



المؤتمر الدولي لإدارة الأصول والمرافق والصيانة في الدول العربية
International Asset, Facility and Maintenance Conference
in the Arab Countries

Digitization - Excellence - Sustainability

Empowering Smart Maintenance: Wireless & Energy-Harvesting IoT Sensors

Redefining Efficiency and Reliability

28-26 January 2025

The Ritz-Carlton Jeddah, Kingdom of Saudi Arabia

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An Initiative By

Organized by

OMAINTEC
المجلس العربي لإدارة الأصول والمرافق والصيانة
Arab Asset, Facility and Maintenance Management Council

EXICON.
International Group
مجموعة أكيكون الدولية

From Reactive to Proactive

Traditional Maintenance Restrictions :

- **Periodic** Inspections: Maintenance occurs at fixed intervals, detection of issue **delayed**.
- High **Labor Costs**: Frequent manual inspections increase labor and operational costs.
- Limited Coverage: Difficult to cover **inaccessible** or hazardous equipment areas during daily inspections.
- **Experience Dependent**: Relies heavily on human expertise and judgment.
- **Insufficient Data** & Methods: Limited parameters fail to provide comprehensive insights.



Power Without Limits: Exploring Energy Harvesting Technologies

ULTRA-LOW POWER CONSUMPTION

YADO Sensor: **0.7 μ A**

International reference: **3 μ A**



Thermoelectric (Temperature)

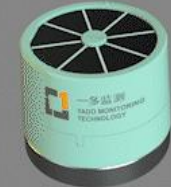
operates by harnessing temperature differences above **5°C**.

Electromagnetic (Current)

operates by harnessing the target's AC current above **3.5A**.

Electric Field (Voltage)

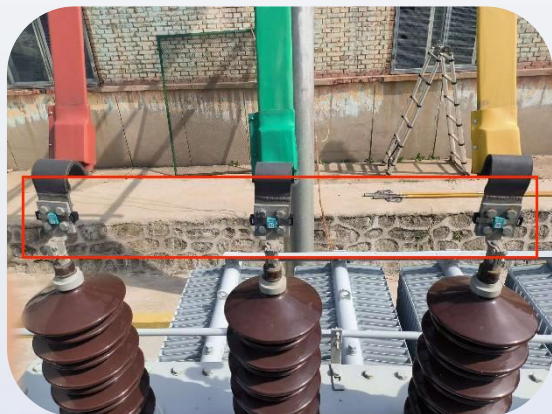
operates by harnessing the target's voltage above **6KV**.



Photovoltaics (Light)

operates by harnessing the photovoltaics above **24lx** light strength

No Wires, No Limits: The True Wireless Solution



150 meters

Outdoor open space



30 meters

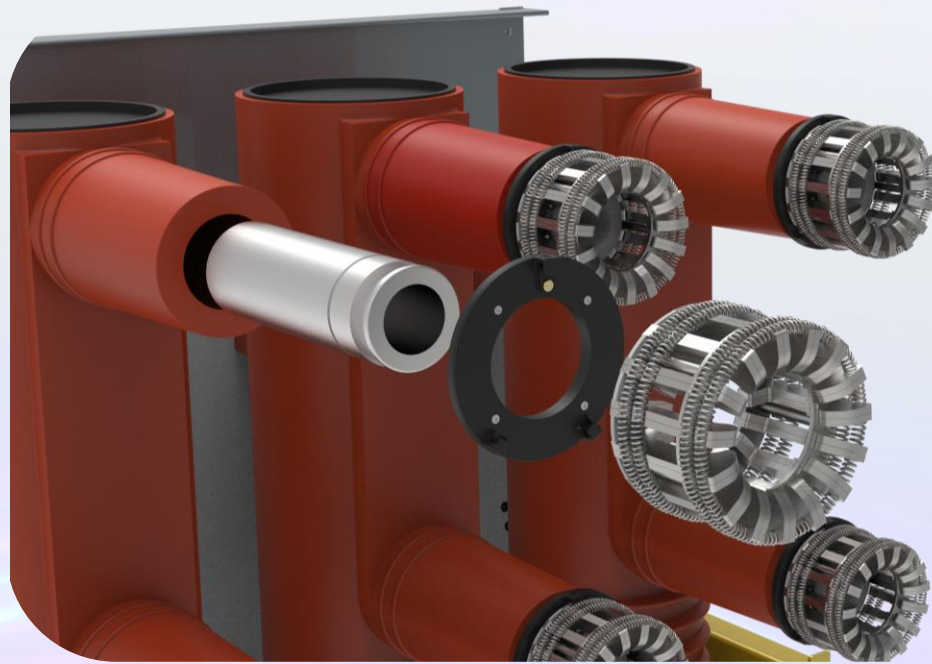
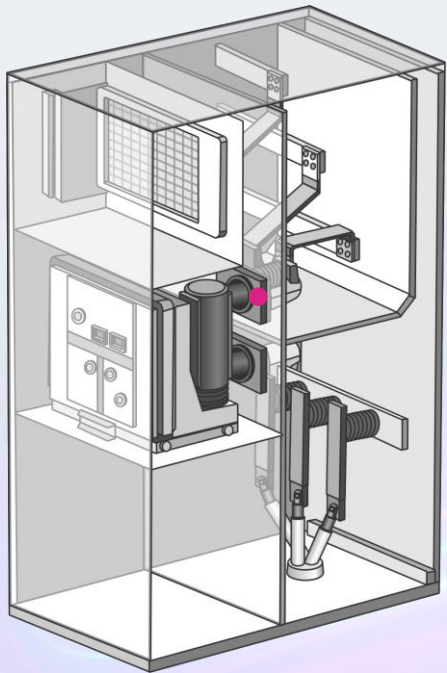
Indoor electrical room



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Wireless & Self-powered IoT-Based Switchgear Monitoring

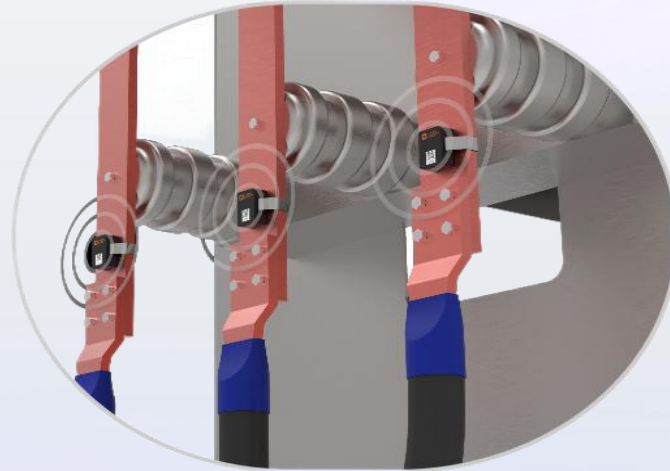
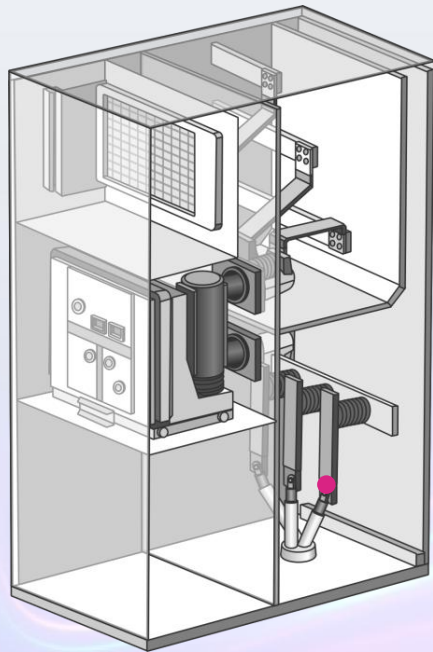


Circuit Breaker

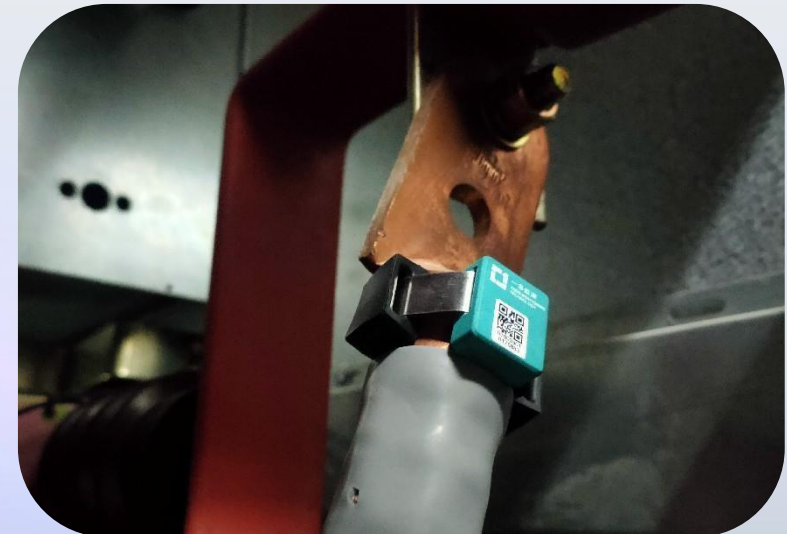
- Contacts temperature measurement
- Current measurement
- Direct measure the most heated **"inaccessible"** spot



Wireless & Self-powered IoT-Based Switchgear Monitoring



- ### Cable Termination
- Cable joints **temperature** measurement
 - **Partial Discharge** measurement
 - **Humidity** measurement



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Smart Maintenance System: Real-Time Insights, Anytime



Chinalco-Southwest Aluminum
Cold Rolling Factory 35PS

Overview Status ECS Risk Evaluation Report MGT Admin

Temp Diagnosis | Load Temp Diagnosis | PD | Mechanical | Vibration | Load Analysis

Location: Evaluation

Overview Importance Level **LV. I**

NAME: P01 Incoming Cabinet



Status **Attention**

Threshold Diagnosis Well

Delta T Horizontal Attention

Delta T Historical Well

Delta T Diff Phases Emergency

Temp Rise Rate Action

Horizontal Diagnosis

Device Type: Central Cabinet CB | Position: Contact IN | Category: Temperature | Phase: All | Threshold Line

Time Range: Day | Week | Month | Custom | 2022-10-01 -- 2022-10-01 | Start | Filter

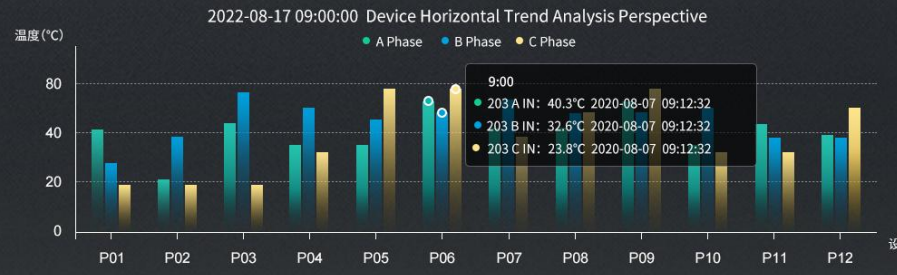
Similar equipment temperature trend chart

Click on the point to check analysis perspective



Click to view 09:00 similar equipment horizontal analysis perspective

2022-08-17 09:00:00 Device Horizontal Trend Analysis Perspective



9:00
 203 A IN: 40.3°C 2020-08-07 09:12:32
 203 B IN: 32.6°C 2020-08-07 09:12:32
 203 C IN: 23.8°C 2020-08-07 09:12:32

ATTENTION: P06's temperature rise faster than similar equipment and exceed the limit!

User: Admin | Version: V2.1.5 | Change Password | Exit | @ Zhuohai Yado Monitoring Technology Co., Ltd.

Well | Attention | Action | Emergency

Alarm Incident: A Real-Life Case Study



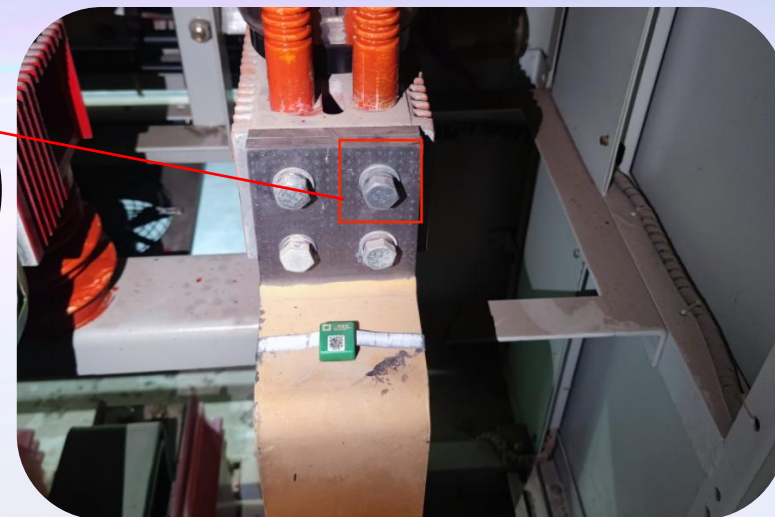
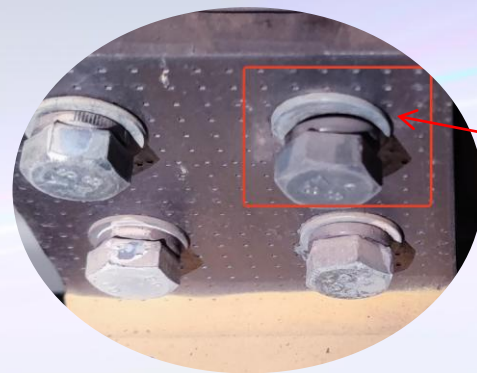
MV 10KV Switchgear Electrical Room of South City Substation in Xiaogan, Hubei, China



Alarm Incident: A Real-Life Case Study



Overheating Emergency ALARM

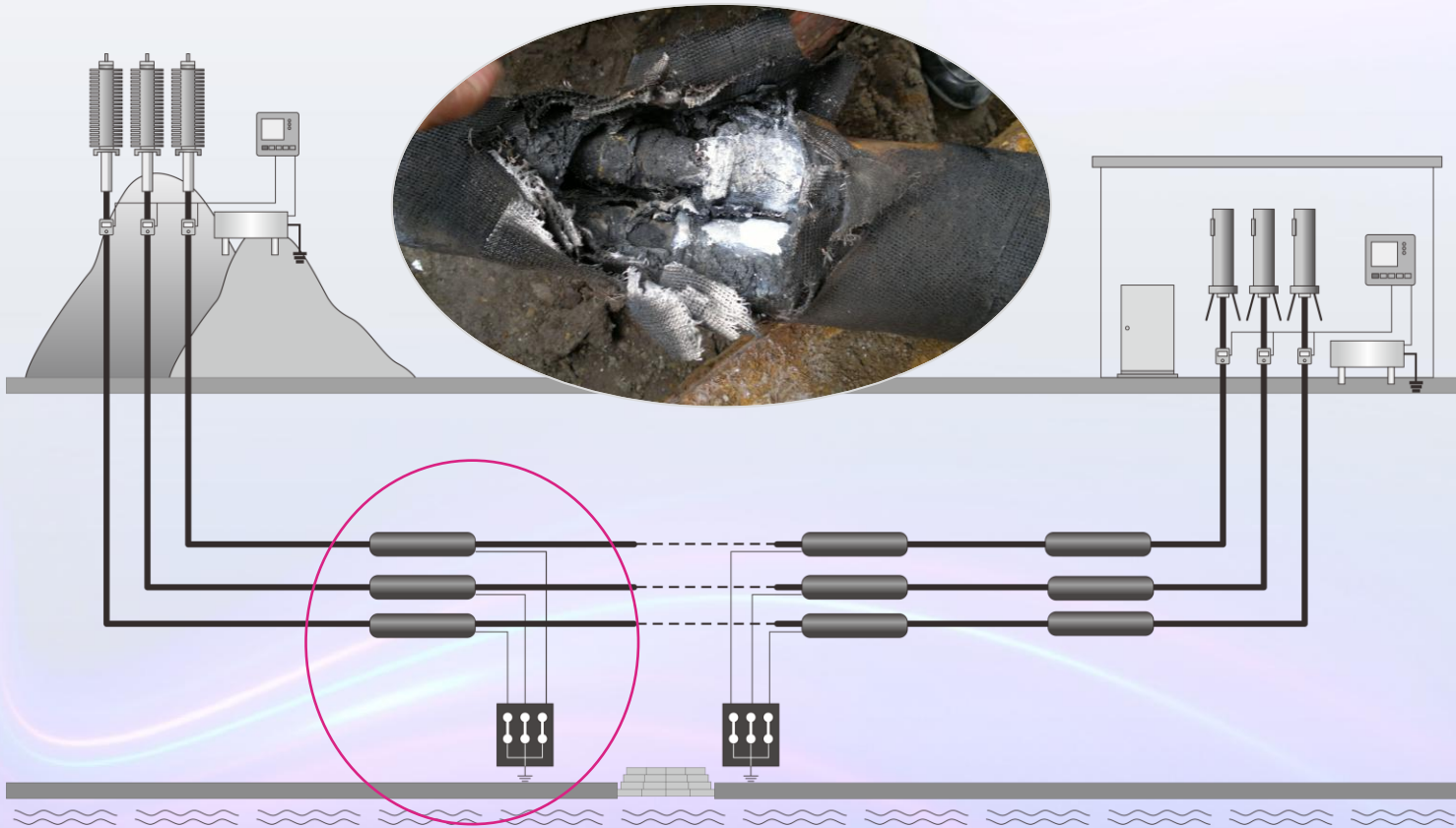


Loose nut



Resistance Measurement

Why Cable Joint Monitoring Matters

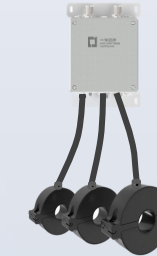


Based on a CIGRÉ investigation,

the failure rate for installed cable joints is approximately **1 to 2 failures per 400 joints** over a 5-year period.



Temperature



Partial Discharge



Sheath circulation

Cable Intermediate Joint Monitoring



Cloud Server

4G



Dual-power Gateway

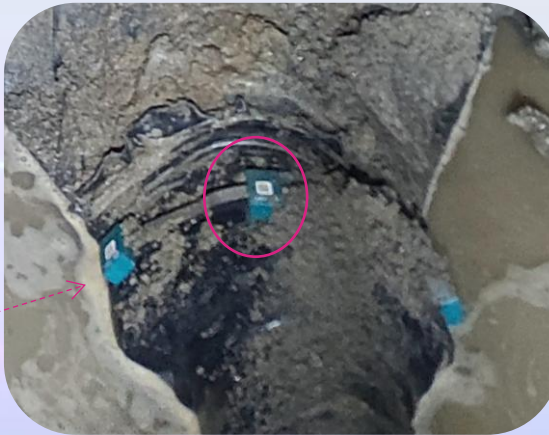
2.4GHz
Wireless



Self-powered Wireless Sensor

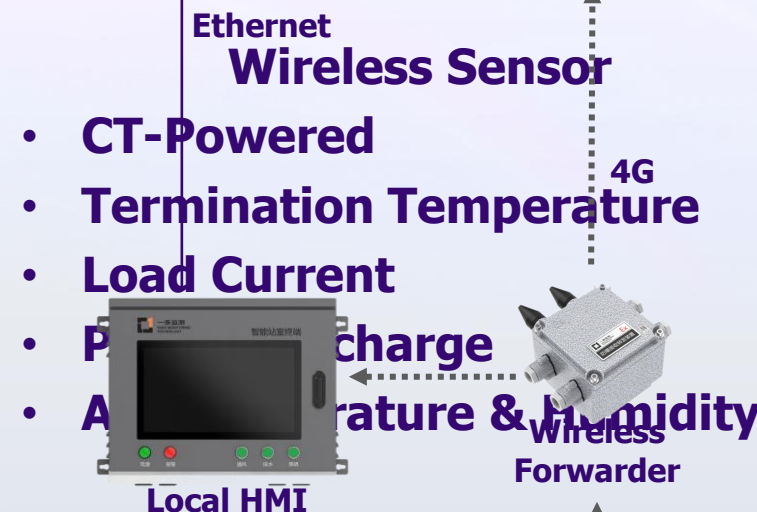
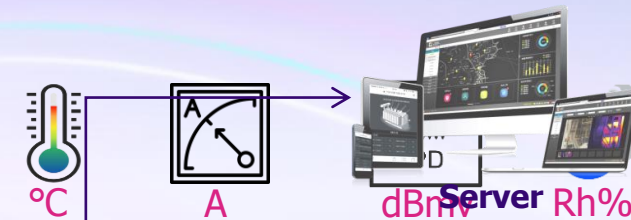
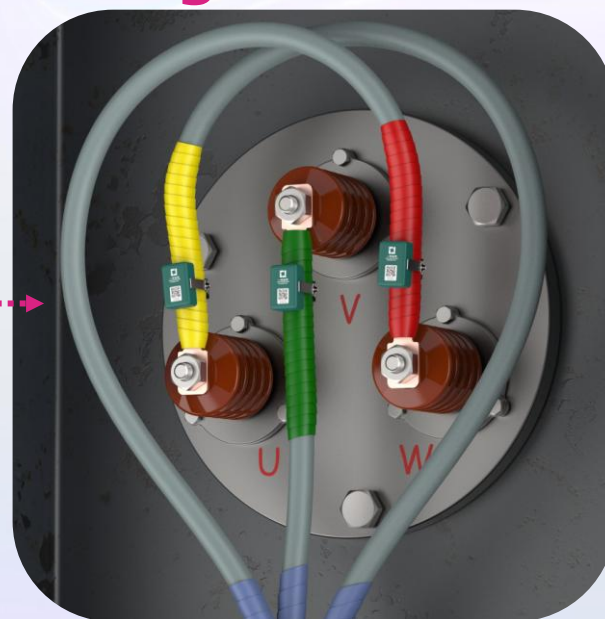
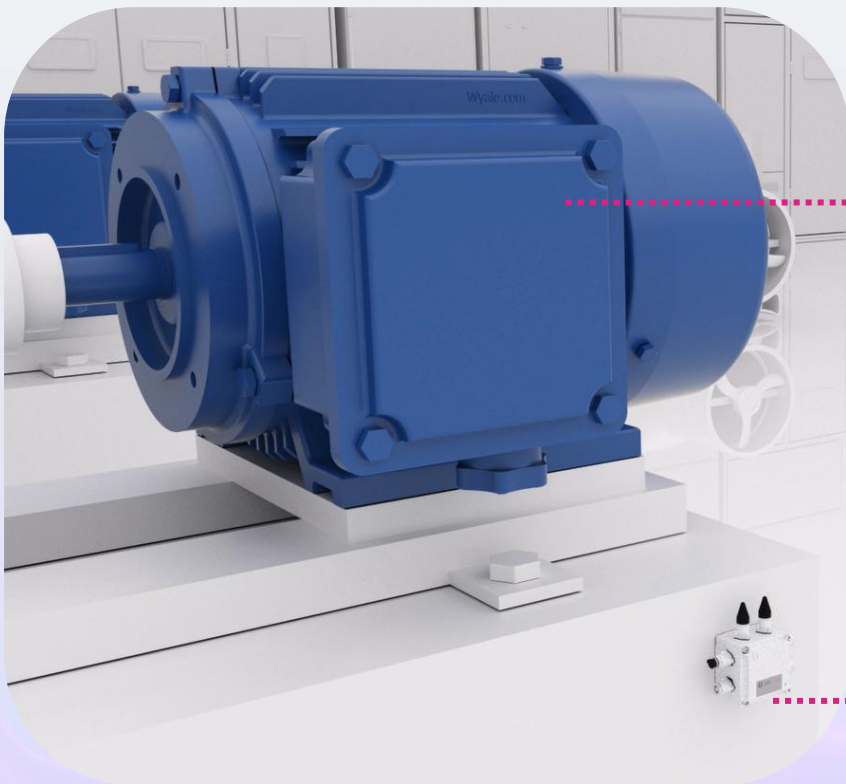
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Field Application: Monitoring Cable Joints Effectively



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Inovative Junction Box Monitoring Solution



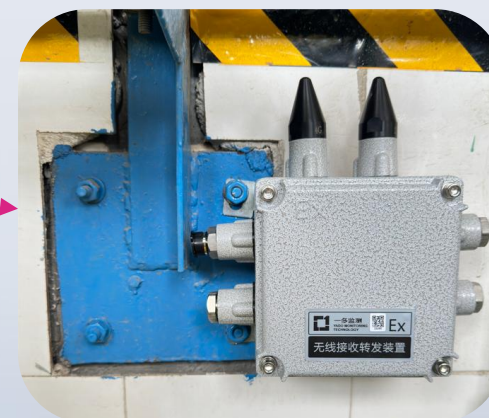
- CT-Powered
- Termination Temperature
- Load Current
- Power Factor
- Ambient Temperature & Humidity

- Ultra-low power consumption
- Long battery life
- 4G upload or 2.4GHz forwarding (150m)

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Wireless Self-powered Sensor

Inovative Junction Box Monitoring Solution



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Digitalize Meter/Guage without Replacing Instruments



Wireless Intelligent Sensing Camera

- Meter photos shooting
- Built-in AI algorithm to identify values
- Digital display screen
- Wireless data upload



Flip cover design



Detachable battery
(5 years life)



Server

Ethernet /
Optic Fiber



Gateway

4G

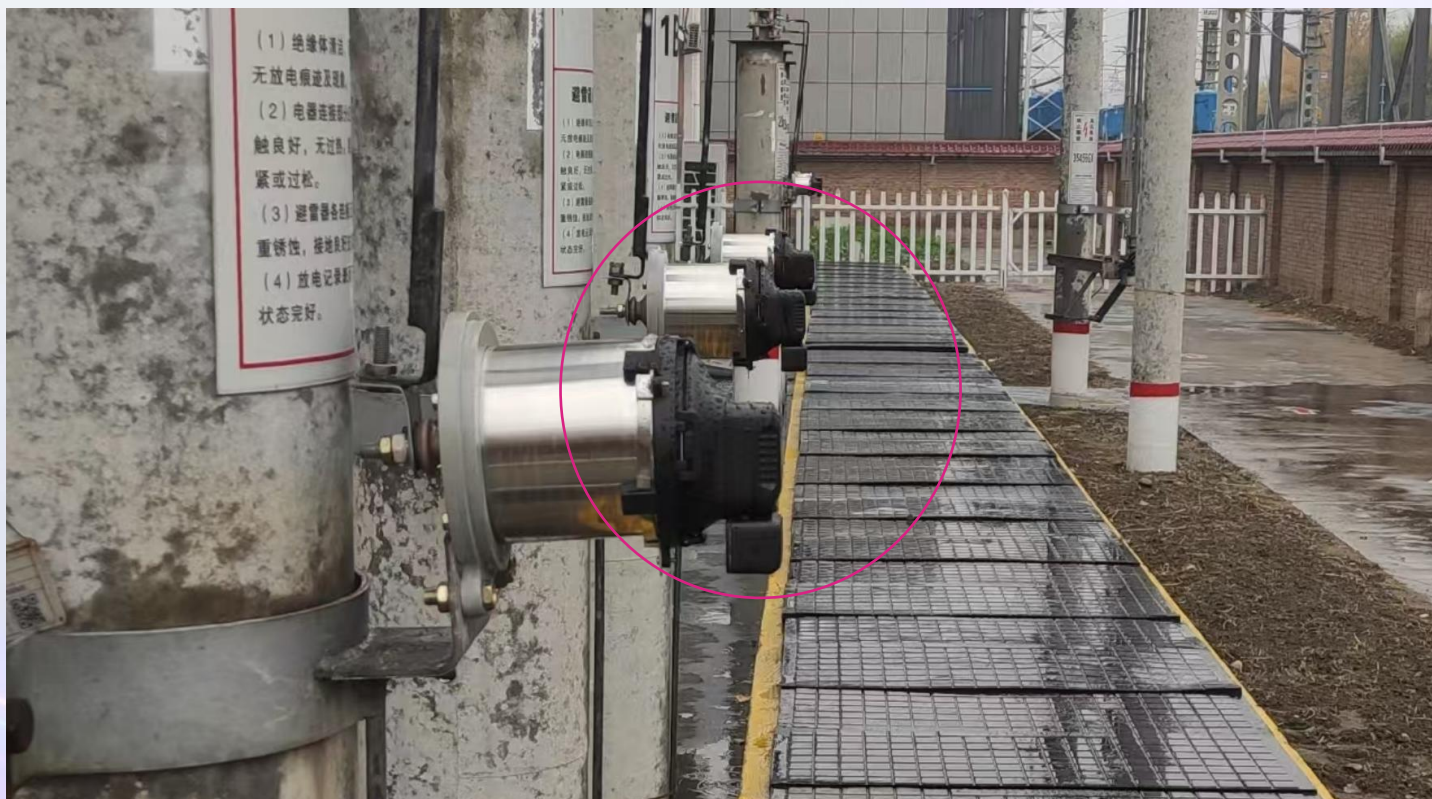
2.4GHz
Wireless



Camera

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Digital Metering without Replacing Instruments



0.4614

admin

Q 查询

拍照图片	图片状态	终端状态
	0.4614	正常 -51 dBm 正常
	0.4614	正常 -51 dBm 正常
	0.4609	正常 -57 dBm 正常



YADO: The Industry Leader in IoT-Based Condition Monitoring



Zhuhai, Guangdong, China

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YADO Mission "Making equipment safer, simplifying maintenance."



23 years

Innovating Condition
Monitoring Since 2002



1 Million+

Sensors applied
worldwide



114+

Patents driving
innovation



20ppm

defect rate ensuring
unparalleled quality

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Manufacturing Center
CNAS&CMA accredited Laboratory

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THANK YOU!

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