MOcreo®

IoT-based Environmental Monitoring System

for Vaccine and Medication Storage

· Real-time monitoring for peace of mind ·

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About MOCREO

MOCREO is a one-stop IoT solution provider for environmental monitoring.

Based on Wi-Fi, BLE, ZigBee, LoRa, 4G, 5G, LTE-M, our customized IoT solution does well in real-time environmental monitoring, instant alert and historical data storage, which is beneficial for food industry, pharmacy, laboratory, greenhouse, server room, etc. to improve regular environmental supervision with high-efficiency operation.

The News About the Vaccine Spoilage

About **450** doses of vaccine had to be discarded following an "electrical problem" that affected a refrigerator in Rotherham's Montgomery Hall, according to the British news agency PA.

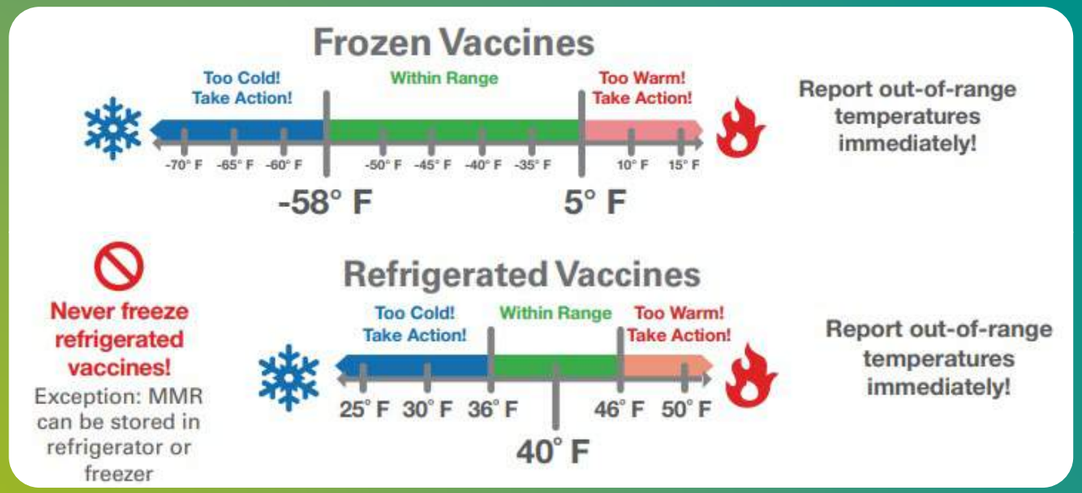
"Ensuring the safe distribution of vaccinations is our utmost priority. Unfortunately, **a batch of vaccinations** went bad due to a refrigeration issue at two locations and we had to dispose of them due to safety and effectiveness concerns."

A Massachusetts Veterans Affairs hospital said that nearly **2,000** doses of Moderna's Covid-19 vaccine were spoiled after a cleaning contractor accidentally unplugged a refrigerator.

The Optimal Temperature Ranges for Vaccine

According to the CDC' s temperature storage requirement, at refrigerator, the temperature should be maintained between 2°C and 8°C (36°F and 46°F). At freezers, the temperature should be kept between -50°C and -15° C (-58°F and +5°F).

Meanwhile, the studies find that most vaccine storage units work best when placed in an area with standard indoor room temperatures, usually between 20°C and 25°C (68°F and 77°F).



The Importance of Medication Storage Temperature

Throughout its shelf life, a medication's active ingredient must retain at least 90% of its potency and its general characteristics must be guaranteed. Medications that have not been stored correctly are considered defective and should not be used.

Temperature and humidity are the most critical factors that affect the stability of sensitive medicines, and sudden changes in temperature can cause physical-chemical and pharmacological changes that can render the medication ineffective or even harmful to patients. Therefore, it is essential to maintain a stable temperature range, typically between 2°C and 8°C, through continuous refrigeration and logistic management plans. The cold chain must be maintained to ensure the stability of medicines and protect the health of patients.

Pharmaceutical products have specific storage requirements to maintain their chemical stability and effectiveness. Improper storage conditions, such as exposure to temperatures that are too high or too low, can cause the drug to degrade and form impurities. These impurities may not be visible, but they can have negative effects on the drug's efficacy and safety when administered.

Challenges

Pharmacy or laboratory personnel spends a lot of time and manual effort in checking the the storage temperature of temperature-sensitive medical resources. However, such inefficient management methods still result in poor storage conditions and medical resource loss, leading to costly consequences.

Lack of warning mechanism

The equipment usually provides the temperature readings but does not have a remote alert system. It is impossible for pharmacists are at the site to observe the temperature status of equipment, especially out of working time.
Or even if a refrigerator appears to be functioning normally after a power outage, it's possible that the temperature inside has risen to a level that can spoil medications.

Time-wasted manual logging

Pharmacy or laboratory personnel often have to devote a significant amount of time and effort to manually check and record the storage conditions of medications.
However, this method is not only inefficient but also prone to errors and inaccuracies, which would compromise the safety and efficacy of the medications.

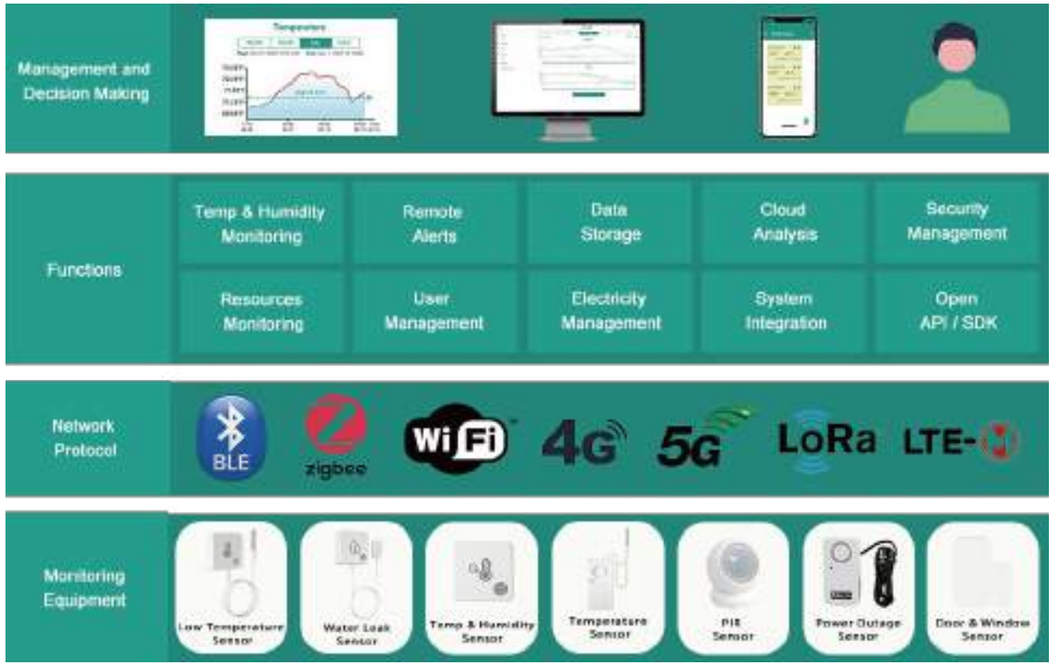
Bad influence on public health

Imagine a situation where pharmacists give the spoiled drugs to patients because they didn’t know the drugs were stored at the abnormal temperature for a long time.
This could have serious consequences as it directly involves human health. The repercussions could be catastrophic.

Solution

MOCREO offers **24/7 automated monitoring to give your medical resources enhanced visibility,** ensuring the protection of temperature-sensitive vaccines and medicines. Equipped with wireless sensors, it collects temperature data and detects abnormalities.

In case of any issues, you and your team will receive alert notifications via email, App notification, and local buzzer, avoiding any negative impact on your medications. Quick ROI is guaranteed as MOCREO provides actionable insights and time-stamped data for compliance audits.



With MOCREO, you will

Realize the remote monitoring in real time

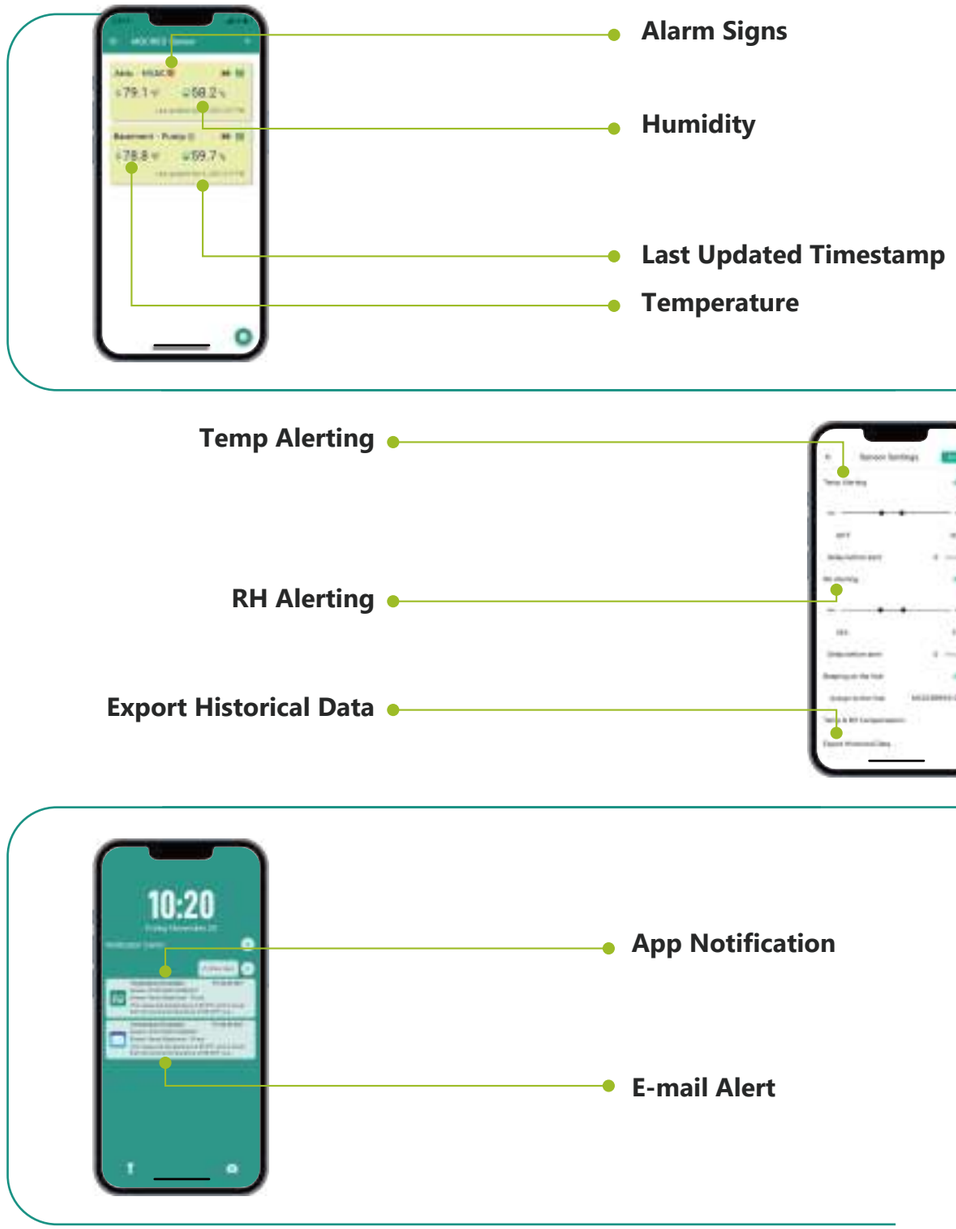
Foresee the potential risk and alert in time

Replace the tradition manual recording

Reduce the loss and the unnecessary cost

MOCREO Dashboard

MOCREO offers 24/7 automated monitoring and you can access the environmental conditions data on your phone, tablet or computer, which helps you and your team have better insight, better management and better decision.



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24/7 Real-time Monitoring

You can always know real-time environmental condition where you want to monitor at any time even though you are not at the site.

3 Optional Instant Alerts

Notifies you through app notification, email alert, beeping on the hub when any abnormality appears

Free Data Storage/Export

Automated storage historical data within 6months for your analysis or export to CSV form for historical track.

Battery Life Up to More than 2 Years

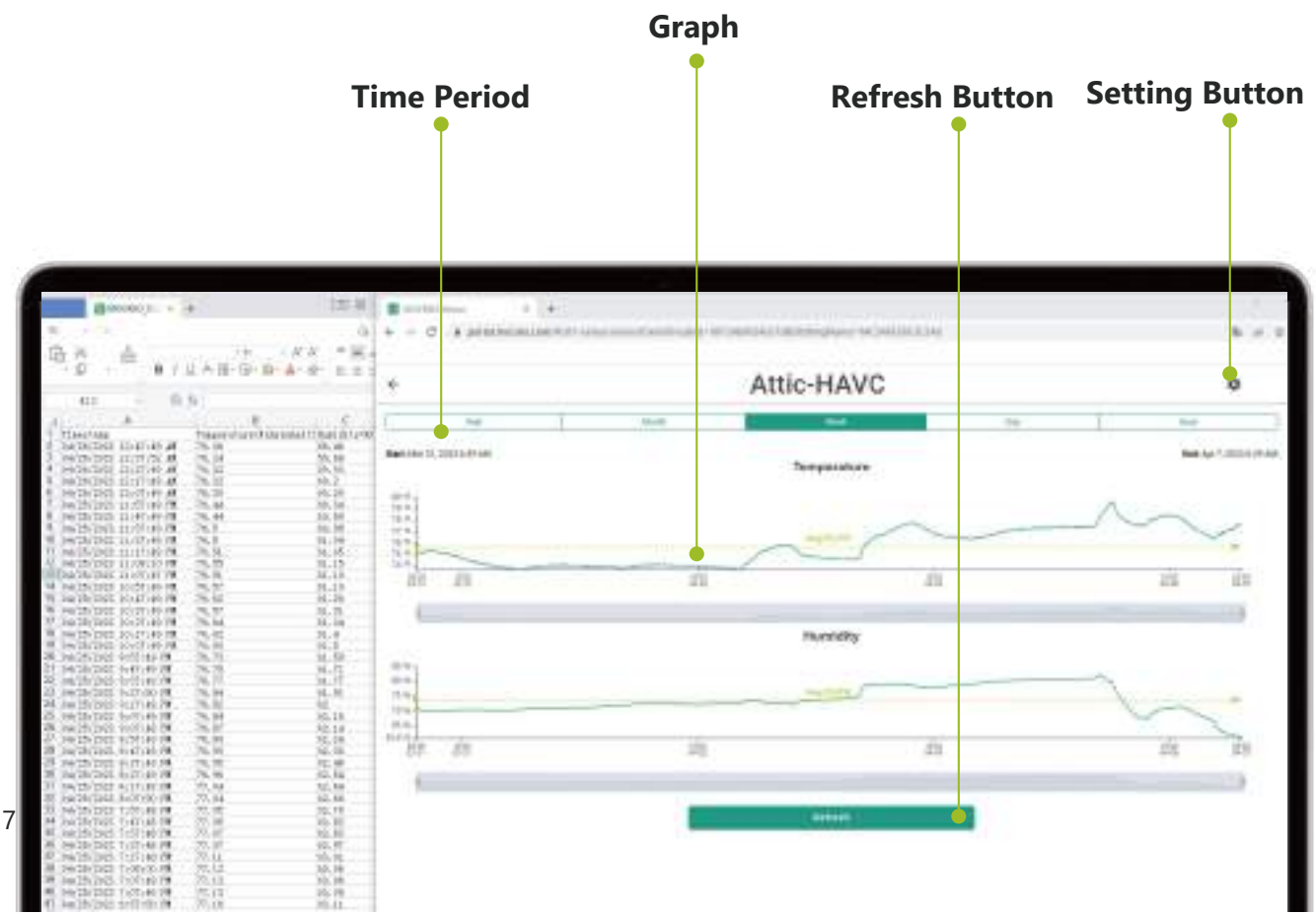
Adopted with low-power consumption communications technology, each sensor can work last for more than 2 years on average before the next charge.

Multi-Device Access to View the Data

Easy for multiple users or devices to log into the same account, which sets up collaborative monitoring and strengthens the warning mechanism.

Scalable Deployment

Single hub supports up to 10 sensors to be connected at multiple occasions.



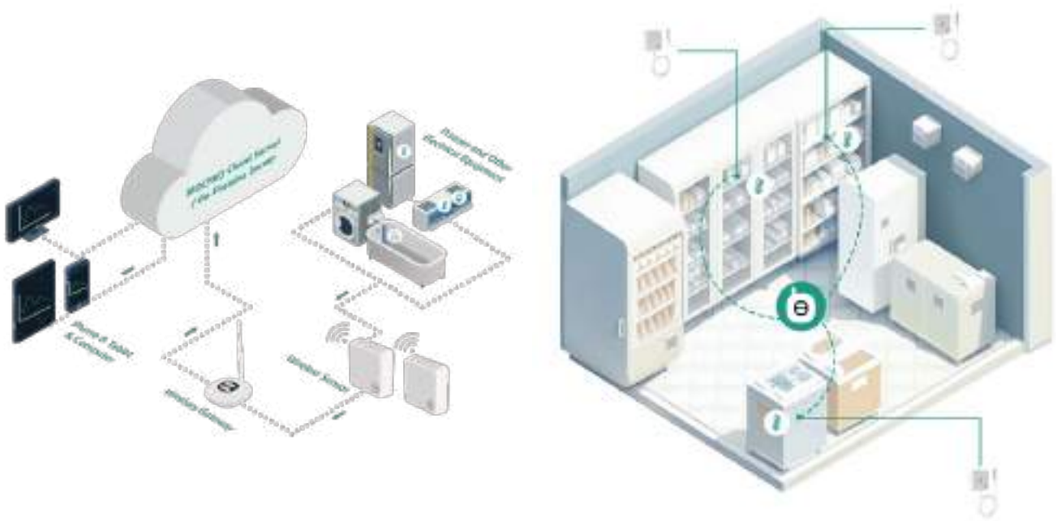
About MOCREO Environmental Monitoring System

It is indispensable and reliable solution
for pharmacies to reduce the unexpected costs and increase working efficiency.

The MOCREO IoT-based environmental monitoring system keep an eye on your valuable medical resources for peace of mind.

It has **wireless sensors**, **gateway** for transmitting data, and **MOCREO platform** for monitoring.

The system can send notifications, emails, and alarms if there is any abnormal condition. The solution is easy to install and can be scaled easily for large deployment.



Hardware

With the intelligent measurement and control system, the remote monitoring terminals (including various environmental sensors and industrial gateway wireless communication terminal) are installed at each collection and monitoring point as a distributed control node station. The main equipment includes low temperature sensor, temperature and humidity sensor, door and window sensor, PIR sensor, etc.

- ✔ Long battery life
- ✔ Easy to scale
- ✔ Reliable, proven technology

Server

Based on cloud servers (AWS, Azure, Google Cloud) and private deployments with advanced data center hosting. You may choose the cloud service solution, or if you prefer private deployment, you may also choose our local server solution. Depending on project needs. The main difference is whether you want to store your data on a cloud server or on site.

Data storage and analysis provides more intelligent insights and accurate drug temperature data for pharmacy/hospital operation and maintenance teams. Big data and cloud computing make automatic management possible.

- ✔ Secure and reliable encryption
- ✔ Cloud/On-Premise-based big data statistics and analysis
- ✔ Accessible around the clock from anywhere

Software

It provides real-time insight into equipment temperature, which allows real-time visualization of data, and timely out-of-standard event detection.

The personnel on duty can receive alerts in time through mobile phones, so as to intervene earlier.

- ✔ Easy to set up and use
- ✔ Alert threshold customization
- ✔ Clear management of individual environmental parameters of pharmaceutical equipment

Environmental Monitoring Sensors

Overview Feature

- 24/7 Real-time Monitoring
- 3 Optional Instant Alerts
- Free Data Storage/Export
- Battery Life Up to More than 2 Years
- Multi-Device Access to View the Data
- Scalable Deployment

	ST6 / ST3	ST5 / ST4	
Name	Temp&Humidity Sensor	Temperature Sensor	Temperature Sensor
Model	ST6/ST3	ST5/ST4	ST7
Wireless Connection	ST6: Bluetooth/ST3: ZigBee 3.0	ST5: Bluetooth/ST4: ZigBee 3.0	Bluetooth
Alarm Type	App Notifications,Email,Hub Beep	App Notifications,Email,Hub Beep	Local Beep
Communication Range	ST6: 131ft/40m (No Obstacles) ST3: 230ft/70m (No Obstacles)	ST5: 131ft/40m (No Obstacles) ST4: 230ft/70m(No Obstacles)	50ft/15m(No Obstacles)
Temperature Measuring Range	-4°F ~ 140°F (-20°C ~ 60°C)	-40°F ~ 257°F (-40°C ~ 125°C)	-40°F ~ 257°F (-40°C ~ 125°C)
Humidity Measuring Range	0 ~ 100%RH (No Condensation)	/	/
Accuracy	±0.5°F(0.3°C); ±0.3%	±0.9°F/±0.5°C	±0.9°F/±0.5°C
Dimensions	2.4 X 2.4 X0.7inch (L x W x H)	2.4 X 2.4 X0.7inch (L x W x H)	3.8 X 1.8 X0.8inch (L x W x H)
Battery(Rechargeable)	3.7V 1800mAh Lithium Battery	3.7V 1800mAh Lithium Battery	9V 6LR61
Alarm Level	/	/	110dB

Water leak Sensor

- **Model:** SW2
- **Wireless Connection:** Bluetooth
- **Alarm Type:** App Notifications,Email,Hub Beep
- **Working Temperature Range:** 14°F ~ 131°F (-10°C ~ 55°C)
- **Working Humidity Range:** 0 ~ 95%RH (No Condensation)
- **Communication Range:** 131ft/40m (No Obstacles)
- **Dimensions:** 2.4 X 2.4 X0.7inch (L x W x H)
- **Battery(Rechargeable):** 3.7V 1800mAh Lithium Battery
- **Alarm Level:** 95dB

PIR Sensor

- **Dimensions:** 1.89 x1.89 x2.09 inch
- **Operating Temp:** 0 ~ 50 °C
- **Connectivity:** BLE
- **Battery:** CR123A (Replaceble)

Door&Window Sensor

- **Dimensions:** 1.61 x0.87x0.43 inch
- **Wireless Protocol:** BLE
- **Battery:** CR1632
- **Maximum Detection Distance:** 22 mm
- **Operating Temperature:** -10°C ~ +50°C
- **Operating Humidity:** 0-95% RH(No Condensation)

Gateway

- **Model:** H1B
- **Working Temperature Range:** -4°F ~ 145°F (-20°C ~ 60°C)
- **Working Humidity Range:** 0 ~ 95%RH (No Condensation)
- **Alarm Level:** 85dB (Adjustable)
- **PAN Wireless Communication:** Bluetooth & Zigbee 3.0
- **Power:** 5V/1A USB Adapter
- **Ethermet:** 10Mbps/100Mbps
- **Wi-Fi:** 2.4GHz 802.11b/g/n Wi-Fi

Customer Reviews

NEDROCKPHARMACY

"Because we creates custom compounds based on what our customers need, we need to make sure the medications are stored at the stable temperature. Otherwise, the efficacy of them would be impaired and bring bad effect on our customers' skin. If so, we definitely lose our customers."

"We offer immunizations for all ages, but it's crucial to store vaccines at the right temperature to maintain their potency. Improper storage can render them ineffective and unusable, leading to wastage of medical resources. We prioritize strict temperature monitoring to ensure vaccine safety and efficacy."

Desertlife Pharmacy