

Aspen 10 Specifications



Internet of
Things

Electrical specifications are valid over a -20 to +60 °C (noted as ST), unless otherwise specified. Extended electrical specifications (noted as XT) are valid over a -40 to +75 °C. Recalibration is recommended every three years. Critical specifications and system configuration should be confirmed with Campbell Scientific before purchase.

System specifications

Processor: 32-Bit Arm Cortex CPU

Memory:

- 2 MB flash
- 640 KB SRAM

Program Execution Period: 1 s to one day; 1 s increments

Real-Time Clock:

- **Resolution:** ±1 s
- **Accuracy:** ±1 s
- Synchronized with CampbellCloud once per day

Physical specifications

Dimensions 16.2 x 8.0 x 5.8 cm (6.4 x 3.2 x 2.3 in)

Weight/Mass:

- **ST:** 395 g (0.9 lb)
- **XT:** 352 g (0.8 lb)

Case Material:

- High-impact-resistant and UV-resistant ASA, recycle code 7
- IP65 water resistant, Gore-Tex breathability
- IK06 (equivalent to an impact energy level of 1 J). Test conducted using the pendulum and sphere method

Power requirements

Protection: Power inputs and outputs are protected against surge, over-voltage, over-current, and reverse power. IEC 61000-4 Class 4 level.

Charge Source:

- **Integrated solar panel:** Maxeon Gen V

NOTE:

May take up to 72 hours of full sun to charge a fully discharged battery.

Battery:

Charge and discharge characteristics controlled internally according to battery type.

- **-20 to +60 °C (ST):** 3.2 VDC, 7.2 Ah, Li-Po PHD26650: After 3000 charge/discharge cycles, the capacity remains above 80% of initial capacity. Battery stops charging below -10 °C and above 60 °C.
- **-40 to +75 °C (XT):** 3.65 VDC, 5.6 Ah, Li-ion Saft MP176065 xtd: After 1500 charge/discharge cycles, the capacity remains above 80% of initial capacity. Battery stops charging below -30 °C and above +75 °C.

Average Current Drain @ 3.2 VDC:

- **Deep sleep:** <0.35 µA
- **Idle:** <1 mA
- **Sensor power supply current at no load**
 - 5 VDC: 10 µA (ultra-low power)
 - 5 VDC: 5 mA
 - 8 VDC: 14.3 mA
 - 12 VDC: 30 mA

Cellular Module (Cat M1) On. Additional Current Contribution:

50 to 150 mA

- **Idle:** 1.7 µA
- **Receive:** 21.2 µA
- **Transmit:** 219 mA

BLE Active: 4 mA average

GPS: included w/ cellular

Power output

Regulated 5, 8, or 12 VDC. Disabled when battery capacity <0.5 Ahr.

Pin: 5

Current limit:

- 5 VDC: 30 mA (ultra-low power)
- 5 VDC: 210 mA
- 8 VDC: 210 mA
- 12 VDC: 210 mA

Digital input/output specifications

Terminals configurable for SDI-12.

Terminals: Pin 6, 7

Maximum Input Voltage: ± 20 V

Communications

Protocols: SDI-12

Internet Protocols: HTTP(S), MQTT

Near-field Communications (NFC): Target device compatible with CampbellGo

Bluetooth Low Energy (BLE):

- Compatible with CampbellGo
- Maximum distance: 50 m (165 ft)

SDI-12: Two SDI-12 compliant terminals meet SDI-12 Standard v 1.4.

- Pins: 6,7

Cellular

Maximum speed		
	Download (kbps)	Upload (kbps)
Cat M1	588	1119
Cat NB1	32	70
Cat NB2	127	158.5

Standards compliance specifications

View compliance and conformity documents at www.campbellsci.com/aspens10

Shock and Vibration: ASTM D4169

Protection: IP65

EMI and ESD protection:

- **Immunity:** Meets or exceeds following standards:
 - **ESD:** per IEC 61000-4-2; ± 15 kV air, ± 8 kV contact discharge
 - **Radiated RF:** per IEC 61000-4-3; 10 V/m, 80-1000 MHz

- **EFT:** per IEC 61000-4-4; 4 kV power, 4 kV I/O
- **Surge:** per IEC 61000-4-5; 4 kV power, 4kV I/O
- **Conducted RF:** per IEC 61000-4-6; 10 V power, 10 V I/O

- Emissions and immunity performance criteria available on request.

Safety: IEC 61010-1:2010, IEC 61010-1:2010/AMD1:2016

Environmental conditions

The Aspen 10 can be operated safely under the following conditions.

Location: outdoor

Location: wet environment as defined by IEC 61010-1

Maximum elevation: 4,000 m (13,100 ft)

Temperature:

- **Standard (ST):** -20 to +60 °C
- **Extended (XT):** -40 to +75 °C

Relative humidity: up to and including condensing environments

Pollution degree: 2 as defined by IEC 61010-1

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