Wireless Ambient Temperature& Humidity Local Monitoring Solution

Wireless Temperature&Humidity Monitoring, for distribution cabinet/board/ panel,switchgear, local display & alarm.

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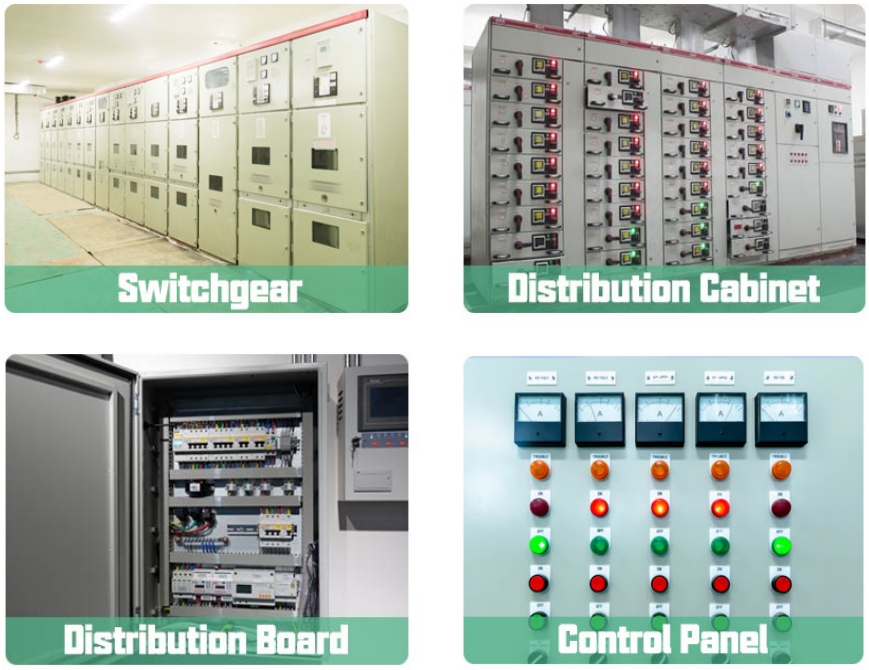
0. Application Scenario

(1) This wiressless temperature&Humidity monitoring solution was majorly designed for monitoring and alarming the ambient temperature&humidity of switchgear, distribution cabinet/board, control panel, and etc.

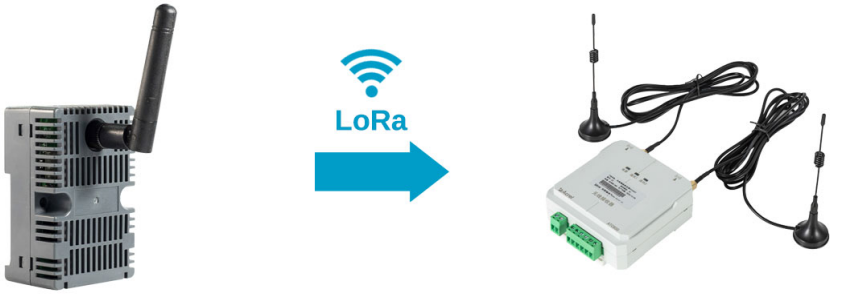
(2) Such place have the potential threat of fire hazard due to the aging of material, slackness of connection, high ambient humidity and etc. Thus a real-time temperature&humidity monitoring and alarm system will be necessary to prevent it from potential fire hazard caused by the rising of temperature or humidity.

(3) Solution here was major designed for local temperature&humidity display and alarm. Distinguish from other Acrel wireless temperature&humidity monitoring soloution which has both cloud&local temperature&humidity display and alarm.

(4) Unlike the traditional wired temperature&humidity monitoring solution, wireless temperature&humidity monitoring solution make the connection between temeperature& humidity sensor and transceiver wireless. This will largely ease the installation and make the overall solution more flexible.



(1) Major Temperature&Humidity Monitoring Scenario Showcase



Wireless Temperature&Humidity Sensor

Wireless Temperature&Humidity Transceiver

(4) WIreless Connection for easy installation

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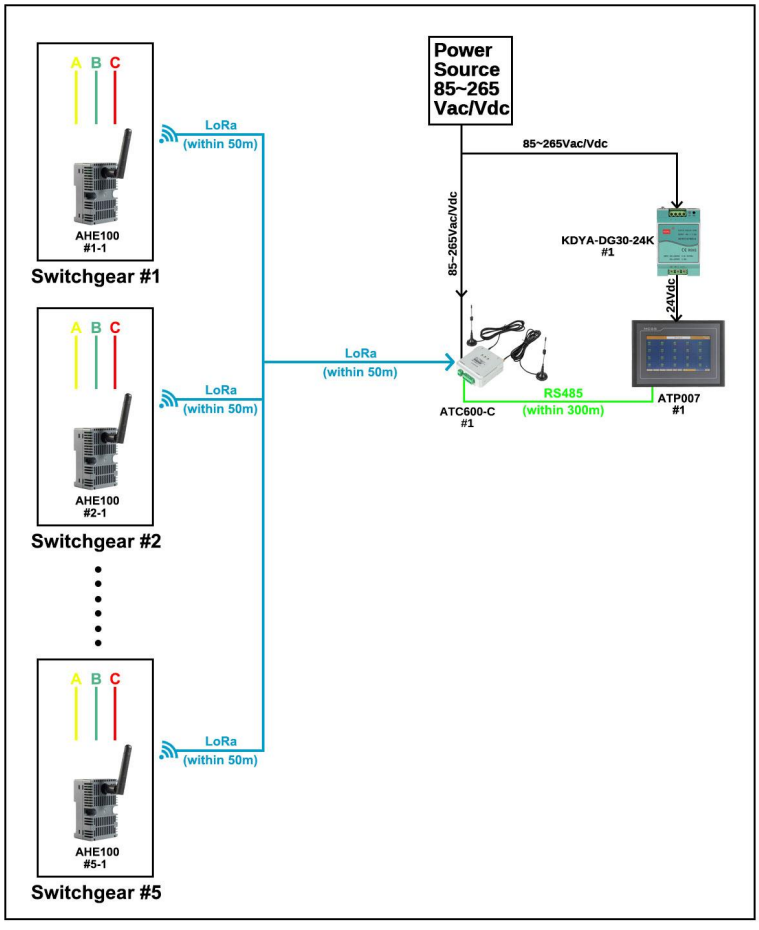
1. Scenario Preset [Switchgear Local Wireless Temperature&Humidity Monitoring Solution]

(1) The target was to monitor and alarm ambient temperature&humidity of 5 switchgears deployed in a single area. Only local display and alarm of temperature&Humidity was requested.
(2) Each switchgear require 1 pcs AHE100 for temperature&humidity monitoring.

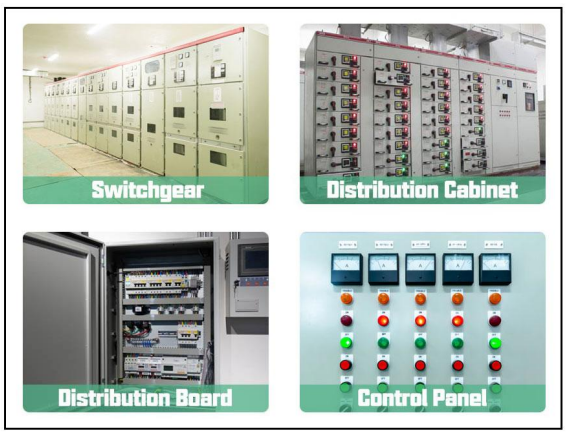
1. Devices Deployment [Switchgear Local Wireless Temperature&HumidityMonitoring Solution]

Area #1 - Switchgear #1 ~ #5:

- 1* ATP007 Smart Touch Screen [For collecting, displaying and alarming for all temperature& humidity data collected by ATC600-C]
- 1* ATC600-C Wilress Temperature&Humidity Transceiver [For receiving the temperature& humidity data collected by AHE100 via LoRa and furture upload to ATP007]
- 5* AHE100 Seires Wireless Temperature&Humidity Sensor [For monitoring the ambient temperature&humidity of switchgear and further upload the data to ATC600-C via LoRa]
- 1* KDYA-DG30-24K Power Supply Module [Paired with ATP007 for 85~265Vac/Vdc Power Supply]



Area #1



Common Application Scenario Showcase

Note 1: Green line stand for RS485 Wired communcation line
Note 2: LoRa is a type of Radio Wireless Comms. Methods

(1) Devices deployment plan Illustraton

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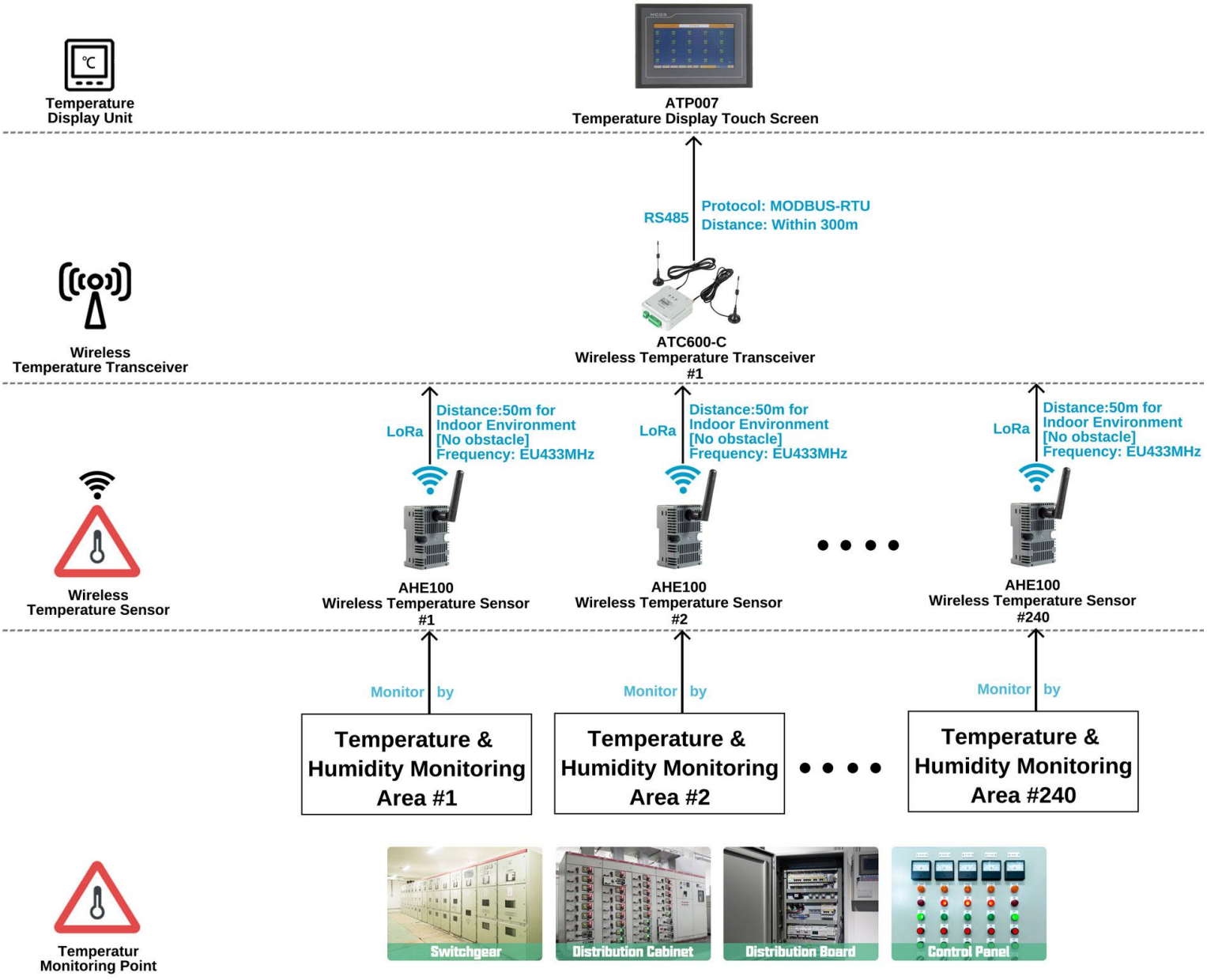
1. Comm. Structure & Logic [Switchgear Local Wireless Temperature&Humidity Monitoring Solution]

(1) Between AHE100 wireless temperature&humidity sensor and ATC600-C wireless temperature transceiver, we are using a radio wireless communications called LoRa. The communication distance is within 50m [when in indoor environment with no obstacle]. The communication protocol is self defined protocol. [1 pcs ATC600-C can support up to 240 pcs AHE100 if comms. distance allowed.]

(2) Between ATP007 smart touch screen and ATC600-C wireless temperature&humidity transceiver, the communication will be RS485 wired Comms. based on MODBUS-RTU protocol. The RS485 Comms. distance between these 2 devices was recommend to be within 300m when we are using 2x1.5mm² RVSP cable for RS485 connection wiring.



(1&2) Communication Structure

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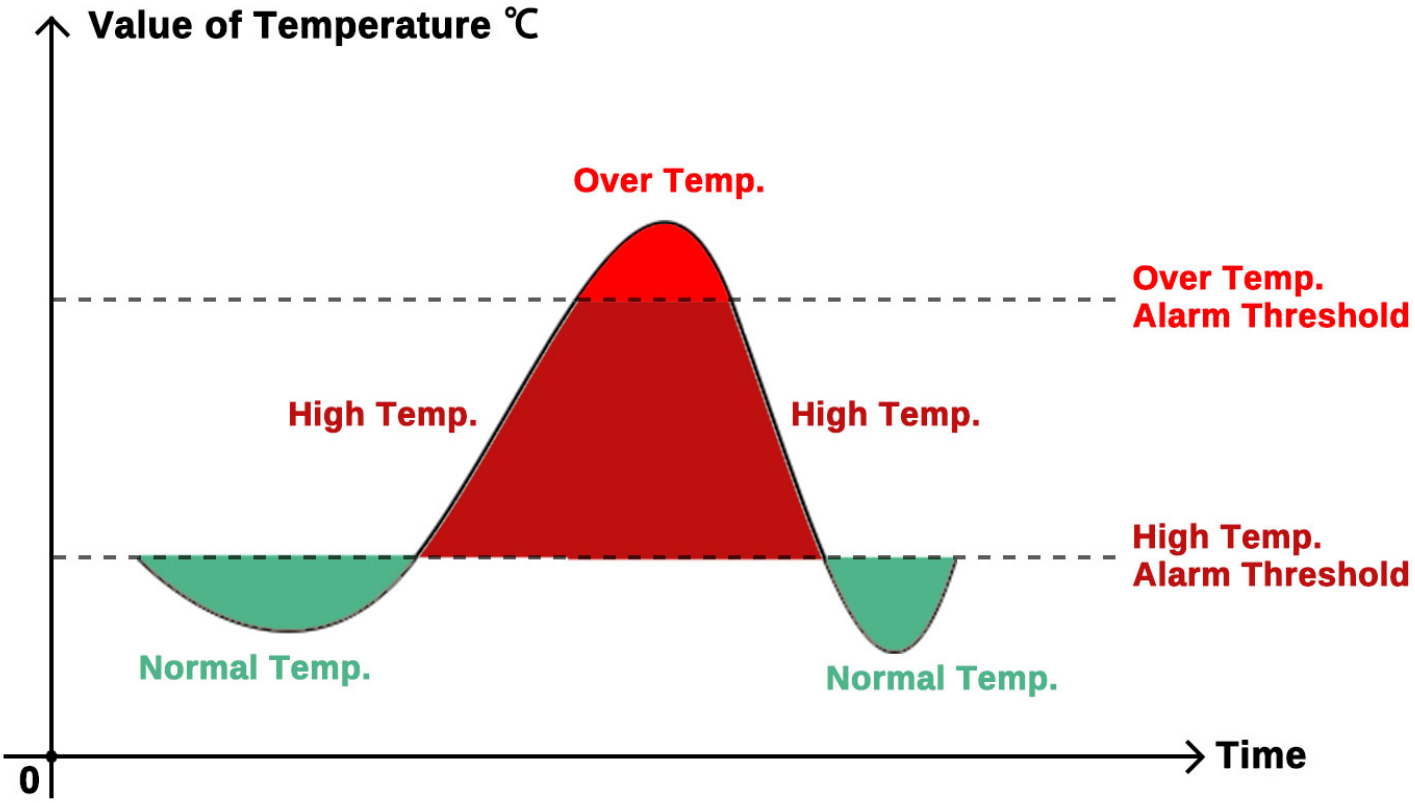
1. Local Device Temperature Alarm Function&Logic [Switchgear Local Wireless Temperature &Humidity Monitoring Solution]

ATP Seires Tempearture Display Devices support 2 types of major temperature alarm logic. When any of the below alarm logic was set and triggered, it will alarm the buzzer up.

(1) High Temperature Alarm: When temperature of certain monitoring node was higher than a certain preset threshold value, this will twigger high temperature alarm. [Normally used as a pre-alarm for mentioning related person to take care of temperature rising issue in monitoring places]

(2) Over Temperature Alarm: Similar like high temperature alarm, but over temperature alarm normally will be preset a higher alarm threshold. [Normally used for alarming the related person that there are severe temperature rising issue happened and need to be solved immediately]



(1&2) High&Over Temperature Alarm

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1. Hardware Devices Overview [Switchgear Local Wireless Temperature&Humidity Monitoring Solution]

Model 1: AHE100 Wireless Ambient Temperature& Humidity Sensor

LoRa Wireless | -30℃~85℃
Temp.&Humidity | 0~100%RH

- Temperature Measuring Range: -30℃~85℃ [±1℃]
- Humidity Measuring Range: 0~100%RH [±3%RH]
- Wireless Comms: LoRa Radio Comms. [433~510MHz, self-defined protocol]
- LoRa Comms. Distance: within 50m [when in indoor environment without obstacle]
- Power Supply: Built-in replacable battery [battery module CR2450, 3 years life span, when main body under 25℃ operating temperature]
- Installation: DIN-rail

Model 2: ATC600-C Wireless Temperature Transceiver

Temp. Transceiver | Up to 240 Sensors
GFSK Wireless | 1-way RS485

- Wireless Comms. [Downstream]: LoRa Radio Comms. [433~510MHz,self-defined protocol]
- LoRa Comms. Distance: within 50m [when in indoor environment]
- Wired Comms. [Upstream]: 1-way RS485 [MODBUS-RTU protocol]
- Support: up to 240 pcs ATE300P Wireless Temperature Sensors based on LoRa
- Power Supply: 100~265Vac/Vdc
- Working Temperature: -20℃~+55 ℃
- Working Humidity: <=95%

Model 3: ATP007 Temp. Display&Alarm Touch Screen

Touch Screen | 2-way RS485
Temp. Display | 1-way Ethernet

- Comms.: 2-way RS485 [one for upstream, one for downstream, MODBUS-RTU]; 1-way Ethernet [for upstream, MODBUS-TCP]
- Support: Display the temperature data of up to 240 pcs temperature monitoring points.
- Alarm: High-tempearture alarm, over-temperature alarm.
- Power Supply: 24Vdc [±10%]; consumption 15W
- Screen Size: 7 inchs [10 inchs option available, module ATP010]
- Working Temperature: -10℃~+55 ℃
- Working Humidity: <=95%

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1. Hardware Devices Overview [Switchgear Local Wireless Temperature&Humidity Monitoring Solution]

Input Range	Output Range
100~240Vac/Vdc	24Vdc

Model 4: KDYA-DG30-24K Power Supply Module

- Rated Input Range: 100~240Vac/Vdc
- Rated Outpu Range: 24Vdc
- Application: paired with ATP007 for power supply input

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1. Overall Model Selection&Quoation [Switchgear Local Wireless Temperature&Humidity Monitoring Solution]

(1) This Quotation doesn't include freight charge. To gain a complete quotation, please refer the actual quantity that you want to request for the actual order, once we receiving it. We will issue a Official Proforma Invoice with Acrel Stamps on it for later procedure.

Local Temperature Display&Alarm Device					
	Touch Screen **ATP007**	**Comms.:** 2-way RS485 (MODBUS-RTU); 1-way Ethernet [MODBUS-TCP] **Support:** Up to 240 ATE series Transceiver. **Auxiliary Power Supoply**: 24Vdc **HS Code:** 8471609000	1 pcs	/	/
	Power Supply Module **KDYA-DG30-24K**	**Application:** Paired with ATP007Kt for 85~265Vac Power Supply Input **Input:** 85~265Vac **Output:** 24Vdc **HS Code:** 8504409999	1 pcs	/	/
Wireless Temperature Transceiver					
Overview Picture	**USAGE&MODULE NAME**	**DESCRIPTION & SPECIFICATION**	**QUANTITY**	**FOB UNIT PRICE (USD)**	**AMOUNT (USD)**
	Temperature Transceiver **ATC600-C**	**Upstream:** RS485 (MODBUS-RTU) **Downstream:** LoRa (433~510 MHz) **Support:** Up to 240 ATE300P series wireless temperature sensors using LoRa communication. **Power Supply:** 100~265Vac **HS Code:** 9025191010	1 pcs		
Wireless Temperature Sensor					
Overview Picture	**USAGE&MODULE NAME**	**DESCRIPTION & SPECIFICATION**	**QUANTITY**	**FOB UNIT PRICE (USD)**	**AMOUNT (USD)**
	Temperature&Humidity Sensor **AHE100**	**Temperature Measuring Range:** -30℃~85℃ [±1℃] **Humidity Measuring Range:** 0~100%RH [±3%RH] **Communication:** LoRa (EU433 MHz) **Power Supply:** Built-in replaceable battery **HS Code:** 9025800090	5 pcs		

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2. Project Sample #1 - Italy Enel Green Power Project

(1) Project Overview:

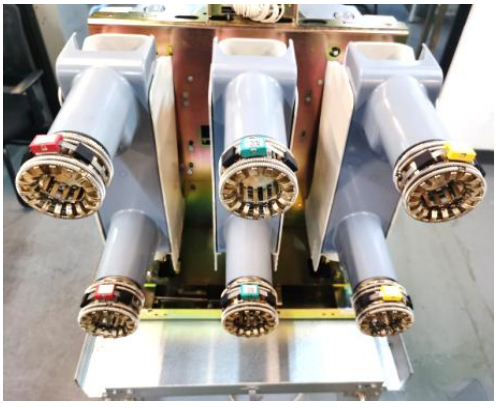
· **Customer:** SEL S.P.A [Switchgear Complete set factory]
· **Country:** Italy
· **Project Aim:** Integrate Acrel wireless temperature monitoring devices with switchgear s produced by SEL S.P.A for adding satety feature to their switchgear products.
· **Project Amount:** About 400.000 USD

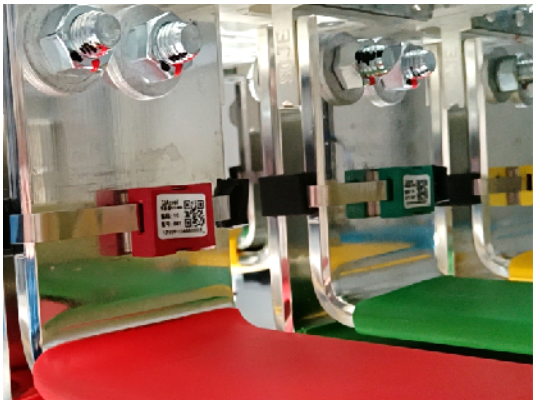
(1) Customer: SEL S.P.A [Switchgear Complete set factory]

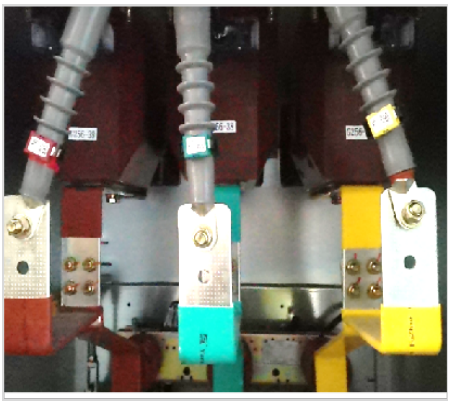
(1) Project Aim: Switchgear Wireless Temperature Monitoring

(2) Applied Product Combination:

- ARTM-P30-400 Wireless Temperature Transceiver and Display Unit
[For collecting, displaying and alarming for all temperature data collected from ATE400]
- ATE400 Wireless Temperature Sensor
[For monitoring the temperature of electrical connection nodes and send the data to ARTM -P30-400 via GFSK wirelesss Comms.]







(2) Site Installation Picture

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2. Project Sample #2 - Vietnam Lotte Mart Project

(1) Project Overview:

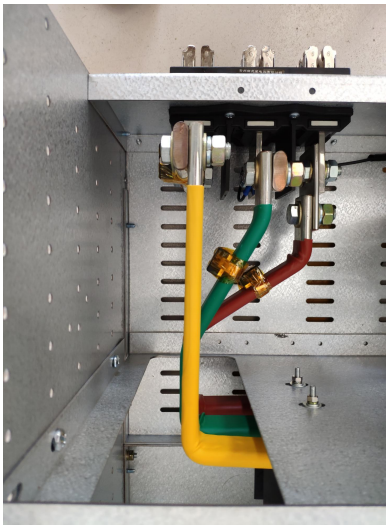
· **Customer:** V.T.E.C.H Electrical Technology Co., Ltd , EPC [Party A]
· **Country:** Vietnam
· **Project Aim:** Client use Acrel complete Cloud Wireless Temperature Monitoring Solution for monitoring and alarming electric cabinet in Lotte Mart to ensure electricity safety.
· **Project Amount:** About 100.000 USD

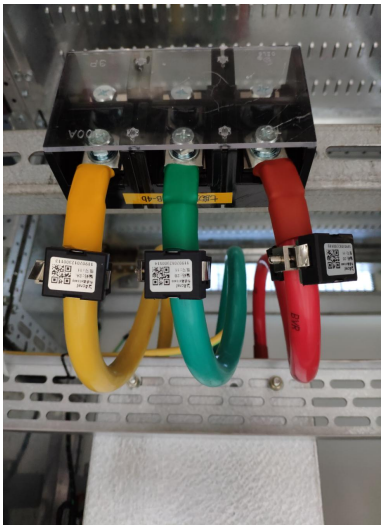
(1) Customer: V.T.E.C.H Electrical Technology Co., Ltd , EPC [Party A]

(1) Project Aim: Online IoT based Wireless Temperature Monitoring&Alarming

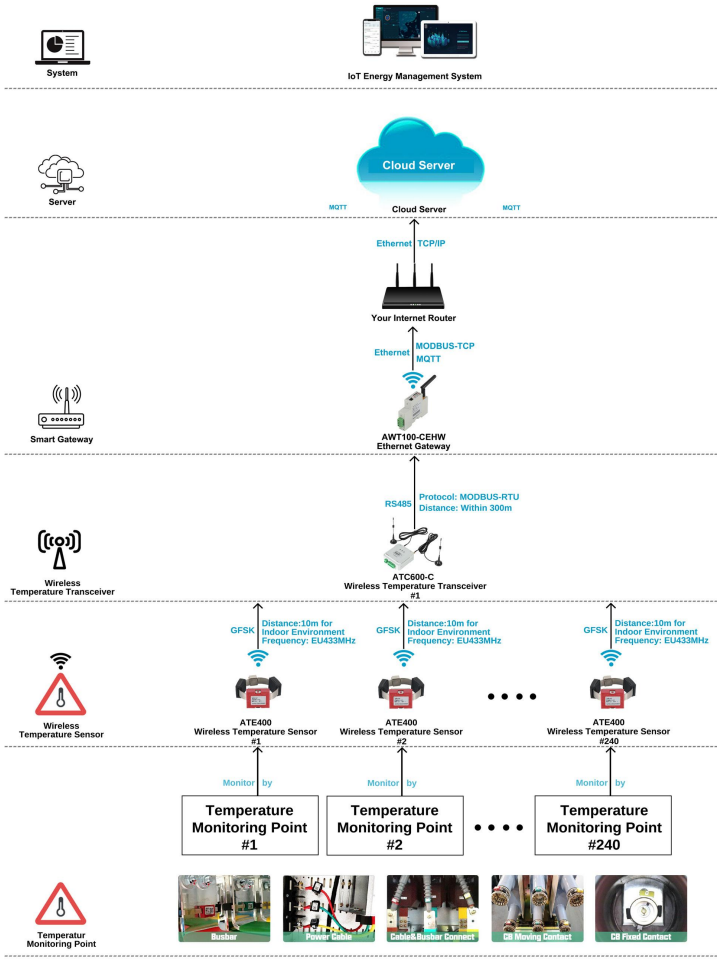
(2) Applied Product Combination:

- AWT100-CEHW Ethernet IoT Gateway
- AWT100-POW Power Supply Module
- ATC600-C Wireless Temperature Transceiver
- ATE400 Wireless Temperature Sensor





(2) Site Picture Gallery



(2) Solution Overall Structure