



ForestGuard DataSheet

ForestGuard is a device that can detect and prevent wildfires in real-time. It uses sensors of temperature, humidity, pressure and CO2 to monitor the air quality and the fire risk in forests. It also uses edge computing to process the environmental data and detect any anomalies. ForestGuard can create fire risk heatmaps before the fire to predict any possible fire threats in the following weeks. It can also detect any smoke and fire by using an AI algorithm that processes 30+ parameters in real time. ForestGuard IoT devices use LoRa® technology to communicate over satellite and terrestrial networks. They do not need any gateway infrastructure and can send and receive data and commands in real-time. These fire risk monitoring and detection sensors can also cooperate with other devices using LoRa® modulation for updates and connections.

Eco-friendly and durable, they use solar energy to power themselves and have supercapacitors and optional batteries for backup. They are waterproof and can withstand extreme temperatures. The fire risk monitoring and detection sensors can be easily installed on any tree trunk, pole or structure. They have an inertial sensor and an inclinometer to measure the position and movement of the structure. They can also connect to external digital or analogue sensors for more data. They have IP67 enclosures to be durable for extreme outdoor conditions. ForestGuard is powered by batteries that can last for several years, and it is made from recycled plastics collected in forests. ForestGuard IoT devices are the ideal solution for protecting forests and structures from natural and human threats. They provide real-time and hyper local data and control over satellite and terrestrial networks. They are compatible with EchoStar Mobile™ S-Band LoRa® network and LoRaWAN® 868/915/923 MHz networks.

- Real-time detection of wildfires using sensors of temperature, humidity, pressure, VOC and CO2
- Communication can be customized in between LoRaWAN gateways and S-Band satellites
- Manufactured from 99% recycled plastics collected in forests and nature
- Reducing false alarms by 2-step verification on edge computing and AI integrated cloud
- Easy and wireless installation on tree trunks, poles, or any surface using elastic straps
- Localization of sensors by triangulation of signals received by gateways and satellites
- Integration with geographic information systems (GIS) and mobile applications
- Solar power and supercapacitor powered with 5+ years of autonomy

computing



Node-to-satellite communication allow us to notify authorities in **15 seconds**, globally.

Technical Specifications

Parameter	Value	Unit
Sensor battery	3.6 V, 19 Ah	
Sensor dimensions	10 × 10 × 5	cm
Sensor weight	200	grams
Sensor power consumption	0.1 (standby), 0.5 (transmission)	W
Sensor protection	IP67, ABS Enclosure	
Sensor operating temperature	-40 to +85	°C
Maintenance Frequency	3	years
Power source	Solar-powered, Supercapacitors	

Communication Specifications

Parameter	Value	Unit
LoRaWAN operating frequency	868 (Europe) or 915 (North America)	MHz
LoRaWAN range	up to 15	km
LoRaWAN data rate	up to 50	kbps
S-Band operating frequency	2.2-2.4	GHz
S-Band range	up to 500	km
S-Band data rate	up to 1	Mbps
Sensor sampling interval	15 (configurable)	minutes
Sensor data packet size	20	bytes

Temperature

Parameter	Value	Unit
Operating Range	-40 to 85	°C
Absolute Accuracy (0-65 °C)	± 0,5	°C
Resolution of Output Data	0,01	°C
RMS Noise	0,005	°C

Humidity

Parameter	Value	Unit
Full Accuracy Range (Temperature)	0 to 65	°C
Full Accuracy Range (Humidity)	10 to 90	% r.H.
Absolute Accuracy	± 3,0	% r.H.
Resolution of Output Data	0,008	% r.H.
Noise in Humidity (RMS)	0,01	% r.H.
Long Term Stability	0,5	% r.H./year

Pressure

Parameter	Value	Unit
Operating Range (Temperature - Operational)	-40 to 85	°C
Operating Range (Temperature - Full Accuracy)	0 to 65	°C
Operating Range (Pressure)	300 to 1100	hPa
Absolute Accuracy	± 0,6	hPa
Resolution of Output Data	0,18	hPa
Long Term Stability	± 1,0	hPa/Year

Air Quality Index

Parameter	Value	Unit
AQI Range	0 to 500	Units
Absolute Accuracy	± 0,6	hPa
Resolution of Output Data	0,18	hPa
Long Term Stability	± 1,0	hPa/Year

Copyright 2025 ForestGuard, Binary Labs Teknoloji AS