Intelligent Oxygen Detection system

Case Study on Oxygen Usage Risk

A middle-aged female patient, experiencing altered consciousness, required an urgent brain CT scan while using high-flow oxygen. Her vital signs were unstable, necessitating emergency medical accompaniment throughout a nearly 40.

How to Improve This Scenario?

- **Automatic Detection and Notification:** Detects pressure anomalies and sends alerts to prevent oxygen depletion.
- **Proactive Reporting:** Transmits real-time data on abnormal cylinder temperature or excessive vibration.
- **Emergency SOS Button:** Enhances safety with an integrated SOS feature.

FeXGuarD

Intelligent Oxygen Detection system

I. Smart Pressure Gauge

Applications:
Various mobile gas cylinders

II. Smart Pressure and Flow Meter

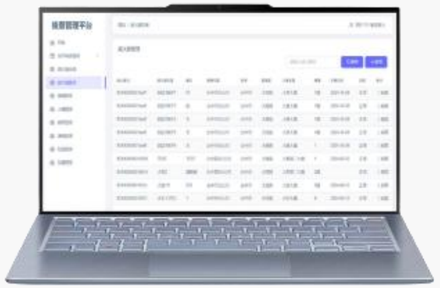
Intelligent Detection System

LoRaWAN Gateway

Server Backend

LoRaWAN™

Wi Fi



- **Low-Power Wireless Technology:** Enables long-range transmission through walls.
- **Cost-Effective Deployment:** Low setup costs for implementation.

- PC Website
- IOS APP
- Android APP

FeXGuarD

Smart Fire Extinguisher Interface Demonstration

Real-Time Equipment Status

Instantly displays whether each extinguisher is "Working," "Malfunctioning," or "Repairing," reducing manual inspection time.

Map-Based Management

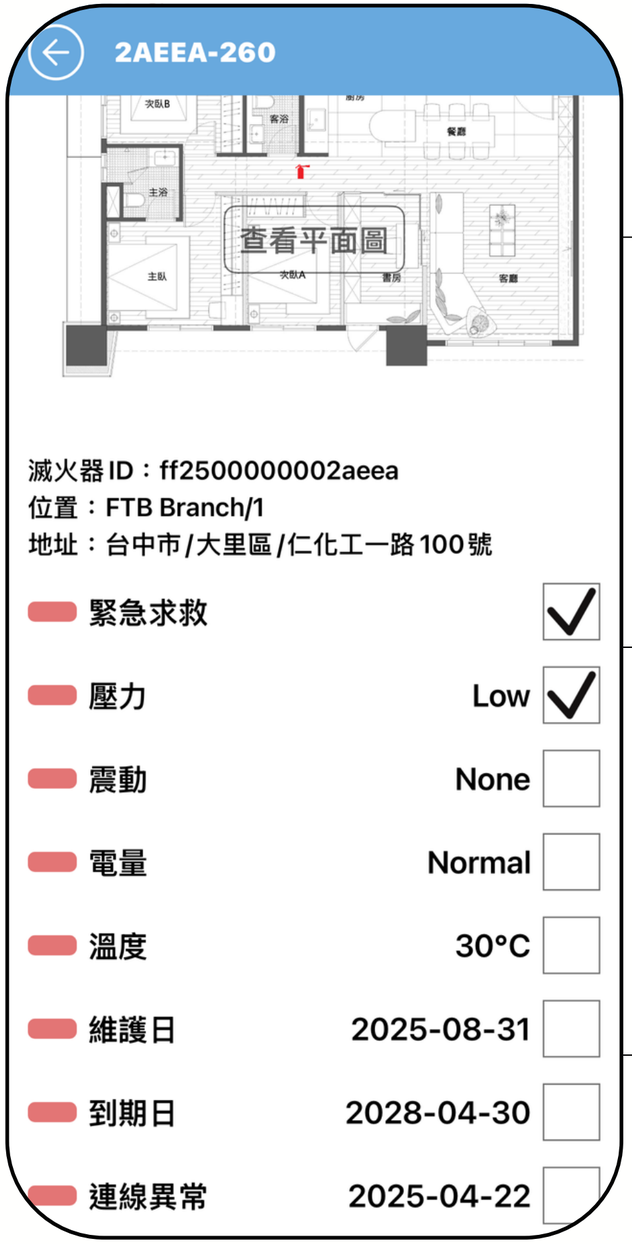
Provides a clear, map-based interface to pinpoint the location and status of each device, facilitating centralized monitoring and rapid task assignment.

Cloud Platform Integration

Allows remote access via a web platform, improving efficiency and emergency response capabilities without on-site presence.

FeXGuarD

Smart Fire Extinguisher Interface Demonstration



Comprehensive Status Transparency

Displays real-time data on pressure, temperature, battery level, vibration, connectivity, and SOS alerts for immediate anomaly resolution.

Precise Device Location with Floor Plans

Integrates with building floor plans to accurately locate extinguishers, enhancing management efficiency and emergency response speed.

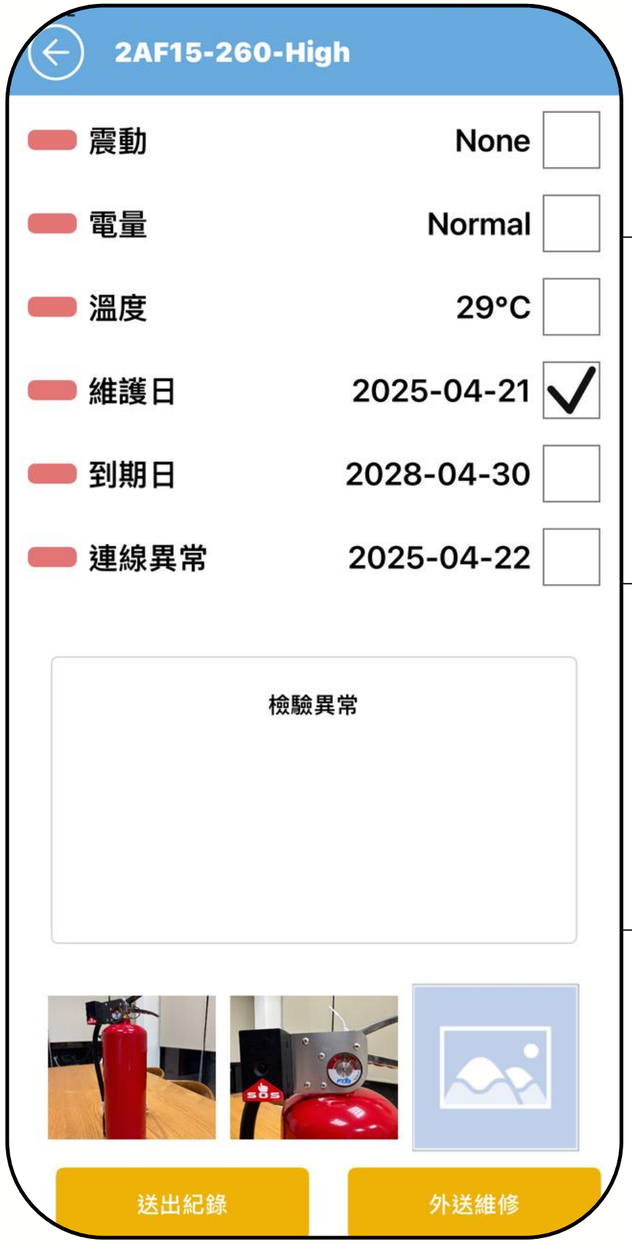
Automated Maintenance and Expiry Tracking

Automatically shows upcoming maintenance and expiration dates, reducing oversight risks and improving compliance.

Features

FeXGuarD

Smart Fire Extinguisher Interface Demonstration



Complete Historical Records and On-Site Photos

Supports on-site photos and maintenance/repair records for easy tracking of anomalies and resolutions.

Real-Time Anomaly Alerts

Automatically notifies managers of maintenance due dates, connectivity issues, battery levels, or temperature anomalies for timely intervention.

One-Click Repair Dispatch

Allows instant assignment of repair tasks to maintenance teams, minimizing manual reporting and process delays.

FeXGuarG

Intelligent Oxygen Detection system

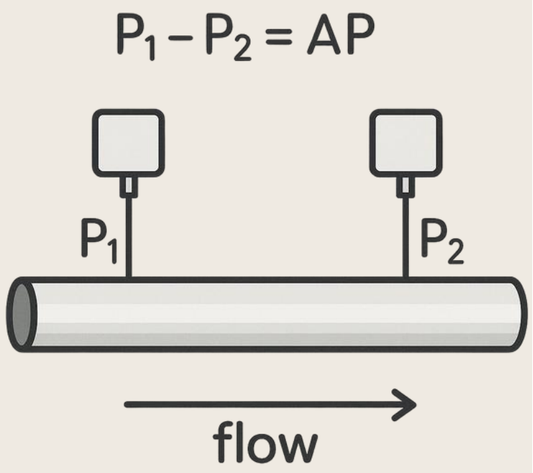
I. Smart Pressure Gauge

II. Smart Pressure and Flow Meter

Applications:

Wards, Emergency Rooms, Operating Rooms

Smart Pressure and Flow Meter



Precise Oxygen Flow Monitoring

- The device uses pressure sensors (P_1 and P_2) at both ends of the pipeline to measure differential pressure (ΔP) and calculate oxygen flow in real-time based on fluid dynamics formulas.

Smart Medical Oxygen Monitoring

- By integrating LoRa/WiFi transmission and cloud platforms, the system synchronously displays multiple data points, including pressure, flow, and temperature. It is widely applicable for medical oxygen supply monitoring, enhancing patient safety and management efficiency.

Traditional Pressure and Flow Meters

No Remote Monitoring

- Data can only be read on-site, making real-time anomaly detection impossible.

No Alert System

- Relies on visual checks, prone to oversight or delays.

No Data Logging

- Lacks data records, relying on manual documentation by nurses.

Smart Pressure and Flow Meter

Remote Real-Time Monitoring

- Data is automatically uploaded to the cloud, allowing medical or engineering teams to monitor oxygen usage status anytime.

Immediate Anomaly Alerts

- Automatically warns of low pressure or other issues, improving response efficiency and patient safety.

Comprehensive Data Retention and Query

- Tracks oxygen usage history, facilitating equipment management, quality tracking, and reducing manpower.

Why Do We Need an Intelligent Oxygen Detection System?

- **Real-Time Anomaly Detection**: Prevents risks of oxygen depletion by automatically reporting low pressure, leaks, or equipment failures, ensuring patient safety.
- **Improved Manpower Efficiency**: Replaces daily manual inspections with automated status reporting, saving nursing and maintenance resources.
- **Instant Emergency Notifications**: SOS buttons or anomaly alerts enable rapid response from relevant teams.
- **Comprehensive Historical Data**: Records pressure, temperature, and oxygen usage hours for easy tracking and auditing.
- **Low-Power Wireless Technology (LoRa/WiFi)**: Offers stable, long-range signal transmission (up to 1 km indoors) through walls, ideal for medical environments.
- **Advancing Smart Healthcare**: Demonstrates a hospital's commitment to cutting-edge monitoring and patient safety systems, boosting patient trust.

Smart Wards

Smart wards integrate information technology and IoT devices to enable real-time monitoring, data integration, and automated management. Equipped with digital dashboards, nursing information systems, smart bed monitoring, and environmental sensors, they enhance medical efficiency and patient safety.

Future Integration with Intelligent Oxygen Detection Systems

- Enables remote monitoring and anomaly alerts for oxygen pressure, flow, and other metrics.
- Builds a more robust ward safety monitoring network.
- Paves the way for true smart healthcare.