GFIS ECOTWIN

Hardware and telemetry bench notes

Chatake Innoworks Private Limited
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Scope

The hardware prototype starts with safe signal acquisition and a reproducible packet contract. A physically commissioned gas-monitoring instrument is outside this software release. No gas release, compression or ignition is required for the demonstration.

Planning bill of materials

ESP32 development board: INR 500–900; temperature probe: INR 200–500; breadboard, wires and safe power supply: INR 600–1,200; potentiometer/ADC signal emulator: INR 400–900; small display and enclosure: INR 600–1,500; spare parts and delivery allowance: INR 1,200–3,000. Combined illustrative range: INR 3,500–8,000. These are unquoted planning assumptions, not current vendor prices or approved spending.

Packet contract

Each packet carries schema gfis-sih-telemetry-v1, plant_id, timestamp_utc, sequence and variables. Temperature uses degrees Celsius. pH is dimensionless. A value must carry source_class and sensor_status. Missing values remain null. In the first bench, gas flow and pH can be electrically emulated and must be labelled synthetic.

Shweta and Samina · acquisition and faults

Shweta owns the probe interface and packet generator. Samina owns event validation and the loss scenario. Test normal updates, duplicated sequence numbers, a stale clock, wrong units and disconnected temperature. Retain a packet log and observed latency. This release supplies the emulator script but does not claim a completed ESP32 bench test.

Sneha and Sakshi · state and integration

Sneha connects the accepted packet to the plant view. Sakshi checks that rejected packets cannot silently become valid observations. Inspect the accessible component controls, the offline fallback and exported event replay.

Field progression

Use qualified plant staff for any later instrument placement. Calibrated methane and hydrogen-sulphide analysers, explosion-protected instrumentation, enclosures and plant permits require a separate engineering design and approved procurement. Prototype pH/temperature screening is not a certified environmental alarm.