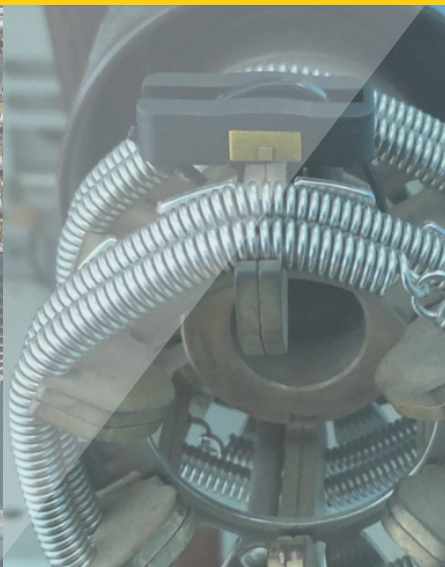


# RTEC

## PASSIVE & WIRELESS MONITORING SYSTEM FOR CRITICAL POWER ASSETS



## Industry First Battery Free UHF RFID Temperature Sensing System

### Key Features

- Truly passive, wireless, CT free, easy to install, stable and secure
- Direct contact conductor monitoring, accurate and reliable data
- Digital monitoring, digital transmission, CRC correction
- Sensor global unique ID
- MODBUS RTU communication protocol
- Stable signal, long communication distance
- Integrated and automated system Integration

## Hidden Risks: Electric Arc Explosion Caused by Overheating of Switchgear

Switchgear is designed to assure the safety of both the end user and the power distribution system, and ultimately determine the reliability of the power grid. Both developing and developed countries alike are continually increasing their demand for power and thus putting higher load requirements as grid demands continue to increase.

However the inevitable aging and aged equipment (majority of installed systems are more than 10years old) and deterioration of the internal switchgear components will increase the load of current flow causing overheating, resulting in arc accidents, loss and mishaps.

Arc blast is typically enormous in magnitude and often result in equipment damage, and both human and severe production losses. The photo on the right shows an actual damage to a medium-voltage switchgear after an explosion.

Various preventive measures exist, such as intermittent examinations and periodic inspections, resulting in countless lives been saved and help avoided serious outages. That said, there are still unacceptably high numbers of accidents, all of which could have been prevented using continuous monitoring.



One of the most common reasons is the lack of an effective proactive monitoring and preventive system. Studies have shown that the most vulnerable and accident prone areas in a switchgear are/include:

- Circuit breaker contact points
- Cable head connector
- Electrical connection points

A proactive monitoring of the temperature on these critical areas via early warning of over-heating would greatly enhance the safety and protection of end user and key production facilities.



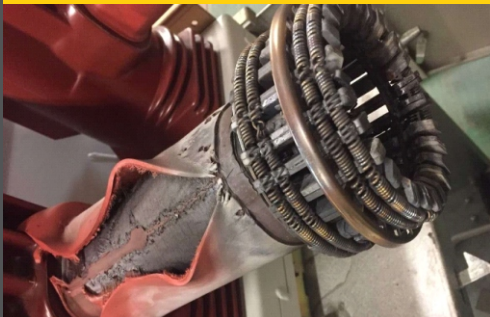
## Unusually high temperatures are a precursor to accidents

- Loose and faulty connections cause an increase of resistance at that localized point.
- The increased resistance causes increased heat in accordance with Ohm's law,  $P = I^2R$ .
- The increase in heat will escalate until complete thermal failure of the connection occurs or the nearby insulation fails resulting in a fault.
- Figure 1 shows a thermal image of a loose switchgear connection that could lead to future failure if not repaired.

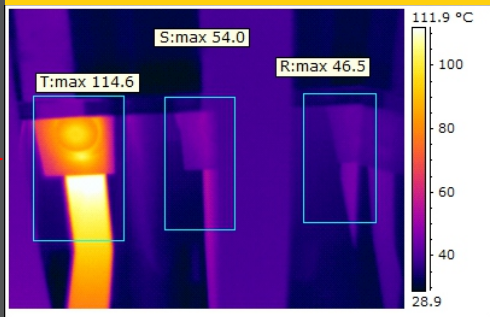


Figure 1 - Hot Fuse Connection

### Equipment Failure



### Temperature raise up



Install RTEC Passive Wireless temperature monitoring system helps to identify troublemaker at early stage

### Accident, exploding



Temperature Reader



Product	R5600 Temperature Reader	R5800 Temperature Reader
Power Supply	AC/DC 80-265V Wide Power Supply	AC/DC 80-265V Wide Power Supply
Work Frequency	RFID 902-928MHZ FCC RFID 866-868MHZ ETSI	RFID 902-928MHZ FCC RFID 866-868MHZ ETSI
Communication Interface	1 Sets RS485/Modbus RTU	2 Sets RS485/Modbus RTU
Dimension	80 x 115 x 45 mm	190 x 100 x 41 mm
Antenna Port	4 ports	8 ports
Operation Temperature	-20°C to +70°C	-20°C to +70°C
Operation Temperature	-20°C to +70°C	-20°C to +70°C

Antenna



Product	RTEC ANT-CR	RTEC ANT-FX
Antenna Gain	4 dBi	9 dBi
Dimension	105 x 105 x 14.5 mm	260 x 260 x 30 mm
Operation Temperature	-30°C to +70°C	-30°C to +70°C
Attachment	Rivet hole / Magnet	Embrace hoop fixed, Φ30-50mm

Temperature Sensor



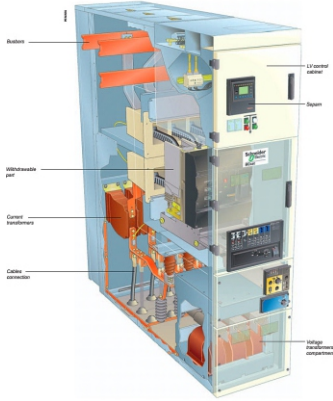
Product	RTEC Minion	RTEC Cube-Ts	RTEC BFX-Ts	RTEC Mn-lite-Ts
Applcation	Busbar / Cable joint	Plum Contact	Cable joint	Busbar
Temperature Range	-20 ~ +125°C	-20 ~ +125°C	-20 ~ +125°C	-20 ~ +125°C
Accuracy	+/-1.5°C	+/-1.5°C	+/-1.5°C	+/-1.5°C
Working Mode		RFID-ISO18000-6C, Passive and Wireless		
Dimension	69 x 27 x 23 mm	14 x 9 x 4 mm	46 x 25 x 1.2 mm	37 x 25 x 12 mm
Mounting	Screws, Cable tie	Fixture	Screw in	Screws, Cable tie

# Applications

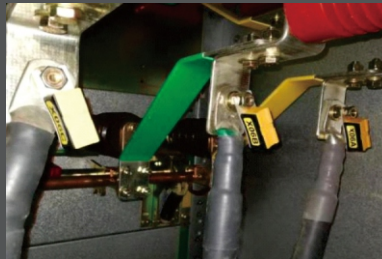
● MV Switchgear

● LV Switchgear

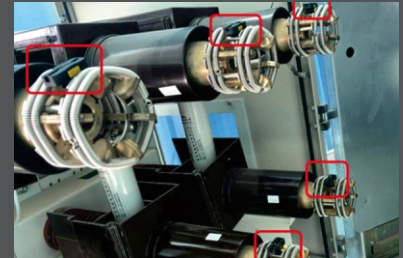
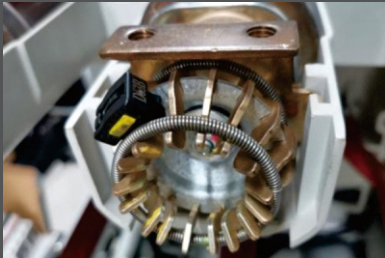
● Transformer



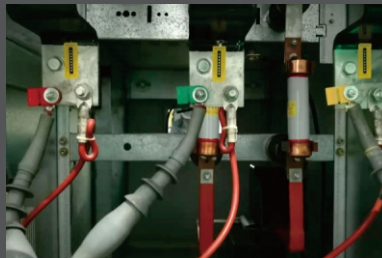
## Busbar / Cable joint



## Circuit Breaker / Plum contact



## Cable joint





# Applications

● Ring Main Units



● Cable Branch Box



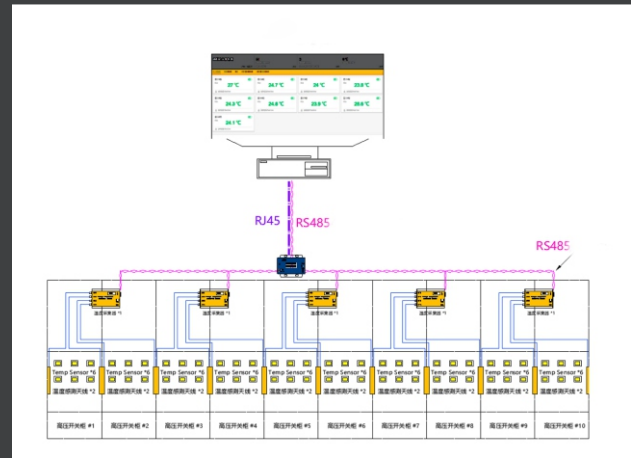
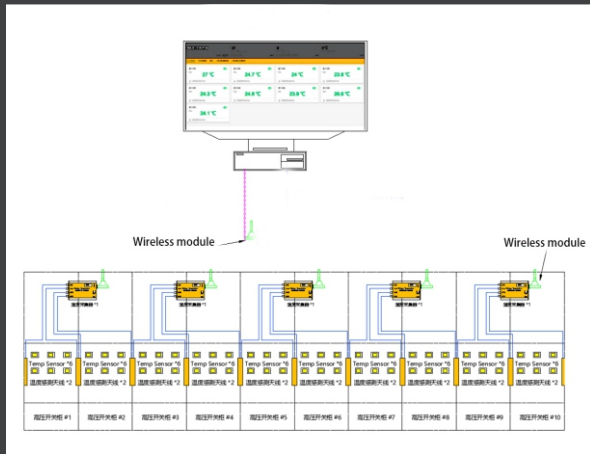
## Nut Sensor / Screw-Ts



## RMU Cable Head



# System Architecture



# Success Stories

