



Data Center Monitoring with LoRa®

Four-Faith's wireless monitoring solution uses Semtech's LoRa® technology to deliver real-time visibility across temperature, humidity, water leakage, smoke, and power failure without a single cable run through live server rooms. Discover how this innovation is helping data center operators reduce losses, increase efficiency, and lower costs.

QUICKFACTS

Company

Xiamen Four-Faith Communication Technology Co., Ltd.

www.four-faith.com

Customer Profile

Four-Faith is a global high-tech enterprise and leading LPWAN solutions provider, leveraging Semtech's LoRa® technology across 100+ countries and 20+ industries including electronics manufacturing, automotive, medical devices, and smart buildings.

Objectives

- Develop a wireless environmental monitoring solution for data centers
- Eliminate the cost and disruption of traditional wired deployments
- Monitor temperature, humidity, water leakage/immersion, smoke, and power failure conditions
- Support years of battery-powered operation
- Ensure reliable connectivity inside dense, RF-challenging server environments

Results

- Outdoor communication range of 4.2 km (FST100) and 5 km (FST200)
- Indoor penetration of 6 floors (FST100) and 10 floors (FST200)
- Ultra-low sleep current of <math><15.3 \mu\text{A}</math> (FST100) enabling up to 9 years battery life at 10-minute reporting intervals
- IP67-rated terminals withstand water immersion and harsh environmental conditions
- Real-time multi-channel alerting via SMS, email, app, and voice through the Four-Faith Sensor Cloud Platform
- Remote OTA firmware upgrades via NFC or cloud, eliminating on-site maintenance visits
- Stable operation, reduced losses, increased efficiency, and lowered operational costs

Products and Services

- Semtech's [LoRa Connect™](#) SX1262



INTRODUCTION

Data centers are the backbone of the modern digital economy, housing mission-critical IT infrastructure that must operate continuously under tightly controlled environmental conditions. Even brief disruptions caused by temperature spikes, water leakage, smoke, or power failure can result in significant downtime, data loss, and financial damage.

Four-Faith, a globally leading LoRa technology solutions provider based in Xiamen, China, developed a comprehensive wireless environmental monitoring system for data centers powered by Semtech's LoRa® technology. By combining ultra-low-power sensor terminals with a cloud-connected gateway architecture, Four-Faith delivers real-time visibility and rapid multi-channel alerting without the cost and complexity of traditional wired monitoring systems.



Four-Faith: F8926-GW

CHALLENGE

Data centers demand round-the-clock monitoring across multiple parameters: temperature, humidity, water leakage, smoke detection, and power supply status. Traditional wired sensor deployments are expensive to install, difficult to maintain, and operationally disruptive requiring cable runs through active server rooms and raised floors.

Facility teams also faced the challenge of achieving reliable wireless coverage in environments packed with dense metal server racks and reinforced concrete spaces where Wi-Fi and cellular signals are inconsistent or restricted. They needed a solution that combined deep indoor penetration, years of maintenance-free battery operation, and immediate multi-channel alerting.



Four-Faith: F8L10GW

SOLUTION

Four-Faith deployed its LoRa®-based data center monitoring solution using two complementary sensor products. The FST100 LoRa Temperature and Humidity Sensor Terminal is placed directly within server rooms to continuously track environmental conditions. The FST200 LoRa Sensor Terminal serves as a multi-sensor aggregation node, connecting to water immersion probes, smoke detectors, and power failure alarm sensors distributed throughout the facility.

Both terminals transmit data wirelessly over LoRa® to either an indoor F8926-GW-02 or outdoor F8L10GW LoRaWAN gateway, depending on the facility layout. Data then travels via 4G or Ethernet to the Four-Faith Sensor Cloud Platform,



where operations teams receive real-time alerts through SMS, email, mobile app notifications, or voice calls and can access historical trend data for proactive facility management.

The FST100 achieves a deep sleep current below 15.3 μA , enabling up to 9 years of battery life at 10-minute reporting intervals. The FST200 offers a 5 km outdoor communication range and penetrates up to 10 floors indoors ensuring consistent LoRa® coverage even in the most signal-challenging data center environments.



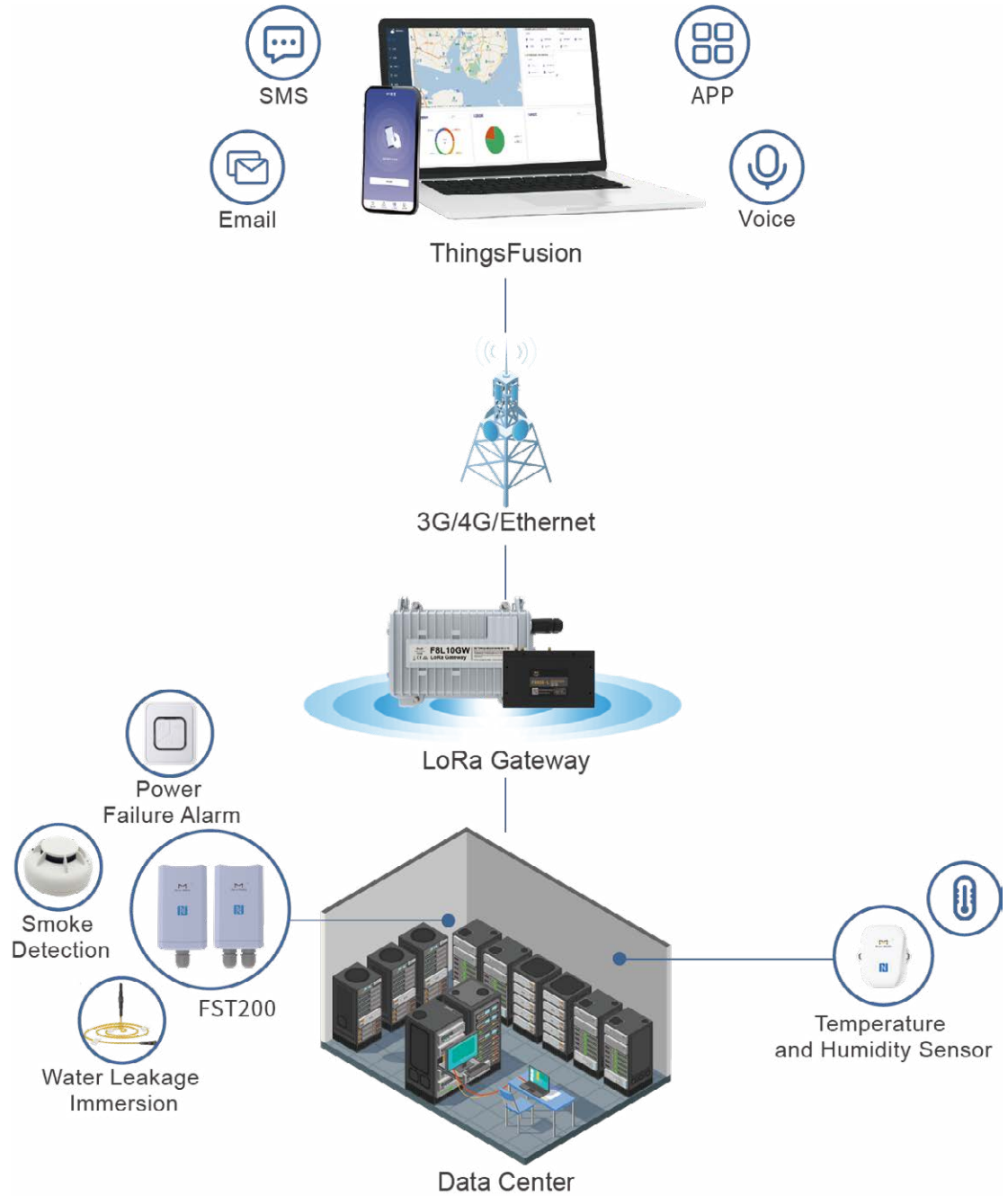
Four-Faith: FST100



Four-Faith: FST200

BENEFITS

- Wireless Deployment with Zero Cabling Disruption**
 LoRa®-enabled FST100 and FST200 terminals are installed without any cable runs through active server infrastructure. Rapid, non-intrusive deployment reduces installation time and avoids disruption to live IT operations.
- Multi-Parameter Monitoring with Alerting**
 Temperature, humidity, water leakage, smoke, and power failure conditions are monitored simultaneously allow teams to respond before minor anomalies escalate into critical failures.
- Up to 9 Years Battery Life**
 The FST100's ultra-low sleep current of less than 15.3 μA on a single lithium battery supports nearly a decade of field operation, dramatically reducing maintenance visits and battery replacement costs.
- Superior Penetration in Challenging RF Environments**
 LoRa®'s industry-leading sensitivity penetrates up to 6 floors (FST100) and 10 floors (FST200), and delivers connectivity across distances up to 5 km outdoors ensuring reliable sensor coverage throughout the facility, including areas inaccessible to Wi-Fi or cellular.
- Remote Management and OTA Upgrades**
 The FST200 supports NFC-based, local serial port, and remote OTA firmware upgrades via LoRa, enabling system-wide updates and maintenance without dispatching technicians to the data center floor.
- Scalable Cloud Architecture**
 All data aggregates on the Four-Faith Sensor Cloud Platform over 4G or Ethernet, providing centralized dashboards, configurable alarm thresholds, and historical analytics scalable as facilities grow and adaptable to third-party platform integrations.



Complete Four-Faith solution architecture with their Eco System

About Semtech

Semtech Corporation (Nasdaq: SMTC) is a leading provider of high-performance semiconductors powering AI data center networking, IoT connectivity and intelligent connected devices worldwide. Our global teams are committed to empowering solution architects and application developers to develop breakthrough products for the infrastructure, industrial and consumer markets.

To learn more about Semtech technology, visit us at [Semtech.com](https://www.semtech.com) or follow us on [LinkedIn](#) or [X](#).

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