

STP40

Operating manual



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DESCRIPTION

The Senstick Temperature Probe STP40 is a robust LoRaWAN sensor designed for reliable temperature monitoring in harsh environments. Its ruggedized housing and flexible probe configuration ensure seamless deployment for soil, mulch, water and rail track monitoring, while integrated motion detection provides immediate alerts if the device is tampered with or moved.

DATASHEET

Enclosure	
Weight	170g w/ batteries / 230 g with batteries
Dimensions	Casing: 105mm x 25mm / Probe: 5mm x 50 mm
Materials	UV stable plastic
Cable length	2m or custom
IP rating	IP68

Operating conditions	
Temperature	-40°C to +85°C
Humidity	0 to 100% RH

Configuration	
Sending interval	Configuration via NFC and downlink
Data upload interval	Configuration via NFC and downlink
NFC configuration	Native Android App

Connectivity	
Wireless Technology	LoRaWAN® 1.0.3
Wireless Security	LoRaWAN® End-to-End encryption (AES-CTR), Data Integrity Protection (AES-CMAC)
LoRaWAN Device Type	Class A - End-device
Supported regions	US902–928, EU863–870, AS920-923, AU915–928
Link Budget	137dB (SF7) to 151dB (SF12)
RF Transmit Power	14dBm (Region specific)

Power supply	
Battery type	1x 3,6V Lithium
Expected operation	<7 years (depending on sampling, signal, environment)

SENSORS

Temperature	
Range	-55°C to +125°C (Possible higher with custom probes - contact sales)
Accuracy	±0.5°C

Acceleration	
Range	±2g to ±16g

PARTS AND BATTERIES

The Senstick Temperature Probe STP40 consists of two main parts: the sensor enclosure containing the PCB and the external temperature probe connected via a 2-meter (or custom-length) cable.

The STP40 is powered by a single 3.6V Lithium battery. For optimal performance and a maximum expected operation lifetime of up to 7 years (depending on the reporting interval, signal strength and operating conditions), the use of an industrial-grade lithium battery is recommended.

The battery is inserted directly onto the PCB inside the ruggedized housing.

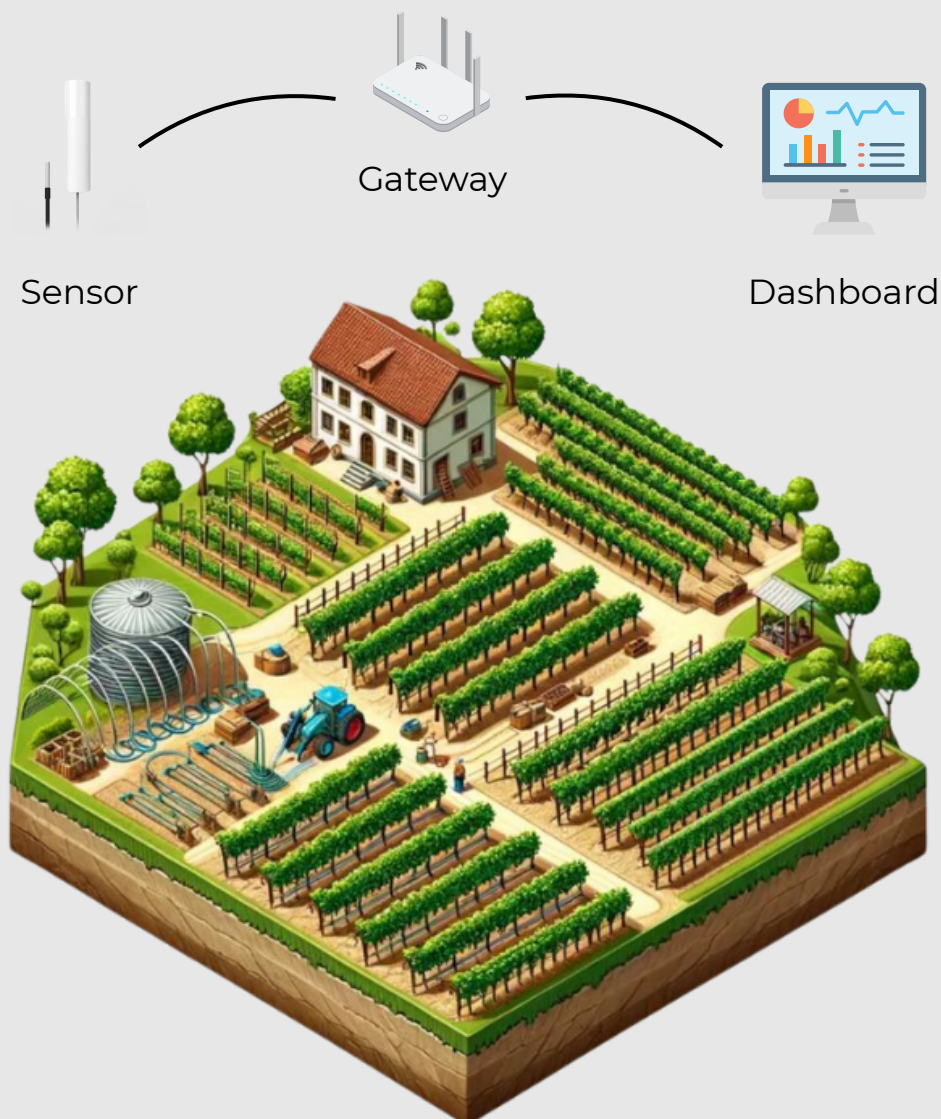


UNDERSTANDING THE LORAWAN ARCHITECTURE

Senzemo sensors operate via LoRaWAN, meaning they collect environmental data and wirelessly transmit it to a nearby LoRaWAN Gateway. The Gateway then forwards this data to a Senzemo Dashboard or your own custom platform, where it becomes available for analysis, visualization or integration with third-party systems.

Senzemo devices are compatible with any LoRaWAN platform. For customers seeking a streamlined experience, we also offer complete end-to-end solutions from data acquisition to visualization.

In case of any questions on this topic, please feel free to contact: support@senzemo.com



LoRaWAN PROTOCOL MANUAL

For detailed instructions on integrating Senstick with your LoRaWAN network, including sending downlink commands, decoding uplink payloads, and configuring network parameters, please refer to the complete LoRaWAN Protocol Manual below:

https://senzemo.com/wp-content/uploads/2024/01/Senstick_STP40-HWv4.0_FWv1.0-LoRaWAN_Protocol_v1.0.pdf

DECODER:

By default, Senzemo provides a decoder compatible with The Things Network (TTN). However, with minimal adjustments, it can be adapted for use with other LoRaWAN servers such as AWS IoT Core, ChirpStack, Lorient, and others.

You can access the decoder at the following link:

https://senzemo.com/wp-content/uploads/2024/02/Senstick_STP40-HWv4.0_FWv1.0-LoRaWAN_Decoder.txt

In case of any support needed, please feel free to contact: support@senzemo.com

Activity and Data Transmission

The factory settings of the Senstick are the following:

Measurement interval: 15 minutes

The sensor performs a measurement and sends data every 15 minutes.

Adaptive Data Rate: ON

ADR automatically adjusts the data rate based on signal quality and network conditions. This helps optimize battery usage and ensures reliable communication.

Movement detection: ON

The sensor monitors for movement events. If movement is detected, the device can trigger an additional data transmission and flag the event in its payload.

Packet Acknowledgment: Every 24th packet

Every 24th LoRaWAN uplink message requests an acknowledgment (ACK) from the network.

If the device does not receive an ACK, it will automatically attempt to rejoin the network.

The retry process follows a backoff strategy:

Rejoin attempts start every minute,

then gradually extend to every hour,

then every 6 hours,

and finally, once per 24 hours until the connection is re-established.

This approach ensures network stability while preserving battery life.

Configuration

The Senstick parameters, from the previous topic, can be configured by either the Senstick Android App or via Downlink (look at the protocol manual from the page 7)

To download the app, visit Google Play Store:

[https://play.google.com/store/apps/details?](https://play.google.com/store/apps/details?id=org.se.senstick&pcampaignid=web_share)

[id=org.se.senstick&pcampaignid=web_share](https://play.google.com/store/apps/details?id=org.se.senstick&pcampaignid=web_share)



Please note that the user must follow the rules of LoRaWAN standards, which include limitations on sending rates, packet acknowledgment, and adaptive data rates.

Senzemo does not take responsibility for network issues, battery drain, or connectivity problems resulting from user-modified settings that violate LoRaWAN specifications or best practices.

SENSTICK INSTALLATION ACCESSORIES

The Senstick Temperature Probe STP40 can be installed using the MPOM40 snap-on mounting kit, which is available as an accessory and is suitable for indoor use, allowing the sensor enclosure to be securely fixed onto a wall.

Installation instructions

After registering the device and inserting the battery, the user can proceed with the installation of the Senstick Temperature Probe STP40.

Please see some real use case examples below:



