



M2M Cellular Modem Catalog

Build a Smarter IOT world, Your Trustworthy Partner

ENTERPRISE PROFILE



Jinan USR IOT Technology Ltd., a leading industrial Internet of Things software and hardware solution service provider, has more than 500 employees, has a manufacturing plant, provides customers with IoT modules, communication terminals, smart gateways, cloud platforms and IoT solutions.



USR IOT has more than 500 employees now, nearly half of them are research and development staff. USR IOT has won many honors such as "National High-tech Enterprise, software enterprise, gazelle enterprise, invisible champion cultivation enterprise, national excellent enterprise in electronic information industry, most valuable and influential IOT communication enterprise".



Cloud

Remote monitor

Remote access

PUSR Cloud
account.usriot.com

Device management

Data acquisition

Communication layer



5G/4G Industrial router

5G industrial cellular router
4G industrial cellular router



serial to Ethernet converter

Industrial Serial to Ethernet Converters
Cost-effective Serial to Ethernet Converters
WiFi Serial to WiFi Converters
CAN CAN to Ethernet Converter
Industrial Network Switches



IIOT terminal

PLC gateway
PLC Ethernet
Ethernet PLC
Remote IO controller



2G/4G Modem

4G Modem
2G Modem



Cat-1 series

Cat-1 DTU
LTE Cat-1 modem



Din-Rail Terminal

Din-Rail 4G modem
Din-Rail serial device server



LoRa | NB-IoT

Lora Modem
LoRa DTU
NB-IoT module



Embedded IoT modules

4G module
WiFi module
Ethernet module
KPORT module
Bluetooth module

sensors and actuators

Perception layer



TABLE OF CONTENT

Dual Serial Port LTE Cat Modem USR-MB706-----2

Dual Serial Port 4G Modem USR-G786-----5

Din Rail LTE 4G Modem USR-DR504-----7

Dual Serial Port LTE Cat 1 Modem USR-G771 -----10

Din Rail LTE Cat 1 Modem USR-DR502-----12

Compact LTE Cat 1 Modem USR-DR150/152/154-----14

Embedded LTE Cat 1 Module WH-LTE-7S1-----17

Solutions and applications -----19

PUSR cloud -----23





● What is a serial to cellular modem?

The cellular modem(also called IP modem,DTU) is designed to provide internet connectivity across a broad range of M2M and IoT applications. Cellular modem is a wireless terminal device used to convert serial data into IP data or IP data to serial data through wireless communication network. Also, it can be used as SMS modem and Modbus RTU to Modbus TCP converter.

LTE CAT M/CAT 1/CAT 4 modem is widely used in meteorology, smart grid, intelligent transportation, industrial automation, intelligent building, fire alerting, solar power farm, environmental monitoring, tank monitoring, agriculture, forestry industry. They allow PLCs, meters, instruments have network connectivity via serial port such as RS232/RS485. They help to transport data from any industrial device to data control servers over the LTE cellular network, allowing businesses to benefit from real-time data monitoring and acquisition, device management and control.

The USR IOT industrial cellular modems have been designed to an industrial specification to allow an easy connection for remote devices over the internet. The USR IOT modems move away from the traditional approach of TCP/UDP connection built and maintenance using a set of AT commands which require a high skill level to implement correctly and reliably. Instead, setup and management are all achieved using the modern configuration utility which makes deployment a simple task.

● How does modem work?

The GSM/GPRS/3G/4G modems with dynamic IP address, will create the connection to the server to build the tunnel, so the server can communicate to the modem. With the heartbeat, it can keep the connection tunnel online all the time. Once the connection disconnected, the GSM/GPRS/3G/4G Modem will auto redial to create the connection. The server must with static IP address or DNS.

Under TCP/UDP mode, when the data length exceeds a fixed length or within the fixed time no new data received, the GSM/GPRS/3G/4G IOT M2M Modem will start to process the received data, packing the data then send to the specified IP address and Port or DNS and Port. Or unpack the data packets from the internet then transfer to the com port according to the baud rate.

With the development of IoT ,cloud platform and big data technology, more and more devices start to support MQTT, HTTP protocol, our DTU is the same. More devices with serial ports can transmit data to remote servers through edge acquisition. Unified processing and analysis of data makes the data produce greater value and make the decision-making and control more scientific and accurate.

Dual Serial Port LTE Cat Modem | USR-MB706



USR-MB706 is a LTE Cat M serial modem which supports GNSS. It supports LTE Cat M1, NB-IoT, and EDGE/GPRS compatible, covers global frequency bands. It has perfect software function, supports transparent transmission, HTTPD Client, SMS mode and AT command configuration. Also, it is simple to configure, has high reliability and built-in hardware watchdog, supports FOTA upgrading. USR-MB706 adopts terminal interface design, RS232/RS485 interface easy to connect to serial port sensors, PLC, IPC, and controller, meets the needs of different application scenarios such as meter reading, security monitoring, vehicle positioning, alarms, asset tracking, etc.



Global Frequency bands



GNSS



High Coverage

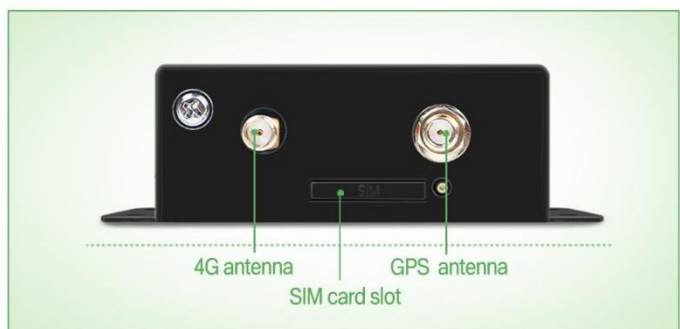


Modbus RTU/TCP



Industrial Standard

Hardware & Dimensions



❖ Hardware

- **Power supply**
Connector: terminal block
Input range: DC 9 - 36V
Operating current: average 43mA/12V
- **Serial port**
RS232/RS485: terminal block
Baudrate: 2400~230400bps
Parity: NONE/ODD/EVEN
Data: 8
Stop: 1/2
- **Antenna**
LTE Connector: SMA-K*1
GNSS Connector: SMA-K*1
- **SIM card slot**
SIM card holder: standard draw type SIM slot * 1
USIM: 1.8V MINI SIM 2FF
- **Indicators**
POWER,WORK,NET,LINKA
- **Reload**
Factory reset button

❖ Software

- **Transmission Speed**
Cat M1:588Kbps DL/1119Kbps UL
Cat NB2:127Kbps DL/158.5Kbps UL
EDGE:296Kbps DL/236.8Kbps UL
GPRS:107Kbps DL/85.6Kbps UL
- **Network protocol**
TCP/UDP,HTTP(S),MQTT(S),DNS,FTP
- **Work mode**
Transparent transmission (TCP/UDP)
HTTP transmission
SMS transmission

❖ Physical

- **Installation**
Panel mounting
- **Dimensions**
Dimensions: 105mm × 94mm × 28mm

❖ Electrical

- **Power supply protection**
ESD: IEC 61000-4-2 Level 3
Surge: IEC 61000-4-5 Level 3
EFT: IEC 61000-4-5 Level 3
- **RS232 protection:**
ESD: IEC 61000-4-2 Level 3
- **RS485 protection:**
ESD: IEC 61000-4-2 Level 3
Surge: IEC 61000-4-5 Level 3
EFT: IEC 61000-4-5 Level 3

❖ Environmental

- **Ambient environment**
Operating temperature: -35°C~+75°C
Storage temperature: -40°C~+85°C
Relative Humidity: 5%~95%(non-condensing)

❖ Certification

- **approval**
CE , RoHS ,FCC

USR-MB706 Ordering Guide

Model	Region	Frequency bands
USR-MB706	Global	<p>Cat M1: B1/2/3/4/5/8/12/13/18/19/20/25/26/27/28/66/85</p> <p>Cat NB2: B1/2/3/4/5/8/12/13/18/19/20/25/28/66/71/85</p> <p>GSM/EDGE: 850/900/1800/1900 MHz</p>



4G LTE Modem Ordering Guide

Model	USR-G786	USR-DR504	USR-G771	USR-DR502	WH-LTE-7S1
LTE Category	LTE Cat 4	LTE Cat 4	LTE Cat 1	LTE Cat 1	LTE Cat 1
Transmission Speed	LTE FDD: 150Mbps (DL)/ 50Mbps (UL) LTE TDD: 130Mbps (DL)/ 30Mbps (UL)		LTE FDD Rel.13:10Mbps(DL) / 5Mbps (UL)		
Region	-G:Global -EUX: Europe -AUX:Australia/Latin America	-G:Global -EUX: Europe -AUX:Australia/Latin America	-E:Europe	-E:Europe	-E:Europe
Serial interface	RS232/RS485	RS485	RS232/RS485	RS485	TTL-3.0V
Connector	RS232:3P terminal RS485:2P terminal	RS485:3P terminal	RS232:DB9-M RS485:2P terminal	RS485:3P terminal	TTL-DIP
Buadrate (bps)	2400~230400	2400~230400	600~230400	600~230400	600~921600
Antenna	SMA-K	SMA-K	SMA-K	SMA-K	Ipex
SIM	MINI SIM(2FF)	Micro SIM(3FF)	MINI SIM(2FF)	Micro SIM(3FF)	MINI SIM(2FF)
USIM	3.0V/1.8V	3.0V/1.8V	3.0V/1.8V	3.0V/1.8V	3.0V/1.8V
Installation	Panel mounting	Din-Rail mounting	Panel mounting	Din-Rail mounting	DIP
Dimensions(mm)	111.51 × 94 × 28	28 x 64.7 x 109.7	82.6 × 86 × 25	28 x 64.7 x 109.7	44.4 × 41.8 × 12.5
Certification	CE,RoHS	CE,RoHS	CE,RoHS	CE,RoHS	CE,RoHS

Dual Serial Port 4G Modem | USR-G786



USR-G786 is an LTE Cat 4 Modem with low latency, high reliability and high real-time characteristics. The product has a fast transmission rate, with an uplink peak rate of 50Mbps and a downlink peak rate of 150Mbps. USR-G786-G supports the frequency bands of major operators all over the world, USR-G786-EUX in European, and USR-G786-AUX in Australia and Latin America.

The product supports TCP/UDP transparent transmission, SMS transparent transmission, HTTP transparent transmission, and mutual conversion between modbus TCP and RTU. The product has rich functions, simple to use, and supports customization. It can realize functions such as MQTT to meet more functional needs of customers.



High performance



High speed



Low latency



Industrial terminal



Modbus RTU/TCP



Industrial grade design

Hardware & Dimensions



USR-G786 Ordering Guide

Model	Region	Frequency bands
USR-G786-G	Global	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28 LTE-TDD: B38/B39/B40/B41 UMTS: B1/B2/B4/B5/B6/B8/B19 GSM: B2/B3/B5/B8
USR-G786-EUX	EMEA/APAC	LTE-FDD: B1/B3/B7/B8/B20/B28A LTE-TDD: B38/B40/B41 WCDMA: B1/B8 GSM: B3/B8
USR-G786-AUX	Australia/New Zealand/Taiwan/Latin America	LTE FDD: B1/B2/B3/B4/B5/B7/B8/B28 LTE TDD: B40 WCDMA: B1/B2/B4/B5/B8 GSM: B2/B3/B5/B8

❖ Hardware

● Power supply

Connector: terminal block
Input range: DC 9 - 36V
Operating current: average 55mA/12V

● Serial port

RS232/RS485: terminal block
Baudrate: 2400~230400bps
Parity: NONE/ODD/EVEN
Data: 8
Stop: 1/2

● Antenna

Connector: SMA-K*1

● SIM card slot

SIM card holder: standard draw type SIM slot * 1
USIM: 3.0V/1.8V MINI SIM 2FF

● Indicators

POWER,WORK,NET,LINK

● Reload

Factory reset button

❖ Software

● Transmission Speed

LTE FDD: Peak 150Mbps (DL)/ 50Mbps (UL)
LTE TDD: Peak 130Mbps (DL)/ 30Mbps (UL)
DC-HSDPA: Peak 42Mbps (DL)
HSUPA: Peak 5.76Mbps (UL)
WCDMA: Peak 384Kbps (DL)/ 384Kbps (UL)
EDGE: Peak 296Kbps (DL)/ 236.8Kbps (UL)
GPRS: Peak 107Kbps (DL)/ 85.6Kbps (UL)

● Network protocol

TCP/UDP,HTTP(S),MQTT(S),DNS,FTP

● Work mode

Transparent transmission (TCP/UDP)
HTTP transmission
SMS transmission

❖ Electrical

● Power supply protection

ESD: IEC 61000-4-2 Level 3
Surge: IEC 61000-4-5 Level 3
EFT: IEC 61000-4-5 Level 3

● RS232 protection:

ESD: IEC 61000-4-2 Level 3

● RS485 protection:

ESD: IEC 61000-4-2 Level 3
Surge: IEC 61000-4-5 Level 3

❖ Physical

● Installation

Panel mounting

● Dimensions

Dimensions: 111.51mm × 94mm × 28mm

❖ Certification

● approval

CE , RoHS,FCC

❖ Environmental

● Ambient environment

Operating temperature: -35℃~+75℃
Storage temperature: -40℃~+90℃
Relative Humidity: 5%~95%(non-condensing)

Din Rail LTE 4G Modem | USR-DR504



USR-DR504 is a DIN-Rail type LTE Cat 4 Modem, with low latency, high reliability and high real-time characteristics. The product has a fast transmission rate, with an uplink peak rate of 50Mbps and a downlink peak rate of 150Mbps. USR-DR504-G supports the frequency bands of major operators all over the world, USR-DR504-EUX in European, and USR-DR504-AUX in Australia and Latin America.

The product supports TCP/UDP transparent transmission, SMS transparent transmission, HTTP transparent transmission, and mutual conversion between modbus TCP and RTU. The product has rich functions, simple to use, and supports customization. It can realize functions such as MQTT to meet more functional needs of customers.



Din Rail



High speed



Low latency



Industrial terminal



Modbus RTU/TCP



Industrial grade design

Hardware & Dimensions



USR-DR504 Ordering Guide

Model	Region	Frequency bands
USR-DR504-G	Global	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28 LTE-TDD: B38/B39/B40/B41 UMTS: B1/B2/B4/B5/B6/B8/B19 GSM: B2/B3/B5/B8
USR-DR504-EUX	EMEA/APAC	LTE-FDD: B1/B3/B7/B8/B20/B28A LTE-TDD: B38/B40/B41 WCDMA: B1/B8 GSM: B3/B8
USR-DR504-AUX	Australia/New Zealand/Taiwan/Latin America	LTE FDD: B1/B2/B3/B4/B5/B7/B8/B28 LTE TDD: B40 WCDMA: B1/B2/B4/B5/B8 GSM: B2/B3/B5/B8

❖ Hardware

● Power supply

Connector: 3Pin terminal block
Input range: DC 9 - 36V
Operating current: average 102mA/12V

● Serial port

RS485: 2Pin terminal block
Baudrate: 2400~230400bps
Parity: NONE/ODD/EVEN
Data: 8
Stop: 1/2

● Antenna

Connector: SMA-K*1

● SIM card holder

SIM card holder: Built-in push push card slot * 1
USIM: 3.0V/1.8V Micro SIM 3FF

● Indicators

PWR,WORK,NET,LINK,Tx,Rx,RSSI

● Reload

Factory reset button

❖ Electrical

● Power supply protection

ESD: IEC 61000-4-2 Level 3
Surge: IEC 61000-4-5 Level 3
EFT: IEC 61000-4-5 Level 3

● RS485 protection:

ESD: IEC 61000-4-2 Level 3
Surge: IEC 61000-4-5 Level 3

❖ Certification

● Approval

CE , RoHS

❖ Software

● Transmission Speed

LTE FDD: Peak 150Mbps (DL)/ 50Mbps (UL)
LTE TDD: Peak 130Mbps (DL)/ 30Mbps (UL)
DC-HSDPA: Peak 42Mbps (DL)
HSUPA: Peak 5.76Mbps (UL)
WCDMA: Peak 384Kbps (DL)/ 384Kbps (UL)
EDGE: Peak 296Kbps (DL)/ 236.8Kbps (UL)
GPRS: Peak 107Kbps (DL)/ 85.6Kbps (UL)

● Network protocol

TCP/UDP,HTTP(S),MQTT(S),DNS,FTP

● Work mode

Transparent transmission (TCP/UDP)
HTTP transmission
SMS transmission

❖ Physical

● Installation

Din Rail mounting

● Dimensions

Dimensions: 28mm x 64.7mm x 109.7mm

❖ Environmental

● Ambient environment

Operating temperature: -35℃~+75℃
Storage temperature: -40℃~+90℃
Relative Humidity: 5%~95%(non-condensing)

4G Modem applications

The USR-G786 and USR-DR504 products can be used in a variety of industrial application scenarios, relying on 4G high speed high reliability and high coverage features. It is widely used in high speed rate and big data transmission scenarios, such as remote control of power distribution cabinet, cold chain transportation, traffic management, street lighting control, temperature / humidity monitoring, weather monitoring, public safety, factory automation, energy monitoring, heating control, door and window status monitoring, remote AMR, electric car charging, car parking payment, access control, door entry systems etc.



Typical Applications



■ Dual Serial Port LTE Cat 1 Modem | USR-G771



USR-G771 is an LTE CAT 1 cellular modem, which supports LTE and GSM. USR-G771-E covers the mainstream frequency bands of European operators. It has perfect software function, supports TCP/UDP transparent transmission, SMS transmission, HTTPD Client mode, and AT command configuration. Also, it is simple to configure, has high reliability and built-in hardware watchdog, supports FOTA upgrading.

USR-G771 has wide-voltage power supply terminals and DC interfaces, standard RS232 and RS485 interfaces meets the needs of different application scenarios.



Compact size



Highly-reliable



Low latency



Modbus RTU/TCP



Industrial grade design

Hardware & Dimensions



❖ Hardware

● Power supply

Connector: 5.5*2.1 barrel type socket, terminal block
Input range: DC 9 - 36V
Operating current: average 50mA/12V

● Serial port

RS232: DB9-Male
RS485: 2Pin terminal
Baudrate: 600~230400bps
Parity: NONE/ODD/EVEN
Data: 8
Stop: 1/2

● Antenna

Connector: SMA-K*1

● SIM card slot

SIM card holder: standard draw type SIM slot * 1
USIM: 3.0V/1.8V MINI SIM 2FF

● indicators

POWER,WORK,2G/CAT1,LINK,DATA

● Reload

Factory reset button

❖ Electrical

● Power supply protection

ESD: IEC 61000-4-2 Level 2
Surge: IEC 61000-4-5 Level 2
EFT: IEC 61000-4-5 Level 2

● RS485 protection:

ESD: IEC 61000-4-2 Level 2
Surge: IEC 61000-4-5 Level 2

❖ Physical

● Installation

Panel mounting

● Dimensions

Dimensions: 82.6mm × 86mm × 25mm

❖ Certification

● Approval

CE , RoHS

❖ Software

● Frequency Bands

LTE FDD: B1/B3/B7/B8/B20/B28
GSM: 900/1800MHz

● Transmission Speed

LTE FDD Rel.13: 10MbpsDL/5Mbps UL
GPRS: 85.6KbpsDL/85.6Kbps UL(multi-slot class 12)

● TX Power

GSM: 900MHz: 33dBm±2dB
GSM: 1800MHz: 30dBm±2dB
FDD: B1/3/7/8/20/28: 23dBm±2dB

● Rx Sensitivity

GSM: 900MHz: -109.5dBm
GSM: 1800MHz: -108dBm
FDD: B1/3/20: -98dBm
FDD: B7: -97.5dBm
FDD: B8/B28: -98.5dBm

● Network protocol

TCP /UDP/IPV4/IPV6/ HTTP(S)/ MQTT(S)/DNS
ECM/RNDIS/PPP
FOTA/VoLTE/NTP/FTP

● More functions

SMS: MO/MT Text and PDU modes
TCP/UDP/HTTPD/SMS transparent transmission
CMD mode,AT command operation
Socket Distribution Protocol
Base station geolocation

❖ Environmental

● Ambient environment

Operating temperature: -30℃~+75℃
Expansion temperature: -40℃~+85℃

■ Din Rail LTE Cat 1 Modem | USR-DR502



USR-DR502 is a LTE Cat 1 communication modem, which supports LTE and GSM. USR-DR502-E covers the mainstream frequency bands of European operators. It has perfect software function, supports TCP/UDP transparent transmission, SIM transmission, HTTPD Client mode and AT command configuration. In addition, it is simple to configure, has high reliability and built-in hardware watchdog, supports FOTA upgrading.

Din rail industrial modem USR-DR502 adopts wide-voltage Power supply terminals, convenient for customers to use.



Din Rail



Compact size



Highly-reliable



Low latency



Modbus
RTU/TCP



Industrial
grade design

Hardware & Dimensions



❖ Hardware

● Power supply

Connector: 3Pin terminal block
Input range: DC 9 - 36V
Operating current: average 90mA/12V

● Serial port

RS485: 2Pin terminal block
Baudrate: 600~230400bps
Parity: NONE/ODD/EVEN
Data: 8
Stop: 1/2

● Antenna

Connector: SMA-K*1

● SIM card holder

SIM card holder: Built-in push push card slot * 1
USIM: 3.0V/1.8V Micro SIM 3FF

● Indicators

PWR,WORK,NET,LINK,Tx,Rx,RSSI

● Reload

Factory reset button

❖ Electrical

● Power supply protection

ESD: IEC 61000-4-2 Level 2
Surge: IEC 61000-4-5 Level 2
EFT: IEC 61000-4-5 Level 2

● RS485 protection:

ESD: IEC 61000-4-2 Level 2
Surge: IEC 61000-4-5 Level 2

❖ Physical

● Installation

Din Rail mounting

● Dimensions

Dimensions: 28mm x 64.7mm x 109.7mm

❖ Certification

● Approval

CE , RoHS

❖ Software

● Frequency Bands

LTE FDD: B1/B3/B7/B8/B20/B28
GSM: 900/1800MHz

● Transmission Speed

LTE FDD Rel.13: 10MbpsDL/5Mbps UL
GPRS: 85.6KbpsDL/85.6Kbps UL(multi-slot class 12)

● TX Power

GSM: 900MHz: 33dBm±2dB
GSM: 1800MHz: 30dBm±2dB
FDD: B1/3/7/8/20/28: 23dBm±2dB

● Rx Sensitivity

GSM: 900MHz: -109.5dBm
GSM: 1800MHz: -108dBm
FDD: B1/3/20: -98dBm
FDD: B7: -97.5dBm
FDD: B8/B28: -98.5dBm

● Network protocol

TCP /UDP/IPV4/IPV6/ HTTP(S)/ MQTT(S)/DNS
ECM/RNDIS/PPP
FOTA/VoLTE/NTP/FTP

● More functions

SMS: MO/MT Text and PDU modes
TCP/UDP/HTTPD/SMS transparent transmission
CMD mode,AT command operation
Socket Distribution Protocol
Base station geolocation

❖ Environmental

● Ambient environment

Operating temperature: -30℃~+75℃
Expansion temperature: -40℃~+85℃
Storage temperature: -40℃~+85℃
Relative Humidity: 5%~95%(non-condensing)

■ Compact LTE Cat 1 Modem | USR-DR150/152/154



The USR-DR15X series is an ultra-small Din-Rail modem, including the USR-DR154 with RS485 interface, the USR-DR152 with 232 interface and USR-DR150 with UART TTL 3.0V. This series of products features with high speed, low latency, small size, simple configuration, etc.

Industrial CAT 1 modem has wide voltage input range, RS232, RS485 standard terminal interface, more convenient for customers to use. The product comes with DIN-Rail buckle, easy to install.



Din Rail



Compact size



Highly-reliable



Low latency



Modbus
RTU/TCP



Industrial
grade design

Hardware & Dimensions



❖ Hardware

● Power supply

Connector: 2Pin terminal block
Input range: DC 5 - 16V
Operating current: average 90mA/12V

● Serial port

RS485(DR154): 2Pin terminal block
RS232(DR152): 3Pin terminal block
TTL(DR150): 3Pin terminal block
Baudrate: 1200~230400bps
Parity: NONE/ODD/EVEN
Data: 8
Stop: 1/2

● Antenna

Connector: SMA-K*1

● SIM card holder

SIM card holder: Built-in push push card slot * 1
USIM: 3.0V/1.8V Nano SIM 4FF

● Indicators

POW,WORK,NET, LINKA

● Reload

Factory reset button

❖ Electrical

● Power supply protection

ESD: IEC 61000-4-2 Level 2
Surge: IEC 61000-4-5 Level 2
EFT: IEC 61000-4-5 Level 2

● RS485 protection:

ESD: IEC 61000-4-2 Level 2
Surge: IEC 61000-4-5 Level 2

❖ Physical

● Installation

Din-Rail mounting, Ear mounting

● Dimensions

Dimensions: 22mm x 24mm x 74mm

❖ Software

● Frequency Bands

LTE FDD: B1/B3/B5/B8
LTE TDD: B38/B39/B40/B41

● Transmission Speed

LTE FDD: 10MbpsDL/5Mbps UL
LTE TDD: 7.5MbpsDL/1Mbps UL

● TX Power

FDD:B1/B3/B5/B8: 23dBm±2dB
TDD:B38/B39/B40/B41: 23dBm±2Db

● Rx Sensitivity

FDD:B1/B3/B5/B8: -98dBm
TDD:B38/B39/B40/B41: -98.5dBm

● Network protocol

TCP /UDP/IPV4/IPV6/ HTTP(S)/ MQTT(S)/DNS
FOTA/VoLTE/NTP/FTP

● More functions

SMS: MO/MT Text and PDU modes
TCP/UDP/HTTPD/SMS transparent transmission
CMD mode,AT command operation
Socket Distribution Protocol
Base station geolocation

❖ Environmental

● Ambient environment

Operating temperature: -25℃~+75℃
Expansion temperature: -35℃~+85℃
Storage temperature: -40℃~+90℃
Relative Humidity: 5%~95%(non-condensing)

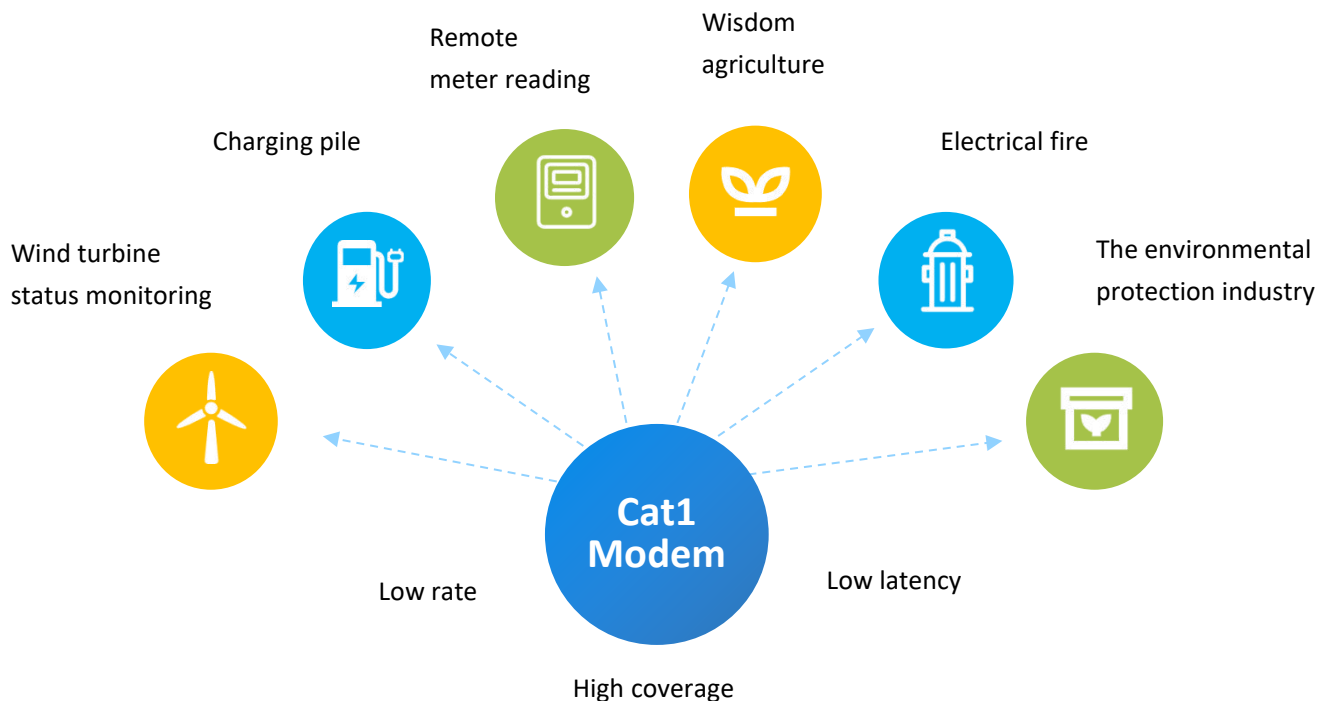
❖ Certification

● Approval

CE , RoHS ,CCC

LTE Cat 1 Modem applications

USR-G771 and USR-DR502 rely on the current popular LTE Cat 1 network, the 10M download rate and 5M uplink rate meet the requirements of most medium-low speed communication applications. With the inevitable retirement of 2G and 3G, LTE Cat 1, offers a best-matching solution for its low cost. Cat1 series Modem is suitable for state monitoring of wind generator, charging pile, electrical fire monitoring, intelligent agriculture, remote meter reading, etc.



Typical Applications



■ Embedded LTE Cat 1 Module | WH-LTE-7S1



WH-LTE-7S1 is a LTE Cat 1 communication module, which supports LTE and GSM. WH-LTE-7S1-E covers the mainstream frequency bands of European operators. It has perfect software function, supports TCP/UDP transparent transmission, SMS transmission and configuration, and also supports HTTPD Client mode and AT command configuration. At the same time, it supports MQTT(S).

In addition, it is simple to configure has high reliability, supports FOTA upgrading. This model is using a double inline package design, convenient for customers to install.



Compact size



Low latency



Modbus RTU/TCP

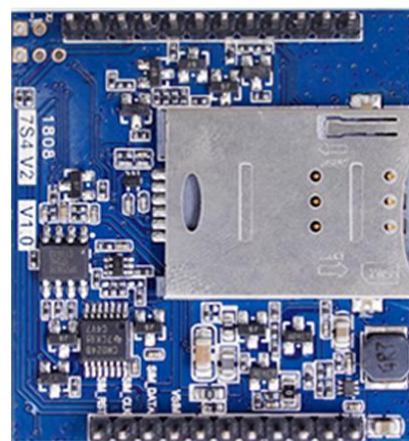
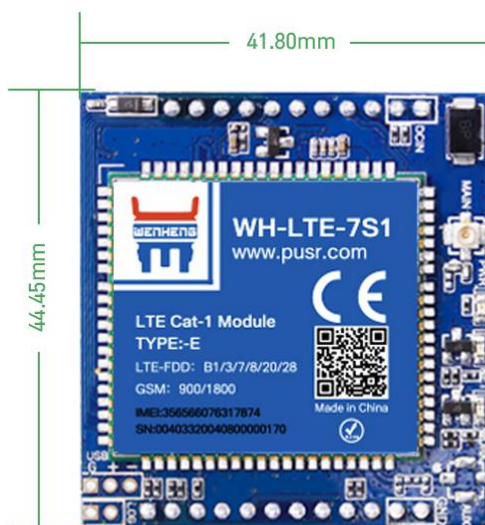


CAT 1 LTE Speeds



Wide voltage range

Dimensions



❖ Hardware

● Power supply

Input range: DC 3.4V~4.2V / 5~16V
Operating current: average 90mA/5V

● UART

UART: TTL: 3.0V
Baudrate: 600~230400bps
Parity: NONE/ODD/EVEN
Data: 8
Stop: 1/2

● Antenna

Connector: IPEX seat *1

● SIM card holder

SIM card holder: Built-in push push card slot * 1
USIM: 3.0V/1.8V MINI SIM 2FF
Reserved pin

● Indicators

PWR,WORK,NET
Pin: LINKA,LINKB

● Reload

Reload pin

❖ Physical

● Installation

DIP

● Dimensions

Dimensions: 44.4mm×41.8mm×12.5mm

❖ Environmental

● Ambient environment

Operating temperature: -30℃~+75℃
Expansion temperature: -40℃~+85℃
Storage temperature: -40℃~+85℃
Relative Humidity: 5%~95%(non-condensing)

❖ Software

● Frequency Bands

LTE FDD: B1/B3/B7/B8/B20/B28
GSM: 900/1800MHz

● Transmission Speed

LTE FDD Rel.13: 10MbpsDL/5Mbps UL
GPRS: 85.6KbpsDL/85.6Kbps UL(multi-slot class 12)

● TX Power

GSM: 900MHz: 33dBm±2dB
GSM: 1800MHz: 30dBm±2dB
FDD: B1/3/7/8/20/28: 23dBm±2dB

● Rx Sensitivity

GSM: 900MHz: -109.5dBm
GSM: 1800MHz: -108dBm
FDD: B1/3/20: -98dBm
FDD: B7: -97.5dBm
FDD: B8/B28: -98.5dBm

● Network protocol

TCP /UDP/IPV4/IPV6/ HTTP(S)/ MQTT(S)/DNS
ECM/RNDIS/PPP
FOTA/VoLTE/NTP/FTP

● More functions

SMS: MO/MT Text and PDU modes
TCP/UDP/HTTPD/SMS transparent transmission
CMD mode,AT command operation
Socket Distribution Protocol
Base station geolocation

❖ Certification

● Approval

CE , RoHS

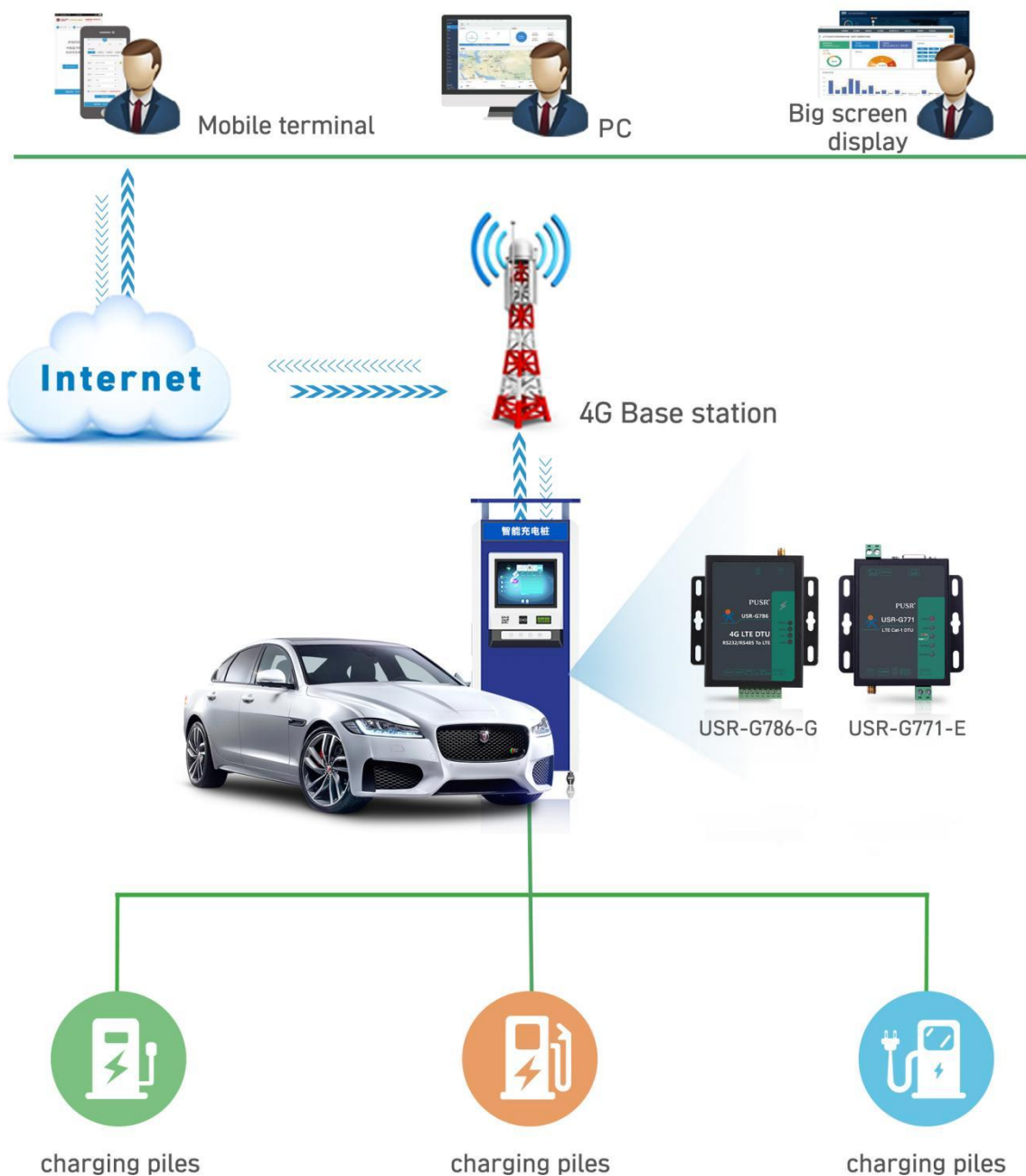


Industry Case >

● SOLUTION-Electric Vehicle Charging

Charging pile stations provide charging services for electric vehicles. A charging intelligent service system need to be built to ensure a good user experience and operational efficiency.

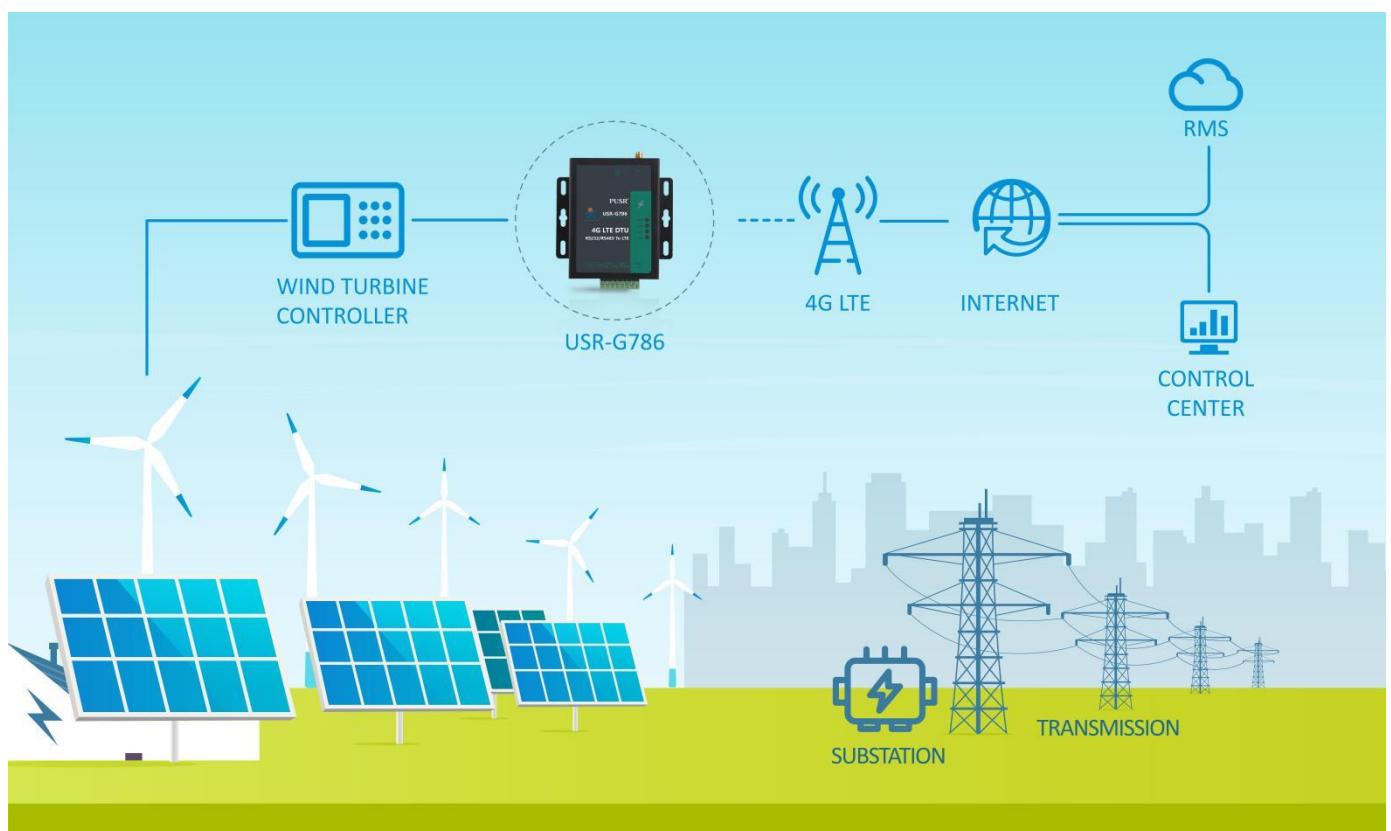
The charging intelligent service system needs to provide real-time monitoring of charging power, geographic location positioning, data transmission and billing functions and cooperate with APP to achieve data synchronization. The local data of the charging pile is uploaded in real time, and the charging fee is automatically settled. The charging pile control board is connected to the Modem through a serial port, and the wireless Modem is automatically dial-up and is connected to the monitoring operation center of the charging operation company through the operator's 4G cellular network to establish the data transmission channel between the charging facility and the monitoring operation center.



● SOLUTION-Remote Control And Monitoring of Wind Turbines

Energy generated from wind is one of the most prominent green energy solutions. Wind farm locations are usually remote, far away from civilization, in the hills or the seaside. Such places are used because for the wind farm to be profitable, there must be conditions that would generate as much wind as possible throughout the year. Wind turbine controllers, like PLCs, are the brains for every wind turbine, since it is used for controlling the whole system, generating reports and monitoring. The controllers must be connected to a unified system for remote monitoring, energy generation reporting, parameter control, and predictive maintenance.

The topology below shows the whole solution: wind turbine generates energy which is passed to a substation and further transmission. On the other side, everything is controlled and remotely monitored via the wind turbine controller, which is connected to G786 – a small but powerful 4G LTE Serial gateway by USR IOT. This device provides a reliable and stable Internet connection and acts as a Modbus gateway between controller and control center where all monitoring and management takes place.



● SOLUTION-Agricultural Greenhouse Remote Monitoring

Many farmers are looking to automate the various components of their farming operations to ensure maximum crop yields. They need to know if their soil is too hot, too dry, too wet, too acidic, or just right. They need to be able to automate irrigation and nutrient delivery systems, but also be able to tell if those systems are functioning properly. For indoor growing operations this becomes even more important as farmers to monitor and control fans, pumps, tank levels, and lighting systems. But even more importantly, those managing these farms, across multiple fields and grow houses, need to be able to access and control all these systems remotely.

Therefore, USR IOT delivers a smart agricultural greenhouse monitoring system using IoT technology and the industrial cellular modem G786. It is able to monitor the variables in the greenhouses and help create conditions for high yield, high quality and improve efficiency for agricultural production.



● SOLUTION-Remote Monitoring of Oil & Gas Pipelines

Extraction of energy from oil and gas sources is a complex process which requires a lot of infrastructure. One part of such infrastructure are the pipelines which are the key transport mechanism for Oil & Gas industries. To preemptively diagnose possible safety and/or productivity issues the rate of the flow of materials must be closely monitored. However, pipeline infrastructure is usually placed in remote areas where wired Internet connectivity is not available.

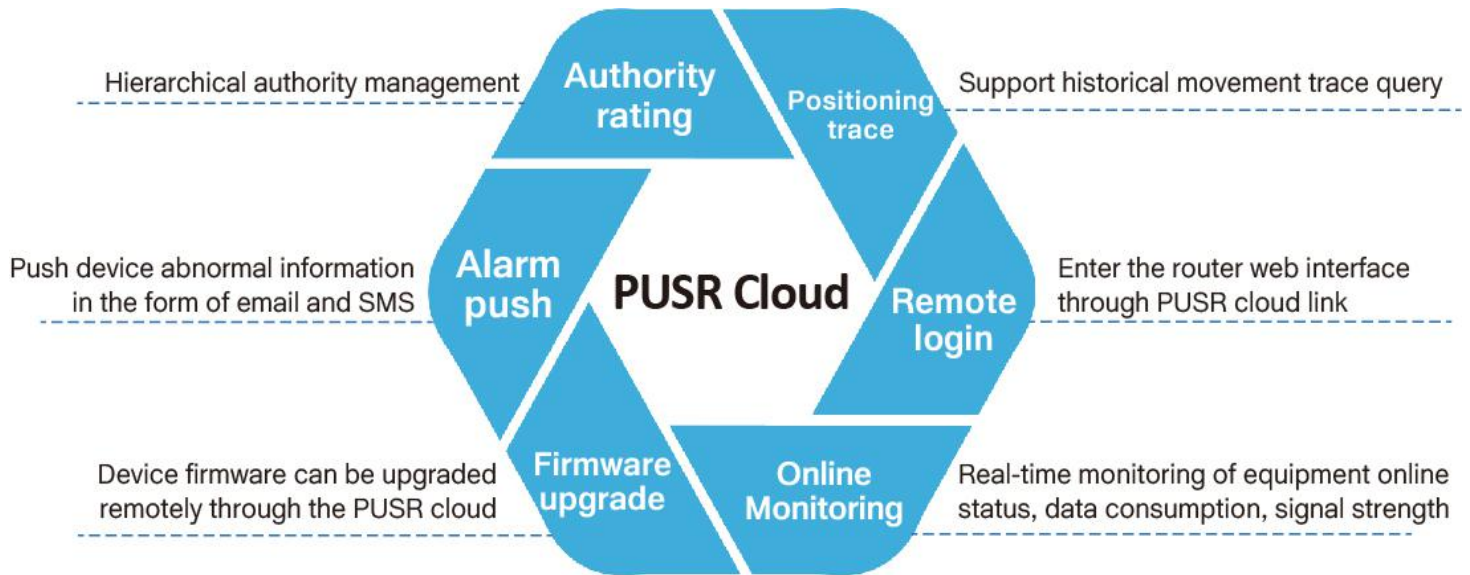
Satellite communications are still highly expensive, however global expansion of 4G LTE coverage enables Oil & Gas companies to implement a wide pipeline flow monitoring network by using dedicated flow meters which output data using industrial protocols. In many cases, serial communication with RS-485 and Modbus industrial protocol is used. The data generated by the flow meter must be obtained and forwarded to control centers, SCADA systems to aggregate and interpret centrally. G786 Serial IoT Gateway is perfect for such applications - with RS-485 interface, Modbus RTU Master functionality and 4G LTE Cat 4 it is able to periodically read flow meter information and send gathered data to remote HTTP/HTTPS servers or various IoT platforms using MQTT.



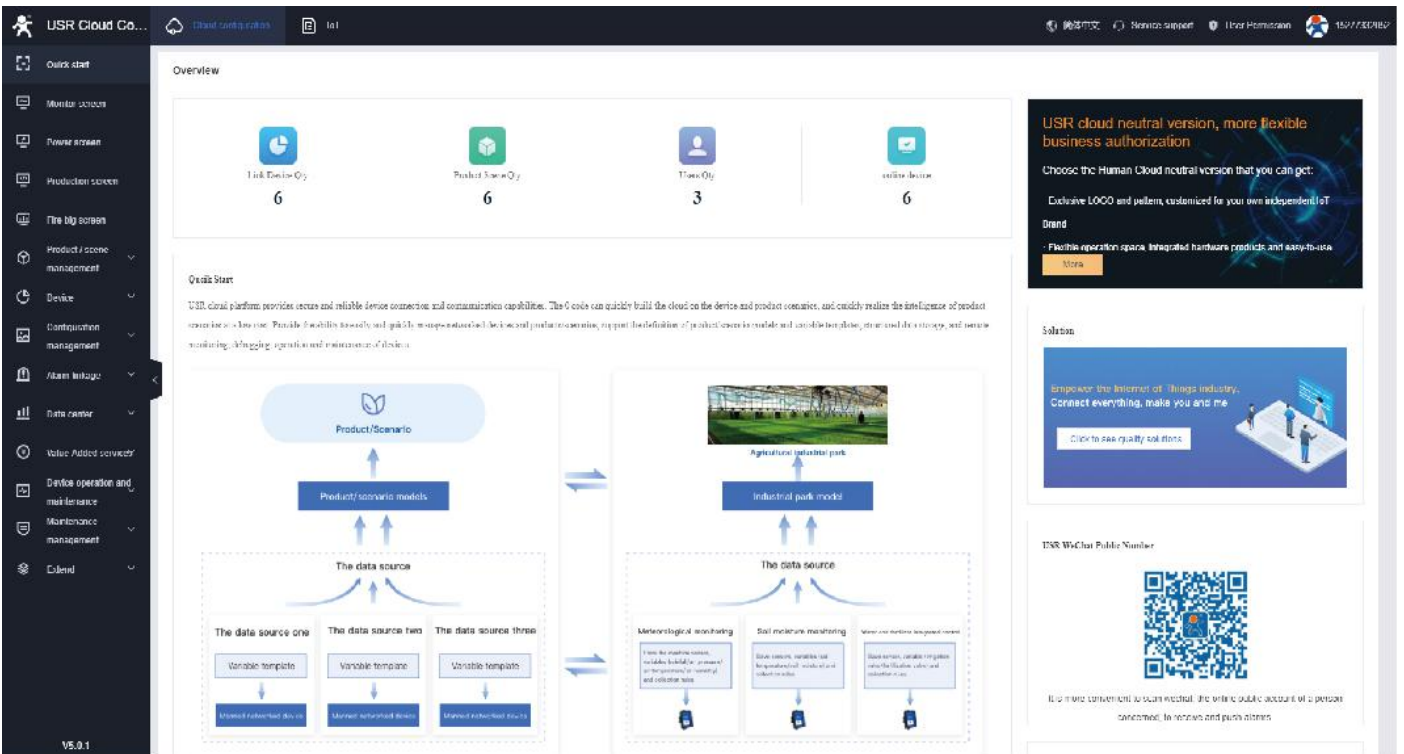
■ PUSR Cloud

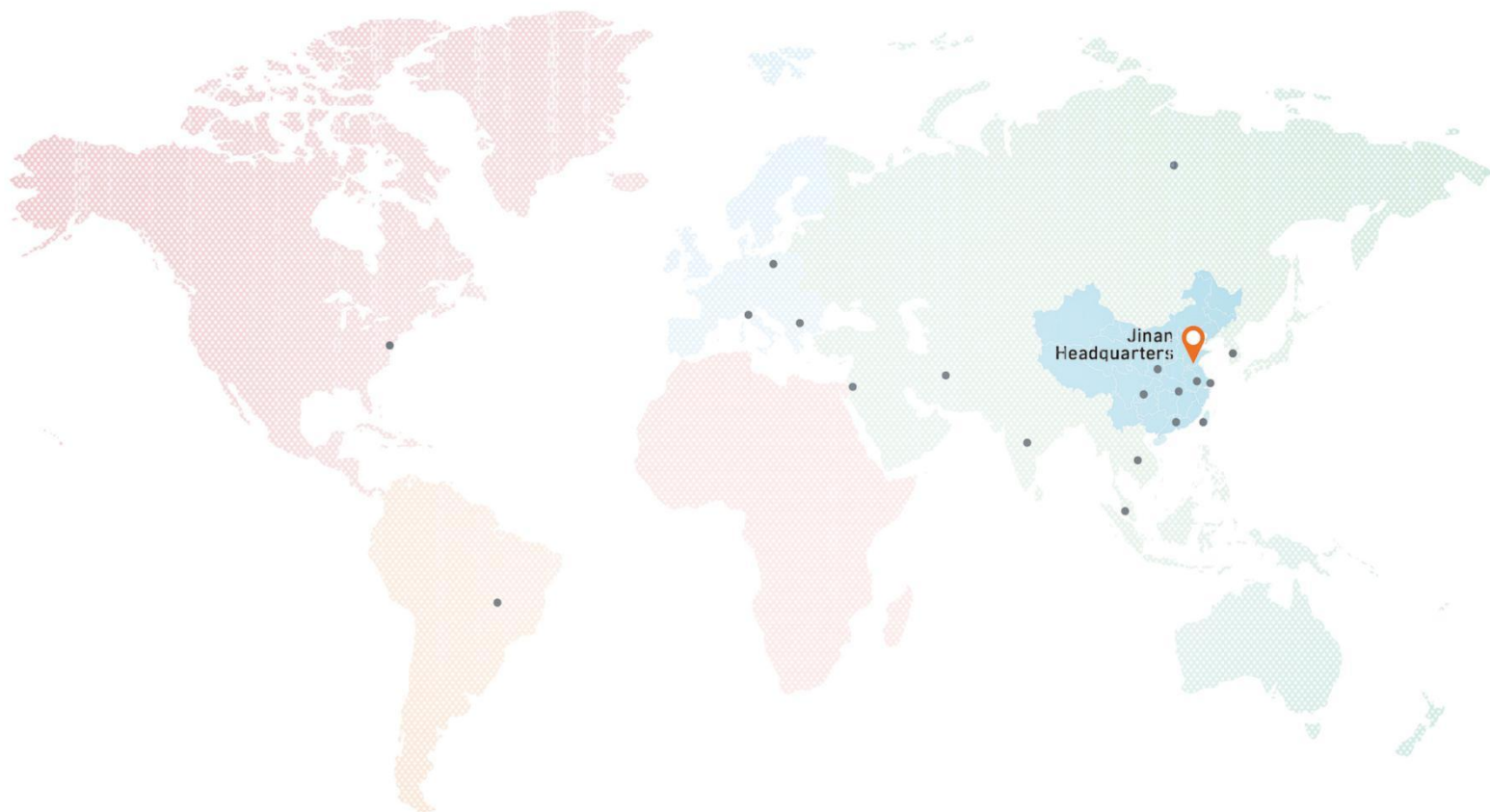
PUSR cloud provides enterprises with a one-stop solution for software and hardware, empowering many industries, providing safe and reliable equipment access, data display, configuration services, operation and maintenance management, data statistics and analysis and other core functions, helping enterprises to reduce costs , build your own IoT system efficiently.

The USR IOT cloud platform supports the storage, analysis of the metering data and display them through charts and screens.



Monitor Screen





Official website: <https://pusr.com>
Official shop: <https://shop.usriot.com>
Technical support: <http://h.usriot.com/>



Communication Expert
of Industrial IOT

Contact Us

Email : sales@usriot.com

Tel : +86-531-88826739

Fax : +86-531-88826739-808

Address : Floor 12 and 13, CEIBS Alumni Industrial Building,
No. 3 Road of Maolingshan, Lixia District, Jinan, Shandong, China