

VELOX-PII

Downlink	145.980 MHz	Upper Sideband (USB)
CW beacon	Speed: 6 dots/second	Interval: 60s (LEOP) / 120s (LEOP)

TLE (update: 27-11-2013)

```
1 00365U 00328A 13325.30958044 .00000000 00000-0 10000-4 0 5
2 00365 97.7958 41.2323 0085130 175.4161 35.0228 14.75244057 08
```

Character 1-6: Satellite ID: VELOXP

Character 7: Satellite Mode

2 – Early Operations Mode
G – LEOP Idle Mode
4 – LEOP Power Safe-hold Mode
C – Idle Mode
6 – Ground Pass Mode
Q – Mission Mode
8 – Power Safe-hold Mode

Character 8: Battery State of Charge (SOC)

D – SOC < 25%
F – 25% ≤ SOC < 40%
2 – 40% ≤ SOC < 50%
G – 50% ≤ SOC < 55%
4 – 55% ≤ SOC < 60%
C – 60% ≤ SOC < 65%
6 – 65% ≤ SOC < 70%
Q – 70% ≤ SOC < 80%
8 – 80% ≤ SOC < 90%
Z – SOC ≥ 90%

Character 9: Battery Voltage (V_batt)

D – $V_{\text{batt}} < 5.0\text{V}$
F – $5.0\text{V} \leq V_{\text{batt}} < 6.0\text{V}$
2 – $6.0\text{V} \leq V_{\text{batt}} < 6.5\text{V}$
G – $6.5\text{V} \leq V_{\text{batt}} < 7.0\text{V}$
4 – $7.0\text{V} \leq V_{\text{batt}} < 7.4\text{V}$
C – $7.4\text{V} \leq V_{\text{batt}} < 7.6\text{V}$
6 – $7.6\text{V} \leq V_{\text{batt}} < 7.8\text{V}$
Q – $7.8\text{V} \leq V_{\text{batt}} < 8.0\text{V}$
8 – $8.0\text{V} \leq V_{\text{batt}} < 8.2\text{V}$
Z – $V_{\text{batt}} \geq 8.2\text{V}$

Character 10: Sensor Status

D – GPS off | IMU A off | IMU B off
F – GPS off | IMU A off | IMU B on
2 – GPS off | IMU A on | IMU B off
G – GPS off | IMU A on | IMU B on
4 – GPS on | IMU A off | IMU B off
C – GPS on | IMU A off | IMU B on
6 – GPS on | IMU A on | IMU B off
Q – GPS on | IMU A on | IMU B on

Character 11: Battery Temperature (T_batt)

D – $T_{\text{batt}} < -20^{\circ}\text{C}$
F – $-20^{\circ}\text{C} \leq T_{\text{batt}} < -15^{\circ}\text{C}$
2 – $-15^{\circ}\text{C} \leq T_{\text{batt}} < -10^{\circ}\text{C}$
G – $-10^{\circ}\text{C} \leq T_{\text{batt}} < -5^{\circ}\text{C}$
4 – $-5^{\circ}\text{C} \leq T_{\text{batt}} < 0^{\circ}\text{C}$
C – $0^{\circ}\text{C} \leq T_{\text{batt}} < 5^{\circ}\text{C}$
6 – $5^{\circ}\text{C} \leq T_{\text{batt}} < 10^{\circ}\text{C}$
Q – $10^{\circ}\text{C} \leq T_{\text{batt}} < 15^{\circ}\text{C}$
8 – $15^{\circ}\text{C} \leq T_{\text{batt}} < 20^{\circ}\text{C}$
Z – $T_{\text{batt}} \geq 20^{\circ}\text{C}$

Character 12: Power Subsystem's MCU Temperature (T_pwrs_mcu)

D – $T_{\text{pwrs_mcu}} < -20^{\circ}\text{C}$
F – $-20^{\circ}\text{C} \leq T_{\text{pwrs_mcu}} < -10^{\circ}\text{C}$
2 – $-10^{\circ}\text{C} \leq T_{\text{pwrs_mcu}} < 0^{\circ}\text{C}$
G – $0^{\circ}\text{C} \leq T_{\text{pwrs_mcu}} < 15^{\circ}\text{C}$
4 – $15^{\circ}\text{C} \leq T_{\text{pwrs_mcu}} < 30^{\circ}\text{C}$
C – $30^{\circ}\text{C} \leq T_{\text{pwrs_mcu}} < 45^{\circ}\text{C}$
6 – $45^{\circ}\text{C} \leq T_{\text{pwrs_mcu}} < 60^{\circ}\text{C}$
Q – $60^{\circ}\text{C} \leq T_{\text{pwrs_mcu}} < 75^{\circ}\text{C}$
8 – $75^{\circ}\text{C} \leq T_{\text{pwrs_mcu}} < 85^{\circ}\text{C}$
Z – $T_{\text{pwrs_mcu}} \geq 85^{\circ}\text{C}$

Character 13: ADCS Subsystem's MCU Temperature (T_adcs_mcu)

1. D – $T_{\text{adcs_mcu}} < -20^{\circ}\text{C}$
2. F – $-20^{\circ}\text{C} \leq T_{\text{adcs_mcu}} < -10^{\circ}\text{C}$
3. 2 – $-10^{\circ}\text{C} \leq T_{\text{adcs_mcu}} < 0^{\circ}\text{C}$
4. G – $0^{\circ}\text{C} \leq T_{\text{adcs_mcu}} < 15^{\circ}\text{C}$
5. 4 – $15^{\circ}\text{C} \leq T_{\text{adcs_mcu}} < 30^{\circ}\text{C}$
6. C – $30^{\circ}\text{C} \leq T_{\text{adcs_mcu}} < 45^{\circ}\text{C}$
7. 6 – $45^{\circ}\text{C} \leq T_{\text{adcs_mcu}} < 60^{\circ}\text{C}$
8. Q – $60^{\circ}\text{C} \leq T_{\text{adcs_mcu}} < 75^{\circ}\text{C}$
9. 8 – $75^{\circ}\text{C} \leq T_{\text{adcs_mcu}} < 85^{\circ}\text{C}$
10. Z – $T_{\text{adcs_mcu}} \geq 85^{\circ}\text{C}$

Character 14: Not used

Character 15, 16, 17, 18, 19: Solar Panel 1-5 Temperature (T_sp1 .. T_sp5)

1. D – $T_{\text{sp1}} < -30^{\circ}\text{C}$
2. F – $-30^{\circ}\text{C} \leq T_{\text{sp1}} < -10^{\circ}\text{C}$
3. 2 – $-10^{\circ}\text{C} \leq T_{\text{sp1}} < 10^{\circ}\text{C}$
4. G – $10^{\circ}\text{C} \leq T_{\text{sp1}} < 30^{\circ}\text{C}$
5. 4 – $30^{\circ}\text{C} \leq T_{\text{sp1}} < 50^{\circ}\text{C}$
6. C – $50^{\circ}\text{C} \leq T_{\text{sp1}} < 70^{\circ}\text{C}$
7. 6 – $70^{\circ}\text{C} \leq T_{\text{sp1}} < 90^{\circ}\text{C}$
8. Q – $90^{\circ}\text{C} \leq T_{\text{sp1}} < 110^{\circ}\text{C}$
9. 8 – $110^{\circ}\text{C} \leq T_{\text{sp1}} < 130^{\circ}\text{C}$
10. Z – $T_{\text{sp1}} \geq 130^{\circ}\text{C}$

Reading VELOX-PII Beacon

1 2 3 4 5 6 7 8 9 10 11 12-14 15-19

VELOXP G 8 Q Q Z C C D 6 C 4 2 F → Solar Panels Temp

Letter	Value
D	0
F	1
2	2
G	3
4	4
C	5
6	6
Q	7
8	8
Z	9

MCU Temp:
PWRS
ADCS
Not used

Battery Temp

GPS|IMU A|IMU B

Battery Voltage

Battery SOC

Satellite mode

[illegible]