

ULTRASONIC SMART WATER METER



2025.02



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PENTAFORCE
CORPORATION LIMITED



Hexing Profile

Company Profile

Established in 1992 and listed on the main board of the Shanghai Stock Exchange in November 2016, Hexing has always been dedicated for the sustainable development of global utilities by offering a variety of smart electric solutions and services.



Global Employees

> 3500



Years of Experience

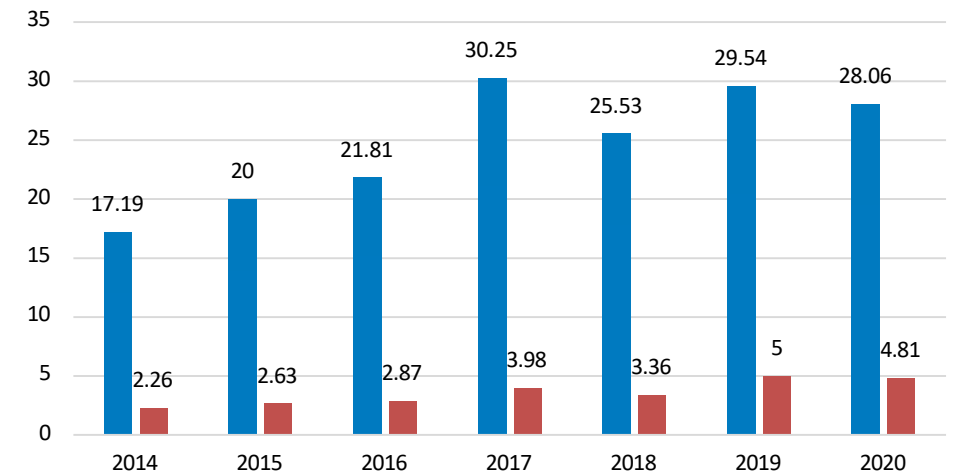
29



Countries

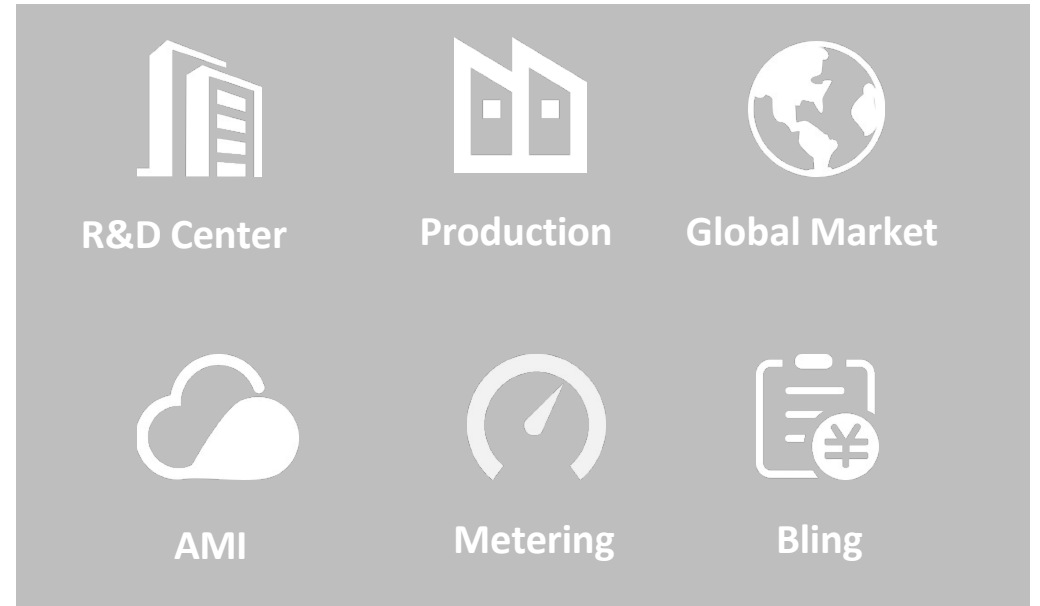
> 90

Revenue and net profit



Ningbo ZLINK Technology CO. Ltd is subsidiary of HEXING Group, established in 2012 as water meter division in ZLINK metering department and was reunited as ZLINK technology in 2018, focuses on IOT products and water related business. ZLINK has R&D centers in Hangzhou and Ningbo, production factories in Ningbo and Brazil.

ZLINK is committed to be the innovative water ecosystem provides on delivering a smart metering solution for drink water system and agricultural irrigation with the cutting-edge IoT technology, set new standards for accuracy, performance, and reliability.





Key Technologies

Transducers

Self-developed & produced transducer,
20 years' working life

Communication Module

Extremely low power consumption, stable

Ultrasonic Water Meter

High accuracy, low pressure loss, long and
stable service life



Professional Production

Automatic production

Automatic production lines, quality
guarantee

Traceable supply chain management

Fast manufacture and delivery

Full sizes production

DN15 to DN600 ultrasonic water meter
production and calibration ability



CNAS Testing Ability

CNAS certified lab (ISO17025)

Can conduct all ISO4064 related tests:

EMC test: Static pulse test, Surge
test

Environmental test: IP 68 test

Reliability test: Accuracy test,
Pressure test
Etc.



Enterprise Qualification

Technology leads

- Wi-SUN certification
- SAP integration certification
- CMMI Level 5 Certification

Company Certification

- ISO9001
- ISO17025
- ISO14001
- IEC27001

Product Certification

- STS 2.0 certification
- Brazil INMETRO certification
- Type approval certificate for the full range of products
- MID certification





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ZLINK Water Meter Overview

Ultrasonic Water Meter



Smart Residential Meters



Smart Building Meters



Smart Bulk Meters

Magnetic Meter



Magnetic Water Meter



Magnetic Flow Meter

Meter Box



Residential Meter Box

Residential ultrasonic water meter

Outstanding performance

Q3/Q1=R500

Starting Flow Rate 1L/h

≤25kPa pressure loss

Bi-directional flow measurement

Remote communication

Support optical interface, RS-485 interface, M-BUS interface

Support NB-IoT, RF and other remote communication

Support STS prepaid function

Extremely stable and long service life

high strength Anti-aging

No moving parts, no wear, IP68

Low power consumption design,

Stably work for 10 years

Easy implementation

U0D0

Can be installed in any direction

Empty tube design, won't get stuck



Problems ultrasonic meter solve

Water tamper



Tiny flow rate measurement, drip metering

Starting flow rate: 50L/h



Starting flow rate: 1L/h

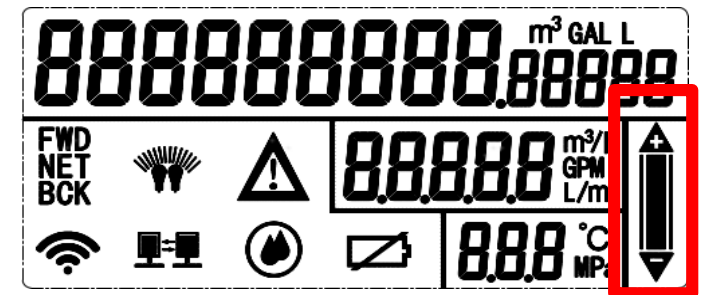


Even if meter is installed backwards on purpose, forward flow rate will be measured individually

Unidirectional measurement

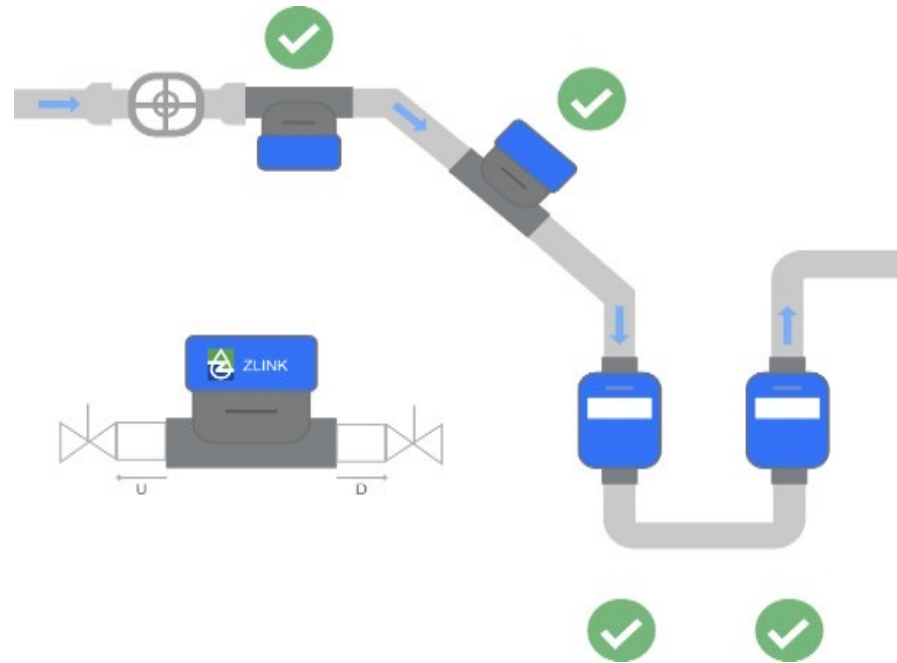


Bi-directional measurement



Problems ultrasonic meter solve

High Requirement for installation



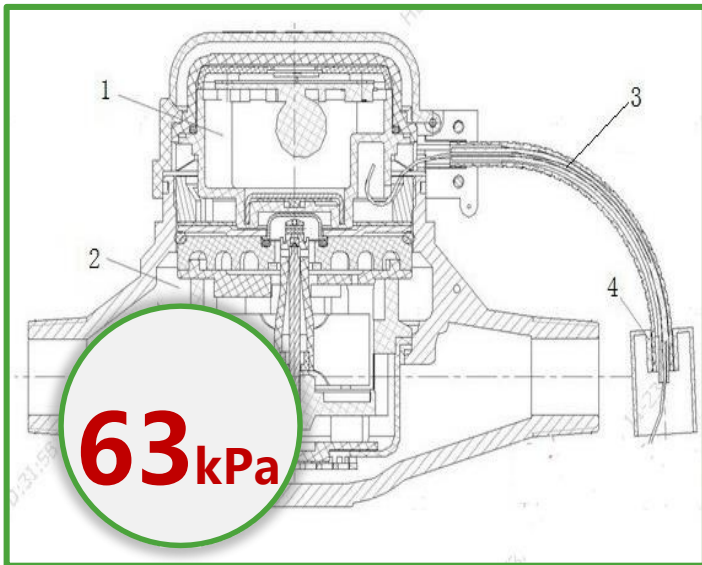
U10D5 **VS** U0D0

Unidirectional **VS** Any direction

Problems ultrasonic meter solve

Big pressure loss, high energy consumption

Very complicated inner design



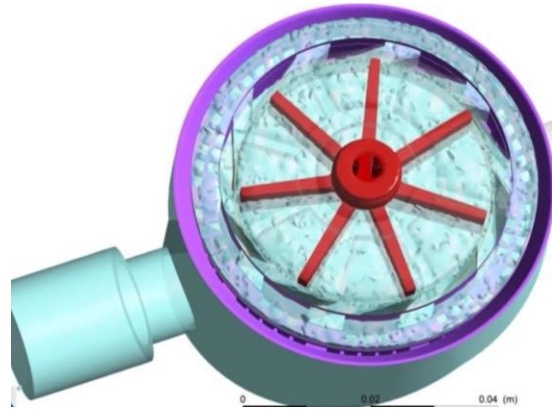
$\geq 63\text{kPa}$ Pressure Loss **VS** $\leq 25\text{kPa}$ Pressure Loss

Empty and simple tube design



Problems ZLINK ultrasonic meter solve

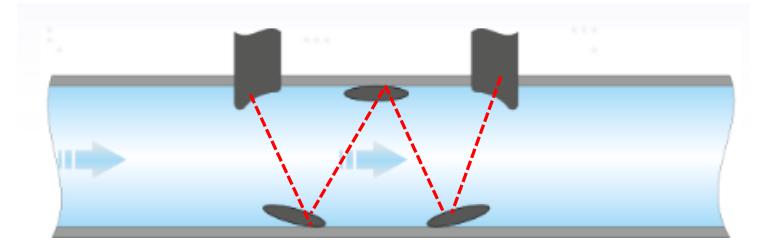
Mechanical wear, short-time accuracy



**Mechanical
movement**

VS

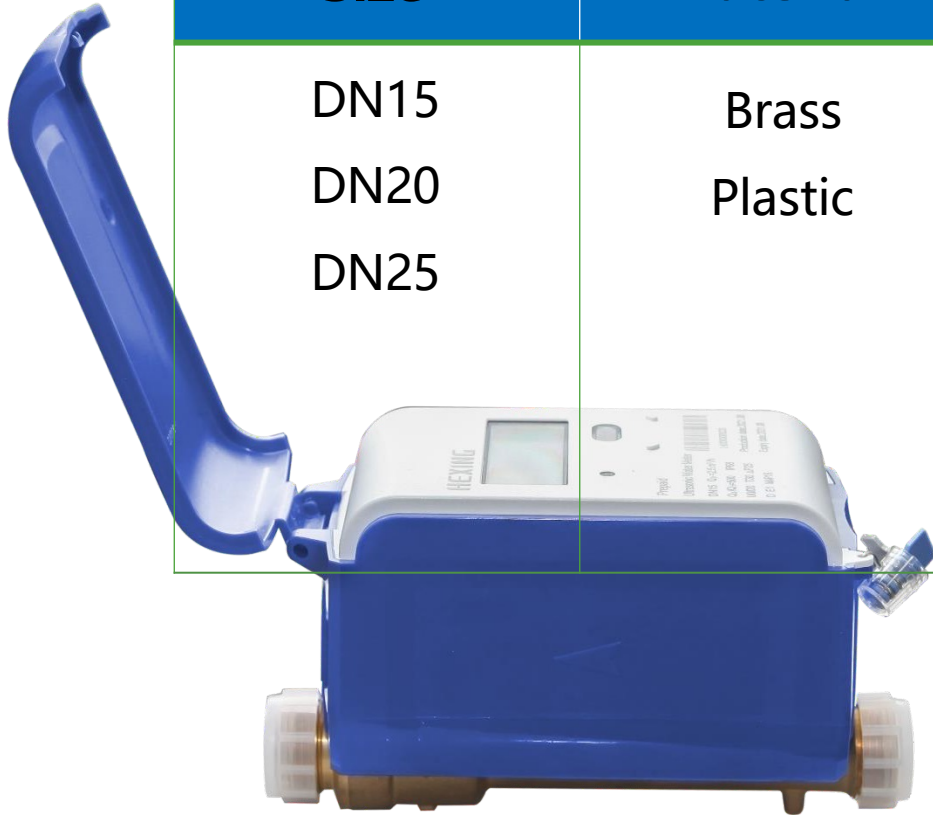
**Static
measurement**

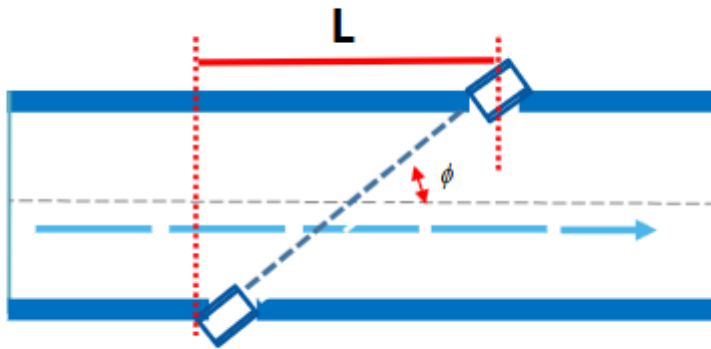




Meter Configuration

Size	Material	Ball valve	Communication	Antenna
DN15	Brass	Included	RS485	Inner antenna
DN20	Plastic	Not included	M-BUS	External antenna
DN25			NB-IoT	
			Pulse	
			RF	





t_{AB} = Ultrasonic downstream propagation time

t_{BA} = Ultrasonic countercurrent propagation time

$$V_m = \frac{L}{2 \cos \phi} \left(\frac{1}{t_{AB}} - \frac{1}{t_{BA}} \right)$$



Working principle: The ultrasonic water meter adopts the **time difference** method to measure the flow; that is, installed one or multiple pairs of transducers at the upstream and downstream of the meter tube. The transducers are used to transmit and receive ultrasonic signals mutually. The propagation speed of the transducer signal in the forward and reverse flow is different. Therefore, the running time of the forward and reverse ultrasonic signals in the water is different. The **flow velocity** of the fluid can be calculated by measuring the difference of the time. And then converted to flow rate, so as to achieve flow measurement.



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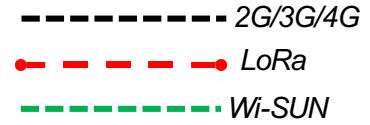
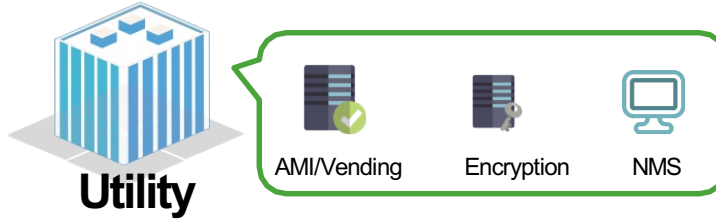
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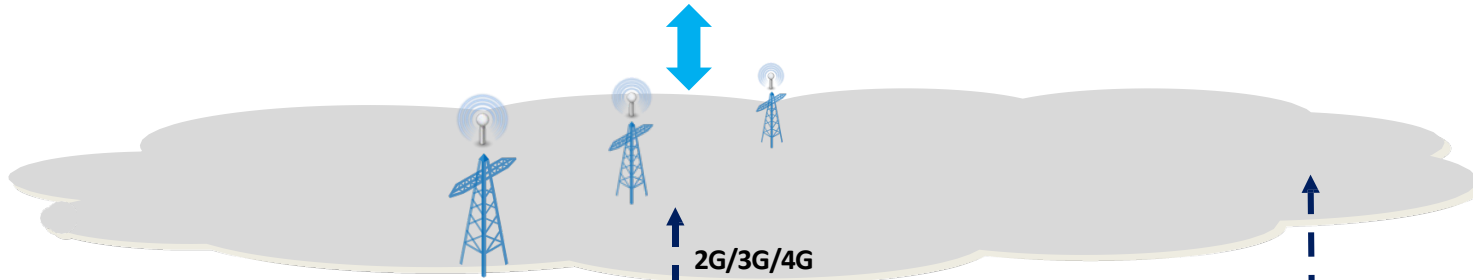


AMI Solution Architecture

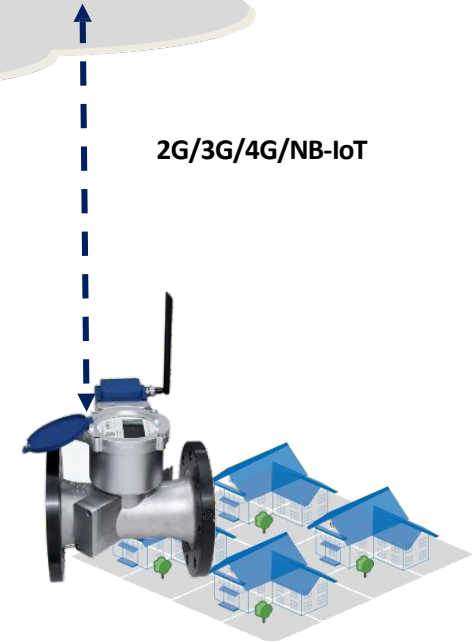
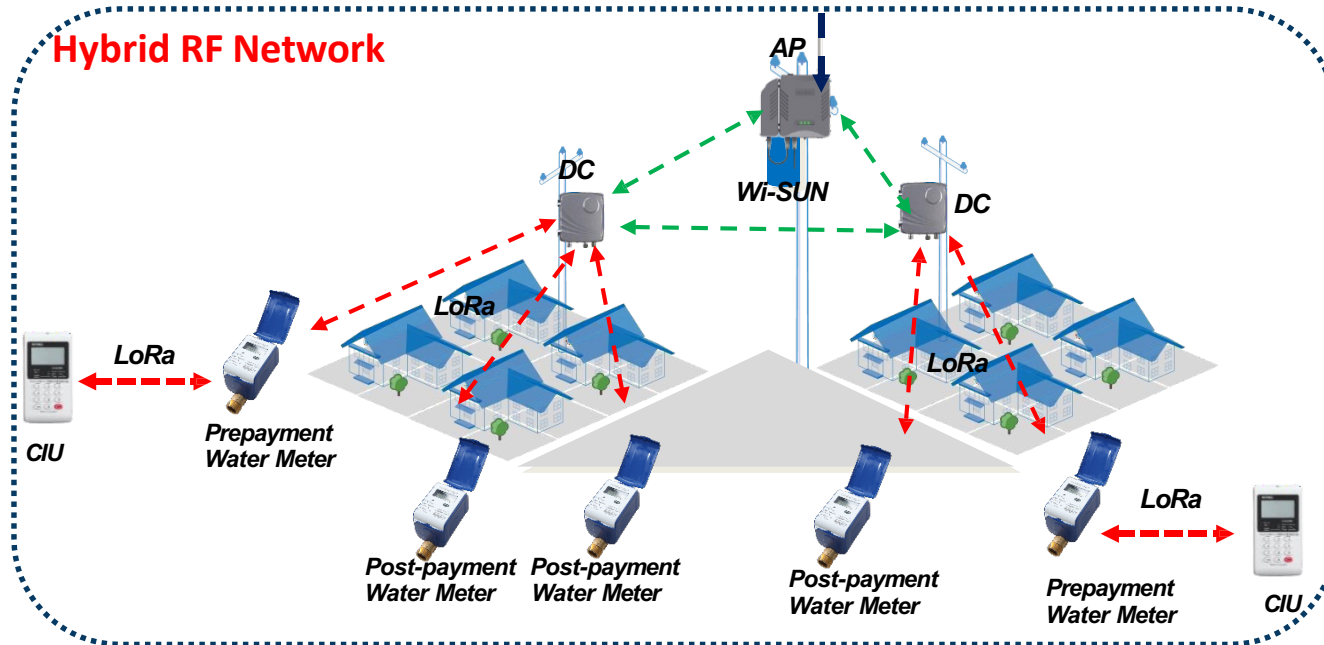
System



WAN



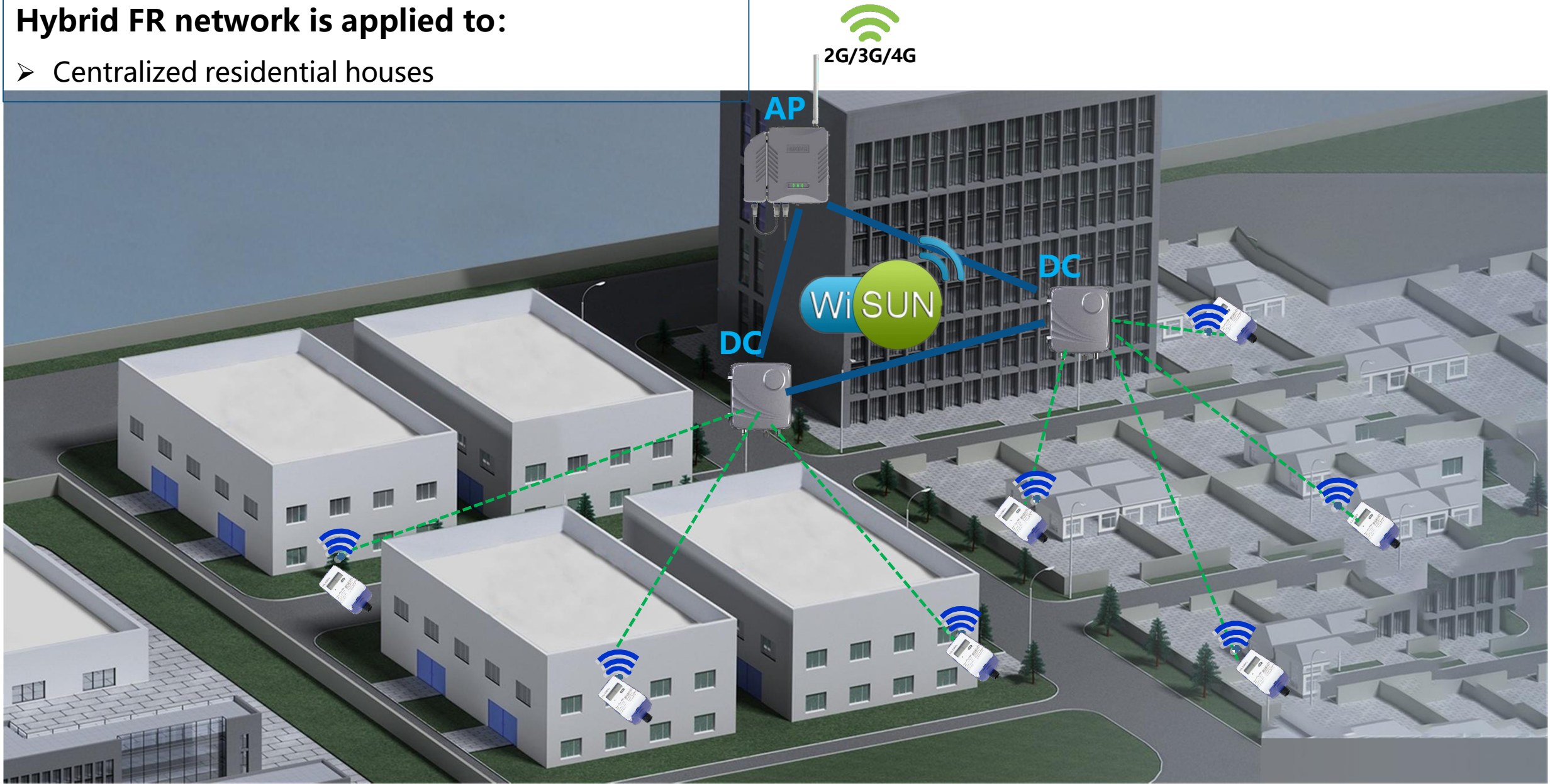
FAN



RF Application Scenario

Hybrid FR network is applied to:

- Centralized residential houses



Features of Hybrid RF Network

Supports access to electric/water/gas meters

The DC and AP can integrate electric/water and gas meters, which could largely decrease the communication deployment cost and network management.

Ultra-low power consumption, battery life up to 10 years

The communication module uses low power wireless technology, adopts the unique sleep and wake-up mechanism, and supports the water meter battery can work more than 10 years.

Real-time monitoring

High reliability, wide coverage

The AP and DC terminal is Industrial design, IP67 protection, and the design life is up to 15 years.

One AP can support access up to 2,000 water meters, and the maximum communication coverage radius is 3km.

Easy deployment, remote maintenance

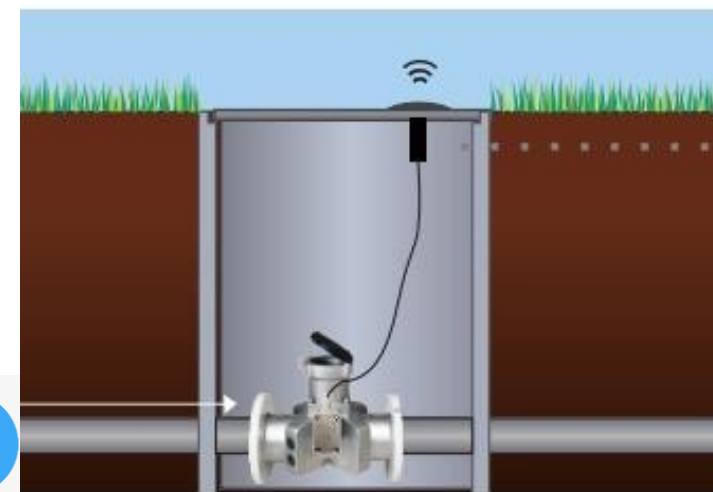
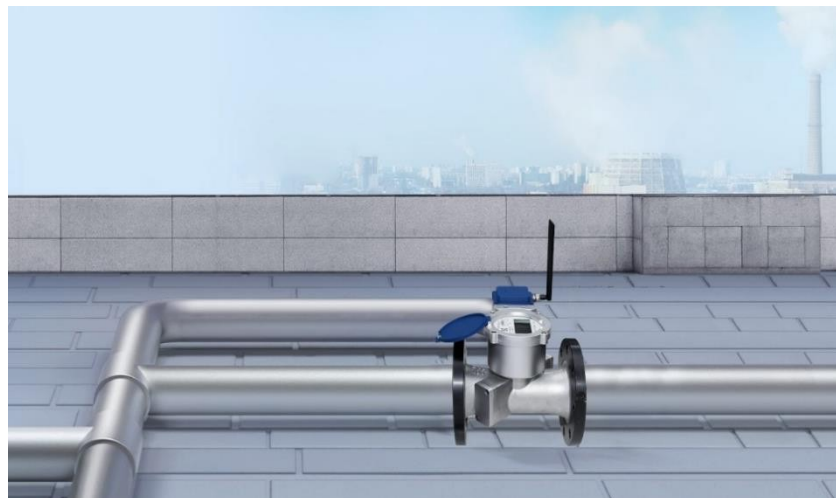
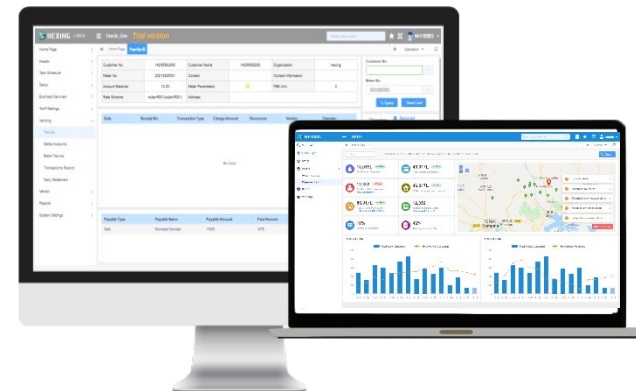
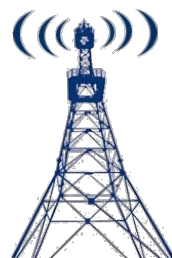
Auto-networking, and support remotely optimized the network parameters and fault maintenance.


The AP and DC can support firmware differential upgrade FOTA.

2G/3G/4G Application Scenario

2G/3G/4G is applied to:

- Bulk ultrasonic water meters
- Bulk magnetic water meters

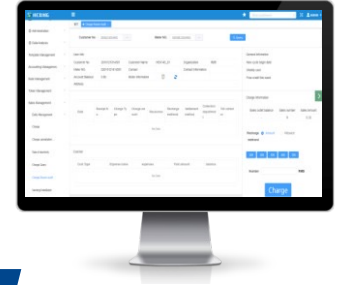


 Poor signal?



AMI System Main Functions

Providing a comprehensive data collection and real-time monitoring solution.



Assets management

- Meter registration
- Meter Configuration
- Load control and alarms configuration.
- Other Configurations
- Etc...

Operational Commands

- On Demand Reading
- Historical Data Reading
- Time Synchronization
- Open/Close
- Firmware Upgrade
- Etc...

Customer Information

- Customer Management
- Metering Points Management
- Registration Files Import
- Etc...

Task Schedule

- Meter Task Configuration
- Task Recurrence
- Etc...

Reports

- Meter Readings Reports.
- Events & Alarms
- Readings Rate
- Equipment Status
- Log Viewer
- Etc...

Setup

- Organization
- Authentication(Roles, Users, IP Whitelist)

AMI system

ZLINK | ORCA Please input name ★ ✕ 👤 MDC管理员

- Assets >
- Network Management >
- Operational Commands >
- Task Schedule >
- Reports >
- Customer Information >
- Admin >
- Alarm >

Home Page

Operation ▾

Dashboard

Device Type				Total	RSI					LQI				
Online	2	9	146	157	Quantity	0	3	10	159	Quantity	0	0	13	146
Total	13	13	146	172	Accounted	0.00%	1.74%	5.81%	92.44%	Accounted	0.00%	0.00%	8.18%	91.82%

Online Rate Statistics

○ AP
 ○ RELAY
 ○ METER
 ○ DC
 ○ WATER_METER
 ○ TOTAL

Alarm Statistics

Alarm	Today	Last Week	Total
		Loading	
		No Data	



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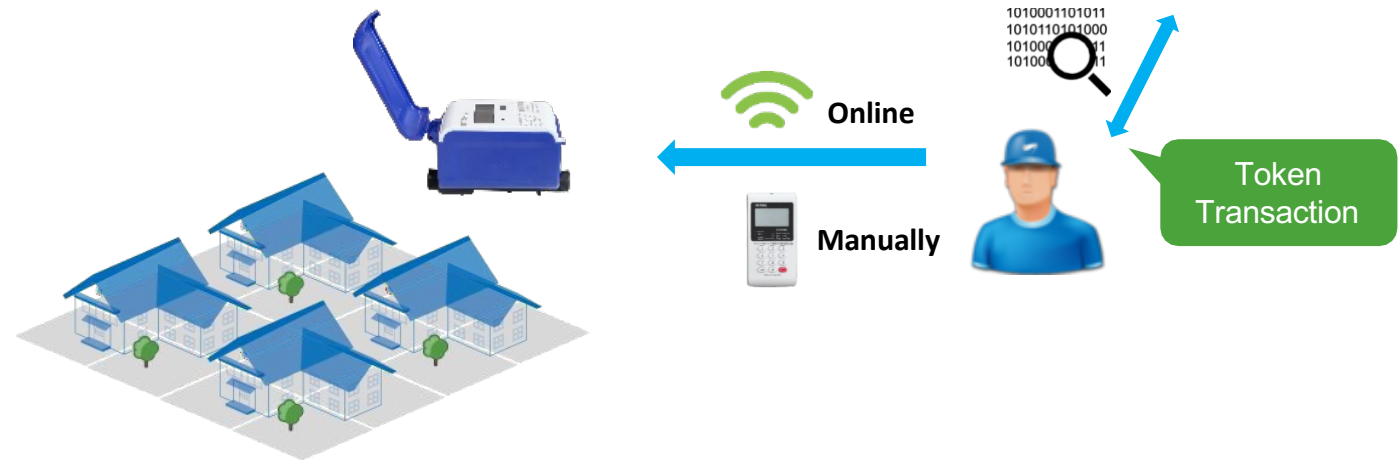
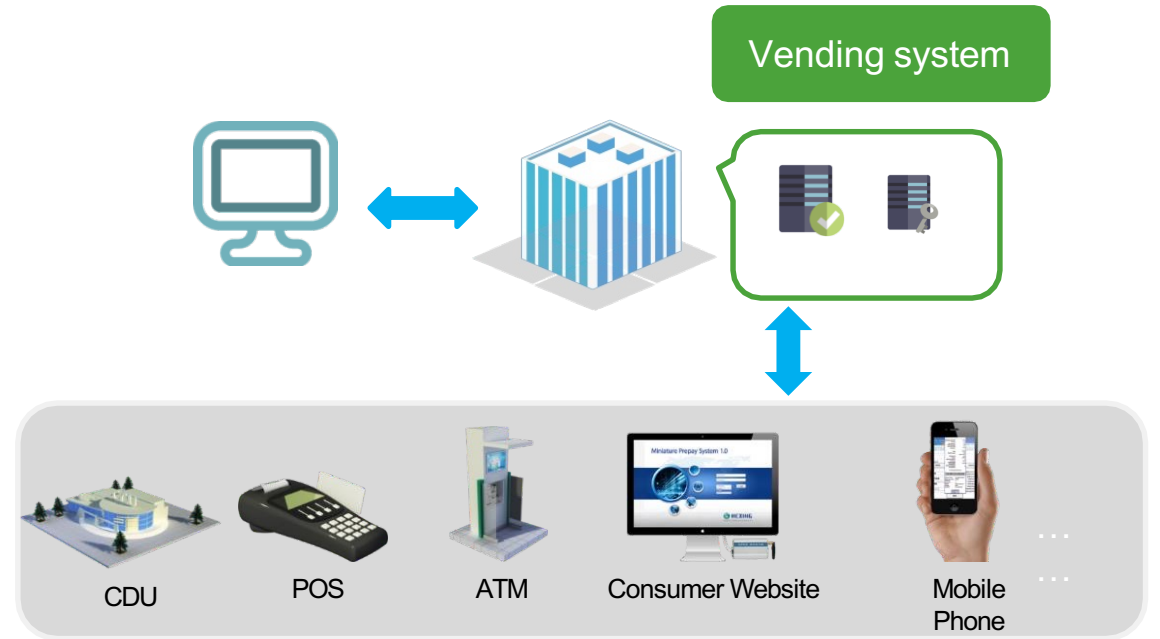




Prepayment Solution Structure

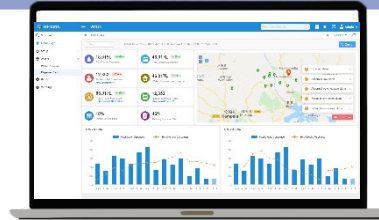
Solution Advantages:

- Support electricity/water/gas meters
- STS 2.0 certified system and meter, provide safe Top-up environment
- Standard vending system, can be integrated into 3rd part system
- Prepayment meter, no meter reading is needed, no need to worry about bad debt.
- Can be implemented on Cloud or Locally
- Interact with multiple payment tools
- Transfer tokens manually or online





Vending System Main Functions



Tariff

- Multi-tariff(single/step)
- Configure tax/fee
- Tariff Subsidy

Vending

- Vending method (Daily/Batch)
- Free basic water
- Vending report
- Customized receipt

Debt

- Various ways of paying
- Overdue penalty

Agent

- Balance Limitation & Reminder
- Limitation of single transaction amount
- Commission scheme is supported

Engineering Token

- Workflow management
- Pre-configuration of engineering token template

Report

- Financial Report
- Management Report
- Audit Report



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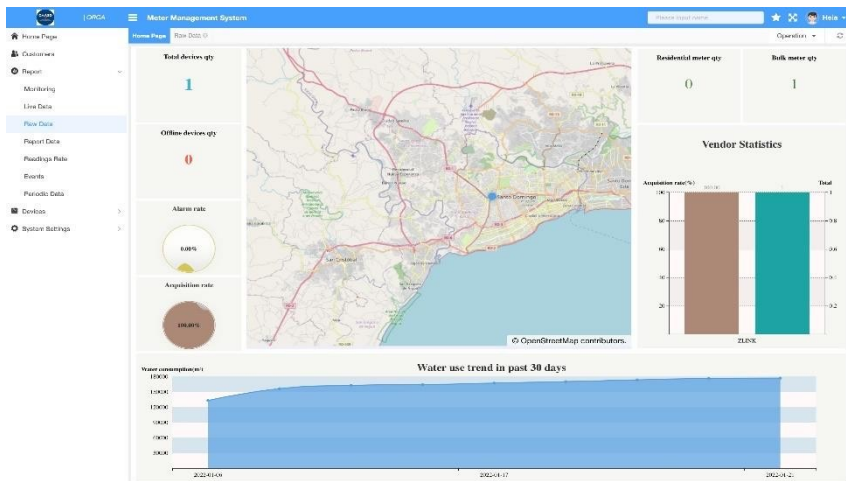
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Dominican smart water meter pilot



Project information:

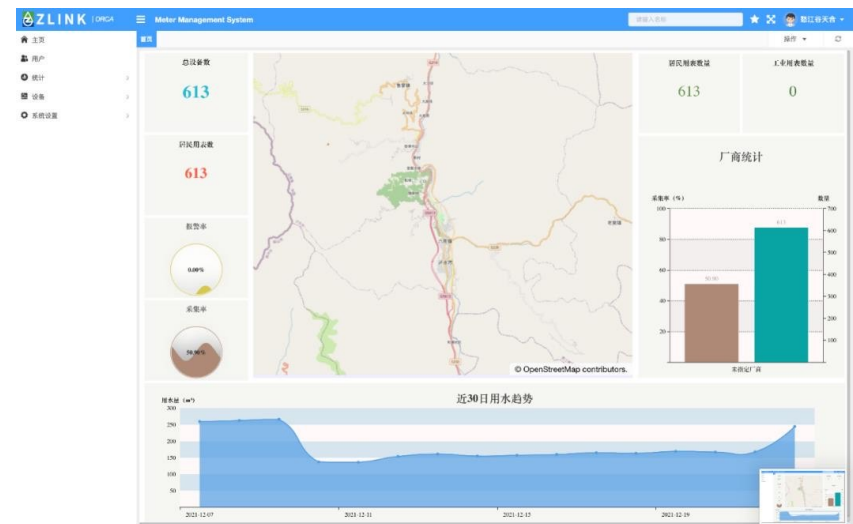
Country: Dominican Republic
Product: DN15&DN20 residential ultrasonic water meter
DN200 4G bulk ultrasonic water meter
AMI system
Qty: 50pcs
Installation time: September, 2021
Communication: DN15&DN20 RF
DN200 4G

Chongqing Smart Ultrasonic Meter Project



Project information:

Country: China
 Product: DN50 ultrasonic water meter
 DN100 ultrasonic water meter
 AMI system
 Qty: 150pcs
 Installation time: Dec. 2021





Case study



Project information:

Country: China-Shanxi
Product: DN15 smart water meter
DN20 smart water meter
AMI system
Qty: 10000pcs
Installation time: Feb. 2020
Communication: RF



Project information:

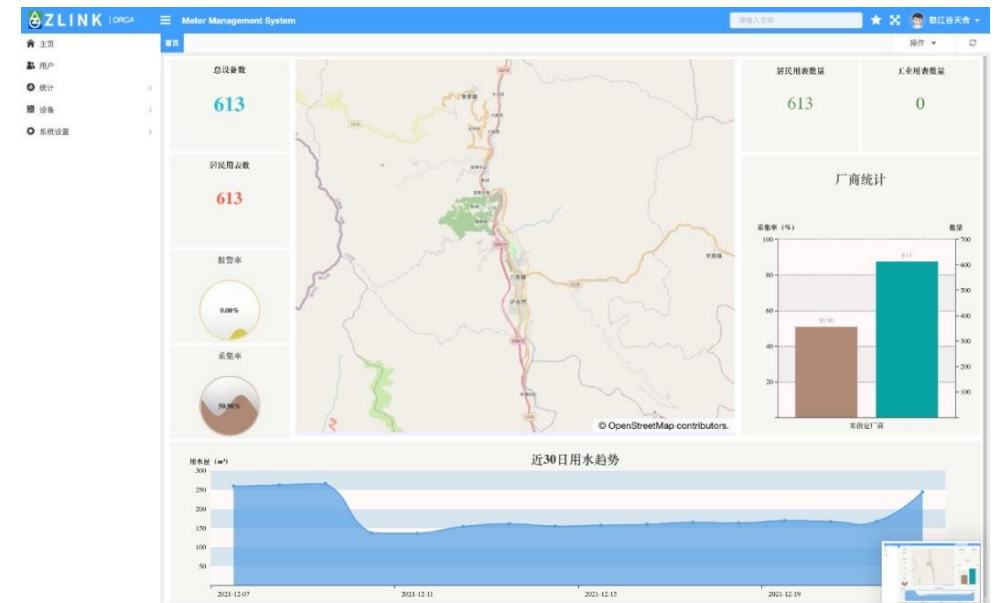
Country: China-Guangdong
Product: DN15 ultrasonic water meter
DN20 ultrasonic water meter
AMI system
Qty: 5000pcs
Installation time: July. 2020
Communication: NB-Iot

Renovation of old community in Shenyang



Project information:

Country: China
Product: DN15&DN20 ultrasonic water meter
AMI system
Qty: 50,000pcs
Installation time: August, 2021
Communication: NB-IoT





Case study



Project information:

Country: Mozambique
Product: DN15 ultrasonic water meter
DN20 ultrasonic water meter
AMI system
Qty: 3000pcs
Installation time: Feb. 2021
Communication: RF



Project information:

Country: South Africa
Product: DN15 STS Prepayment ultrasonic water meter
DN20 STS Prepayment ultrasonic water meter
AMI system
Qty: 2000pcs
Installation time: March. 2021
Communication: RF

THANKS



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