OKet® 澳科

A caring and reliable partner

QINGDAO OKET TECHNOLOGY CO., LTD.

A: No.16 Shoufeng Rd, Free Trade Zone, Qingdao, China
T: +86-532-86769572
W: www.oket-group.com
E: info@oket-cn.com

Web

OKet-auto-V2.6

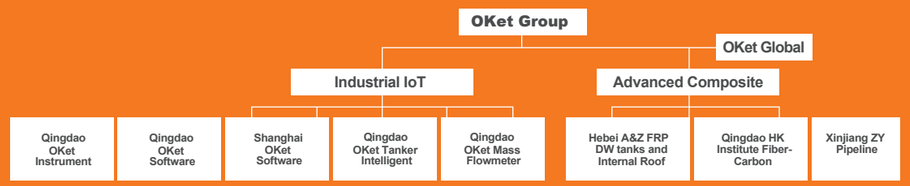
OKet® 澳科

OKet Intelligent Solutions for Fuel Retail Stations

The products listed in this brochure are:

ABOUT OKet®

OKet is a leading technology group headquartered in Qingdao, China, with over 20 years of experience. The company owns high-tech enterprises, specializing in Industrial IoT (I-IoT) solutions and Advanced composite materials.



OKet provides intelligent solutions for retail stations, tanker transportation, and petrochemical depots, showcasing their expertise in the Oil & Gas downstream sector.

OKet's products and solutions are widely adopted globally, especially in China where OKet hold a significant market share. OKet's automatic tank gauge, environmental monitoring sensors, and tank-eye remote software solutions dominate with nearly 50% market share in major Chinese oil companies like PetroChina and Sinopec. Additionally, OKet's Automation System for Fueling Equipment, leveraging IoT techniques, is renowned for its intelligence and forward-looking features.

01 Automatic Tank Gauges

Features and specifications for the PD-350+ and PD-350P models:

Features:

- Supports up to 16 tanks (wired with 16 probes or wireless with 8 probes)
- 8-inch colorful touch screen display
- Multilingual support: Chinese, English, French, Spanish, Portuguese, Russian, Persian, Arabic, Thai
- Monitors fuel level, water level, temperature, net volume, ullage, and optional density measurement
- Automatic delivery monitoring and report generation
- Sound-light alarms for high/low level, high water, and other alerts
- Automatic and manual shift functions
- Tank tilt compensation support
- Customizable fuel list and color coding
- Leak test function with standard and optional sensitivity
- Anti-theft alarm during non-working hours
- Integration with various leak detection sensors
- Record keeping of parameter adjustments and reports in memory
- Operation authority management system

Type	PD-350+	PD-350P
Size	310*230*125mm	310*230*125mm
Weight	6.65KG	7.35KG (includes a printer)
Power Supply	AC220V(±10%) or AC110V(±10%) (customizable)	
Multiple interface options	2 RS-232 ports (1 RS-485), 1 USB, 1 RJ45 Ethernet, 2 relays	
Optional features include **Ex-alarm(see notes below)** and 4G/GSM module for wireless transmission		

Notes: The ATG console can be connected to an explosion-proof alarm bell, enhancing the alarm system with sound and light alerts to remind staff of critical alerts or abnormal conditions.

02 Wireless ATG

To address the challenge of not being able to install wiring at gas stations, OKet has developed a ***Wireless Automatic Tank Gauging (ATG) solution***. This wireless technology is highly reliable and provides customers with seamless monitoring and management capabilities, offering them a lot of convenience.

Scenario Content:

- Wireless ATG Probe
- PLS-RWT-X Power Unit (Battery Pack + Antenna)
  - *Antenna Options:*
    Stick Antenna (Standard)
    Load-Bearing Antenna (Optional)

PLS-5BX Wireless Probe

PLS-RWT-X Power Unit

Features:

- Ex Certification (Ex ia IIB T4 Ga): Intrinsic safety design
- Supports up to 8 tanks per console
- Plug and Play (PnP) Design: No manual setup required
- Compatible with Original PLS-5BX Probe
- Wireless Communication
- 4 to 5 years of Battery Life

PD-350P Wireless Console

SIoT Edge Computing Box

Wireless Probe is Connectable

Benefits:

- Time & Cost Saving Solution: Saves time and costs associated with digging, paving, and cabling.
- Convenient Installation, Debugging, and Maintenance: Simplifies the process and reduces maintenance efforts.
- Wireless Communication Technology: Provides a strong signal and ensures data safety.
- Independent Power Supply: Eliminates worries about power supply and current overload, ensuring reliable operation.

ATG Probe Datasheet:

Item	PLS-5BX fuel probe
	
Purpose	To measure product level, water level and temperature
Titles of medium	Gasoline, diesel, kerosene, Ethanol gasoline
Measured variable	Product level, water level and temperature of 5 sensors and average temperature
Vessel pressure	-0.015~0.2MPa
Product level accuracy	±0.5mm
Water level accuracy	±0.5mm
Temperature accuracy	±0.2℃
Resolution	0.001mm
Repeatability	±0.1mm
Response time	＜1 second
Leakage detection function	Yes
Explosion-proof grade (safety level)	Ex ia II B T4 Ga (Intrinsically safe)
Temperature	-40℃～70℃
Lowest product inactive zone	with3" floater 100mm
Lowest water inactive zone	with3" floater 15mm
Floater size	3" or 2”
Probe length	0.6m～4m
Method of communication	RS-485
Power supply	+24～26VDC
Protection level	IP68
Cable	4-core shielded cable
Length	Customization

Wireless Suite for Automatic Tank Gauges:

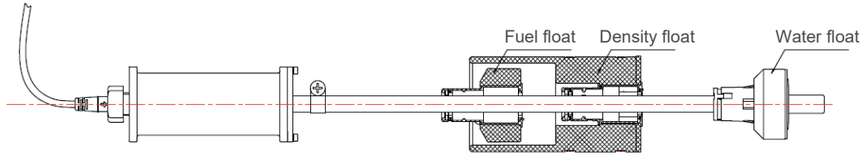
Wireless suite type	PLS-RWT-X	
Description & Application	OKet Wireless Suite type PLS-RWT-X is an intrinsically safe device that works together with PLS-5BX Probe and PD-350+ (wireless) /PD-350P (wireless) Console / SIoT edge box equipment. Its function is to help Probe send level data and temperature data to Console wirelessly.	
General data		
Ambient temperature	-40℃~60℃	
Protection level	IP67	
Power supply voltage	7.2 VDC (battery powered)	
Battery life	4~5 years	
Ex data		
Explosion-proof grade	Ex ia II B T4 Ga	
For use with probe	Can only work together with PLS-5BX Probe	
Ex data of PLS-5BX probe		
Explosion-proof grade	Ex ia II B T4 Ga	
Power supply terminals	Ui=28V, Ii=120mA, Pi=0.84W, Ci=0.021uF, Li=0mH	
Communication terminals	Ui=9V, Ii=50mA, Pi=112mW, Ci=8.7uF, Li=0mH	
Wireless data	**925MHz**	**433 MHz**
Communication interval	10~120 sec (on demand)	10~120 sec (on demand)
Communication distance	800m	800m
Antenna interface	SMA-K	SMA-K
Frequency band	920 ~ 925 MHz	423 ~ 443 MHz
Maximum transmitting power (MTP)	1000mW	1000mW
MTP and wireless antenna gain	2512mW	2512mW
Maximum package data length	200Bytes	200Bytes
Maximum cache data length	400Bytes	400Bytes
Air speed	4.8k (configurable)	4.8k (configurable)
Air sensitivity	-147dBm	-147dBm
RSSI signal receiving strength	Enabled	Enabled
LBT channel busy monitoring	Enabled	Enabled

ATG PLS-5BX LPG/DEF Probe:

Item	
Probe description & application	The PLS-5BX LPG/DEF probes are used for monitoring LPG/DEF product level and temperature in tanks
Measured variable	LPG, DEF
Measured variable	Product level, and temperature of 5 sensors and average temperature
Vessel pressure	≤3Mpa
Product level accuracy	±0.5mm
Temperature accuracy	±0.2℃
Resolution	0.001mm
Repeatability	±0.1mm
Response time	＜1 second
Leakage detection function	Yes
Explosion-proof grade (Safety level)	Ex ia II B T4 Ga (Intrinsically safe)
Temperature	-40℃～70℃
Lowest product inactive zone	83 mm
Float size	2inch(40mm)
Probe length	0.6m～4.0m
Method of communication	RS-485
Power supply	+24～26VDC
Protection level	IP68
Cable	4-core shielded cable
Length	Customization
Console compatibility	PD-350+ & PD-350P

PLS-5BX Fuel Probe with Density Float:

Item	PLS-5BX density probe
	
Gasoline density range	(690~800)kg/m³
Diesel density range	(790~900) kg/m³
Accuracy	±0.3%
Outer diameter	95mm (4 inch riser required)
Lowest product inactive zone	With density float 198mm
Lowest water inactive zone	With 3” float 15mm / With 2” float 23mm

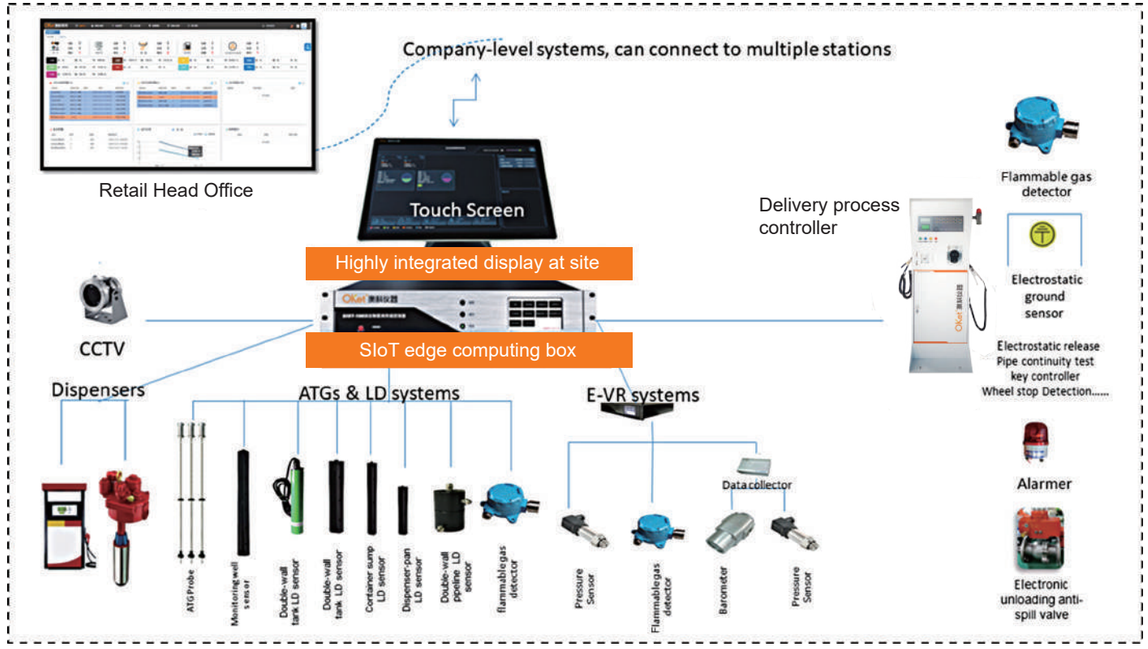


04 SIoT-100: Gas Station Internet of Things

The SIoT-100 represents a state-of-the-art solution for intelligent fuel station management, designed to elevate operational standards to unprecedented levels. By seamlessly integrating unique features, SIoT-100 offers real-time visualization, heightened safety protocols, optimized efficiency, remote operational oversight, and data-driven decision support. This comprehensive approach not only ensures unparalleled operational accuracy and security but also streamlines processes through automation and remote control. The data-driven decision support empowers fuel station operators to make strategic, well-informed decisions, maintaining a competitive edge in the dynamic market landscape. SIoT-100 stands as a holistic solution that is shaping the future of intelligent fuel station management, delivering innovation and efficiency to the industry.

SIoT Dashboard and Functions:

Highly Integrated by SIoT——Schematic:



Features:

Real-time Visibility
- Instant insights into operational processes.
- Seamless integration for a unified system.

Enhanced Safety Measures
- Automated safety protocols for heightened security.
- Intelligent operations fostering a secure environment.

Efficiency Optimization
- Streamlined processes for enhanced efficiency.
- Real automation, reducing manual intervention.

Remote Operations Mastery
- Effortless management from anywhere.
- Comprehensive remote oversight for complete control.

Data-Driven Decision Support
- Leverage data for strategic decision-making.
- Enable informed decisions with data-backed insights.

Benefits:

- **Operational Precision:** Achieve heightened operational precision through real-time monitoring and integrated systems.
- **Safety Excellence:** Elevate safety measures with automated protocols, ensuring a secure and efficient environment.
- **Efficiency Gains:** Optimize efficiency by minimizing manual intervention and implementing real automation in processes.
- **Remote Control:** Manage operations from anywhere, fostering comprehensive control and swift response to changes.
- **Strategic Decision-Making:** Leverage data-driven insights for strategic decision enablement, positioning your operations for the future.

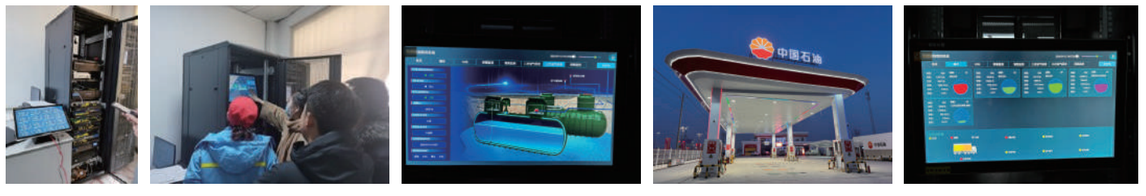
Station IoT Platform:

Station IoT | Fuel retailer company unify management

Diverse Display Forms:

Touch screen monitor | Large screen display | Office computer screen

Cases(installation&on-site training):

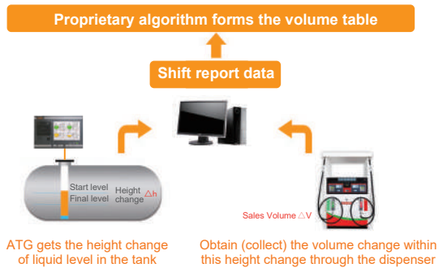


05 Tank Chart Calibration

Standards compliant:

- JJF (Lu) 170-2023 "Standard Chart Method Horizontal Tank Capacity Calibration Specifications"
- NB/SH/TXXXX—202X "Gas Station Buried Tank Volume Calibration Dispenser Method "

Newest Technology: Big Data Tank Calibration Method



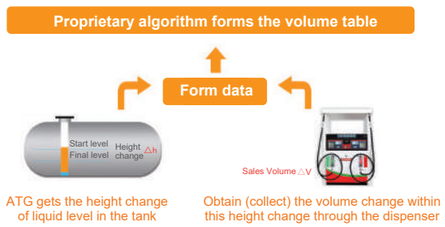
Implementation method and data requirements:

The method involves utilizing Shift Reports with Sales & ATG Data from fueling stations. This data is essential for accurate tank calibration and operational analysis.

Advantages:

- **Historical Data Availability**
  Historical data can be utilized for calibration, offering a more comprehensive analysis
- **Brand Flexibility**
  The method is not limited to specific ATG (Automatic Tank Gauge) brands, providing flexibility in application

ATG + Dispenser Sales Data Acquisition Method



Implementation method: Collect data from the ATG and dispenser to generate a tank chart.

Key processes:

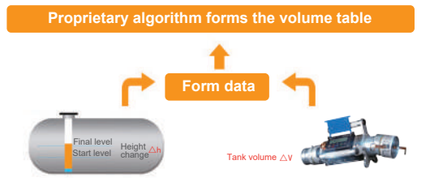
- Confirmation of data collection methods
- Server setup
- Data collection
- Data processing and tank chart generation
- Tank chart verification
- Issuance of tank table

◆ While the time for generating a single chart is relatively long, multiple stations can be calibrated simultaneously.

Advantages:

- **Convenience**
  Does not affect business
  No need to close down business
- **Safety**
  No fuel operation
- **Accurate results**
  Accuracy≤0.25% (k=2)

ATG + Flow Meter Delivery Data Acquisition Method



Implementation method: Collect the delivery section data and ATG data at the station end, and generate the tank chart at the server end.

Key processes:

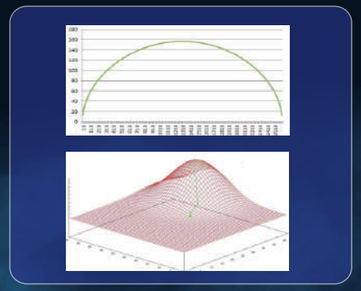
- Flow meter segmentation data acquisition
- ATG fuel stabilization
- Upload of data pairs
- Tank chart generation

◆ The single chart time is short, with high accuracy, and convenient operation.

Core algorithm based on big data

Commonly used tank chart calibration algorithms include fitting standard geometric dimensions to calculate tank chart, interpolation methods, etc., which are relatively simple. However, for tanks that are non-standard circles or ellipses, especially horizontal tanks in underground or different loading states, errors are prone to occur.

OKet adopts a method based on big data and multiple fitting of samples to calculate irregular surface volumes. This approach is used to process and self-verify collected data, resulting in more accurate generation of tank chart.



[Patent] Calibration algorithm technology

- Comprehensive consideration of influencing factors (liquid level fluctuations, etc.)
- Algorithm model:
  Big data fitting technology
- Self-checking technology:
  the power of data

Comparison of various horizontal tank calibration methods

Comparison of various methods	Accuracy of results	Manpower	Risk level	Overall costs	Overall time
Manual gauging & calculation	Low	High usage	Uncertain	Low	Medium
Electro-optical internal distance measurement calculation	Medium	Medium usage	Risky	High	Short
Metal measuring devices vs. manual dipstick	Excellent	Medium usage	Big	High	Medium
Delivery flow meter & gauging	Excellent	Medium usage	Minimal	Medium (easy to carry and operate)	Short
Remote (data matching from dispenser & ATG)	Excellent	Low usage	Zero	Low	Long (not applicable when sales volume is small, but can be used for multiple tanks at the same time)
Big-data (shift reports with sales & ATG data)	Excellent	Low usage	Zero	Low	Short (historical data is available)

10 AI Video Analysis Terminal

Embedded design,no GPU cost

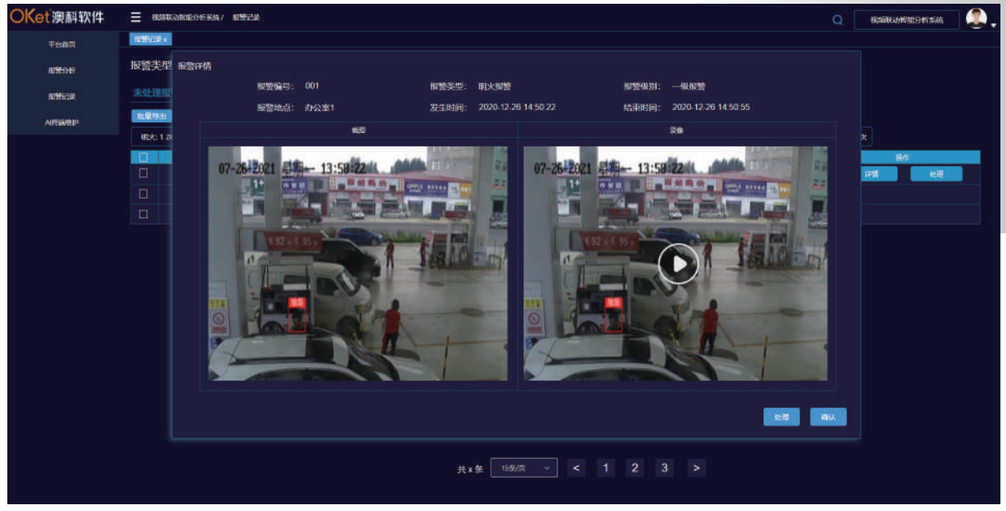
Efficient algorithm model, flexible customization

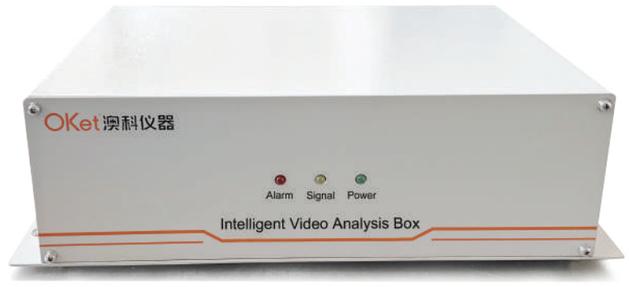
Support multi-terminal expand

Support mainstream camera and video systems

Up to 720*8 or 1080P*4 in each terminal

Identify up to 10 + types of non-compliance





- Smoking
  Cell Phone Call
  Illegal entry
- Illegal leave
  Appearance of smoke
  Appearance of fire
- Not wearing PPE

11 Installation Pictures