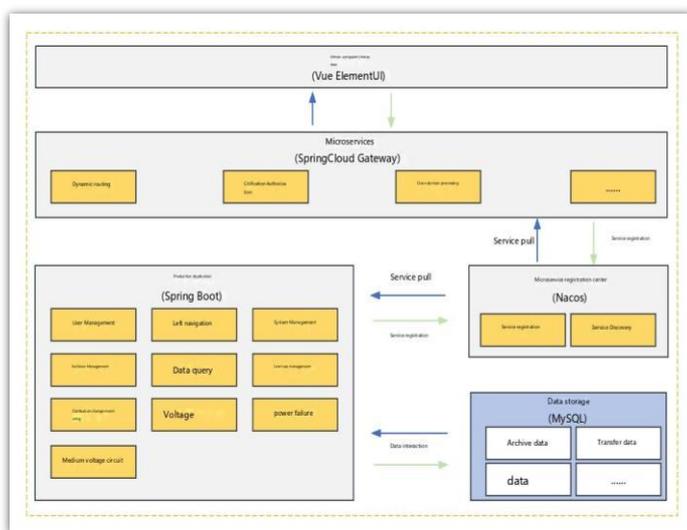# E200Pro system

Product Description

E200Pro system accurately grasps the positioning of the user side as "the main platform for equipment access, the general entrance for sensing data, and the general exit for control instructions", refers to the scheduling system, maintains the integrity and independence of the system, follows the design concepts of "universal and forward-looking architecture, stable and advanced technology, independent and expandable functions, and tailor-made interface Following the design concept of "universal and forward-looking architecture, stable and advanced technology, independent and expandable functions, and tailor-made interface", the system is built into a customer-side energy Internet infrastructure system with excellent performance, rich functions, security and stability, which supports the full access, full collection and full control of various types of energy-using equipment, supports the consumption of clean energy and the diagnosis of users' energy efficiency, serves the data and business needs of governments at all levels, the majority of customers, the departments of distribution networks, and the specialties, and helps the energy transition and the digitalization transition.

Architecture and key components

Based on the Cloud architecture, E200Pro system consists of the following modules:

- Human-computer interaction, Micro-service gateway processing, Micro-service registry, Data storage.

- E200Pro system business functions include User management , Archives management, Data queries, Distribution transformer monitoring, Analysis of line losses, Analysis of power outages, System disaster recovery , Customization of Reports and etc.

Product highlights

E200Pro system closely grasps the four principles of "standardized design, dynamic monitoring, intelligent interaction and customized service", and builds a uniformly deployed collection system. It focuses on enhancing the system's information collection capability, load flexibility control capability, grass-roots business support capability, and disaster recovery capability; realizing high-frequency collection, realizing the transformation from daily timed collection to real-time customized collection, realizing the transformation from unidirectional call measurement to bidirectional interaction, realizing the transformation from power collection to power monitoring, and realizing the transformation from full-volume push to on-demand sharing; comprehensively serving the market ecology of energy trading, serving the intelligent distribution network operation ecology, serving the end-end lean operation ecology, and serving the end-end lean operation ecology. It serves the market energy transaction ecology, intelligent distribution network operation ecology, end-end lean operation and maintenance ecology, green energy low-carbon ecology, business environment optimization ecology, and assists the development of distribution network digital transformation.

Taking "the total entrance of measurement data collection and the total exit of control instruction execution" as the basic goal, applying technologies such as big data, cloud platform, micro-service, artificial intelligence, mobile application, etc., and combining with the collaborative management of "cloud-side-end" to realize the new structure of technology application, The goal is to realize a new architecture of technology application, a new system of hierarchical control, a new ecology of business application and a new experience of customer service.

- **New Technology Architecture:**

  Combining the device-side edge computing, blockchain and other technologies, and applying micro-services, cloud platforms, big data and artificial intelligence, we have built a collection system that supports multi-device sensing, real-time collection, flexible control and digital transformation.

- **New system of hierarchical control:**

  building equipment management system, security protection system, user login authority system, unified collection platform, control center, calculation and analysis center, business application center and monitoring and operation and maintenance system.

- **New ecology of business application:**

  Facing different scenarios of equipment operation and maintenance, system operation and maintenance, business operation and maintenance, as well as the support of metering business application, distribution network business application, dispatching business application, etc., combining with the new structure of technology application, we will cultivate new types of business based on the support of business application at all levels, and build a new ecology of business application.

- **New customer service experience:**

  for power users, distribution companies, enterprises and governmental units, it supports value-added services such as intelligent energy use, demand response, energy efficiency analysis, auxiliary decision-making, etc. Combined with mobile applications, it provides a new experience of high-quality service for users at all levels.

Key functions

1. User management

- Single Sign-On: Customers can log in only after synchronizing the user name/password with other AD/OA systems. The user can log in only after synchronizing the user name/password with other AD/OLA systems.

- Privilege hierarchy: different user privileges data query scope and functional operations are different.

2. Archives management

- One-key import: support ECU, station, transformer file templated import, automatic verification of primary key conflicts. The following is a list of the most popular features of the system

- Intelligent correlation: manually configure the relationship between ECU and station, and send it to the terminal in real time to ensure data consistency
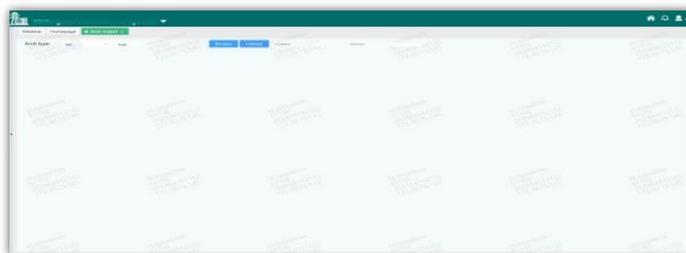

3. Data queries

- Multi-dimensional analysis: real-time display of single-user/station electricity data (voltage, current, power curve), supporting 7-day historical retrospective

- Acquisition quality: statistical success rate, completeness rate, timeliness rate, equipment on-line rate, locating acquisition weaknesses.
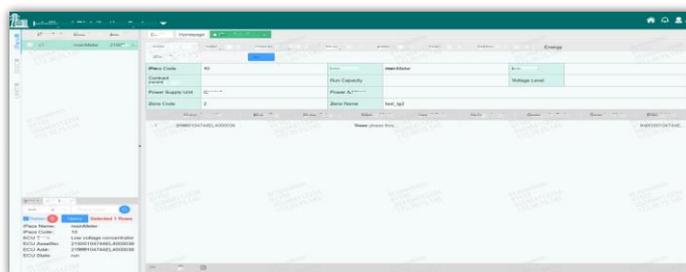
4. Distribution Transformer monitoring

- Real-time monitoring of transformer data in real time: V, I, kW, KVAR, KVA, PF, kWH, kVARH, system loss level, THD and data from IoT Sensors such as tank temperature, ambient temperature, humidity etc.

- Data collection: Terminal APP collects and reports the data to roma platform, roma platform forwards the data to kafka message middleware through rule engine, and kafka data will be stored in the main station of distribution network. The data reporting frequency can be set to 5,15,30 or 60 minutes.

- Power outage:The voltage monitoring threshold is utilized to detect voltage conditions, with the threshold adjustable between 50% and 80% of the rated value. When the voltage drops below 50% of the threshold, it indicates an under voltage condition. Conversely, when the voltage reaches 80% of the rated value, it signifies a power outage.

- Abnormality warning: When transformer abnormality occurs, you can analyze the reason of abnormality through the curve of voltage, current, power, temperature.

- Trend insights: support long-term, seasonal and episodic voltage problems statistics, assisting grid transformation decision-making
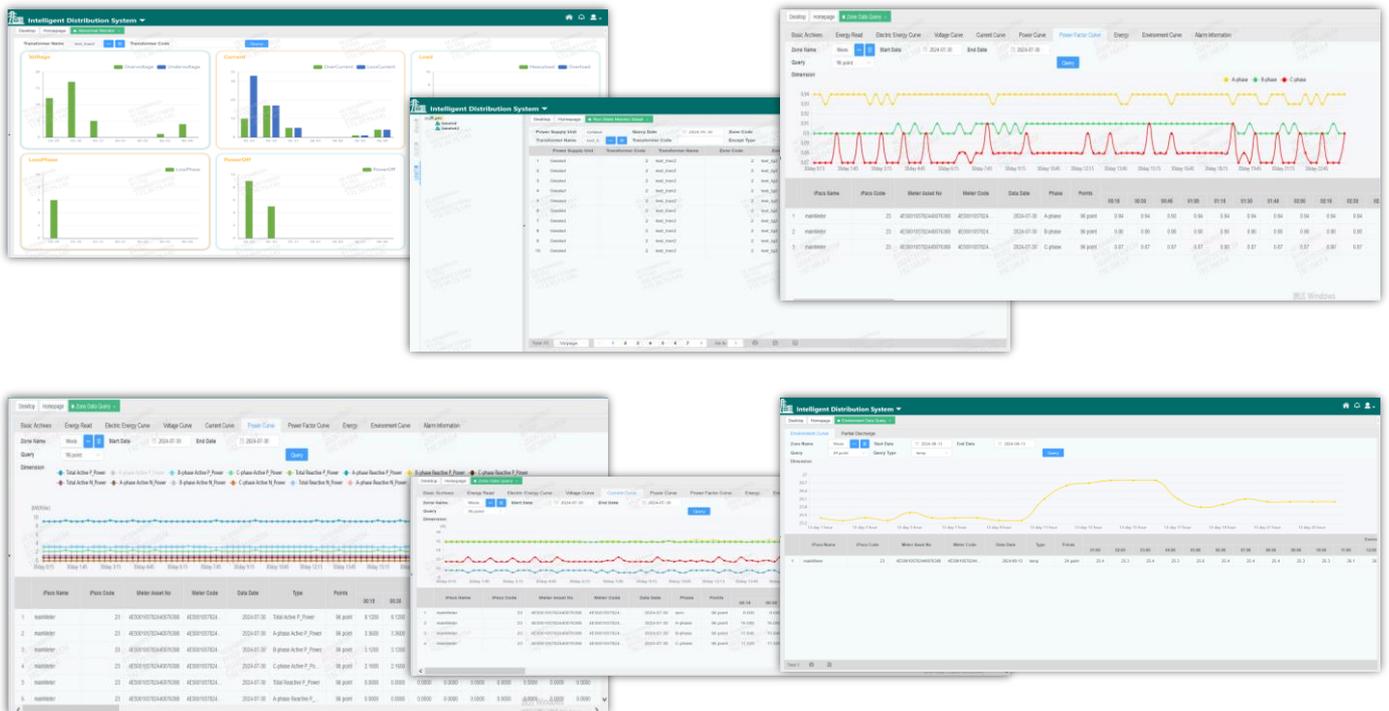
5. Analysis of line losses in the area of the station

- Dynamic monitoring: line loss rate segmentation statistics (qualified rate, high loss rate), automatically generate governance reports

- Intelligent self-testing: Diagnose the root causes of problems such as file errors and metering anomalies, and provide measures to address them and track their effects. The following are some of the most important features of the system


6. Analysis of power outages

- Panoramic view: real-time statistics on the number of outage users, stations and lines, and the authenticity of outage and resumption events

- Event Traceability: Correlate the terminal and meter shutdown records to distinguish between the original event and the system's findings
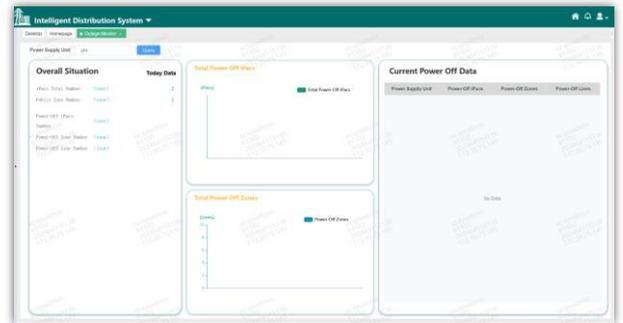

7. Anomaly alerts

- Alarm details: you can query the details of Distribution transformer anomalies, in the alarm details can be viewed according to the type of anomaly.

- Anomaly Analysis: Provide anomaly analysis such as system loss level per DT, overload level, under/over voltage, under/over frequency, reverse power, THD level and related troubleshooting recommendations

- Abnormal push: desktop push, internal email, SMS push to users. You can customize the frequency of push, also can be customized according to the importance of the level of internal mail and SMS push. Customers need to provide SMS platform interface and mailbox server.
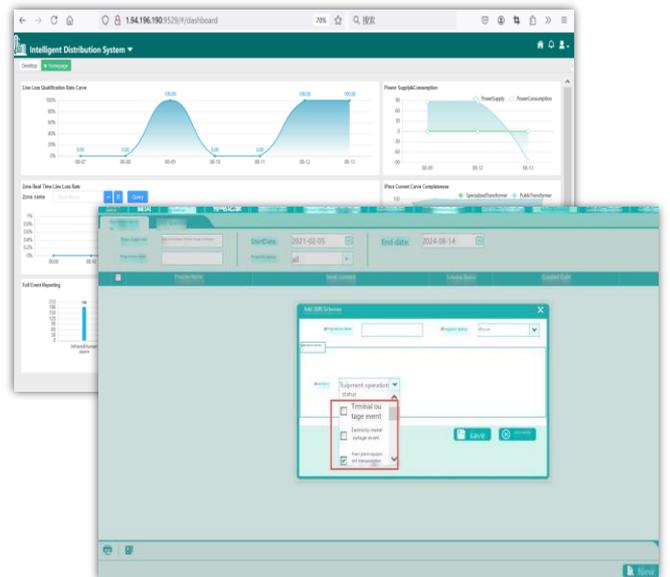
8. System Disaster Recovery

- Highly available in a single server room. Micro-applications including front-end, gateway, and business micro-applications are deployed using multiple instances and containerized deployment. Micro-applications use feign calls internally. Front-end and gateway have ELB for load balancing to achieve high availability of applications. Front-end services use load balancing mode, all services are load balanced on two ECS servers, when a server fails, the traffic is automatically switched to another server.

- Cross-center high availability. Data Management Service DAS is used to synchronize the database synchronization of the main and standby center in real time. When the main center is unavailable, the backup center will completely take over the business of the main one. In order to ensure the continuous development of the business of the system, the main switching contents are as follows:
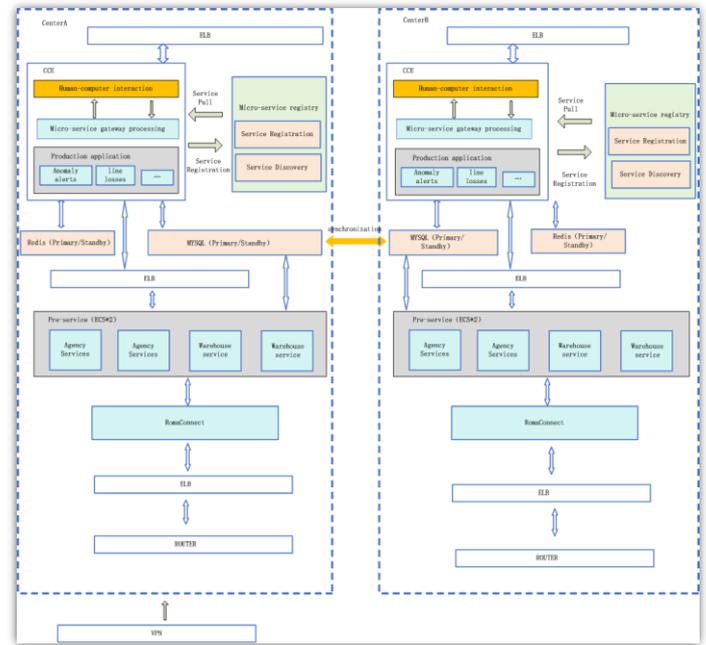
(1) The user visits the system address of the power distribution master station in the backup center, and the switching time is 1 minute.

(2) Synchronous suspension of data from the database in the main center to the database in the standby center.

(3) Manually operate the border router equipment, and the channel is automatically switched to the backup line in the backup center, and the switching time is 5-10 minutes.

(4) The acquisition terminal is disconnected and reconnected to the backup center, and the switching time is 10-15 minutes. When the main center has the conditions to switch back, the main switching content is:

> 4.1 Reversely synchronize the relevant database data of the backup center to the main center.
>
> 4.2 Manually operate the border router equipment to switch the operator's APN dedicated line to the main center, and the collection terminal is disconnected and reconnected to the main center.
>
> 4.3 Synchronous opening of the database in the main center to the database data in the standby center.
>
> 4.4 The user accesses the system address of the power distribution master station in the main center, and the switching time is 1 minute When the backup center is unavailable, the main center has been handling all business normally, and the business development of the main center will not be affected when the backup center is unavailable:
>
> > -Data synchronization suspension from the main center to the backup center When the backup center is restored:
> >
> > -The data from the main center to the backup center is synchronously opened.

9. Customization of Reports

- Report customization: report statistics, generate report details and provide download function.
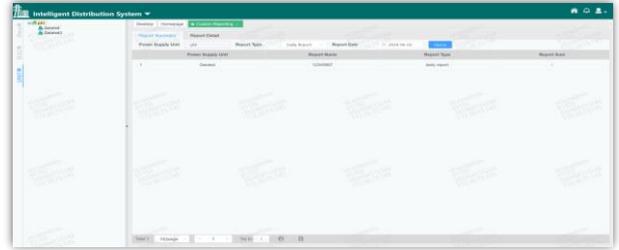
10. Thematic customization

- Thousands of faces: user-defined monitoring themes (line loss rate curve, load analysis, etc.), data broad generated with one click

11. Access to other systems

- High compatibility: can push data to other systems of the customer, such as voltage, current, power, etc.

- Supported interfaces and protocols: Restful/Kafka.