

A hand is shown interacting with a futuristic digital interface. The interface is composed of numerous semi-transparent blue squares, each containing a white icon. The icons represent various concepts: a truck, a factory, a robotic arm, a smartphone, a bar chart, a line graph, a pie chart, a magnifying glass over binary code, a network diagram, a calendar, a checkmark, and a gear. The background is a blurred image of a person in a blue shirt, and the overall color scheme is dominated by blue and white.



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Corporate Introduction

INVT (Shenzhen INVT Electric Co., Ltd) has been concentrating on industry automation and energy power since its foundation in 2002 and is committed to "Providing the best product and service to allow customers more competitiveness". INVT goes public in 2010 and is the first A-share listed company (002334) in Shenzhen Stock Exchange in the industry. At present, INVT owns 15 subsidiaries and more than 4000 employees, over 40 branches, forming a sales network covering more than 100 overseas countries and regions.

INVT has been awarded as the Key High-tech Enterprise of National Torch Plan based on mastering of key technologies in power electronics, auto control and IT. With business covering industry automation, electric vehicle, network power and rail transit, INVT has established 11 R&D centers nationwide, boasts more than 1300 patents and owns the first lab in the industry awarded ACT qualification from TÜV SÜD, UL-WTDP and CNAS National Lab. The industrial parks in Shenzhen and

Suzhou aim to provide customers with advanced integrated product development design management, comprehensive product R&D test and auto informational production. The worldwide INVT branches and warranty service centers are ready to offer customers all-around back-ups including professional solutions, technical trainings and service support.

In the next decade, INVT will continue to take "Honesty and Integrity, Professionalism and Excellence" as our business philosophy, enhance core business sectors including industrial automation, electric vehicle, network power and rail transit based on the three major technologies in industry automation and energy power fields, and strive to become a leading, responsible and harmonic international professional group armed with proper product structure, leading technologies, efficient management, robust profitability and superior competitiveness.

Industrial Park in Suzhou

Group's core industrial base and R&D center in East China



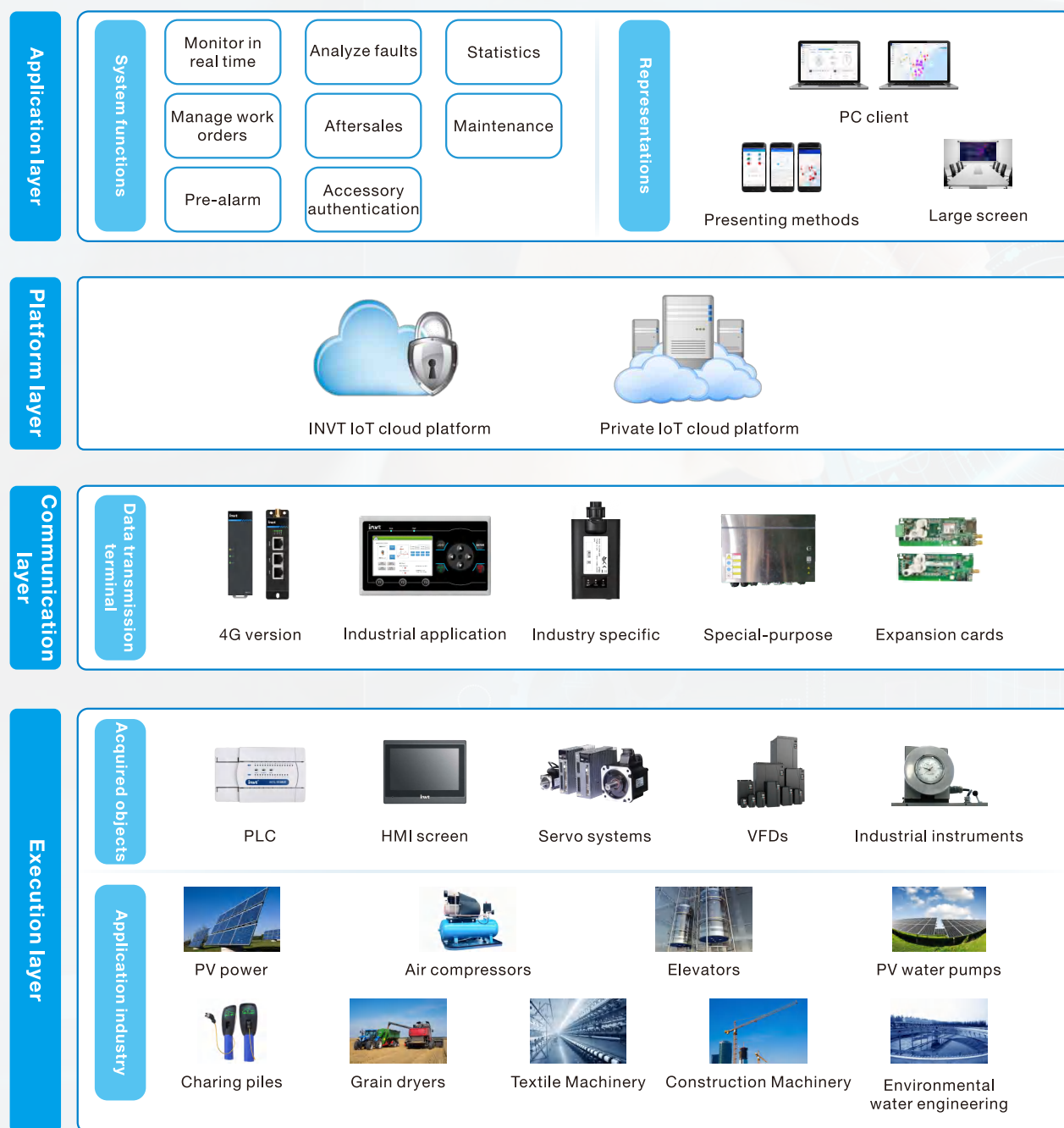
Industrial Park in Guangming Shenzhen

Group headquarters, new product development and new business incubation base



Industrial Internet solutions

INVT independently develops and boasts industrial Internet products, including IWOCLOUD industrial Internet cloud platform, IWOScene application system, IWOLink data terminal products, and ICS industrial cloud services, which can work with INVT industrial automation family of products to provide end-to-end integrated solutions for industrial customers, helping them to move towards a new journey of digital transformation.



IWoScience service application system

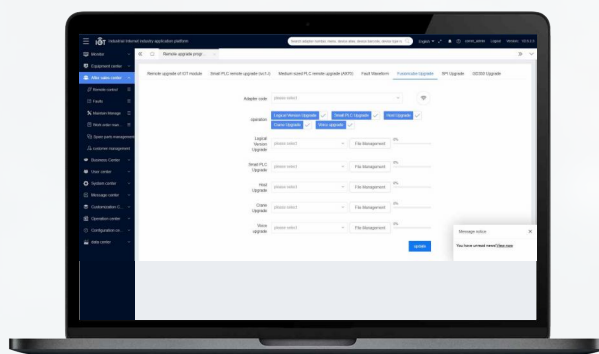
IWoScience is an IoT monitoring system that can be remotely managed, maintained, analyzed, and monitored. It supports universal access from devices such as VFDs, servos, PLCs, and HMIs, and it can be applied to PCs and Android and iOS mobile clients.

Aftersales assistant tool to resolve problems remotely and effectively.

· Remote working unit

Remote upgrade without site service

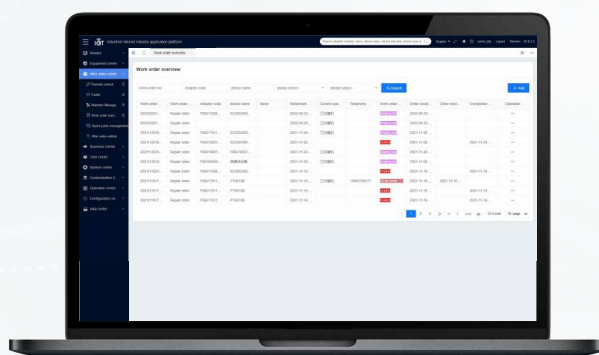
Enables you to upload, download, and monitor programs to remote devices, including PLCs, VFDs, and data terminal modules.



· Aftersales work order management

Online handling of aftersales service

Able to transfer aftersales work orders such as fault handling, installation, and maintenance, with the entire process from the handling to the result under surveillance, improving the efficiency of aftersales maintenance work, enhancing user experience and corporate image.



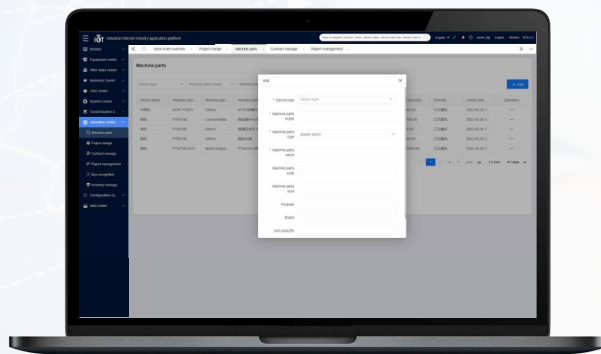
Financial leasing management tool, supporting new business development.

A set of device leasing service functions supports leasing business development, such as managing parts, projects, contracts, reports, and flows.

· Device operation management

Device leasing management tool

The tool already has many mature applications such as contract management, payment collection management, electronic fencing, spares management, remote device locking, and flow approval management.

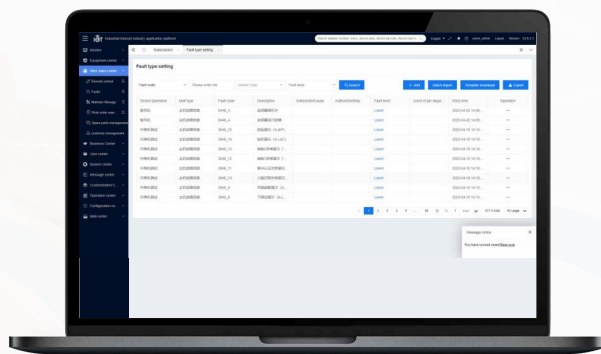


Passive service changed to active service.

· Fault pre-alarm/alarm

Electronic guard, protecting device safety in real time

The system provides instant feedback on all the alarm and pushes alarm information by means of app, SMS messages, and emails. Prealarm values can be set for important parameters of key devices, preventing accidents in advance.

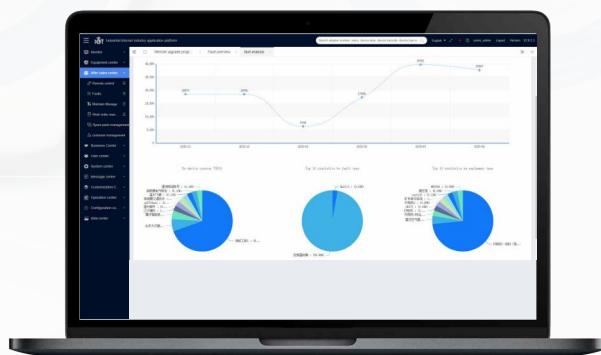


It provides a set of aftersales maintenance functions, improving maintenance efficiency, including managing faults, warranty, work orders, and spares.

· Preventive device maintenance

Passive aftersales service becomes active service

Such as device lifetime prediction, key part preventive cleaning, warranty parts lifecycle management, and device exception pre-alarm.



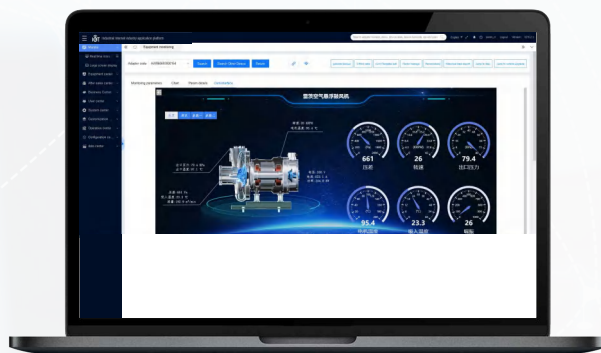
A new trend – Device networking.

It provides a set of various device monitoring functions, such as real-time monitoring for device safe running purposes, monitoring of device operation efficiency and energy efficiency, and large-screen monitoring.

· Remote device monitoring

Managing anywhere anytime

Various ways such as mobile app, PC web page, and large-screen monitoring help to understand device real-time status, and implement video monitoring, remote start or stop, and parameter modifying.



Foundation of data value digging in the era of big data.

It provides a set of system operation and daily platform management functions, which meet system management requirements, such as managing system setup, operation records, user data statistics, and corporate dynamics.

· Historic data query

Dimensional data applications

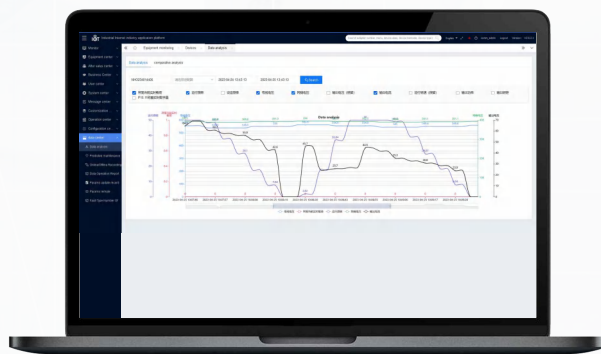
Able to define key parameter types, addresses, charts, and faults. The user-defined data charts can be displayed, and historic data can be exported to various files and saved to the local server.



· Data analysis and statistics

Providing objective data support for fault analysis

You can define to generate various statistics reports for historic data, facilitating data analysis and application in various views. You can collect data on various parameter evaluation and make analysis, providing objective data support for R&D, after-sales, and sales to make decisions.



System features

INVT provides industrial enterprises with complete, reliable, flexible, and quick-deliverable solutions.



Pan-access

Supporting various VFDs, servo, PLC, and HMI screens.



Multiple presenting

Supporting PC and mobile app (on Android and iOS)



Privatization deployment

The system cloud platform supports privatization deployment



Safe and stable

Supporting the pushing by means of mobile app, email, and SMS message



Multimedia access

Supporting onsite video, image, and interface access, and AI recognition of face.



Quick start

Easy to operate and user friendly interface



Personalized customization

Application system functions can be customized



Data analysis

Historic data, condition collection, and data reports



Alarm pushing

Data is encrypted before transmission, and servers are managed in distributed mode



Data interface

The platform provides the API, eliminating data silos

Multiple login ways

You can visit <https://iot.invt.com> to enter the login page



You can log in through the mobile app



Large-screen application

Customized large-screen display can be applied to system data, which can be planned as follows:

- Macro data: Device distribution map, online/fault/alarm device distribution
- System key statistics: Device status statistics and work order quantity display





IWOLink data terminal product

To adapt to data acquiring requirements of various industrial devices and network scenarios flexibly, INVT launches data acquiring product series to provide quick, easy, and safe IoT data connection solutions.

ICA 417 series

Excellent performance

Edge computing, transparent VPN transmission, remote OTA, the same as local operation.



4G flagship version

ICA413 series

Strong adaptation

A device supports many scenario applications. (Serial port to 4G; serial port to network port, network port to 4G)



4G standard version

4G vigor version

ICA100 series

WiFi version

Supporting connection to WiFi.



WiFi version

ICA200 series

Ultimate costeffectiveness

Customizable, supporting remote monitoring/upgrade.



2G version

EC-IC series

Perfect matching

Embedded with such a card, a traditional device upgrades with IoT functions.



Expansion card version



Model description

INVT ICA series product model description:

ICA * * * - * * * - * *

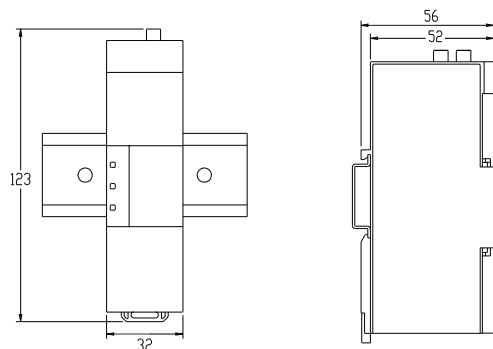
Field description	Content
Product series abbreviation	ICA: Internet Communication Adapter
Wireless communication method	0: Not support wireless communication 1: WiFi 2: GPRS 4: 4G
Wired communication method	0: Not support wired communication 1: Ethernet
Local data collection method	0: Rs485 1: Ethernet 3: RS485+Ethernet 7: RS485+Ethernet+VPN
Data flow card	0: Pluggable 1: SMD 2: Pluggable + Carried
IP rating	0: IP00 (No housing) 1: IP20 (Housing for wall mounting) 2: IP20 (Housing for rail mounting) 6: IP65 (Housing for push-in mounting)
Special functions	G: With GPS N: Embedded with antenna P: Configured with display This feild is omitted by default, which means no special function
Voltage class	5: 4.5–6V. The standard configured voltage is 12–24V. This field is omitted
Version	CN: China version EU: Europ version LA: Latin America version This field is omitted for a 2G/WiFi product

Technical specifications

Data terminal product	ICA100-02	ICA200-00HP	ICA200-00HN	ICA200-00GHP	ICA200-02
Ordering code	11095-00008	34008-00130	34008-00126	34008-00131	11023-00091
Product positioning	WiFi version	2G vigor version			2G standard version
Communication parameters					
Upstream networking	WiFi	2G			
Upstream network speed	54Mbps	15-20Kbs			
Downstream communication	RS485/232	RS485/232			
Downstream network speed	10Mbps	85.6Kbps			
Hardware parameters					
IP rating	IP20	IP00			IP20
Power supply voltage	10~24V				
Overall power consumption	2W				
Indicator	Power indicator, network status indicator, and run status indicator				
Mounting method	Standard DIN rail mounting				
Work temperature	-25~65℃				
International version	-	Universal			
Antenna	External		Embedded	External	
Housing material	Engineering plastic	No housing			Aluminium alloy
Software functions					
Real-time data monitoring	Support				
Edge computing	Support				
OTA remote upgrade	Not support	Support VFD upgrade (GD270/GD350 based special purpose products)			
Serial port transparent transmission	Not support	Support			
Network port VPN transparent transmission	Not support				

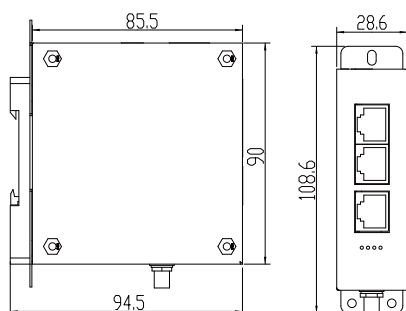
Data terminal product	ICA413-02-CN	ICA400-02-CN	ICA417-02-CN	ICA417-12-CN	EC-IC501-1	EC-IC501-2	EC-IC502-2-CN
Ordering code	11095-00006	11095-00004	11095-00019	11095-00020	11023-00131	11023-00130	11095-00009
Product positioning	4G stanard version	4G vigor version	4G flagship version		2G expansion card		4G expansion card
Communication parameters							
Upstream networking	4G/network port	4G	4G/network port		2G		4G
Upstream network speed	5Mbps	5Mbps	50Mbps		15-20Kbs		50Mbps
Downstream communication	RS485/RS232/ network port	RS485/232	RS485/RS232/network port		RS485/232		RS485/232
Downstream network speed	10Mbps		100Mbps		85.6Kbps		100Mbps
Hardware parameters							
IP rating	IP20				IP00		
Power supply voltage	10~24V						
Overall power consumption	3W			5W	2W		3W
Indicator	Power indicator, network status indicator, and run status indicator						
Mounting method	Standard DIN rail mounting				Screw		
Work temperature	-25~65℃						
International version	Support CN/EU/LA versions				Universal		Support CN/EU/ LA versions
Antenna	External				Embedded	External	
Housing material	Engineering plastic		Sheet metal		-		
Software functions							
Real-time data monitoring	Support						
Edge computing	Support						
OTA remote upgrade	Support VFD upgrade (GD270/GD350 based special purpose products)						
Serial port transparent transmission	Support						
Network port VPN transparent transmission	Not support		Support		Not support		

Structure size



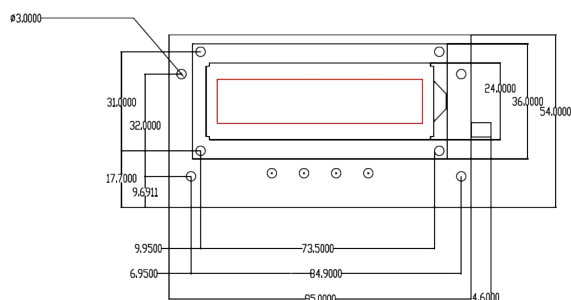
Model	Size (WxHxD) (including rail snap)	Weight (excluding antenna)
ICA413 series	32×123×56mm	55g

Positioning: Three-in-one version
(485 to 4G/485 to network port/network port to 4G)
Features: DTU price with RTU performance



Model	Size (WxHxD) (including rail snap)	Weight (excluding antenna)
ICA417 series	28.6×108.6×94.5mm	153g

Positioning: 4G flagship version (High speed 4G cat 4 version)
Features: VPN transparent transmission, supporting remote commissioning



ICA200 Model	Size (WxHxD) (including rail snap)	Weight (excluding antenna)
ICA200-00HNP	95×54×10.4mm	35g
ICA200-00HN	95×54×10.4mm	12g
ICA200-00HP	99.6×54×10.4mm	36g
ICA200-00H	99.6×54×10.4mm	13g
ICA200-00GHN	95×54×10.4mm	35g
ICA200-00GH	99.5×54×10.4mm	12g

Technical characteristics

No.	Function category	ICA413 series function description
1	Supported network	Supporting TDD-LTE, FDD LTE Compatible with HSPA+, EVDO, GPRS, and CDMA networks In the case of unstable 4G network coverage, smooth downward compatibility ensures uninterrupted data transfer
2	4G network speed	10Mbps (downstream)/ 5Mbps (upstream) @CAT1
3	Supported interface	One standard RS485 interface One standard RJ45 network port (10/100M)
4	Indicator	Power indicator, network status indicator, and run status indicator
5	Power range	DC 10V-24V
6	Overall power consumption	Less than 5W
7	Temperature range	-25~+75°C
8	IP rating	IP20
9	Mounting method	Din rail mounting
10	Main functions	Supporting IP and PORT client tool configuration Supporting ARP, Ethernet, MODBUS, MQTT and FTP protocols Supporting OTA remote upgrade Supporting remote query for system status, network connection status, and signal intensity

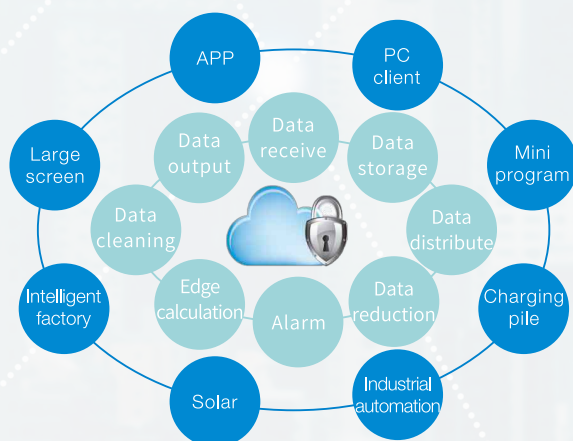
No.	Function category	ICA417 series product function description		
1	Supported network	Upstream	4G	LTE FDD、LTE TDD、GSM
			WAN	10/100M self-adaptive port
		Downstream	RS485	Modbus RTU MASTER
			LAN	Modbus TCP CLIENT
2	Supported interface	Commissioning port	Supporting one USB type-C commissioning port	
		Serial port	Supporting one-to-one frontend device data acquisition through RS485 communication	
		Ethernet port	Supporting three 10/100M self-adaptive ports: one WAN port and two LAN ports	
		SIM card	Supporting one pop-up SIM card holder (large)	
		Antenna	Supporting one SMA female antenna interface	
3	Indicator	Power indicator, network status indicator, run status indicator, and signal indicator		
4	Power range	DC 10V-24V		
5	Overall power consumption	Less than 5W		
6	Temperature range	-25~+65°C(-13~+149°F)		
7	IP rating	IP20 sheet metal		
8	Mounting method	DIN rail mounting and wall mounting		
9	Main functions	Remote monitoring	Supporting active acquiring 01/02/03/04 function codes, 19200 as default baud rate of serial port, even parity, automatically obtaining INVT PLC barcode and model	
		Remote upgrade	Supporting active acquiring 01/02/03/04 function codes, 192.168.1.100 as default IP address, port number 502, automatically obtaining INVT PLC barcode and model	
			Firmware upgrade: Remotely upgrading 4G data terminal application programs	
			Policy upgrade: Remotely upgrading policy files	
			Serial port: Virtual serial port transparent transmission	
			Network port: VPN transparent transmission	
		Multi-network access	4G and Ethernet	
		VPN transparent transmission	VPN transparent transmission, facilitating remote commissioning	
	4G routing	Transforming public LTE wireless networks to wired networks, providing networking for devices		
	Switch	Two LAN ports support the switch function		

No.	Function category	Specifications	ICA200 series product function description
1	Communication	Communication protocol	GPRS, IoT MQTT, PPP dialing, FTP transfer, and embedded TCP/UDP protocols
		Remote upgrade	Supporting the use of GPRS module to upgrade system and VFD programs remotely
		Communication interface	Supporting RS232 commissioning output, one-to-one frontend device data acquiring through RS485 communication, and MicroSD card data storing
			Supporting the use of external flash to store module configuration information and upgrade files (2MB)
		Parameter settings	Modbus device serial port baud rate, data bit, stop bit, and parity bit are configurable
		Software watchdog	Monitoring system run status in real time
		GPRS heartbeat mechanism	Monitoring server connection in real time
2	Interface	External interface	Enhanced AT command set
			4-pin socket (RS485, power), SIM card slot + Reserved SMD SIM card
			RS232/TTL debugging port, MicroSD card slot
			Onboard antenna + Reserved GPRS/4G external antenna design
		Serial port	Button cell; reserved 2G GPS chip + GPS antenna
		Indicator	One RS232 interface and one RS485 interface, built with 15kV ESD for protection
		Antenna interface	SMD light-emitting diode, power indicator (red), signal indicator (yellow), data indicator (green), and fault indicator (red)
		SIM/UIM card interface	Standard configuration: PCB embedded antenna + Reserved standard SMA female antenna interface + Reserved GPS antenna interface
		MicroSD card interface	Standard user card interface (compatible with SMD SIM configuration), supporting 1.8V/3V SIM/UIM card, built with 15kV ESD for protection
3	Power supply	Power supply interface	Standard MicroSD interface
		Text display interface	Terminal interface, built with power phase reversal and overvoltage protection
		Standard power	Supporting the text display of SPC device real-time monitoring parameters, in two lines
4	Power consumption	Supply range	DC 24V/5~30V/5V
		Communication status	DC 6~30V/ 4.5~30V/5~6V
		Standby status	200mA@12VDC; 400mA@5VDC
		Sleep status	20mA@12VDC; 35mA@5VDC
5	Physical characteristics	Scheduled shutdown status	8mA@12VDC; 18mA@5VDC
		Housing	0.6mA@12VDC; 1mA@5VDC
6	Indicator	Size	No housing, Ip00
		Status display	39mm*88mm

IWoCloud

IWoCloud industrial cloud platform

INVT develops the industrial IoT data processing platform to provide a stable, safe, and high-efficiency base for various IoT industries and application scenarios. As the IoT "brain", the platform provides large-scale data terminal node access and high concurrent terminal access capability to accept, clean, arrange, distribute, and save data uploaded from various devices. In addition, it provides standard database interfaces in unified data format externally, meeting enterprise informationization development needs.



INVT public cloud platform

Customers upload device acquired data to INVT cloud platform (IWoCloud)

- System running: safe and stable
- Maintenance: at low cost

Privatized IoT platform

Customers can deploy industrial cloud platform with private permissions on specified servers, and upload device acquired data to the platform.

- Data privatization
- Maintenance: at high cost for the need of specialist for system stability maintenance



Industrial cloud service



Policy file maintenance service

ICS-SW

Data acquiring policy
File maintenance service



Data flow card service

ICS-SIM-

- Standard card: 30MB per month
- Large data flow card: 100MB per month
- Users can recharge their cards before the 12-month service life expires.



Cloud data storage service

ICS-DS-

- 6M: The data storage rolling period is 6 months.
- 12M: The data storage rolling period is 12 months.



Cloud platform use and maintenance

ICS-PF

INVT cloud platform
use and maintenance

Policy file maintenance service

- ICS-SW: Data acquiring policy file maintenance service, implementing the upgrade or update on different data points of monitored devices

Data flow card service

- Standard card: 30MB per month
- Large data flow card: 100MB per month. Users can recharge their cards before the 12-month service life expires

API service

- CS-API: A third-party system can obtain device real-time data, facilitating remote device control and remote program upgrade.
- Standard version: The service application system provides data interfaces, for third-party systems to invoke data.
- Customized version: Data interfaces can be customized based on third-party system requirements.

Cloud platform use and maintenance

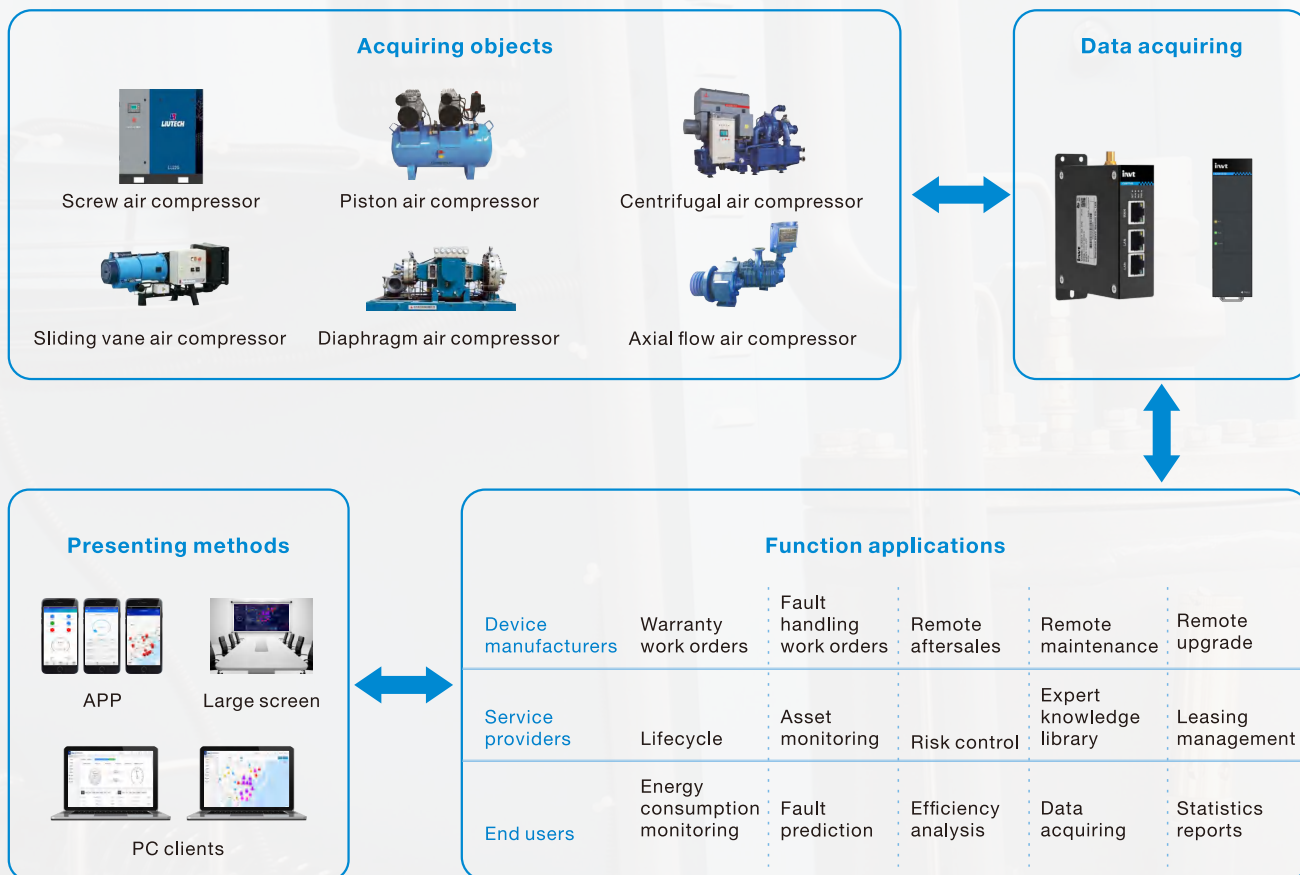
- INVT cloud platform use and maintenance

Cloud data storage service

- 6M: The data storage rolling period is 6 months
- 12M: The data storage rolling period is 12 months

Typical industry solutions

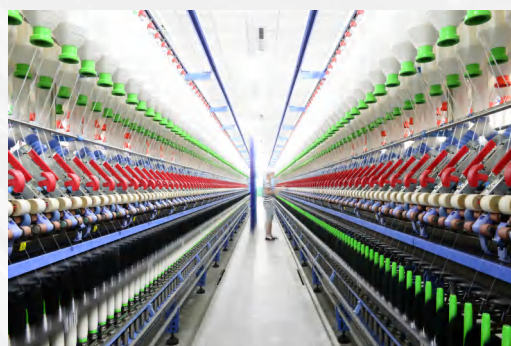
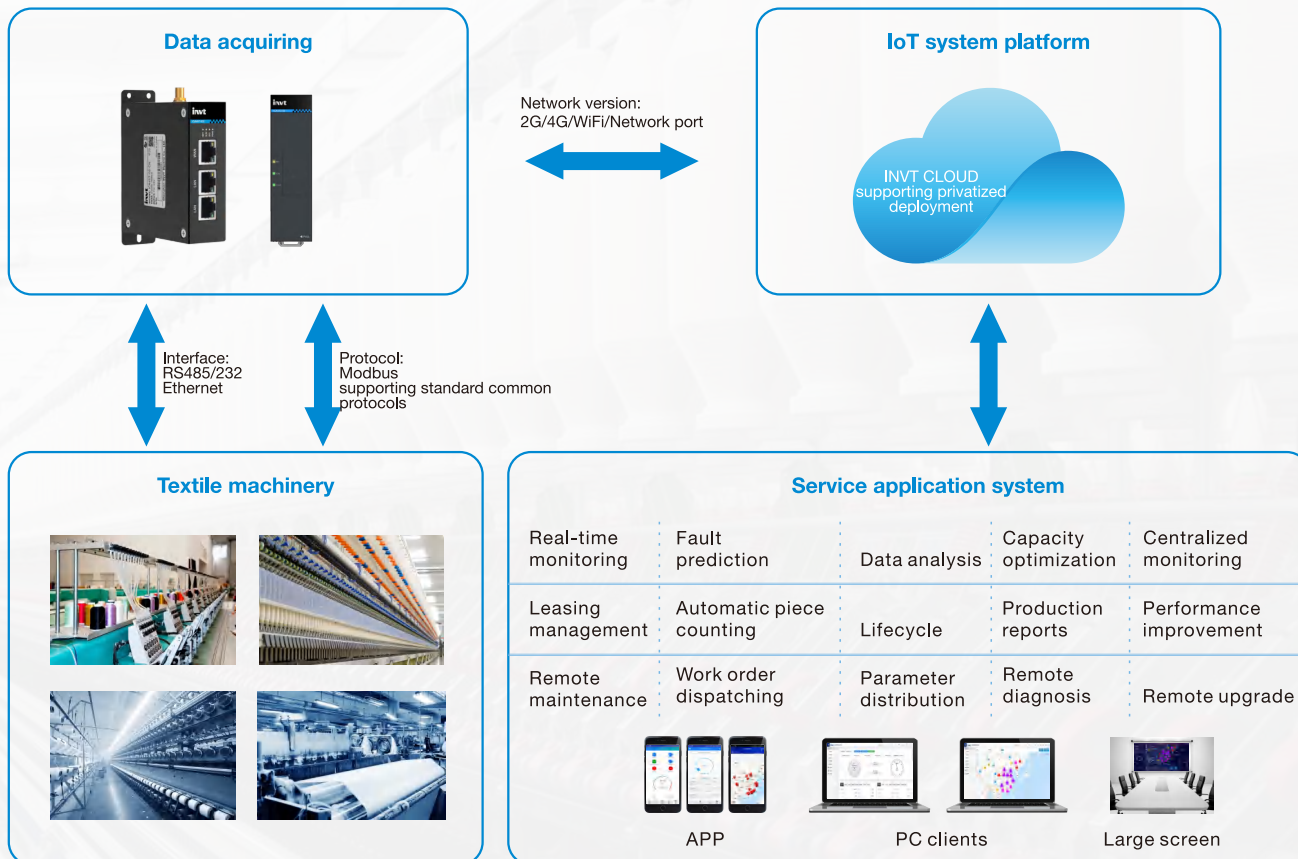
Air compressor IoT comprehensive service management platform



● Solutions

1. Saving aftersales costs: Remote aftersales can improve overall aftersales efficiency and reduce aftersales costs.
2. Device status monitoring and operation analysis: The best economic efficiency of replacing vulnerable and consumable parts can be achieved by real-time detection and intelligent analysis of these parts of air compressor.
3. IoT supervision and online leasing business: The ownership of leased device is separated from operational services, improving efficiency and reducing risks.
4. Refined energy consumption management: Through the IoT management, an enterprise can achieve a reduction of approximately 10% in energy consumption under the same operating conditions, saving at least RMB 700,000 in energy consumption costs annually.

Textile IoT smart management platform

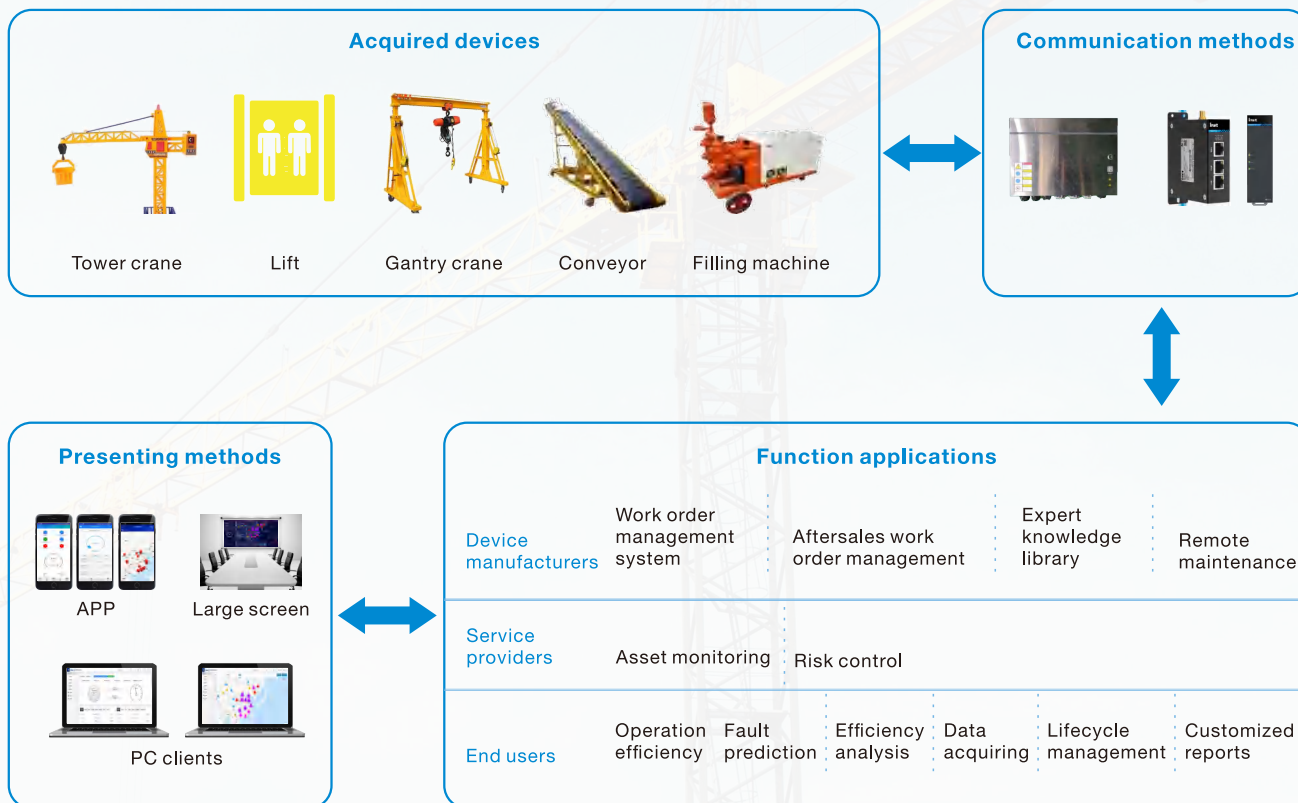


Textile process production line

● Solution

1. It realizes remote monitoring of textile production line device, batch parameter distribution, real-time monitoring of device status, improving production efficiency.
2. It realizes remote fault prediction, reducing downtime of textile production line device, ensuring system stability, and reminding of periodic device maintenance.
3. It realizes the integration of IoT platform with enterprise ERP, PLM, CRM, SCM and other management information systems, helping enterprises in efficient resource flow and integration from product design to production, and ensuring the stability and efficiency of production.

Construction machinery IoT smart management platform



● Solution

Device manufacturers

1. Fault work order management: can handle faults timely and accurately, improving user experience.
2. Aftersales and maintenance work order management: can trigger maintenance tasks actively through remote aftersales and remote control, enhancing customer stickiness, and driving accessory sales.
3. Expert knowledge library management: precise fault handling suggestions pushing to assist in efficient management.

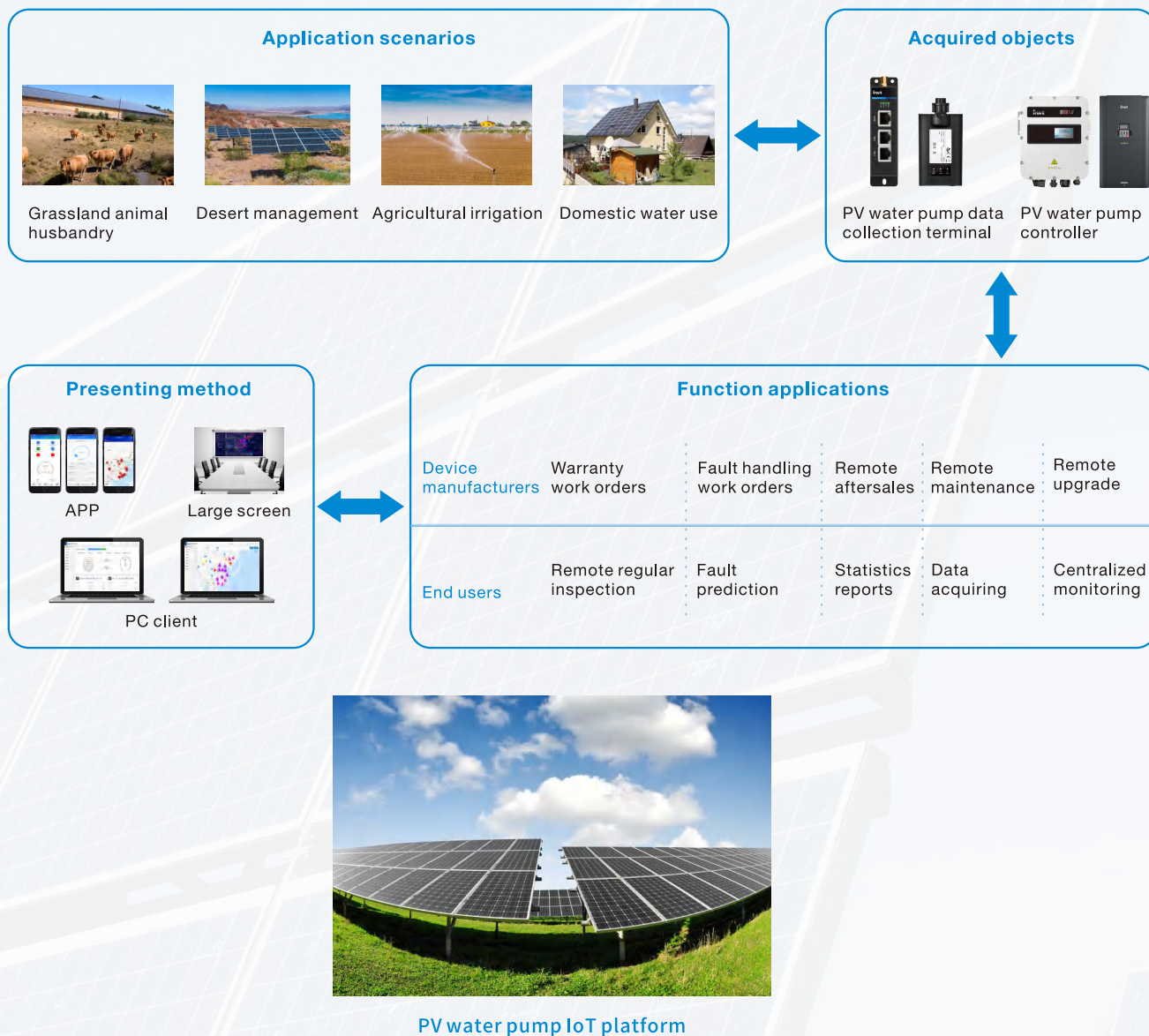
Service providers

1. Risk control: By combining IoT technology to achieve online leasing business, separating ownership of leased device from operational services, improving efficiency and controlling risks.
2. Timely reminder of payment: For device service providers' leasing business, a reminder of lease expiration can be provided to reduce repayment risks.

End users

1. Device monitoring: Real time monitoring of device status and implementation of over limit alarm mechanism for key parameters to ensure onsite safety production.
2. With the help of IoT terminal devices on construction sites, onsite inspectors can track device conditions and respond promptly to emergency situations.
3. Data report management: can generate health data for devices, facilitating maintenance operations, preventing faults, and timely notifying manufacturers for repairs.
4. Full lifecycle management of construction machinery: all device data is fully recorded for engineers to access.

PV water pump IoT smart management platform

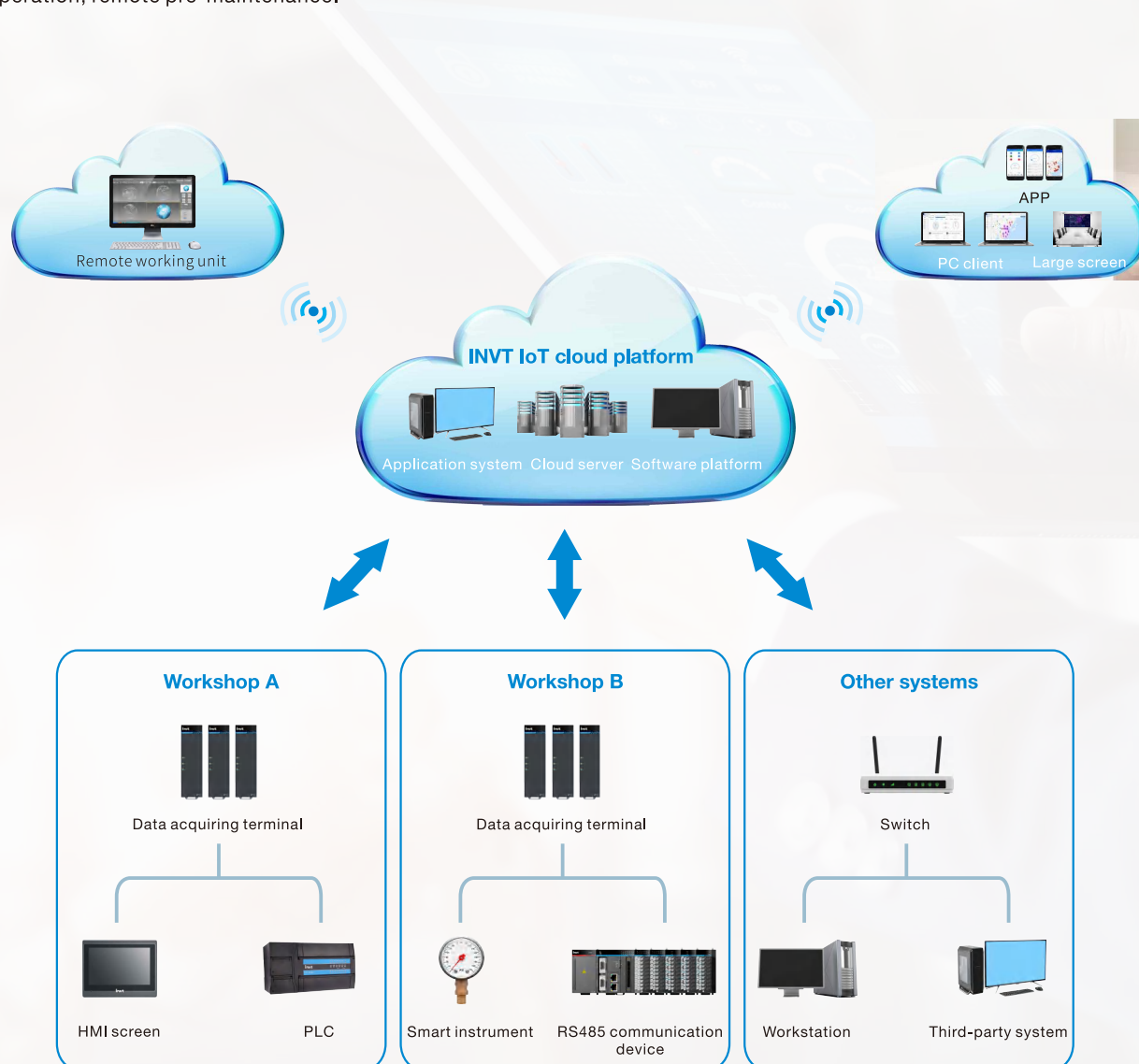


● Solution

1. Smart regular inspection and efficient O&M: can realize remote monitoring and analysis of PV water pump faults and exceptions, effectively solving practical problems such as difficult monitoring and control of PV water pumps, inspection difficulty, and low O&M effectiveness. Ultimately, the annual cost of O&M and inspection can be reduced by 30%.
2. Panoramic monitoring: can acquire operational data information such as voltage, current, and power of PV water pumps in real time, comprehensively monitor the operation of PV devices, and make intelligent analysis to achieve maximum operational efficiency of the entire PV water pump system.
3. PV water pump devices can be remotely controlled through computers and mobile phones, and key parameters of the devices can be remotely regulated.

Smart factory solution—Energy saving, emission reduction, production increase and efficiency enhancement

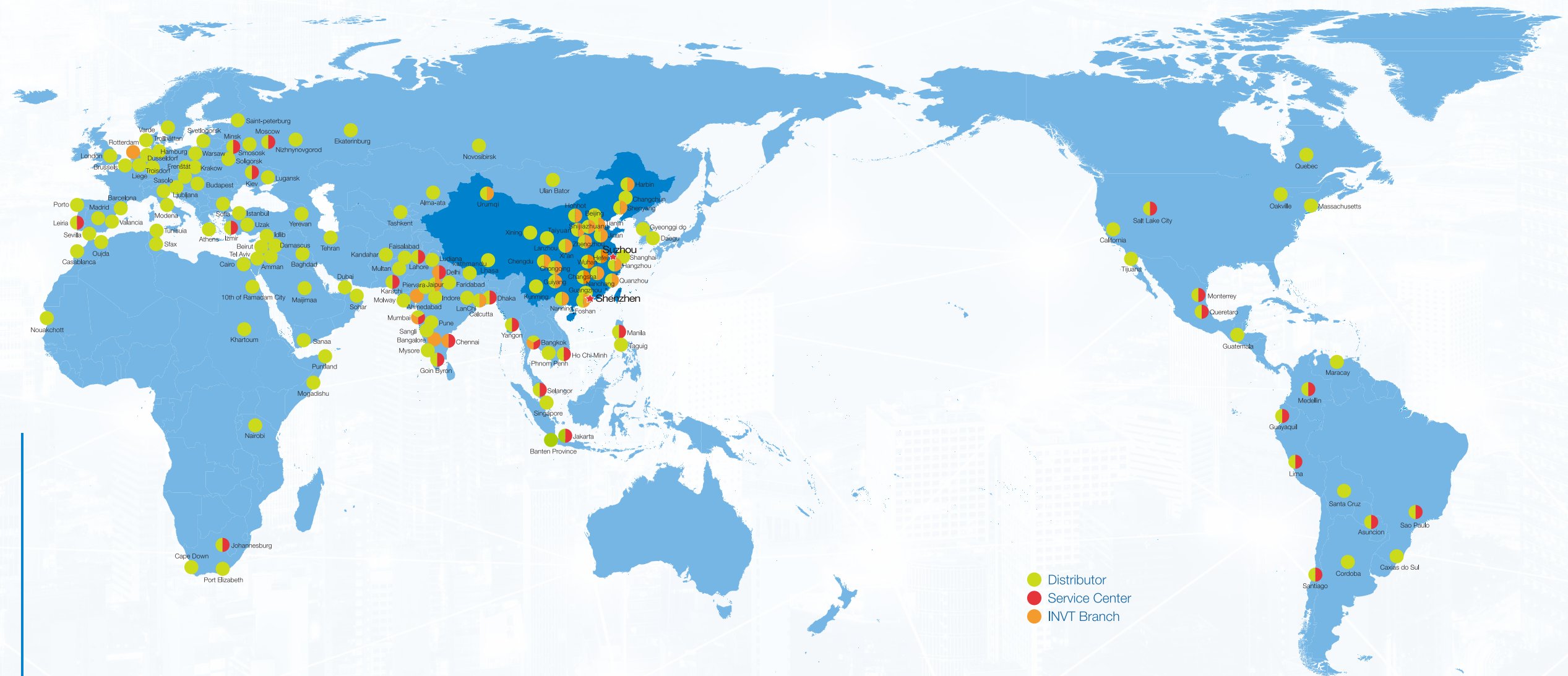
The smart factory solution is a full lifecycle management system for a digital factory or product from requirements to design, production, operation, and maintenance. The purpose is to summarize and integrate the manufacturing data, operation data, maintenance data, and then analyze and process the data through big data analysis systems and artificial intelligence systems, ultimately completing the optimization, production capacity improvement, efficient operation, remote pre-maintenance.



INVT IoT solution gradually achieves the goal of energy saving, emission reduction, and production increase and efficiency enhancement in smart factories in three stages:

1. To realize the interconnection and intercommunication of various industrial device data in the factory.
2. To manage factory device energy consumption and faults.
3. To establish a mathematical model for device energy saving, emission reduction, and production increase and efficiency enhancement by means of data analysis.

INVT Marketing service network



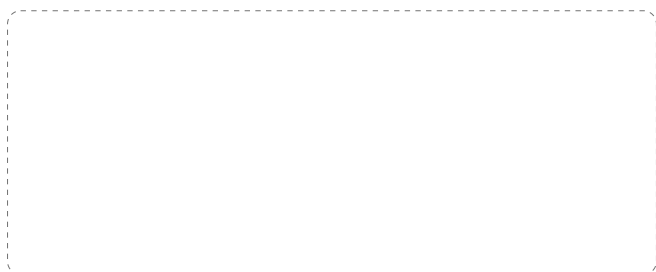
Factories * **3**

Headquarter in Shenzhen

Overseas Subsidiaries and offices * **8**

More than **100** Overseas Partners

Your Trusted Industry Automation Solution Provider



E-mail: overseas@invt.com.cn Website: www.invt.com

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Industrial Automation:

- HMI
- PLC
- VFD
- Servo System
- Elevator Intelligent Control System
- Rail Transit Traction System

Electric Power:

- UPS
- DCIM
- Solar Inverter
- New Energy Vehicle Powertrain System
- New Energy Vehicle Charging System
- New Energy Vehicle Motor

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