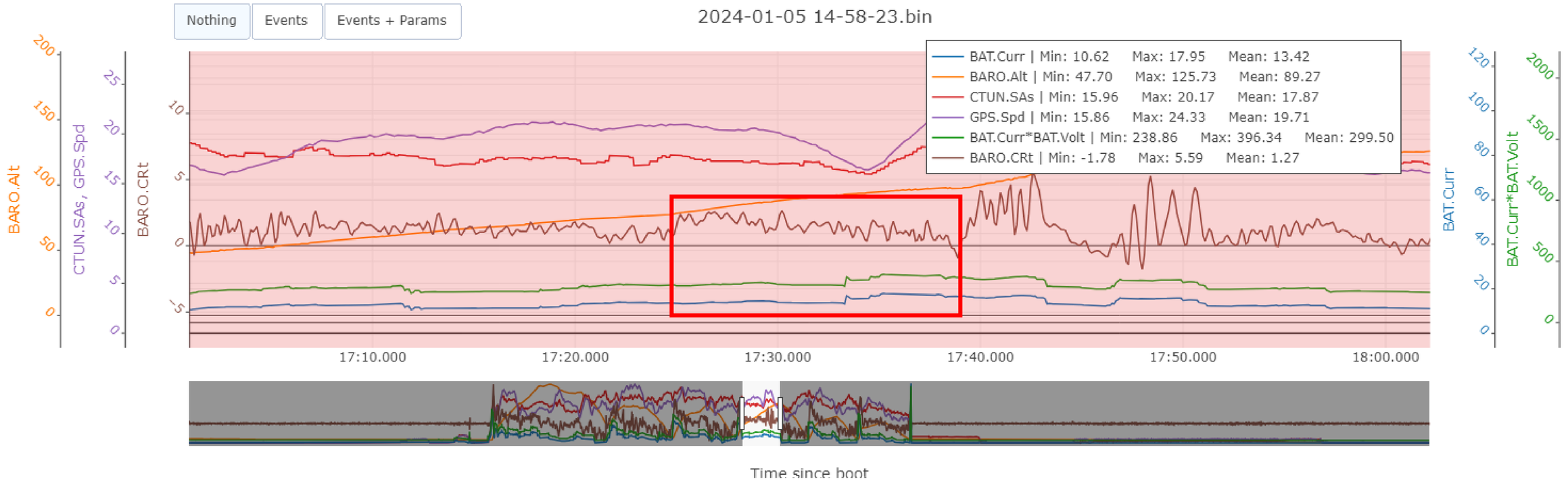
Stall ASpd = 11m/s
Max ASpd = ? (25m/s on tests)
Cruise ASpd = 15 m/s

Climbing



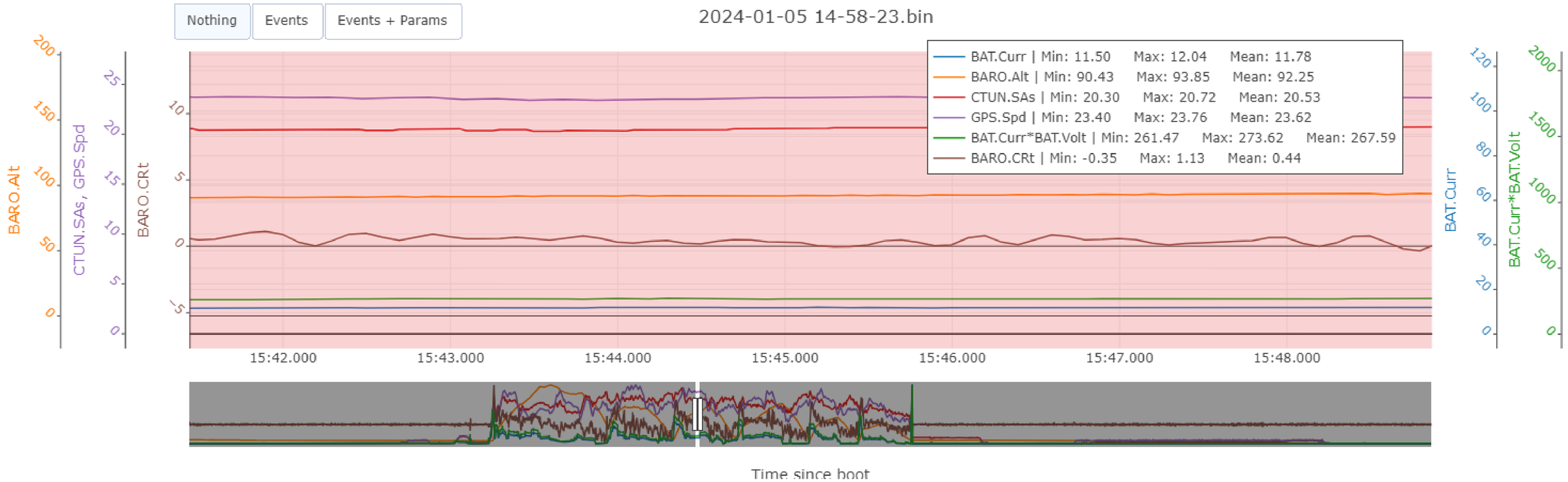
CRt = 2m/s, Current = 17A *2
Power = 400W*2

Climbing



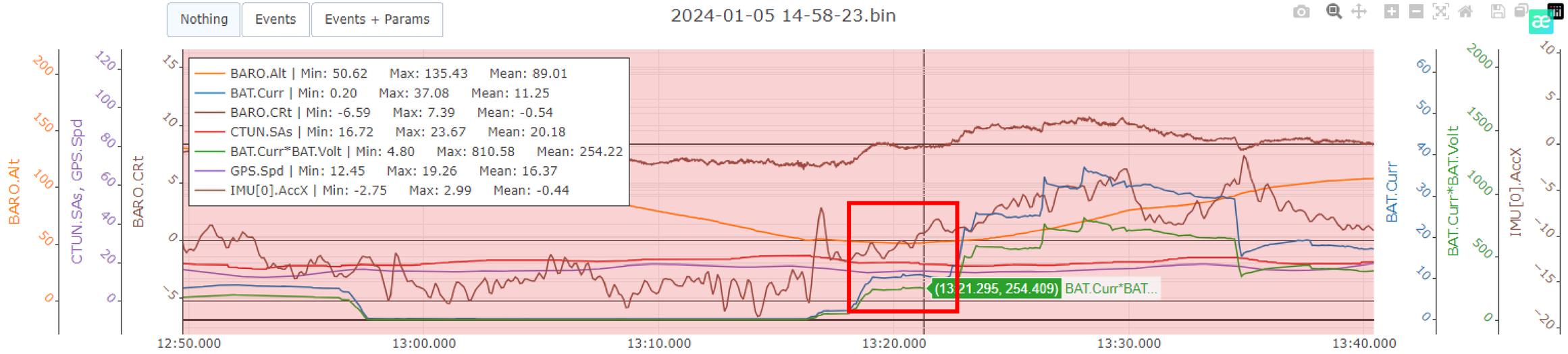
CRt = 1,3m/s, Current = 13,42A *2
Power = 299,5W*2

Climbing (with the wind)



CRt = 0,44m/s, Current = 11,78A *2, Power = 267,6W*2

Cruising (into the wind)



CRt = ca. 0m/s, Current = (8-11,0A) *2, Power = (180 - 245W)*2

Landing

1st example

Landing

2nd example

Summary (I)

1. Preliminary tests:
    1. CoG – OK
    2. Communication range – OK
2. Taxiing test on the aileron:
    1. Forward, reverse thrust
    2. Turning:
        1. Servo tail wheels – really helpful
        2. Differential thrust – default 10% is enough
    3. Riding with tail up - OK

Summary (II)

TS17 – flight parameters (II)

1. Take-off
    a. 13-14 m/s; 35-40A;800-900W (TS17-v1)
    b. 14 m/s, 40A, 650W (TS17-v2)
2. Climbing after Take-off, up to Alt ca. 50m, 7-8s
    a. 24,6A; 578W; 3,6 m/s (climb rate)
    b. 26,8A; 618W; 3,3 m/s
    c. 28,2A; 628W; 3,0 m/s
    d. 27A; 623W; 2,9m/s
3. Horizontal flight
    a. 14,0 m/s; 190W
    b. 14,6 m/s; 182W
    c. 15 m/s; 200W
    d. 15,6 m/s; 200W
    e. 16 m/s; 300 W
    f. 16,5 m/s; 305W
4. Regular climbing
    a. 0,46m/s; 244W
    b. 0,77m/s; 255W
    c. 1m/s; 300W
    d. 1,5m/s; 390W
    e. 1,62m/s; 370W
    f. 2m/s; 440W
5. Stall speed
    a. 10-11m/s
6. Energy consumed
    a. 3579mAh x 2; 18mins
    b. 2932mAh x 2; 14,5mins
    c. 2384mAh x 2; 15mins (included gliding)

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