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V.A.D Technical Engineering and  
Investment  
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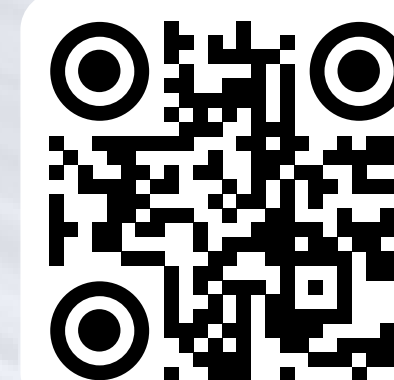
GLOBAL

# Enterprise IoT Platform

Full Technology Stack From One Source

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GLOBAL

# Enterprise IoT Platform

Eco-conscious consumption using IoT technology

## Key objectives

To increase awareness of resource consumption, reduce emissions into the atmosphere, reduce energy consumption, reduce energy dependence, unify data transmission technologies, automate accounting and reduce costs, ensure transparency of resource supply, improve planning and forecasting, eliminate claims work, implement predictive analytics using AI, transparent monitoring and audit, improve security, increase trust in government institutions.



Global Enterprise IoT Platform is compliant with the international security management system ISO/IEC 27001



## Reduction of Resource Consumption

- Reduction of energy consumption by automating the control processes of HVAC systems, lighting, household appliances.
- Adaptive control of resources consumption with the ability to adjust to specific conditions and preferences of residents, including the use of predictive models.
- Possibility of integration with smart grids and other smart city elements to improve overall energy efficiency.

from **10** to **40** %



## Reduction of Emissions into the Atmosphere

The reduction of harmful emissions into the atmosphere occurs due to the overall reduction in energy resources consumption.

more than **10** %



## Reduction of Resource Accounting Costs

- Collection and automatic processing of energy consumption data in real time.
- Modeling and adaptive planning of consumption scenarios using machine learning algorithms to predict energy consumption based on historical data, weather conditions, and occupant preferences.
- Reduction of operating costs by optimizing the operation of engineering systems and using flexible electricity tariffs.

Up to **70** %



# Main Tasks



STEP 01

## Collect information from all types of devices into a single system at the lowest possible cost:

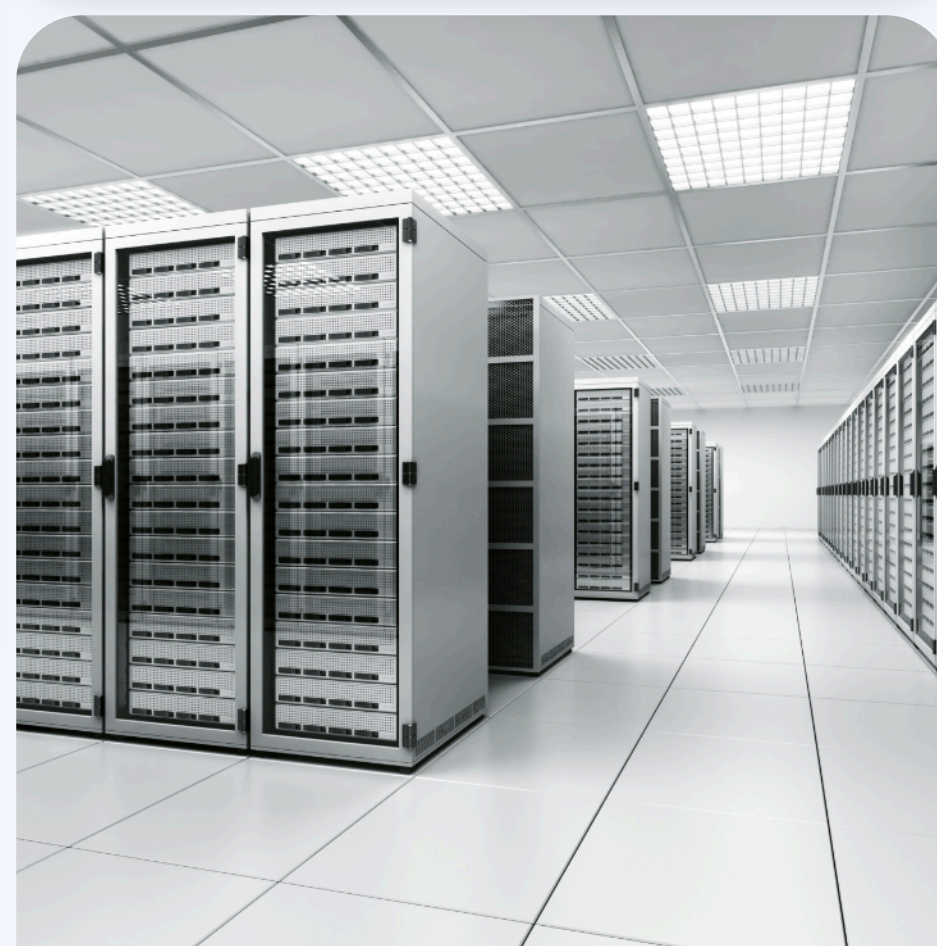
- Save all operating devices by integrating them into the system.
- Retrofit existing metering units with telemetry.
- Install new meters with data transmission.
- Identify control points and install sensors to monitor, search and eliminate all types of energy leaks.
- Integrate devices into energy-consuming equipment (air conditioners, fan coils, boilers, heat pumps).



STEP 02

## Digitize the supply chain of resources in sections:

- Supply hierarchy.
- Demand hierarchy.
- Energy zones.
- Geoinformation scaling.
- Data access hierarchy.



STEP 03

## Create a unified reporting system



STEP 04

## Implement predictive analytics mechanisms



STEP 05

## Assign roles and train staff



STEP 06

## Train AI models to control and manage:

- Resource consumption balance.
- Resource supply forecasting.
- Identifying anomalies in resource consumption.
- Search for and control of critical, unbalanced zones of resource consumption.
- Identifying areas of resource leaks.
- Identifying areas of excessive resource consumption.
- Formation of recommendations and instructions for management personnel.
- Tasks, target functions and control of accompanying and service personnel.
- Formation of a corrective action plan for all segments/hierarchy of supply and consumption of resources.

# Technical Requirements

## IIoT, IoT Hardware, Resource Meters with integrated IoT

- Typed exchange protocols.
- Support and availability of UTD (Universal Telemetry Device) driver for the upper-level platform.
- Availability of cross-platform OPC UA/DA server (for devices with external interface lines).
- Ability to compress and encrypt data packets
- Use of existing data transmission networks and no costs for creating a network data transmission infrastructure.
- Support of translator mode for devices with external interfaces (the entire algorithm and polling mechanism is prescribed in the upper-level system).
- Active protection of connections (blockchain, tokens, sessions).
- Minimum power consumption per session.
- Guaranteed number of communication sessions.
- Guaranteed service life.
- Minimum traffic per session.
- Use of low-temperature power supply -40..+50 C.
- Requirements for monitoring the gain of product antennas.
- Minimum cost of components.
- Requirements for PCB corrosion protection procedures (for manufacturers).
- Climatic protection requirements.
- Self-diagnostics and troubleshooting.
- Monitoring and requirements for internal power consumption.
- Autonomous power supply control.
- Hardware protection and interference control.
- Mechanical protection from interference.
- Storage of event archive.
- Support of GSM (GPRS, NB-IoT) and/or LoraWan.
- Support of standardized interfaces M-Bus, Modbus, RS-485, RS-232, Opto (for devices with external interfaces).
- Installation "on the fly", the device is completely ready for installation at any time, contains sufficient battery life and traffic for the entire period of operation.
- Absence of any requirements for startup, configuration and commissioning operations (except for plumbing and mechanical work for a specific metering unit).
- Replacement "on the fly" with new device in warranty cases (service interval should not include repair time).
- Availability of a personal account and/or mobile application for the end user.
- Ability to notify the user about events
- Clearly defined permissible error (for meters with integrated IoT).
- Documented resource calculation methodology (for meters with integrated IoT).
- ROHS - compatibility.
- Compliance with national standards and requirements.





# Technical Requirements

## Data Collection Server

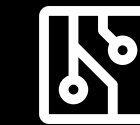
- Multi-threaded data collection, UTD drivers for any type of device.
- Multi-processing and load balancing.
- Support for virtualization of processes and modules.
- Multi-resource accounting.
- Scalability (world-country-region-settlement) in all aspects: data storage, resource accounting, analytics).
- Hierarchy of supply, consumption, zoning, etc.
- End-to-end management of user roles and hierarchies.
- Compliance with security directives.
- OpenSource, usage of open libraries and open DBMS.
- Cross-platform.
- AI and predictive analytics modules.
- Sets for external integrations (API, export-import, support for typed exchange protocols, electronic document management).
- Multi-language interface, a single set of related linguistic dictionaries for all interfaces.

## Manufacturers and Vendors of IIoT, IoT Devices, Resource Meters with integrated IoT

- Guarantee of compliance with production localization requirements (launch of the production technological cycle less than 6 months).
- Automation and documentation (logging of actions and parameters) of all production processes.
- Low technological complexity of production processes.
- Availability of qualified personnel in national labor markets (number is determined by the delivery schedule).
- ISO-9001 2015 quality management system certification.
- Support for the top-level platform.
- Free transfer of the UTD driver and/or cross-platform OPC UA/DA server for the operation of each IIoT and IoT device.
- Availability of a minimum amount of warehouse stock of finished devices (determined by the delivery schedule).
- Availability of a certain % of devices for replacement during the warranty period.
- Compliance with international and national requirements and standards.

## Implementation Stages

- Audit
- Formation of a reference book of national standards and conformities.





# Telemetry Devices and PCB Production

All-ready Industrial and household devices

## Household telemetry and Smart Meters

- Alphanumeric LCD display.
- High quality PCB antenna.
- Resistance to ultraviolet radiation.
- Extended temperature range from -40 to +60 °C.
- Proprietary data transfer protocol, low load on the GSM network.
- Two independent power supplies - for the metrological and telemetric parts of the board.
- Storing and transferring archives to the server: accumulated volume; consumption and temperature values averaged over an hour; archives of accidents, emergency situations, events.

## Industrial telemetry

- A universal solution for industrial energy metering units equipped with a digital interface.
- A single type of telemetry module for all types of energy metering devices.
- All operating logic - functions of reading and processing data transmitted from metering devices - is performed on a secure collection server.
- Convenient and quick addition of support for new types of devices and data exchange protocols to the server.
- Universal module for scheduling communication sessions.
- The schedule of data transfer to the server can be quickly changed and determined by the gas supplier.



### Up to 10 years battery life

Reduced power consumption, telemetry power supply LiPo 2000mAh 4.2 - 3.4V.



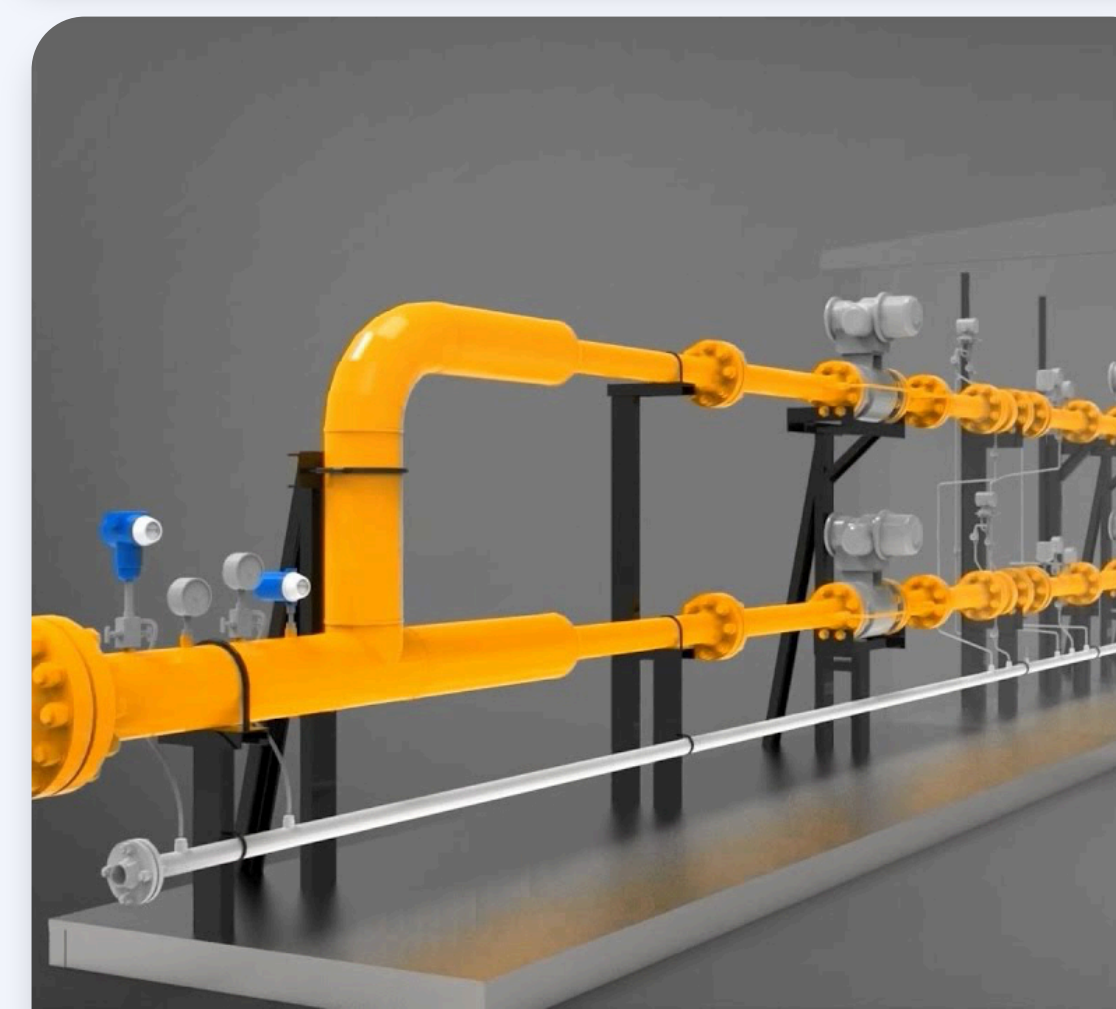
### NB-IoT/GPRS version

Controller supports internal firmware and fast data exchange with the server.



### GSM traffic optimization

The amount of traffic is minimized by transmitting only incremental data.



01  
10

### Electronic counting mechanism with telemetry module.

- Automatic transmission of Smart Meter readings to the collection server, remote control of the shut-off valve, monitoring of leaks and exceeding the maximum flow rate.
- Controlled parameters: archives of meter readings, emergency situations, events, interventions, impacts, etc.
- Various display modes.
- It is possible to easily adapt the board to any type of membrane natural gas meter.



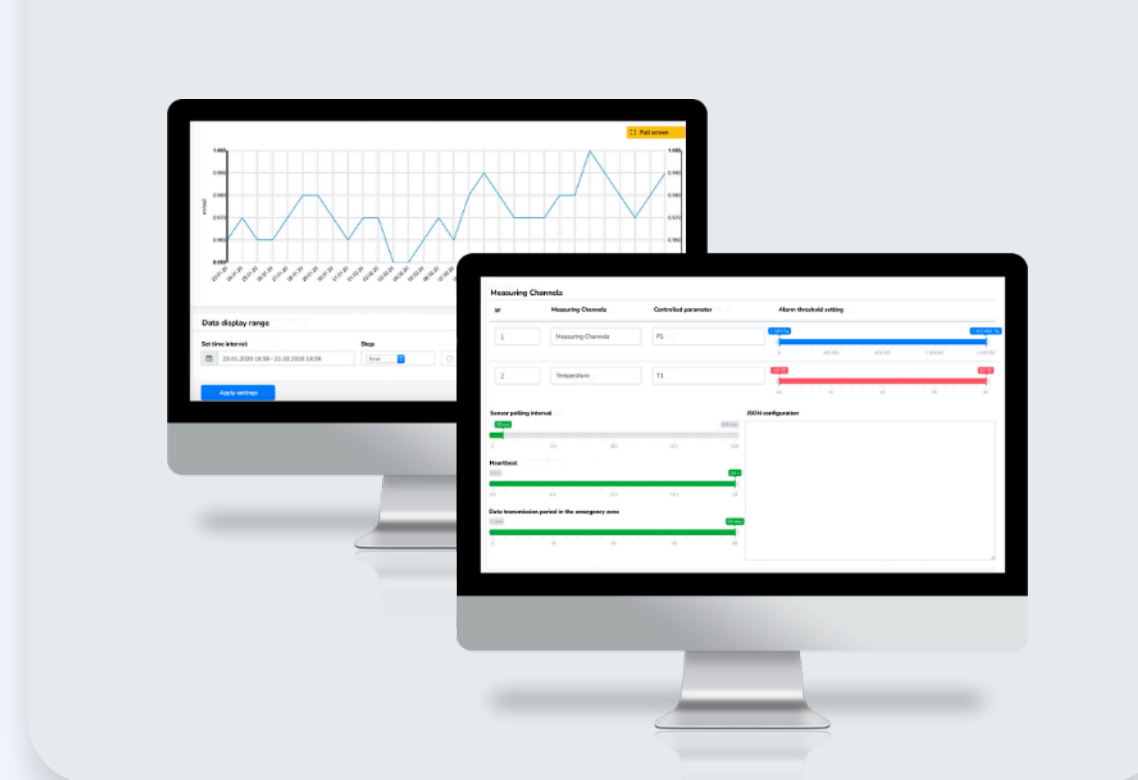
# Pressure and Temperature Sensors

Self-powered devices with build-in telemetry

vd-SENS sensors are designed for monitoring systems for operating parameters in industry: gas facilities, hydraulic and pneumatic systems, water treatment and heat supply systems, boiler automation, water supply automation, heating points, etc., where increased accuracy of pressure measurement is required.

## Technical specifications:

- Gauge and absolute pressure sensors.
- Rechargeable Battery life is up to 10 years.
- GPRS/NB-IoT, continuous measurement mode.
- IP65.
- Permissible overload 1.5 Rmax
- Operating temperature range from -40 °C to + 85 °C.
- Controlled parameters: pressure, measurement accuracy 1%; temperature, measurement accuracy  $\pm 1$  °C.
- Customizable parameters: measurement frequency; schedule of data transfer to the server; limit values for out-of-order data transmission.
- Gas control: CO, CH<sub>4</sub>, C<sub>2</sub>N<sub>2</sub>, HF, HN<sub>3</sub> and other dangerous gases.
- Air/microclimate parameter control.
- Control of electrical network parameters.
- Control of water parameters.



## Online monitoring and alarm notifications

The sensor will reliably inform you about the state of pressure and temperature in the resource supply networks.



## Customizable settings

Dispatcher configures a frequency of measurements, a schedule for transferring data to the server, and the boundary values for out-of-order data transfer.



## Secure data transfer

The data collection and processing server is implemented on the basis of the Unix/Linux platform, certified according to the security requirements for operating systems.



## Measuring ranges

Gauge pressure:

- 0 - 5 kPa
- 0 - 40 kPa

Absolute pressure:

- 0 - 160 kPa
- 0 - 400 kPa
- 0 - 600 kPa
- 0 - 1.0 MPa
- 0 - 1.6 MPa
- 0 - 2.5 MPa
- 0 - 4.0 MPa
- 0 - 60 MPa

Temperature:

- -40 °C...+ 85 °C





# Data Collection Server

## Platform Advantages

A unified server data collection system for industrial and household resource metering units, which is designed to create secure automated systems on its basis. Due to the use of the Unix/Linux OS, the system has a high degree of scalability, fault tolerance and availability.

### Wide Range of Metering Equipment Support

The platform supports a widest range of gas/water/electricity meters, gas volume correctors, sensors, etc.). It also offers quick and convenient addition for new types of devices and data exchange drivers to the server even without the participation of developers.



### Modular Architecture

Distributed database and multi-threaded data processing modules for server load optimization.



### User Experience

Fully functional web-interface accompanied with mobile app for Android and iOS devices.



### Stable & Secure Code

Thorough code testing and external audit.



### Multilanguage Support

12 languages already supported with more upcoming soon.



### Easy Scalability

- ↓ Single resource supply company
- ↓ Group of companies
- ↓ Region
- ↓ Country
- 🌐 [Worldwide](#)



### Access Administration

Role-based access control (RBAC) with a specific set of rights and authorities for each user.



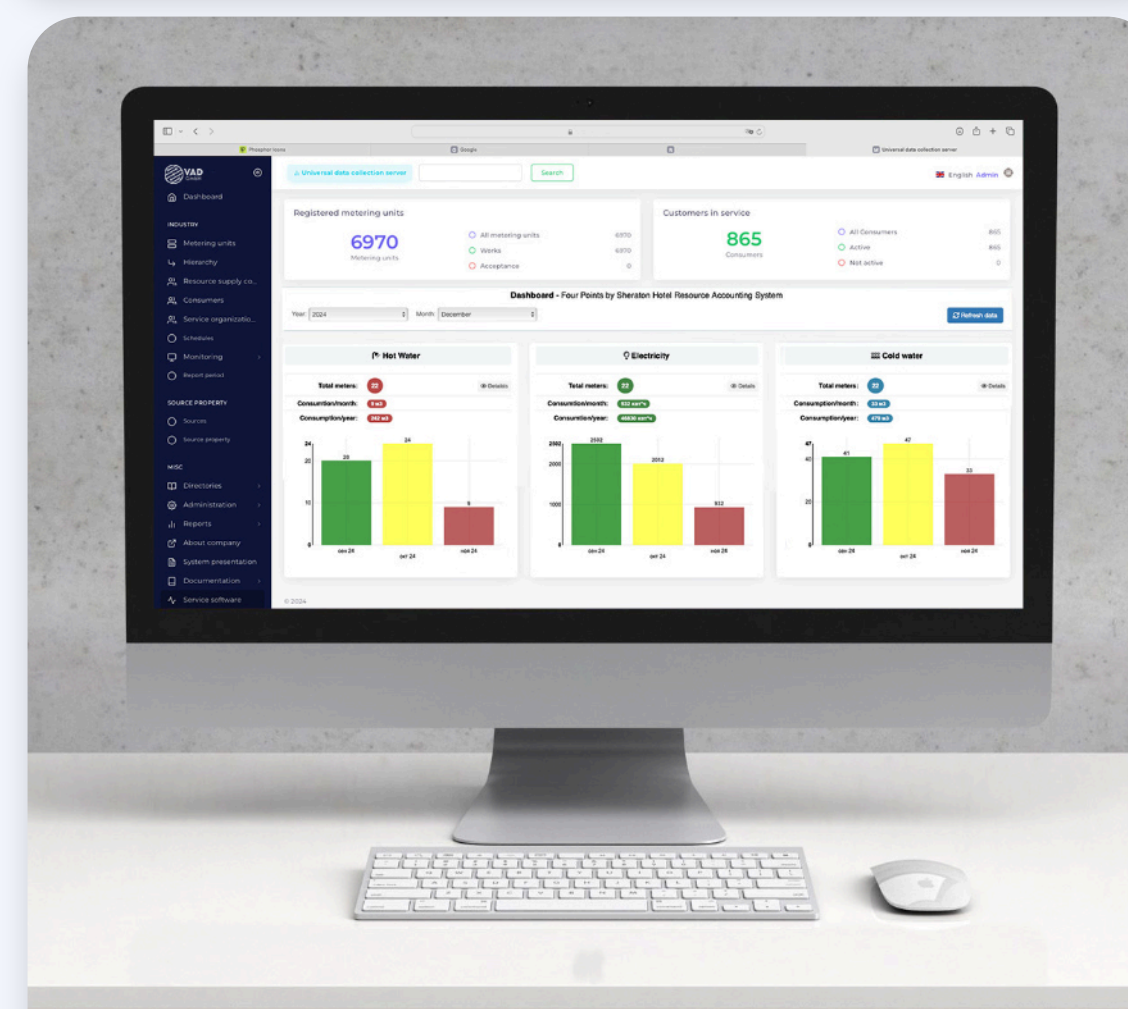
### Cost Efficiency

The server software can be easily installed on existing server platforms as a virtual server, without purchasing new server hardware.



### Predictive Analytics

Resources consumption patterns and trends analysis, including searching for seasonal patterns, analyzing external factors dependencies, predicting future consumption. The module provides the ability to visualize resource consumption data using adjustable color tables.





# Data Collection Server

## Platform Advantages

The system is administered via a secure HTTPS protocol through a web browser. The module for working with the universal report form allows the user to perform a selection and hierarchical presentation of data according to any specified criteria (customer, resource, equipment, time period etc.)



### Multi-tenancy

Enables one application instance to serve multiple customers efficiently.



### Power grid diagram

Automatic creation of a connection diagram for power grid nodes.



### High availability

Ensuring continuous operation of the server system and minimizing downtime.



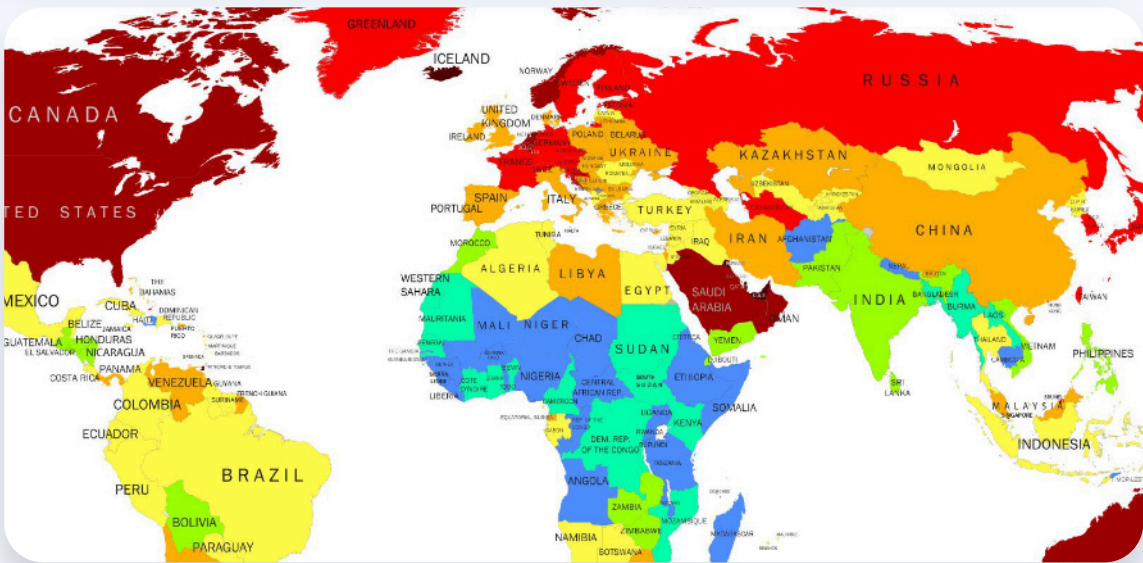
### AI Agents

Possibility of setting up AI agents to automate business processes



### Energy consumption map

Displaying a geographic map of energy consumption, highlighting areas with the highest and lowest energy consumption.



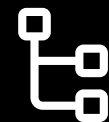
### Smart Contracts

Ability to use smart contracts to automatically generate invoices based on data from IoT devices.



### Automatic optimization of business processes

Optimization of business processes for forecasting energy consumption and planning energy supplies to consumers.



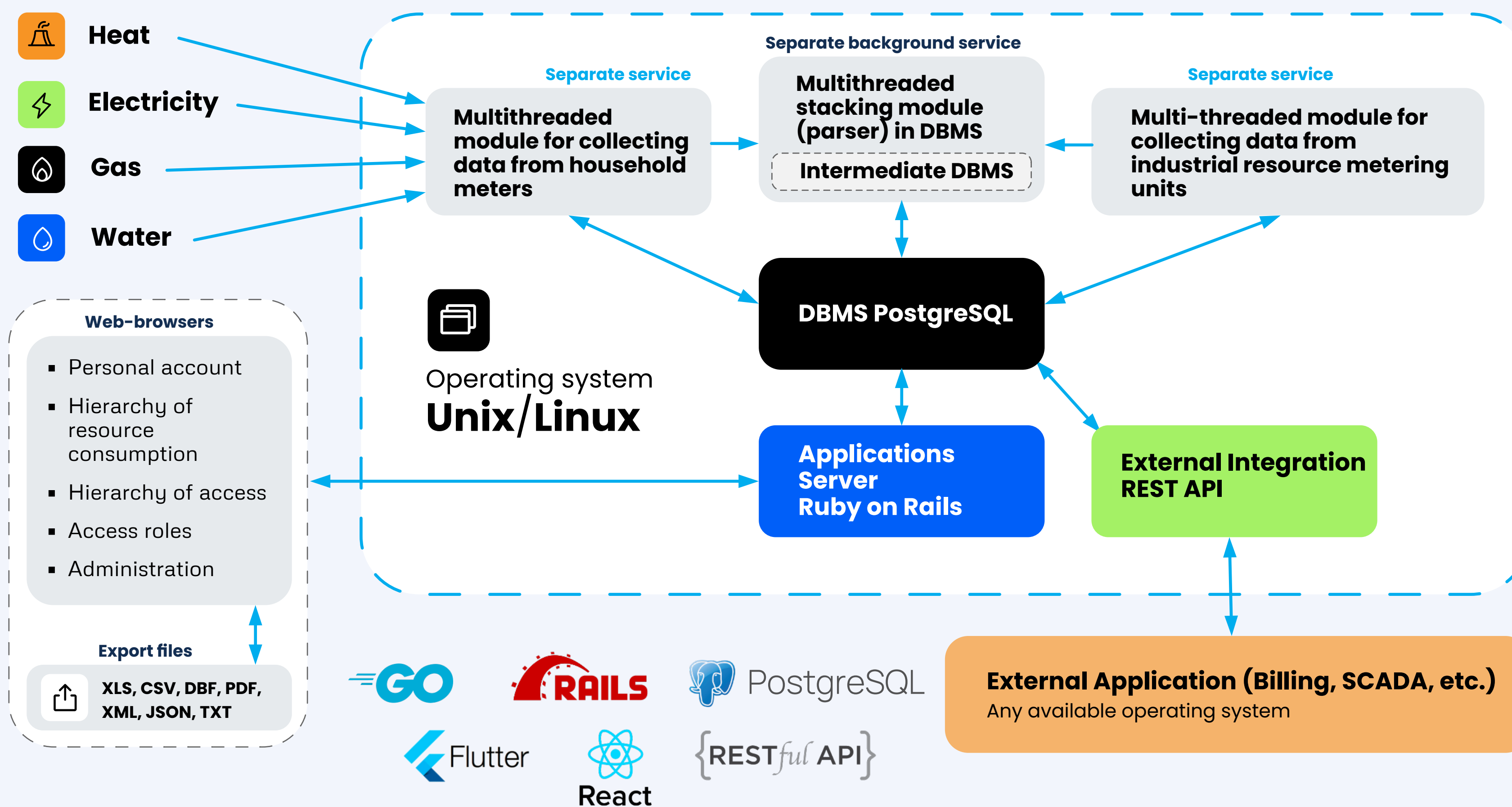
### Hierarchy of energy supply system

The system provides accounting of energy consumption in real time by system objects using the hierarchical connection principle.



# Data Collection Server

Structural Diagram of Server Processes



## Integration with Electronic Document Management Systems

Automatic generation and sending of energy consumption reports signed with an electronic signature.







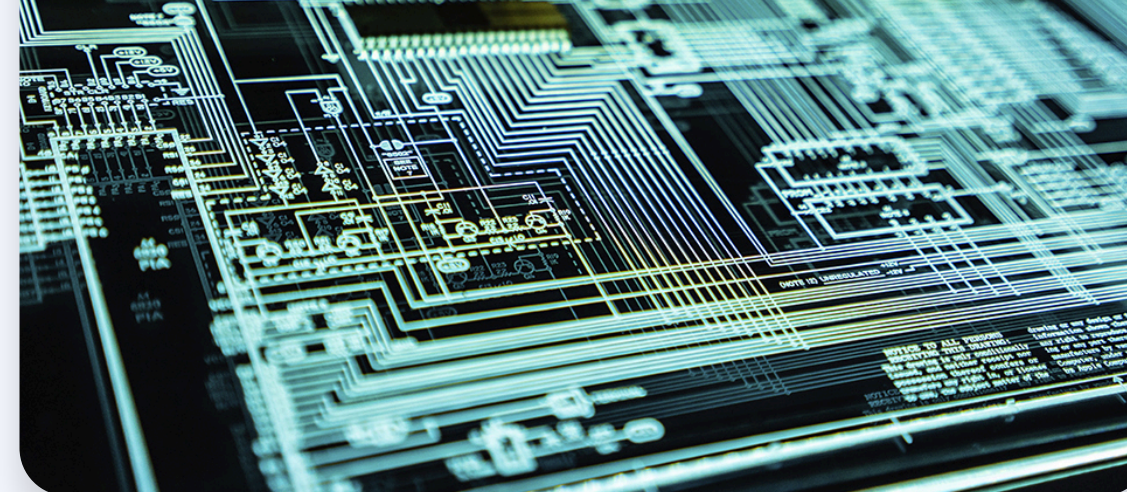
# High-tech Production and Assembly Lines

Turnkey Production

Automation of the assembly process allows to increase production volumes and improve the quality of our products. It gives us ability to quickly scale production capacity if necessary, and also to reduce costs (including environmental costs).

In our production cycle we use:

- Automated equipment for assembling electronic modules;
- Optical and X-ray inspection systems for testing the quality of manufactured products for possible defects in soldered joints of printed circuit boards, electronic modules, etc.;
- Robotic manipulators for precise mounting of miniature components on printed circuit boards, moving products between production stages, assembling finished products into a housing;
- Automatic units for feeding components and printed circuit boards from bulk, tapes or storage systems;
- Assembly machines with a belt conveyor and computer control, providing comprehensive mechanization of the production process and other equipment.



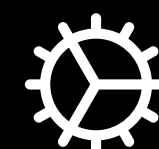
**In-house production of smart meters, telemetry units and modules**



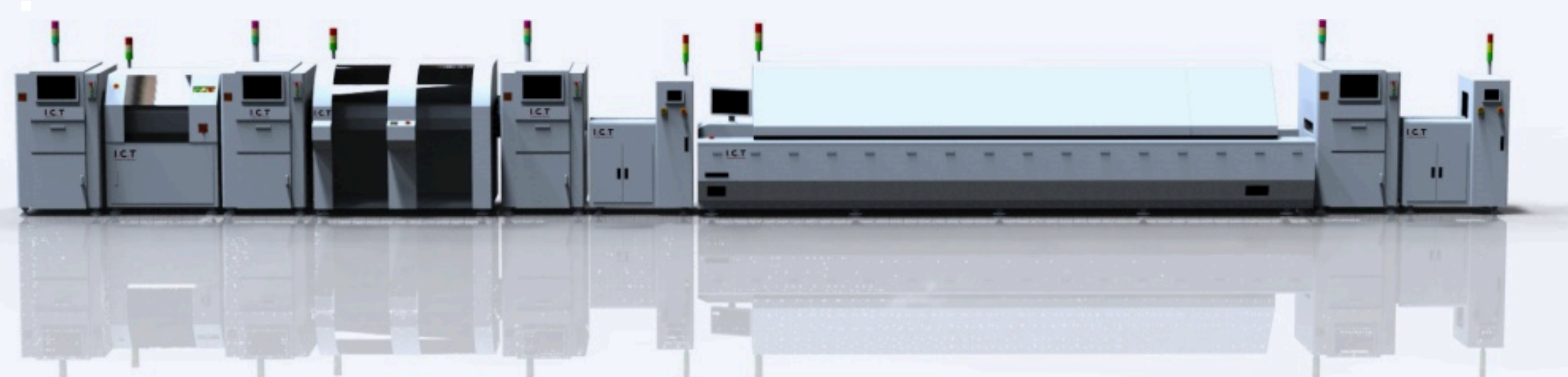
**Verification and calibration rig and software**



**Automated SMD lines for middle and large-scale production**




**Production management software**



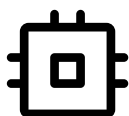


# Our Competencies

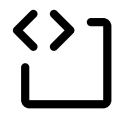
The main direction of the company's activity is the design, creation and maintenance of information-control systems of any complexity level. We develop innovative solutions in the field of process automation and telemetry of industrial and communal facilities.




More than 25 years of experience




In-house micro-electronics design office




Unix/Linux Software development team



More than 40 patents and inventions



Automated printed circuit board assembly lines



Full product launch cycle

## Technologies we use:






 PostgreSQL
 
 docker
 
 git



 {RESTful API}
 
 tailwindcss
 
 React
 
 Flutter





 python™
 
 Adobe® Creative Cloud™
 
 CODE



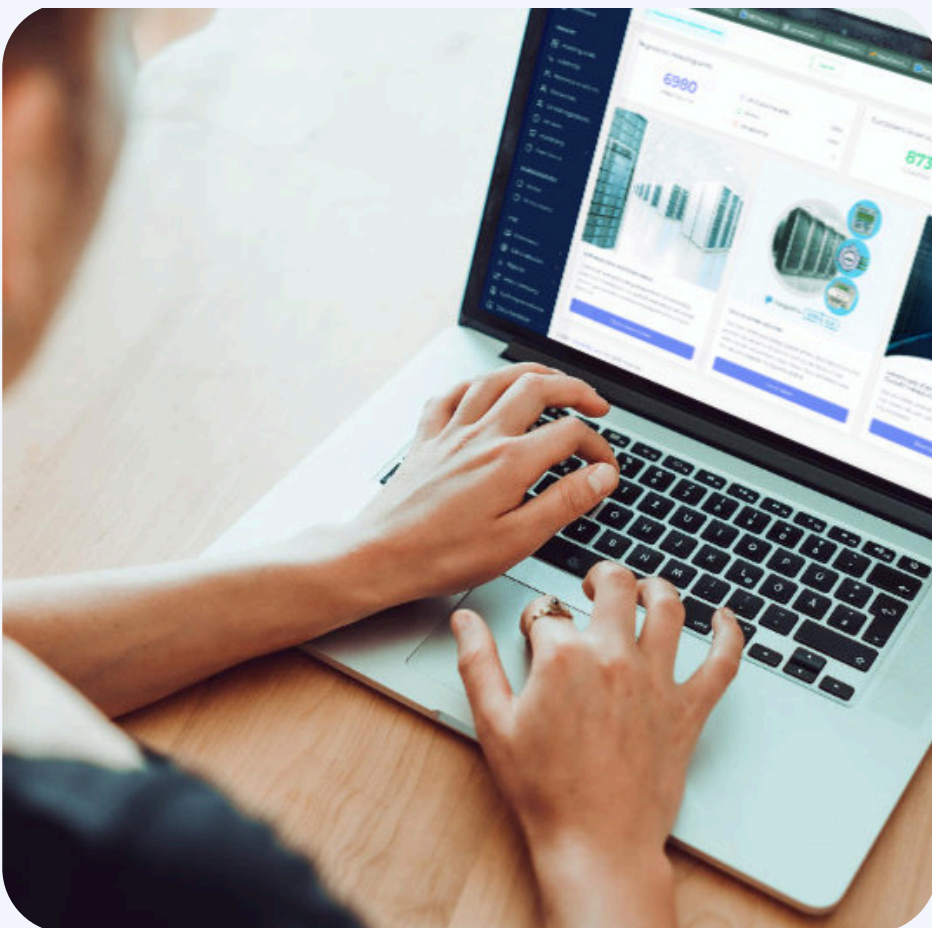
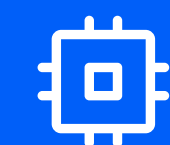
## Server Software Development

More than 20 years of experience in building secure server software, failover clusters and operation systems.



## Microelectronics Design and Development

Up to 100 telemetric and metrological devices






# Company History Timeline


1999

The SCADA system has been developed and implemented




2002

Telemetry system for industrial gas metering units series vdTel




2003

The billing system "Accounting of natural gas subscribers" has been developed and implemented




2006

Monitoring system for gas distribution stations/hydraulic fracturing




2009

Self-powered telemetry units for household gas and water meters vdTel-G3




2010

Virtual Server Management System




2012

Multi-terminal complexes




2013

Self-powered telemetry units vdTel-W7




2015

"Secure IoT platform for collecting and processing telemetry data"



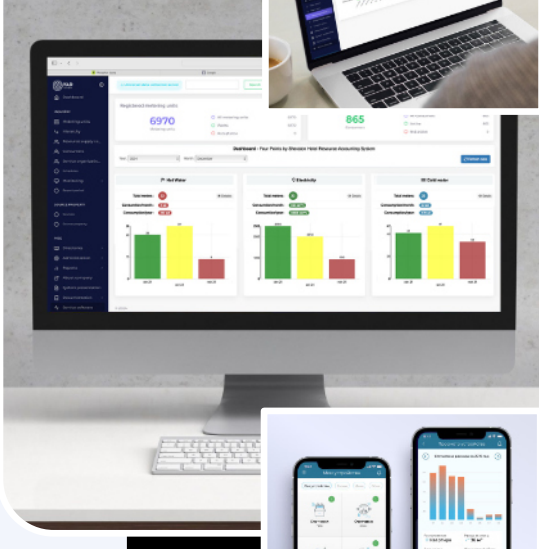
2016

Self-powered pressure and temperature sensors vd-SENS




2017

Automation system for accounting of housing and communal services resources




2018

Mobile application "Smart Consumer"




2020

Predictive analytics modules and implementation of AI mechanisms




2021

Smart gas meters (for 5 types of meters)




2023

OPC UA/DA servers




2024

Development of sensors with integrated AI



2025

ANNOUNCEMENT Automatic SCADA system for constructing resource supply schemes using AI





# Our Contacts

We're ready for mutually beneficial partnership, full/partly copyright transfer, free source code training, deployment of production in the country of a customer.



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