

# Gaia Sentinel

## Standard Operating Procedure (SOP)

**Module Name:** Gaia Sentinel – Water Node

**Version:** 1.1

**Prepared By:** Gaia Sentinel Development Team

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## 1. Purpose

This SOP defines procedures for development and operation of the Gaia Sentinel Water Node.

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## 2. System Overview

The Water Node is an IoT-based water quality monitoring device using ESP32.

It measures:

- Total Dissolved Solids (TDS)
- Water Temperature

It integrates with the Gaia Sentinel Cloud and local dashboard.

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## 3. Data Collection Parameters

### 3.1 TDS (PPM)

| TDS Range | Quality    |
|-----------|------------|
| 0–150     | Excellent  |
| 150–300   | Good       |
| 300–500   | Acceptable |
| 500+      | Unsafe     |

### 3.2 Temperature (°C)

Used for industrial, domestic, and ecological monitoring.

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## 4. Hardware Architecture

### 4.1 Controller

- ESP32

### 4.2 Sensors

- TDS Sensor
- DS18B20 Waterproof Temperature Sensor

### 4.3 Enclosure

- Waterproof plastic enclosure
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## 5. Software Architecture

- WebSocket real-time updates
  - HTTP configuration portal
  - Cloud database logging
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## 6. Deployment

1. Install sensors securely.
  2. Upload firmware.
  3. Configure WiFi.
  4. Verify dashboard data.
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## 7. Maintenance

### Weekly

- Inspect probes

### Monthly

- Clean TDS sensor

### Annually

- Firmware update
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## 8. Conclusion

The Water Node extends Gaia Sentinel to smart water quality intelligence.

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