



GreenHouse



GREEN HOUSE

GreenHouse Co., Ltd.'s LoRaWAN® Heat Stroke Prevention System

GreenHouse Co., Ltd.'s deployment of LoRaWAN-compatible WBGT monitoring systems enables real-time heat stroke prevention across multiple sites in Japan. The solution delivers long-range connectivity, extended battery life, and cost-effective scalability for protecting people in high-temperature environments.

QUICKFACTS

Company

GreenHouse Co., Ltd.
www.green-house.co.jp

Customer Profile

Green House Co., Ltd., headquartered in Shibuya Ward, Tokyo, is a comprehensive manufacturer of electronic devices that handles a wide range of products, including computer peripherals, video and audio equipment, kitchen goods, sales promotional products, OEM products, and IoT solutions.

Objectives

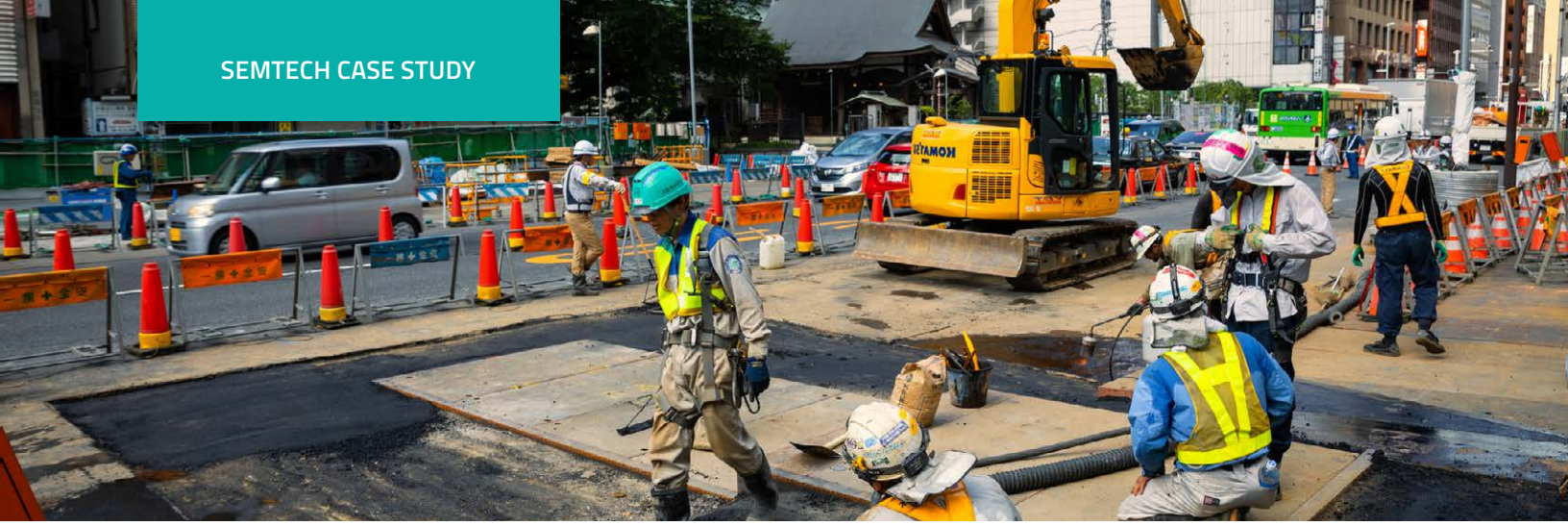
Green House Co. needed to develop IoT products and solutions using proprietary LoRa® communication modules to address increasing heat stroke accidents caused by extreme heat. The company required long-distance communication, low power consumption, cost-effective scalability, and remote monitoring capabilities to enable comprehensive WBGT monitoring across schools, construction sites, and sports facilities.

Results

- Comprehensive monitoring system with JIS B 7922 CLASS1.5 compliance and high precision
- Extended communication ranges of 1.5km (standard antennas) to 4-5km (high-gain antennas)
- Continuous operation for more than 5 months with 8 size C dry cell batteries
- Deployment across mega solar power plants, schools, sports facilities, and construction sites throughout Japan
- Flexible installation with configurable transmission intervals (1-20 minutes)
- Seamless cloud integration enabling real-time monitoring and automated alerts.

Products and Services

- Semtech's [LoRa Connect™](#) – SX1272
- [LoRaWAN®](#)



INTRODUCTION

GREEN HOUSE is a Japanese electronics manufacturer delivering safe, secure, high-quality products across multiple categories. Holding triple international certifications (ISO14001, ISO27001, ISO9001), the company demonstrates commitment to environmental management, information security, and quality assurance.

Leveraging expertise in IoT and wireless communications, GREEN HOUSE develops products and solutions based on proprietary LoRa communication modules. The company's LoRaWAN-compatible WBGT (Wet Bulb Globe Temperature) monitoring system represents a breakthrough in heat stroke prevention technology, setting a new benchmark for health and safety monitoring in high-temperature environments.

CHALLENGE

Increasing Heat Stroke Accidents Due to Recent Extreme Heat

Rising heat stroke incidents created demand for remote monitoring solutions using high-precision WBGT meters across schools, construction sites, and sports facilities. Traditional WBGT meters posed significant challenges:

- **Manual Operation Requirements:** Local display only with manual recording, reading, and notifications made continuous monitoring labor-intensive and inefficient.
- **Power Source Limitations:** Required USB, DC12V battery, or AC100V power supply, making long-term operation difficult in remote or outdoor locations without reliable grid power.
- **Limited Remote Monitoring:** Lack of wireless connectivity prevented real-time monitoring and automated alerts, delaying response to dangerous heat conditions.
- **High Operational Costs:** Manual meter reading and maintenance required regular site visits and personnel deployment.

THE SPECIFIC NEED

A remote monitoring solution that could accurately measure and track WBGT with real-time data, automated alerts, extended battery life, and cost-effective scalability across multiple deployment sites.

SOLUTION

LoRaWAN-Compatible Heat Stroke (WBGT) Monitoring System

GREEN HOUSE combined its LoRaWAN communication technology (GH-WM92LRA module) with Tsuruga Electric's JIS standard-compliant WBGT meter (TC-793-3-LW-X-57) and a partner's IoT platform to create a comprehensive remote monitoring solution.

The solution leverages LoRaWAN technology to provide:

- **Long-Distance Communication:** Wide-area coverage with ranges of 1.5km (standard antennas) to 4-5km (high-gain antennas), ideal for large-site monitoring.
- **Low Power Consumption:** Continuous operation for more than 5 months with 8 size C dry cell batteries, perfect for remote WBGT applications.
- **Cost-Effective Scalability:** Multiple sensors connect through a single gateway at fixed costs, regardless of sensor count. One contract per site with no additional costs for additional sensors.
- **Remote Monitoring:** Wireless data transmission from field sensors to cloud systems via LTE, supporting real-time monitoring, email alerts, CSV exports, and system integration.

KEY ADVANTAGES

- Flexible data transmission intervals (1-20 minutes) configurable via internal switch
- Long-distance, low-power wireless communication covers large areas with minimal infrastructure
- Access data from anywhere via internet connection
- Integration capability with existing systems
- Solar-powered outdoor gateway kits enable deployment without grid power.

BENEFITS

Utilizing Semtech's LoRa® technology has delivered significant benefits:

- **Extended Battery Life:** LoRa/LoRaWAN communication enables continuous operation for more than 5 months with 8 size C dry cell batteries, significantly reducing maintenance costs and site visits.
- **Remote Accessibility:** Cloud-based data recording and threshold-based email notifications enable remote access from anywhere, eliminating manual readings and on-site monitoring.
- **Comprehensive Coverage:** Communication ranges of 1.5km to 4-5km enable monitoring across large facilities including mega solar power plants, school campuses, and construction sites.



- **High Precision Monitoring:** JIS B 7922 CLASS1.5 compliance with $\pm 1.5^{\circ}\text{C}$ WBGT and $\pm 0.5^{\circ}\text{C}$ ambient temperature precision, measuring heat stroke risk parameters (WBGT, ambient/black globe/wet bulb temperature, humidity).
- **Flexible Deployment:** Configurable transmission intervals (1-20 minutes), multiple power options (AC100V, DC12V, AA batteries), IP23 weather resistance, and 0-50°C operating temperatures.
- **Cost-Effective Scalability:** One contract per site with unlimited sensors. Scale deployment without increased costs.
- **Cloud Integration:** Seamless 4G/LTE data transmission enables real-time browser monitoring, email alerts, CSV exports, and system integration through PUSH/PULL configurations.
- **Autonomous Operation:** Solar-powered gateway kits with 100W panels enable installation anywhere regardless of infrastructure availability.
- **Improved Safety Management:** Real-time monitoring and automated alerts enable proactive heat stroke prevention, protecting workers, students, and athletes.

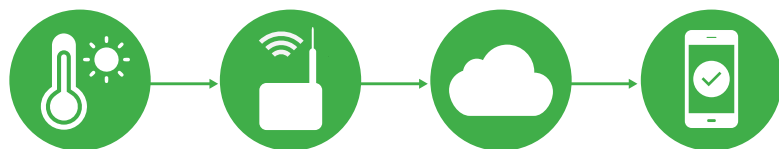
DEPLOYMENT SITES

- Mega solar power plants - Several locations in Japan
- Local public facilities - Including schools
- Sports facilities - Including athletic grounds
- Construction sites

SYSTEM CHARACTERISTICS

- Frequency band: 920MHz~928MHz (Japan domestic standard)
- LoRaWAN channels: Up to 37 channels maximum (when DWELL ON)
- One gateway per site: One contract is required per location
- Multiple sensors supported: Scalable deployment without increased costs

HOW IT WORKS:



Learn More: www.semtech.com/lora

About Semtech

Semtech Corporation (Nasdaq: SMTC) is a high-performance semiconductor, IoT systems and cloud connectivity service provider dedicated to delivering high-quality technology solutions that enable a smarter, more connected and sustainable planet. 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 or follow us on [LinkedIn](#) or [X](#).