
SENSOR+
TIS TECHNOLOGY
The Unified Monitoring System
for PQSE Performance
(Process, Quality, Safety & Environment)

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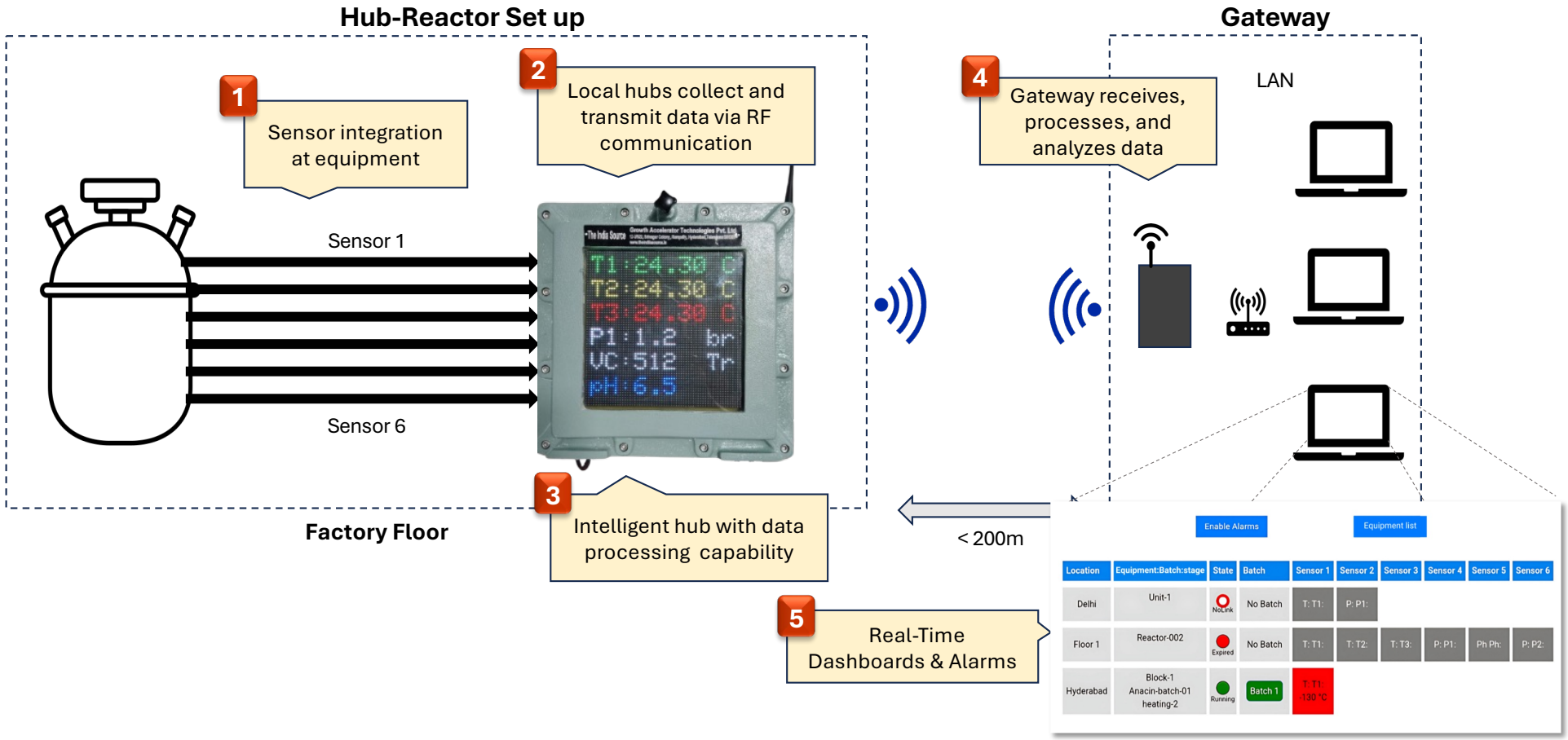
Introduction

What is Sensor+ ?

A next-generation, real-time and cost-effective monitoring system designed to enhance **visibility, ensure regulatory compliance**, and deliver unified oversight of **Process, Quality, Safety and Environmental (PQSE) parameters.**

- **Plug & Play set-up** Installation and Go-live in hours
- **Modular & Scalable** system design
- **Real-time dashboard** for centralized monitoring
- **Threshold-based alerts** ensuring timely action
- **Flexible configuration** Adaptable to any recipe or process
- **Batch & Equipment** centric reports and analysis
- **Regulatory compliance** CFR 21 Part 11 Compliant NABL and IP65 Certified

How Sensor+ works?



Applications

Sensor+ is applicable across diverse industries

Pharmaceuticals

- APIs, Intermediates & Formulations
- Biopharmaceuticals / Biologics
- Biotechnology

Chemicals

- Specialty Chemicals
- Fertilizers
- Agrochemicals
- Industrial Gases
- Dyes & Pigments
- Plastic & Polymers
- Petrochemical Industries
- Paints, Coatings & Inks
- Rubber & Latex Industries

FMCG & Aqua

- Food & Beverages
- Personal Care
- Sea Food Processing
- Aqua Culture & Equipment
- Aqua Feed & Nutrition
- Home Care & Packaged Foods

Manufacturing & Heavy

- Cement Industries
- Steel & Iron Industries
- Textile & Garments
- Leather & Footwear
- Glass & Ceramics
- Mining & Minerals Processing

Environment & Safety

- Water Treatment Plants (ETP/STP/RO)
- Solid Waste Management
- Air Pollution Control Equipment
- Recycling & e-Waste Management

Process Operations Monitoring

Configurable Recipes

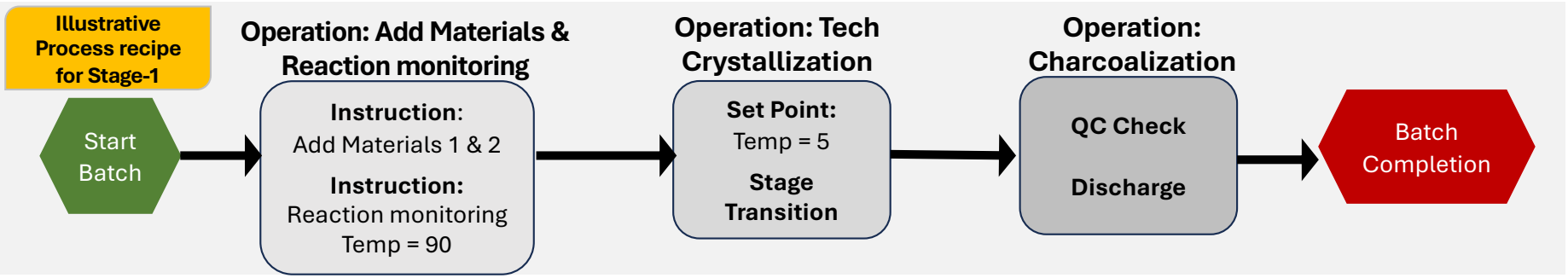
- Multi-stage Processes with setpoints, instructions, and QC checks
- Cleaning operations

Operator-Guided Execution

- Trigger-based stage transitions
- Instruction & QC acknowledgment
- Time-stamped batch actions (Start, pause, resume, terminate, etc.)

Full Traceability & Compliance

- Equipment e-logs for process efficiency
- Product / Recipe Records
- e-batch / e-cleaning records by Equipment, Batch, Stage
- Deviation Reports



No PLC programming | Equipment-ready | Real time data | Fully GMP-aligned | Regulatory Compliance

Equipment & Utilities Monitoring

Equipment Monitoring

Operational Parameters

- Temperature
- pH
- Pressure
- Conductivity
- Vacuum
- Flow Rate
- Agitation speed
- Oxygen/ Nitrogen level

For various equipment like:

- ✓ Reactor
- ✓ Bio Reactor
- ✓ Fermenter
- ✓ Dryer
- ✓ Laminar Airflow
- ✓ Isolator
- ✓ Autoclave
- ✓ Granulator
- ✓ Lyophilizer
- ✓ Blender
- ✓ Solvent tank
- ✓ Receiver
- ✓ Storage container /chamber

Clean room Monitoring

AHU /HVAC Parameters

- Humidity
- Temperature
- Airborne Particle Count
- Air Pressure Differential

Utilities Monitoring

- **Process Water / Purified Water / Water for Injection (WFI) Monitoring:** *TOC & Conductivity*
- **Temperature Monitoring:** *Brine, Chilled Water, Hot Water, Steam*
- **Flow Meters:** Rate, Volume
- **Level Indicators:** *Solvent, Other Generic Items*
- **Nitrogen** Pressure, **Steam** Pressure, Pressure & Vacuum monitoring of all equipment

Environment & Safety Monitoring

Environmental Applications

Pollutants – Water & Air

Water / Liquid Effluent

- *COD / BOD Monitoring*
- *Turbidity / TSS*
- *TDS*

Air Pollution Monitoring

- *Particulate Matter*
- *Specific Pollutant Levels as applicable (O3 / SO2 / NO2)*
- *User defined AQI can be displayed in dashboard*

Safety Applications

LEL - Flammable, Poisonous gases

Nitrogen Pressure in Nitrogen lines for Nitrogen blanket

Solvent storage tanks Temperature / Pressure etc. (to trigger venting, etc.)

Why Sensor+

Why Sensor+

	SENSOR+	Traditional SCADA
Installation time	• Approx. an hour per reactor • No disruptions	• Weeks to months • Equipment downtime required
Batch awareness	• Stage-wise threshold monitoring • Dynamic and easily configurable	• Requires integration with MES • Requires scripting & engineering effort
Data ownership	• Local-first, Highly secure • No cloud or internet dependency	• Cloud and internet dependent • Data access and security requires IT effort
Adaptability for process industries	• Easily adaptable to different recipes and product types	• Requires significant customization for every recipe/product
Integration and engineering cost	• No additional set-up required • Minimal customization required	• Integration with external applications and devices required • High customization required
License cost	• No license cost	• Multiple third-party licenses required
Infrastructure cost	• No additional infrastructure required	• Very high – Wiring, Cabling, Server-hosting cost

One System, Total Visibility. The Sensor+ Advantage

Process Monitoring Benefits	• Real-time monitoring of operational parameters: temperature, pressure, vacuum, pH, agitation speed, flow rate, etc. • Supports a wide range of equipment: reactors, fermenters, bioreactors, dryers, isolators, lyophilizers, autoclaves, granulators, tanks, etc. • Batch-wise process control: raw material addition, reaction tracking, crystallization, and discharge steps • Simplified setup: no PLC programming needed • Instant visibility into each process stage for proactive control • Suitable for multi-stage processes and critical control points • Integrates with control rooms over a <200m range
Quality Monitoring Benefits	• Cleanroom environmental monitoring: temperature, humidity, airborne particles, differential pressure • Utility quality monitoring: TOC, conductivity, temperature in water systems (PW, WFI), steam, chilled water, brine • Accurate data logging for GMP documentation and audits • Ensures consistency in quality-critical parameters across batches • Early detection of deviations to prevent quality failures • Full compliance with pharmaceutical / biotech as well as other industry standards • Dashboard-based visibility for QC and QA teams
Safety & Environment Monitoring Benefits	• Detection of flammable/toxic gases (LEL), solvent vapours, and nitrogen pressure in lines • Automatic alerts for unsafe temperature / pressure conditions in solvent tanks and reactors • Venting trigger options for overpressure/high-temp safety • Air pollution monitoring: PM, SO_2, NO_2, O_3, AQI display • Water/effluent monitoring: BOD, COD, TDS, TSS, turbidity • Prevents accidents through early warning and predictive insights • Supports compliance with environmental norms and EHS audits
Operational & Strategic Benefits	• Cost-effective alternative to SCADA systems • Smarter than data loggers; simpler and faster deployment • Scalable across multiple units and industrial sectors • Enables digital transformation in legacy facilities • Improves OEE (Overall Equipment Effectiveness) and reduces downtime • Centralized data for analytics and predictive maintenance • Boosts regulatory compliance and audit readiness

Thank You!!

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