RDL Technologies Pvt. Ltd.

COLD STORAGE MONITORING SYSTEM

Real-time temperature tracking, automated alerts and cloud analytics that prevent spoilage, ensure compliance and cut operating cost.



Cold storage facilities preserve temperature-sensitive products such as food, pharmaceuticals and biological materials. Even a minor deviation can mean spoilage, regulatory non-compliance and financial loss. An IoT-based monitoring system was implemented to deliver continuous environmental control, real-time visibility and automated alerting.

24 / 7
Real-Time Monitoring

IP68
Industrial Data Logger

4G · LTE
Wi-Fi · GPRS Connectivity

MODBUS
RTU / TCP Supported

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CHALLENGES & OBJECTIVES

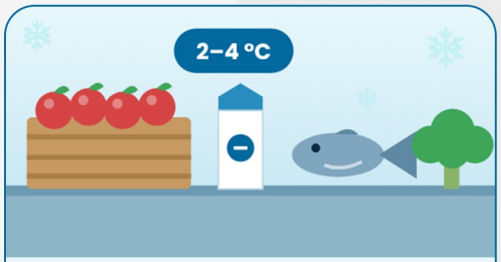
PROBLEM Challenges in the client's cold storage facility

- Manual temperature logging leading to human errors.
- Lack of real-time visibility across storage units.
- Risk of product spoilage from unnoticed temperature fluctuations.
- Compliance issues due to improper record keeping.
- High energy consumption without optimization.

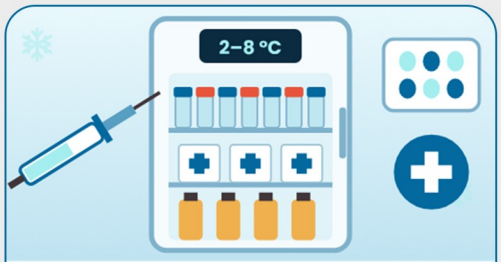
OBJECTIVES What the solution set out to achieve

- Ensure 24/7 real-time temperature monitoring
- Maintain regulatory compliance with automated reports
- Reduce spoilage and wastage
- Improve operational efficiency and energy usage
- Enable remote monitoring and alerts

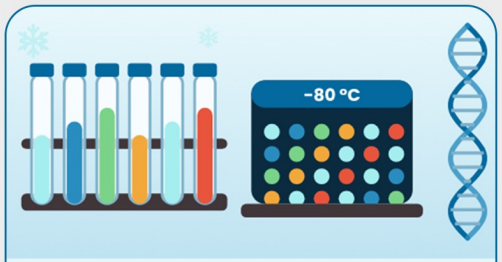
PROTECTING EVERY TEMPERATURE - SENSITIVE PRODUCT



FOOD & PERISHABLES
Continuous control that protects freshness & cuts spoilage & wastage.



PHARMACEUTICAL COLD CHAIN
Audit-ready temperature records for vaccines and medicines.



BIOLOGICAL MATERIALS
Stable environmental conditions for samples and critical specimens.



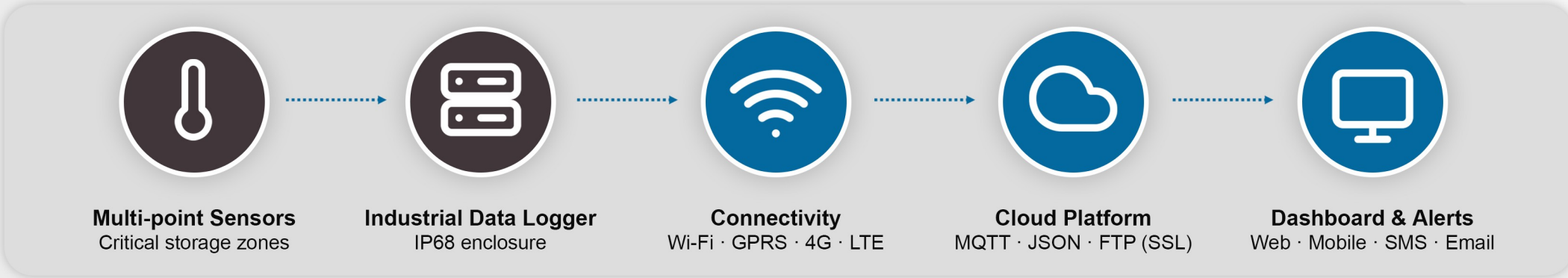
ANY STORAGE DURATION
Consistent conditions from short-term to long-term storage.

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SOLUTION OVERVIEW & SYSTEM ARCHITECTURE

An IoT-enabled Cold Storage Monitoring System connects sensors, an industrial data logger and a cloud platform into one intelligent, three-layer architecture.



Hardware Layer

- Industrial data logger with IP68 enclosure.
- Temperature sensors (multiple points).
- Connectivity: Wi-Fi / GPRS / 4G / LTE.

Communication Layer

- Protocols: MQTT, JSON, FTP with SSL security
- Integration with IoT platforms
- MODBUS RTU / TCP & multiple I/O interfaces

Application Layer

- Cloud dashboard for monitoring
- Data analytics and reporting
- Alert system (SMS / Email notifications)

KEY FEATURES

- Real-time monitoring of refrigerators and freezers
- Automated alerts for threshold breaches
- Cloud-based data logging and analytics
- Multi-sensor integration (temperature, environment)
- Remote accessibility via web and mobile
- Scalable, adaptable architecture (MODBUS RTU/TCP, multiple I/O)

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Operational Benefits

- Real-time monitoring eliminated manual checks.
- Improved safety of stored goods.
- Centralized visibility across multiple locations.

Business Benefits

- Reduced spoilage and wastage.
- Increased profitability.
- Better compliance & audit readiness.

Technical Benefits

- Data-driven decision making.
- Predictive insights from historical data.
- Scalable & customizable architecture.

Energy Benefits

- Optimized energy consumption.
- Improved efficiency through analytics.

RESULTS & IMPACT

Significant reduction in product loss

Improved compliance with regulatory standards

Faster response to critical temperature deviations

Enhanced operational efficiency and cost savings

After implementation, the facility saw fewer losses, faster response and stronger audit readiness.

Conclusion

The system transformed traditional storage operations into a smart, automated, data-driven environment. By leveraging IoT, it ensures product integrity, operational efficiency and regulatory compliance - an essential system for any temperature-sensitive storage facility.