

Mulch Temperature Sensor

LoRaWAN® Battery-Powered Device

The TEKTELIC Mulch Temperature Sensor is an ideal solution for monitoring and transmitting real-time data relating to temperature of mulch beds. Two device variants are available depending on the depth of the mulch that needs to be monitored and also includes an onboard temperature and humidity sensor for the ambient environment.

TEKTELIC's Mulch Sensor utilizes a ruggedized IP-67 polycarbonate enclosure for deployment in the most extreme environmental conditions and includes an integrated Li-SOCl₂ battery for optimized battery life of up to 10 years. The device supports battery status reporting for easy maintenance via an Application server.

Technical and Functional System Specifications

General System Parameters

Operational Temperature	-40°C to +55°C
Operational Voltage	3.6V Nominal
Ingress Protection	IP67
Size	90 x 90 x 60 mm
Probe Length	Variant 1: 137 cm
	Variant 2: 320 cm
Weight	50g (excluding probes)
Battery (up to 10 years)	Li-SOCl ₂

LoRa Parameters

RF Power	NA: 20dBm (100mW), EU: 14 dBm (25mW)
RF Sensitivity	up to -140dBm
ISM Band	NA915, EU868, AS923, JP920, CH779
Antenna	Internal Ceramic, UFL connector for External
LoRa Device Class	Class A, B or C (optional DC power)

Regulatory Compliance

Safety	IEC 60950-1, IEC 60950-22, IEC 62368-1
Environmental	ETSI EN 300 019-2-1, 300 019-2-2
	ETSI EN 300 019-2-3, 300 019-2-4
Regulatory	FCC 15.247 RSS-247
	FCC 15.209 RSS-Gen

Specifications subject to change without notice.



Applications

- » Commercial Mulch/Compost Storage
- » Precision Agriculture
- » Hydroponics and Smart Greenhouses

Mulch Temperature Sensor

LoRaWAN® Battery-Powered Device

Technical and Functional System Specifications

Battery Test Summary

- » A LoRa transmission with 11 bytes payload takes approximately 300 ms Tx time and 300 ms Rx time.
- » Considering the current draws with SX1262 when transmitting at max power (22 dBm), the result is less than 40 mAs battery usage.
- » The background current, when not transmitting or receiving, is less than 17 uA at cold temperatures.
- » **Estimated Capacity:**

Every 10 minutes transmitting 11 bytes ~ 290,000 transmissions = 5.5 years

Every 15 minutes transmitting 11 bytes ~ 260,000 transmissions = 7.5 years

Battery Voltage = 2 bytes

Temperature = 4 bytes

Relative Humidity = 3 bytes

Input 1 (Digital) = 3 bytes

Input 1 Count = 4 bytes

Battery Test Parameters

Operational Temperature	20°C
Current Draw	80mA for 1 second
Tx Interval	Every 3 Seconds
Duty Cycle	33%

Battery Test Results

Number of Tx to Full Drain	900,000
Capacity	20aH

I/O and Interfaces

Input	0-2.5V analog
On Board Temperature Sensor	
On Board Humidity Sensor	