

Canique Ambience Datasheet

document revision 0.1

This datasheet applies to Canique Ambience hardware revisions: 1.3.x

Supported Onboard Sensors

The following sensors are available, but may not have been installed, depending on the hardware configuration:

- Temperature / Humidity Sensor¹
- Barometric Pressure Sensor¹
- Pulse Counter (external 2 pin connector)
- Reed Sensor (external 2 pin connector)
- Accelerometer

Power consumption in sleep

All specifications are provided for an ambient temperature of 25°C, not taking into account the accelerometer quiescent current and the pulse counter quiescent current unless noted otherwise.

Battery Voltage	Quiescent Current
1.5 V	1.7 μ A
1.25 V	2.05 μ A
1.0 V	2.57 μ A

1 Power to this sensor is completely turned off while not in use

Specs

Required battery	1x AA size
Minimum battery voltage to startup	1.1V
Minimum battery voltage to operate	0.9V
Max. supported battery voltage	1.8V
Operating Temperature range ²	-40°C to 85°C
Modulation	FSK
Min./Max. transmission power	-18 dBm / +13 dBm
Transmission speed	25 kbps
Microprocessor	Cortex-M0+
Transmission Interval	30 seconds
PCB size	82 x 25 mm
Drill hole size for screws	M2

Reverse Polarity Protection

The device is equipped with an electronic reverse polarity protection on pins VBAT/GND or the battery connector respectively. The protection circuit prevents damage to the device if the user inserts the battery in reverse direction.

² Except for battery. Energizer Ultimate Lithium e.g. has an operating temperature from -40°C to 60°C.

Temperature/Humidity Sensor

All specifications are provided for an ambient temperature of 25°C unless noted otherwise.

Temperature Range	Temperature Accuracy
0 to 60°C	± 0.2°C
80°C	± 0.3°C
-20°C	± 0.4°C
-40°C	± 0.6°C

Relative Humidity Range	Relative Humidity Accuracy
30 to 70% RH	± 1.8 percent points
10 to 20% RH 80 to 90% RH	± 2 percent points
0% RH 100% RH	± 3 percent points

Specifications	
Humidity range	0% to 100%
Resolution temperature	0.01°C
Resolution relative humidity	0.01 percent points
Quiescent Current	0.3 nA
Quiescent Current @ 85°C	10 nA

Pulse Counter

All specifications are provided for an ambient temperature of 25°C, a cable capacitance of 100pF and an input voltage of 1.5V unless noted otherwise.

Total pulse counter power consumption consists of: idle consumption, pulse consumption and charge consumption³ while charging up input capacitance after every pulse.

Input pullup resistance	6 MOhm
Input discharge resistance	10 kOhm
Input capacitance	100 pF
Max. recommended additional input capacitance	900 pF
Max. frequency ^{4 5}	130 Hz
Max. frequency (@ max. input capacitance)	30 Hz ⁶
Power consumption (idle)	< 20 nA
Power consumption (pulse)	450 nA
Typical avg. power consumption @ 30 Hz	340 nA
Pulse Detection	on falling edge (when pulse counter contacts are short-circuited)
Minimum Pulse Duration ⁷	1 ms
Minimum Pulse Duration (max. input capacitance)	9 ms

3 Charge consumption depends on: pulse frequency and total input capacitance

4 Maximum frequency depends on: total input capacitance and input pullup resistance

5 Maximum frequency can be increased by connecting an external resistor from pin VCC to the pulse counter input pin 0-5V. Example: Adding a 604 kOhm resistor, would result in a total input pullup resistance of: $6 * 0.604 / (6 + 0.604) = 549$ kOhm. This would allow for an 11x increase in frequency, but would also increase power consumption during a pulse by factor $6 / 0.549 = \sim 11x$

6 Tested with 1500 pF additional input capacitance. No missed pulses.

7 Min. pulse duration is affected by the analog low pass filter formed of input pullup resistance and input capacitance. A lower input pullup resistance value allows for shorter pulses and vice versa. A lower input capacitance value (shorter cable) also allows for shorter pulses and vice versa.

Screw Terminal	
Number of pins	2
Wire Gauge	AWG 24-18 / 0.75 mm ²
Length of Stripped Wires	4-5 mm
Pitch	3.5 mm
Screws	M1.6
Recommended max. cable length	4 meters

Reed Sensor

All specifications are provided for an ambient temperature of 25°C, a cable capacitance of 100pF and an input voltage of 1.5V unless noted otherwise.

Input pullup resistance	6 MOhm
Input discharge resistance	10 kOhm
Input capacitance	1 nF
Power consumption (reed closed ⁸)	450 nA
Power consumption (reed open ⁸)	< 1 nA
Detection Delay (from closed to open)	10 ms
Detection Delay (from open to closed)	< 30 μs

⁸ Reed is closed when reed contacts are short-circuited. Reed is open when reed contacts have no connection to each other.