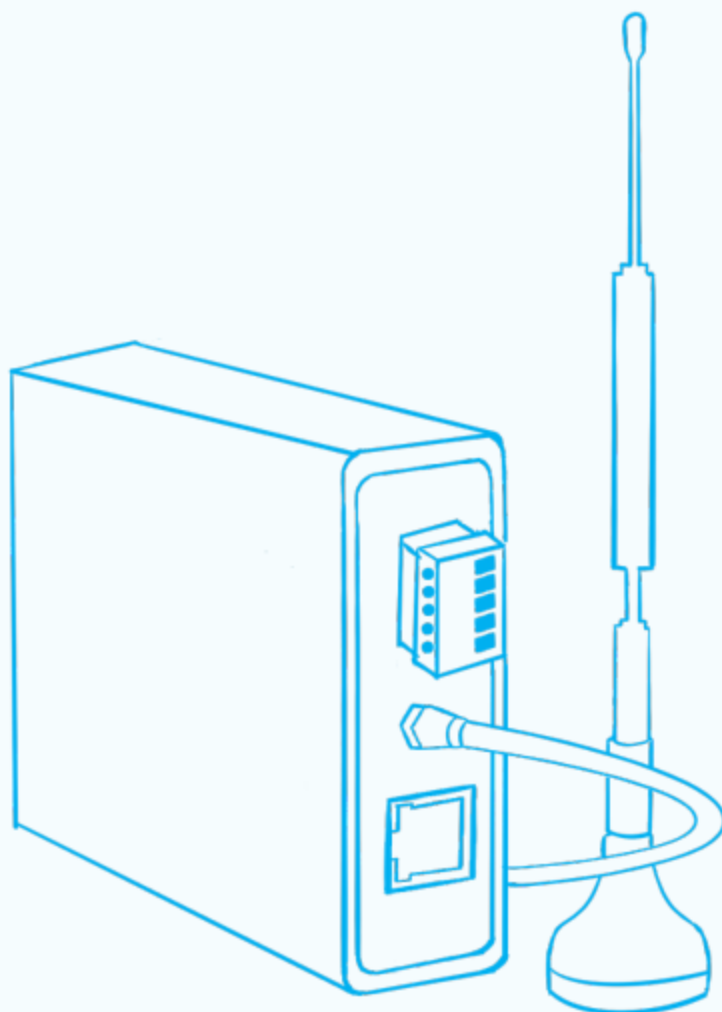


Industrial Intelligence Gateway (WG581)



SPECIFICATION

Product Introduction

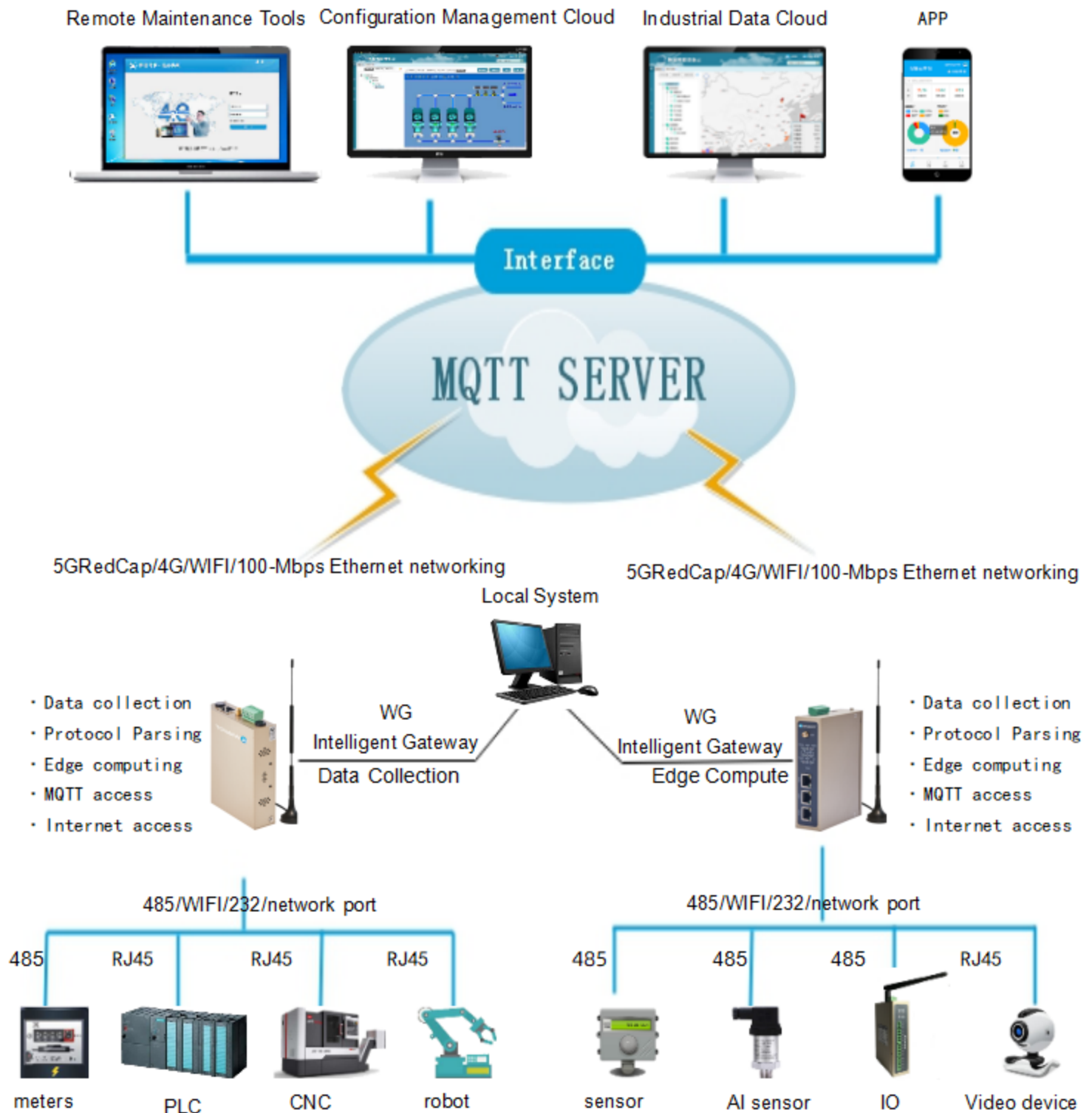
The WG581 series industrial intelligent gateway is an industrial - grade edge computing and highly reliable intelligent gateway for the integration of informatization and industrialization, launched by WideIOT for the industrial Internet field. It can not only provide reliable network access for industrial sites, but also offer rich functions such as data collection, edge computing, and cloud adaptation at the edge nodes for industrial applications.



The WG581 industrial intelligent gateway is equipped with one network port and one serial port. It supports multiple network access methods such as 5G RedCap/4G/WIFI/wired Ethernet, and can collect data from various industrial devices including PLCs, instruments, CNC machines, and robotic arms. It embeds various industrial protocols and edge - computing functions, and supports connection to various industrial Internet platforms and host - computer software through protocols such as MQTT/MODBUS/OPCUA/HTTP. It also supports advanced functions such as serial port forwarding, data passthrough, remote maintenance, remote configuration management, and data encryption.

The WG581 industrial intelligent gateway, with its rich application functions and high - reliability features, is widely used in the following industries: Intelligent factories, Equipment manufacturers, Environmental monitoring, Energy monitoring, Municipal projects such as water supply, heating, and gas supply, Smart agriculture, Intelligent aquaculture, Intelligent buildings, Industrial automation...

Topological Graph



Application Methods

■ Scenario 1: Self - Developing a Cloud Platform with the Gateway

By using the WideIoT industrial intelligent gateway, users can independently develop and build an Internet of Things platform and an industrial Internet system according to the "Open Platform Format API" (MQTT protocol + JSON message) provided by WideIoT..

■ Scenario 2: Access the public IoT platform via a gateway

Adopt the WideIoT industrial intelligent gateway to directly connect to existing and mature third - party platforms. The WideIoT gateway has been adapted to platforms such as Azure IoT , Amazon IoT , Alibaba IoT , Huawei IoT , and others.

■ Scenario 3: Equipment Remote Maintenance and Management System

Use the WideIoT industrial intelligent gateway and the equipment maintenance express line to achieve remote diagnosis, remote debugging, and remote program uploading/downloading for remote on - site equipment (such as PLCs and intelligent controllers).

■ Scenario 4: Overall Internet of Things Application and Industrial Digital Solution

Use the WideIoT gateway to connect to the application cloud platform of WideIoT, realizing remote data monitoring, video monitoring, and operation screen monitoring of on - site equipment.

■ Scenario 5: Protocol Conversion for Local Interconnection and Intercommunication

Employ the WideIoT gateway to convert multiple protocols into a standard protocol, such as Modbus TCP or OPC UA, enabling mutual communication among different local devices..

Product Features



Abundant Networking Functions and Interfaces

It supports one network port and one serial port, as well as multiple networking access methods such as 5G RedCap, 4G, WIFI, and wired Ethernet.



Powerful Protocol Collection Ability

It embeds a professional protocol engine to achieve south - bound data collection of various devices such as PLCs, instruments, machine tools, robotic arms, and power equipment. It also supports personalized protocol customization and development. Through local or cloud platforms, edge collection templates and collection strategies can be adjusted and optimized to achieve efficient data uploading to the cloud. A standardized engine is used to standardize data from different types of devices.



Flexible Cloud Adaptation and Access Capability

It can support simultaneous access to different types of cloud platforms and software. For north - bound access, it supports methods such as MQTT, MODBUS, OPCUA, SQL, HTTP database to access remote software platforms. The types of platforms include customer - self - developed cloud platforms, WideIoT equipment maintenance management platform, WideIoT configuration cloud platform, Azure IoT , Amazon IoT , Alibaba IoT , Huawei IoT , etc.



Rich Industrial Edge Application Functions

It supports protocol forwarding functions to convert multiple protocols into Modbus and other protocols for rapid access to local systems. It also supports functions such as device time calibration, gateway anti - removal, network disconnection resume transmission, breakpoint resume transmission, link encryption, and firewall functions.



Powerful Edge - Computing Function

It supports various edge - computing functions such as intelligent collection, data filtering, alarm calculation, jump - change triggering, formula calculation, and grouping strategies. After establishing device models and standardizing data, it can greatly reduce the pressure on the cloud service center, improve the robustness and high concurrency of the system. By eliminating device heterogeneity and achieving standardization, it can significantly save project R & D and construction costs.



High reliability embedded system design

It embeds multiple software and hardware watchdogs, which is very suitable for high - reliability applications in harsh industrial environments. Through methods such as watchdogs, network disconnection reconnection, breakpoint resume transmission, and function monitoring, it realizes all - round and multi - dimensional device anomaly monitoring and self - healing function design from the system layer, network layer, and application layer, ensuring the real - time online and always - online status of devices and applications, which is very suitable for unattended distributed site applications.



Convenient Remote Operation and Maintenance Function

The WideIoT industrial intelligent gateway embeds a remote operation and maintenance module. Together with the WideIoT equipment operation and maintenance express line and the equipment maintenance cloud platform, it builds a safe and reliable data channel to the remote device site for users, enabling functions such as remote configuration, remote debugging, remote diagnosis, and remote program update of on - site devices. At the same time, together with the WideIoT gateway management cloud platform, it can realize remote configuration, monitoring, diagnosis, and program update of gateways distributed around the world.



Easy - to - Integrate API Interface

The WideIoT gateway provides rich API interfaces for software developers. Through the open - platform - format API of WideIoT, data collection, two - way control, and remote management of on - site devices can be achieved, allowing users to quickly build advanced and professional industrial application systems.



Powerful Security Function

1) Data Transmission Security: It supports L2TP, PPTP, IPSec VPN, Open VPN, and CA certificates to ensure secure data transmission.

2) Network Protection Security: It has a powerful firewall function and can customize comprehensive protection strategies according to customer requirements. For example, it supports SPI full - state detection, Secure Shell (SSH), intrusion protection (Ping - prohibited), DDoS defense, attack defense, IP - MAC binding and other firewall functions to protect the network from external attacks.

3) All nodes provide identity authentication and end - to - end encryption services. These nodes include the device side and various cloud services. The Internet of Things suite also provides device - level permission granularity services, which ensure that devices or applications can only operate certain resources when they have the corresponding access rights.

Product Specifications

Software Specifications

Network Function	Network Access	Support 5G RedCap, 4G, WIFI, and Ethernet access
	Network Authentication	Supports CHAP/PAP authentication and APN access
	CAT1 Network	TDD - LTE/FDD LTE. (specific frequency band information please refer to the order information table)
	CAT4 Network	GSM/GPRS/EDGEUMTS/HSPA+/CDMA2000-EVDO/TD-SCDMA/TDD-LTE/FDD LTE. (specific frequency band information please refer to the order information table)
	LAN Protocols	Supports ARP
	WAN Protocols	Supports PPP
	IP Application	Supports Ping \Trace \DHCP Server \DHCP Relay \ DHCP Client \ DNS relay \ DDNS , ROUTE , NAT , DMZ
	IP Routing	Support static routing
WIFI function (optional)	Protocol Standard	Support IEEE 802.11b/g/n
	Working Mode	Support FAT AP, FIT AP, STA, Relay, etc.
	Band Rate	Support 2.4G single -band, 150M/300Mbps(single - antenna/double - antenna)
	Security Features	Support open system, shared key, WPA/WPA2 authentication
		Support WEP/TKIP/AES encryption
	Transmission Distance	100m (the actual transmission distance depends on the site environment)
Security	Protection Security	Support full - state packet inspection (SPI), prevent Denial - of - Service (DoS) attacks, filter multicast/Ping probe packets, source - port mapping, destination - port mapping, DMZ, access control function (ACL), IP - MAC binding
	Data Security	Support L2TP VPN/PPTP VPN/OPEN VPN/IPSec VPN (optional)
	Security Authentication	TLS security encryption, username - password, and certificate - based access authentication

	Firewall	Built - in firewall function for comprehensive network isolation and protection
Reliability	Link Detection	Support sending heartbeat detection packets for detection and automatic reconnection in case of disconnection
	Watchdog Protection	Software and hardware watchdogs support device operation self - inspection technology, and the device can self - repair in case of operation failures
	Function Security Guard	Real - time monitors various function modules, predicts and handles possible errors, and self - heals
Intelligence	Intelligent Collection	Patented fast and stable collection algorithms ensure stable, reliable, and efficient data collection. One gateway can collect data from multiple different types of devices
	Protocol Parsing	Supports the protocol parsing of mainstream PLC controllers, instruments, collectors, and various controllers (Siemens, Schneider, Omron, Mitsubishi, Delta, Modbus, etc.)
	Edge Computing	Can realize functions such as data filtering, grouped collection, alarm calculation, and time - series error correction
	Standardization	Standardizes data of various protocols and builds device models for standardized applications
	Cloud Access	Supports simultaneous connection to multiple different or the same type of data centers (WidelOT Cloud, Azure IoT, Amazon IoT, Alibaba IoT, Huawei IoT, etc.)
	Data Penetration	Supports data penetration function, and realizes data passthrough applications in conjunction with the equipment express line
	Remote Maintenance	In conjunction with the equipment maintenance express line, it can realize remote diagnosis, remote debugging, and upgrade of on - site devices
	Serial - Port Forwarding	Forward serial - port data to another serial port to achieve multi - master - to - one - slave architecture data
	Sub device Model	Divides real master devices into multiple virtual sub - devices according to business needs through virtual sub - devices
	Breakpoint Resume	Supports breakpoint resume transmission, with the storage medium being memory
	Bidirectional control	Supports various controls such as data timed reporting, immediate read, immediate write, batch read, and batch write
	Channel Monitoring	Supports reporting the online status and heartbeat of devices and gateways to monitor the link status
	Data Standardization	Supports data processing of various data types. After standardizing different protocol data models, the data is reported to the cloud

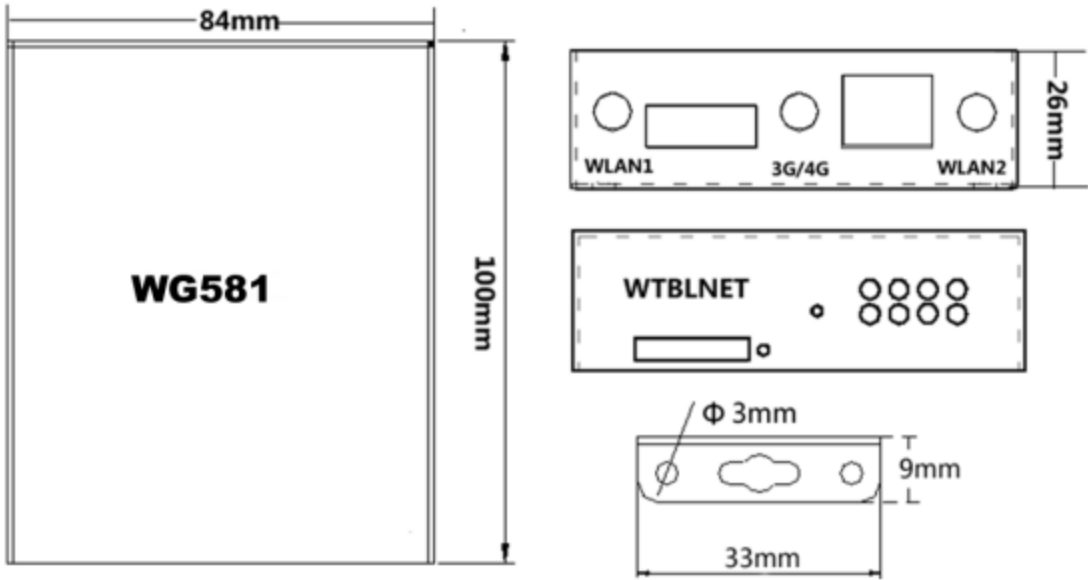
		platform, and customized reporting formats are supported
	Status Reporting	Supports reporting of online/offline status, device status, and gateway heartbeat mechanism
	Bus Adaptation	Supports adapting different algorithms according to different buses to ensure stable and reliable transmission
	Location Information	Supports base - station positioning and GPS/BD positioning (optional)
Management and Maintenance	Configuration Project	Supports local and remote configuration of data collection projects
	Application Upgrade	Supports local and remote program upgrades for rapid product function release and iteration
	Remote Diagnosis	Supports remote diagnosis and recovery of gateway failures
	Log Function	Supports complete and detailed log functions for easy and quick troubleshooting
	Import/Export	Supports the import and export of project files for convenient diagnosis and batch configuration
	Diagnostic Command	Supports rich diagnosis command interfaces for local self - diagnosis
	Status Query	System status, module status, network connection status, application status, etc.
Application Development	Custom Development	Support WideIoT to customize and develop edge applications on the gateway according to user requirements
	Edge Development	Support users' engineers to develop edge - computing application programs on the gateway
	Cloud Development	Provide rich API interfaces for upper - computer software development by development engineers

Hardware specifications

Hardware Platform	CPU Core	580MHZ single - core
	Running Memory	128MB (1Gb)
	Program Memory	16MB (128Mb)
	Data Storage	None
Interface Characteristics	Power Interface	DC 6V - 35V (terminal block)
	Ethernet Port	1*10/100Mbps fast Ethernet port, LAN port, 1.5KV network isolation transformer protection, FE0 (LAN)
	Serial Port	1 serial port (RS232/RS485), 15KV ESD protection
	5G RedCap	5G NR frequency bands N1/N3/N5/N8/N28/N41/N78/N79 LTE - FDD frequency bands B1/B3/B5/B8 LTE - TDD frequency bands B34/B38/B39/B40/B41 Transmission rate: downlink 226Mbps/uplink 120Mbps
	4G Network Standard	LTE Cat4, maximum downlink rate 150Mbps, maximum uplink rate 50Mbps; LTE Cat1, maximum downlink rate 10Mbps, maximum uplink rate 5Mbps
	SIM Card Holder	Drawer - type card holder * 1 (large card)
	Reset Button	Pin - hole - type reset button
	Antenna Connector	3G/4G network: SMA x 1, WLAN: RP - SMA x 2, 5G RedCap: SMA x 2
	Expansion Interface	Support GPS/BD (optional)
Mechanical Characteristics	Dimensions	84x100x26(mm)
	Installation Method	Panel/rail
	Shell	Metal shell (gold - colored)
	Protection Level	IP30
	Heat - Dissipation	Fan-less heat dissipation

	Method	
	Weight	280g
Environment Humidity	Environment Humidity	5% ~ 95% (no condensation)
	Storage Temperature	-40 °C ~ 85 °C
	Operating Temperature	-20 °C ~ 70 °C
Indicator Lights	1*6 indicators	POWER light (red), STATUS light (green), WARN light (yellow), 4G signal strength lights (green) * 3
EMC Index	Electrostatic Discharge Immunity	GB/T17626.2 - 2018, level4
	Electrical Fast Transient Pulse Group Immunity	GB/T17626.4 - 2018, level4
	Oscillatory Wave Magnetic Field Immunity	GB/T17626.18 - 2016, level4
	Radio - Frequency Electromagnetic Field Radiation Immunity	GB/T17626.3 - 2016, level4
	Surge (Impact) Immunity	GB/T17626.5 - 2019, level4
	Power - Frequency Magnetic Field Immunity	GB/T17626.8 - 2006, level4
Physical Characteristics	Vibration	GB/T2423.10 - 2008
	Shock	GB/T2423.5 - 2019
	Drop	GB/T2423.8 - 1995

Product Size



Product Selection

Hardware Selection

Order number	WG581 - <N>-<M>-<P>-<S>
N (Network Type)	L: LTE, WLAN: WiFi, N: 5G RedCap
M (Wireless Module)	L07: 4G CAT4 (TDD - LTE and FDD - LTE, etc.), Chinese version; L09: 4G CAT4 (TDD - LTE and FDD - LTE, etc.), Overseas version; Q2S: 4G CAT1 (only supports TDD - LTE and FDD - LTE), Chinese version; F61: 4G CAT1 (only supports TDD - LTE and FDD - LTE), Chinese version; T57: 5G RedCap
P (Platform and Protocol)	WMQTT (WidelOT platform), MMQTT (Modbus version), MQTT (general MQTT), WCONN (Equipment Express Line)
S (Serial Port Type)	485: RS485 serial port, 232: RS232 serial port
Example	WG581 - LL07 - MQTT - 232: Supports 4G CAT4, general MQTT platform, and RS232 interface. WG581 - LQ2S - WMQTT - 485: Supports 4G CAT1, WidelOT WMQTT platform, and RS485 interface. WG581 - WLAN - WMQTT - 485: Supports 2.4G WIFI, WidelOT WMQTT platform, and RS485 interface. WG581 - NT57 - MQTT - 485: Supports 5G RedCap, general MQTT platform, and RS485 interface.

Company Introduction

Established in 2011, WideIoT is a leading provider of industrial Internet of Things products and industrial digital solutions. It focuses on offering products and solutions such as wireless data terminals, industrial intelligent gateways, equipment remote systems, and industrial application cloud platforms for equipment manufacturers, smart factories, and industry projects. It helps customers achieve digital operation management and tap new values in the industrial Internet.

The products of WideIoT are widely used in various industrial fields, including smart factories, equipment manufacturers, the environmental protection industry, the energy industry, municipal engineering, industrial automation, smart agriculture, and building intelligence. They are favored by top - tier domestic and foreign customers such as BOE, Foxconn, ASD, TCL, Schneider, Shanghai Electric, Shougang Group, Water Affairs Group, and Southern Power, as well as a large number of small and medium - sized enterprises.

Xiamen WideIoT Technology Co. Ltd.

Company Website: www.wideiot.com

Contact Phone: +86-0592-2031080

Contact Email: info@wideiot.com

Contact Address: Xiamen Software Park Phase III, China