PLT-1

The PLT-1 is equipped with a capacitive soil moisture sensor, providing enhanced accuracy and durability over resistive alternatives. The sensor’s ground contact portion is coated with a conformal layer, ensuring long-lasting performance and resistance to environmental factors. It also features an AHT20-F air temperature and humidity sensor, which includes dust protection, an LTR390 UV sensor for Lux/UV measurements, an RGB LED, a piezo buzzer, and an optional DS18b20 waterproof soil temperature probe (20 cm / 7.8 inches).

FAQ

1. What sensors are included in the PLT-1?

• The PLT-1 comes with sensors to measure soil moisture, air temperature, humidity, LUX, and UV. There is also an optional DS18b20 waterproof soil temperature probe available for measuring soil temperature.

2. How does the capacitive soil moisture sensor work?

• The capacitive soil moisture sensor measures the water content in the soil by detecting changes in the dielectric permittivity of the soil, which is affected by moisture. It’s more durable than resistive sensors because it doesn’t corrode and is protected with a conformal coating.

3. Is the PLT-1 battery-powered, or do I need to plug it in?

• The PLT-1 comes in two versions: a battery-powered version and a non-battery (NB) version. The battery version is slightly larger due to the space needed for the battery, while the NB version is more compact.

4. How long does the battery last in the PLT-1?

• Battery life depends on usage and sensor update intervals. Frequent updates will reduce battery life. You can adjust the sleep and wake intervals in the ESPHome configuration to optimize battery usage.

5. How does the optional soil temperature probe work?

• The optional DS18b20 waterproof soil temperature probe is 20 cm / 7.8 inches long. It measures the temperature directly in the soil and can be used to monitor the conditions for specific plants that require precise temperature control for optimal growth.

6. Is the PLT-1 weatherproof? Can I use it outdoors?

• The PLT-1 is primarily designed for indoor use. While some components, such as the waterproof soil temperature probe, can withstand harsher environments, the main body of the sensor is not rated for outdoor use unless adequately protected.

7. How does the PLT-1 connect to Home Assistant?

• The PLT-1 uses WiFi to connect to your Home Assistant instance through ESPHome. Once connected, you can configure automations, monitor data, and set alerts directly in Home Assistant.

8. What kind of automations can I set up with the PLT-1?

• You can create automations for plant care, such as setting notifications when soil moisture is low, turning on lights when LUX readings drop below a certain level, or adjusting your HVAC system based on air temperature and humidity around your plants.

9. How often does the PLT-1 send sensor data?

• The update intervals for each sensor are configurable in ESPHome. For example, you can have the soil moisture sensor report every second or extend it to save battery power in the battery-powered version.

10. Can I customize the PLT-1’s functionality?

• Yes! The PLT-1 is fully customizable through ESPHome, and the software and CAD files are available to the community. You can modify the firmware, adjust settings, and even print new cases for the sensor.

11. What is the RGB LED and piezo buzzer used for?

• The RGB LED can be used for visual alerts, such as changing colors based on soil moisture or plant health. The piezo buzzer can emit sounds for critical notifications, like low moisture warnings or reminders to check on your plants.

12. What is the benefit of using the conformal coating on the soil moisture sensor?

• The conformal coating adds an extra layer of protection to the capacitive soil moisture sensor, ensuring it lasts longer and resists environmental factors like moisture, which can degrade uncoated sensors over time.

13. What plants are compatible with the PLT-1?

• The PLT-1 is compatible with any indoor plants. You can use Open Plant Book in combination with Home Assistant to apply ideal care conditions (such as light, humidity, and soil moisture) for specific plants.

14. Can I use the PLT-1 to monitor multiple plants?

• The PLT-1 is designed to monitor a single plant’s environment. For multiple plants, you would need additional sensors or move the sensor between plants as needed.

15. What makes the PLT-1 better than other plant sensors?

• The PLT-1 offers a highly accurate and durable capacitive soil moisture sensor, real-time data reporting, and the ability to track multiple environmental conditions in one small device. It also integrates seamlessly with Home Assistant, allowing for advanced automations and alerts.

16. Is the PLT-1 compatible with other smart home platforms?

• The PLT-1 is designed specifically for Home Assistant via ESPHome. While it could be compatible with other platforms through customization, its primary use is within the Home Assistant ecosystem.

17. Do I need coding knowledge to use the PLT-1?

• Basic knowledge of Home Assistant and ESPHome is helpful for configuring the PLT-1, but the sensor is designed to be plug-and-play for most users. Customization will require some knowledge of YAML.

18. Can I access data from the PLT-1 remotely?

• Yes, once connected to Home Assistant, you can access your sensor data remotely through your Home Assistant dashboard, provided your setup allows for remote access.

19. What’s the difference between the battery and non-battery versions?

• The battery version is slightly larger and is designed for situations where a power outlet isn’t nearby. The non-battery version is smaller and designed for direct connection to a power source.

20. Can I use multiple PLT-1 sensors in one Home Assistant setup?

• Yes, you can use multiple PLT-1 sensors simultaneously in Home Assistant. Each sensor will appear as a separate device in your dashboard, allowing you to track various plants or environments.

Sensor Definitions

Sensors

LTR390 UV

- **uv_index** (*Optional*): UV index (UVI). All options from Sensor.
- **uv** (*Optional*): Sensor counts for the UV sensor (#). All options from Sensor.
- **light** (*Optional*): Lux of ambient light (lx). All options from Sensor.
- **ambient_light** (*Optional*): Sensor counts for the Ambient light sensor (#). All options from Sensor.
- **gain** (*Optional*, string): Adjusts the sensitivity of the sensor. A larger value means higher sensitivity. Default is `"X18"`, see table below for options.
- **resolution** (*Optional*, int): ADC resolution. Higher resolutions require longer sensor integration times. Default is `20`, see table below for options.
- **window_correction_factor** (*Optional*, float): Window correction factor. Use larger values when using under tinted windows. Default is `1.0`, must be `>= 1.0`.
- **address** (*Optional*, int): Manually specify the I²C address of the sensor. Default is `0x53`.
- **update_interval** (*Optional*, Time): The interval to check the sensor. Defaults to `60s`. It is recommended that the update interval is at least 1 second since updates can take up to 800ms when using a high resolution value.

AHT20-F

- **variant** (*Optional*, enum): Set the variant of the device in use. Defaults to `AHT10`.
  - `AHT10` - For AHT10 devices.
  - `AHT20` - For AHT20 and AHT30 devices.
- **temperature** (**Required**): The information for the temperature sensor.
  - All options from Sensor.
- **humidity** (**Required**): The information for the humidity sensor
  - All options from Sensor.
- **update_interval** (*Optional*, Time): The interval to check the sensor. Defaults to `60s`.

DS18B20

- **address** (*Optional*, int): The address of the sensor. Required if there is more than one device on the bus.
- **resolution** (*Optional*, int): An optional resolution from 9 to 12. Higher means more accurate. Defaults to the maximum for most Dallas temperature sensors: 12.
- **update_interval** (*Optional*, Time): The interval that the sensors should be checked. Defaults to 60 seconds.
- **one_wire_id** (*Optional*, 1-Wire Bus): The ID of the 1-Wire bus to use. Required if there is more than one bus.
- All other options from Sensor.

Sensor Definitions

Controls:

RGB Light:

- This allows you to control the RGB LED on the PLT-1. You can toggle it on or off directly from the ESPHome dashboard, which can be useful for creating visual alerts or indications related to plant health (e.g., turning green if everything is fine, red if moisture is too low, etc.).

Sensors:

Air Humidity: 48.73%

- This sensor measures the relative humidity of the air surrounding your plant. Ideal humidity levels are crucial for maintaining optimal growth conditions for indoor plants. The reading here shows 48.73%, which might be within a reasonable range depending on the plant type. Too low or too high humidity can stress the plant and affect its ability to absorb nutrients and water properly.

Air Temperature: 80.58°F

- This sensor monitors the air temperature around the plant. The temperature is critical to maintaining a suitable growing environment. This current reading of 80.58°F is quite

warm, which might be suitable for tropical or heat-loving plants but could be a bit high for others. The ideal temperature range depends on the plant species, and you can set automations to trigger alerts if the temperature goes beyond a specified range.

LTR390 Light: 3.4 lx

- This is the light intensity sensor, measured in lux (lx). The light sensor helps you track how much light your plant is receiving. 3.4 lux indicates that the plant is currently in low light conditions, which could be fine for shade-loving plants or indicate that it’s not receiving enough light. For sun-loving plants, you may need to increase light exposure.

LTR390 UV Index: 0.00043 UVI

- This sensor measures ultraviolet light (UV Index). UV is another aspect of the light spectrum, important for photosynthesis and general plant health. The low UV Index here indicates very minimal UV radiation, which could be acceptable for most indoor plants since they usually do not require strong UV exposure. However, some plants may benefit from higher levels of UV for robust growth.

Soil Moisture: 59%

- The soil moisture sensor measures the water content in the soil as a percentage. A reading of 59% means the soil has a moderate amount of moisture, but depending on the plant species, you may need to adjust watering. The ideal moisture level varies by plant; for instance, succulents prefer drier soil, while tropical plants may require consistently moist soil.

Soil Temperature: Unknown

- This field represents the reading from the optional soil temperature probe. It currently shows as “Unknown” because the soil temperature probe may not be connected or is not currently returning data. Soil temperature is crucial for root health and affects the plant’s ability to take up water and nutrients. This optional feature can give deeper insights into the root zone environment.

Configuration:

100% Water Voltage: 1.5

- This setting defines the voltage that corresponds to 100% soil saturation (completely wet soil). A voltage of 1.5V is being used as the threshold for completely moist soil. This parameter can be tuned based on your plant’s needs, and it’s helpful in creating accurate alerts or automations when soil moisture is low.

Dry Voltage: 2.7

- This value represents the voltage at which the soil is considered completely dry. A dry voltage of 2.7V indicates the sensor has defined this threshold for when your plant needs watering. Automations can be created to alert you when the voltage rises to this point, signaling that the soil is too dry.

Run Duration: 60 seconds

- This is the amount of time the sensor remains active after a connection has been established. A run duration of 60 seconds is often enough to send all sensor data and updates before entering the sleep mode (to save energy). It’s useful for battery-powered devices.

Sleep Duration: 5 minutes

- This setting specifies how long the PLT-1 will remain in sleep mode between connection intervals. A 5-minute sleep duration is a good balance between battery life and update frequency. You can adjust this depending on how often you want the sensor to wake up and report new data.

Sleep After Connecting: Enabled

- This configuration means the PLT-1 will enter sleep mode after it finishes sending data during each connection. Enabling sleep mode helps conserve battery life, making it ideal for a battery-powered setup.

Prevent Sleep: Enabled

- With this option enabled, the PLT-1 will not enter sleep mode under certain conditions, ensuring continuous operation. This is useful if you want the sensor to remain active for extended periods, perhaps for monitoring changes in real-time without interruptions.

Diagnostic:

ESP Temperature: 89.8°F

- The ESP module’s internal temperature is displayed here. An ESP temperature of 89.8°F could be a result of the WiFi module being continuously active. While this might not directly impact plant health, it’s useful to monitor as it can affect the accuracy of nearby temperature sensors.

Status: Online

- This confirms that the PLT-1 is currently online and connected to the WiFi network, communicating with Home Assistant.

RSSI: -56 dBm

- The Received Signal Strength Indicator (RSSI) shows the strength of the WiFi signal. A reading of -56 dBm is fairly decent, indicating that the PLT-1 has a strong enough connection to the WiFi router. Lower RSSI values (closer to zero) represent better signal strength.

Uptime: 13 hours 37 minutes

- This shows how long the PLT-1 has been running continuously since its last reboot or power-up. An uptime of 13 hours and 37 minutes indicates that the device has been stable and working for a decent period without any issues.

Buttons

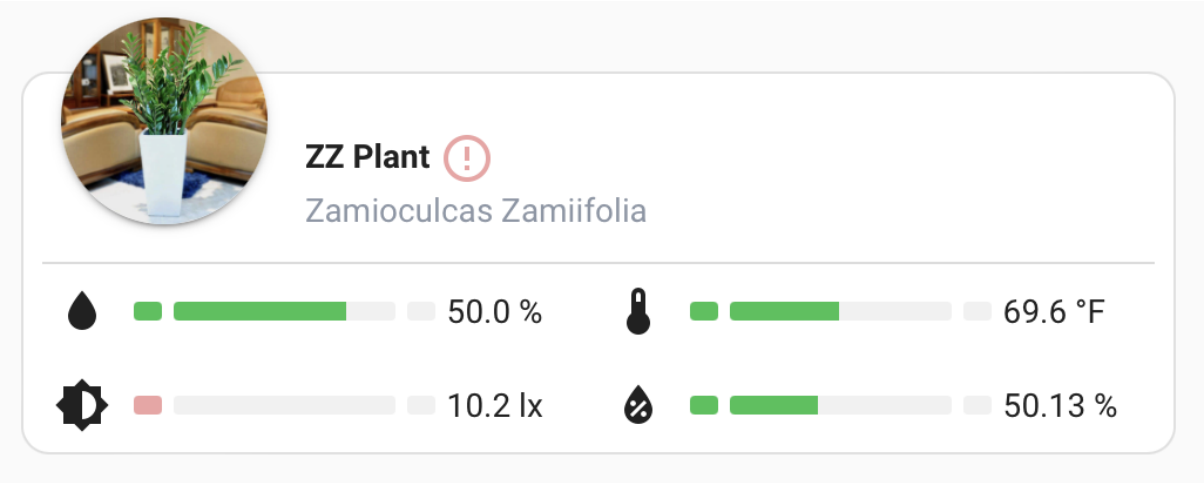
When looking at the PLT-1 from the front, the boot button is on the left and the reset is on the right by the USB-C port

How To Calibrate Soil Moisture

This guide will take you through calibrating your PLT-1's moisture sensor. The sensors come with the default calibration so this method is only needed if you want to make your own adjustments.

1. Take your PLT-1 out of the soil and clean off the probe. It is important to get the dirt off to have the best calibration.
2. Make sure the PLT-1 probe is sitting in the air or on a dry non conductive surface and plugged in.
3. Visit the device's entity drill-down page in Home Assistant and scroll down to the diagnostics section. Enable the entity "Soil ADC"
4. Give the sensor a minute for this new entity to populate
5. Once the value is populated take the value and put it into the "Dry Voltage" entity
6. Now place the prob portion of the PLT-1 into a cup of water. Be careful to not dunk the entire sensor, only the exposed PCB below "Apollo" and the horizontal line can be exposed to water
7. Grab the "Soil ADC" value now and put the value into the "100% Water Voltage" entity
8. You can put your PLT-1 back into your plant and you now have a calibrated

Flower Card



Home Assistant Plant Integration

This integration can automatically fetch data from OpenPlantBook if you are a registered user. Registration is free.

Plants are set up in the UI and all configuration of your plants can be managed there or by automations and scripts.

Open Plant Book Integration

This integration allows fetching plants information from and uploading plant sensors' data to OpenPlantBook. It creates a few service calls in Home Assistant to interact with OpenPlantbook API which are:

- Search plant
- Get plant details
- Upload plants sensors data

This is used as a base for the sister-integration https://github.com/Olen/homeassistant-plant which utilizes this API to add threshold values for such as moisture, temperature, conductivity etc. based on the plant species.

Flower Card GitHub

Flower Card Code

```
type: custom:flower-card
entity: plant.my_plant
show_bars:
- illuminance
- humidity
- moisture
- temperature
battery_sensor: sensor.demo_battery
```

Reviews

Reviews

Simon Says Home Assitant PLT-1 Review

Awesome way to care for your plants with Home Assistant and the PLT1 from Apollo!

https://www.youtube.com/embed/hocliw98_Gk?si=tZ80oO9FugWzt543

Reviews

Michael Leen PLT-1 Review

Ultimate Smart Home Plant Sensor: Apollo Automation PLT-1

https://www.youtube.com/embed/tSYUJESNyFM?si=v0J4iOtFQZP91z4w