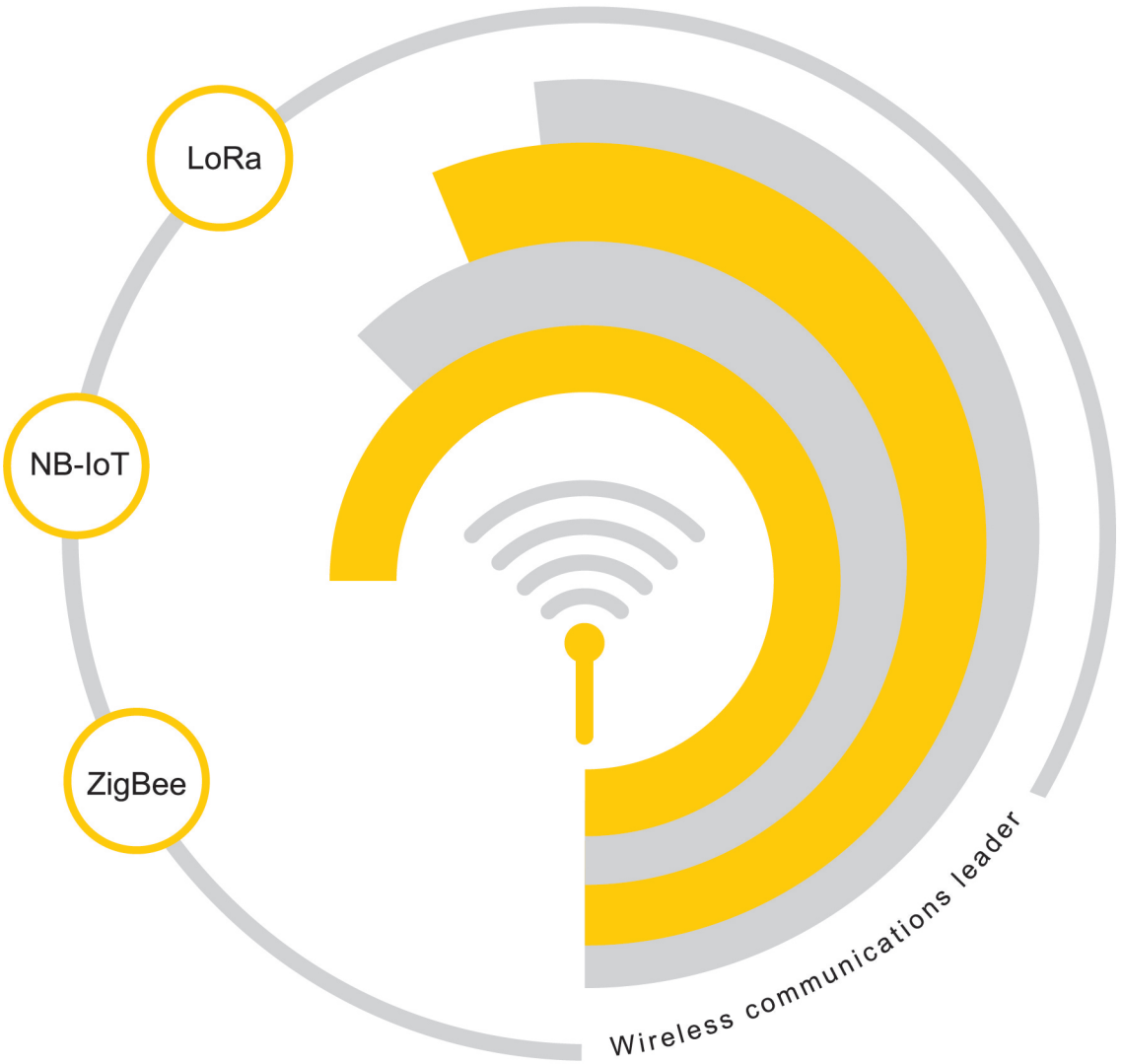
Four-Faith
四信

福建省著名商标



IoT Communication Product and Solution Provider

Contents

Company Profile

Four-Faith is a leading manufacturer of communications products for M2M and IoT. Providing a full spectrum quality , Industrial 3g/4g router, industrial modem, RTU, NB-IOT, LoRa, ZigBee, Android IPC, Mobile DVR and Fault Passage Indicator(FPI) with global certifications,including RoHs, CE, FCC, CE etc. A wide range of applications includes Smart Energy, Smart Grid, Transport Infrastructure, Payment Systems, ATM and Lotteries. Our solutions include rugged devices for industrial and harsh environments for IoT and M2M, which reaches clients in more than 50 countries.Dedicating to customers, employees, distributors, suppliers and society. Four -Faith, enabling an intelligent world and making it easier to get connected.

R&D capability

With not only Industry leading R&D laboratories, advanced experimental equipment and testing environment; but also veteran engineers in IoT wireless communication technology, Four-Faith has deployed many innovative IoT projects in varieties of applications, science study projects and industry research projects. The powerful R&D capability enable Four-Faith to develop rapidly every year with more than 30 invention and utility model patents.

Quality Certification

Four-Faith has been certified by ISO9001, SGS, while our products achieve the "smart, standard, safe and reliable" product target followed certifications of CE, FCC, EMC, ROHS, Environmental Test Certification, State Grid Center Certification, National Industrial Production License.

Production

With innovative & modern production equipment, Four-Faith is capable to produce qualified, high performance M2M / IoT industrial products with Dustless SMT Patch Workshop, Finished Product Assembly Testing Workshop, Japanese high-precision chip mounter production line, High-precision printing machine and ICT Online Tester, controlling products quality by product safety labs, product reliability laboratories, product environmental laboratories, and product aging chambers. The factories are managed strictly under ISO9001 terms.

Service

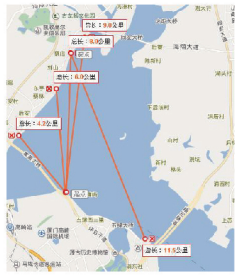
With our markets and sales channels covering over 50+ countries, Four-Faith serves each of our clients through headquarters and sales branches in local markets, offering you the prompt, efficient and reliable services by powerful technical strength, mature sales network, efficient & professional service team.

LoRa Wireless Communication Products

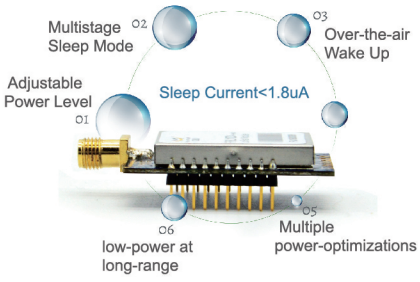
F8L10T F8L10D-E F8L10D-N F8L10S

1.Ultra-long Communication Range: Measured up to 11.5Km

Based on years of wireless communication experience, the Four-Faith LoRa module achieve a maximum transmission distance over 11.5 Km with the Long-Range modulation technique. It provides a perfect solution to the ultra-long communication of low data rate in complex environment and offers great support to the wireless network deployment.

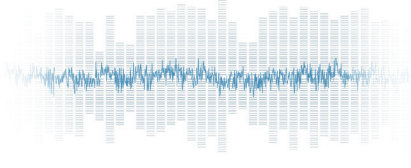


2.Ultra-low-power: Sleep Current less than 1.8uA

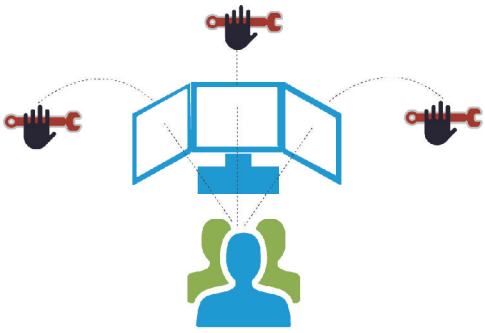


Though it's an arduous task to make balance between transmission distance and power consumption, the optimized Four-Faith LoRa module can realize ultra-long communication with ultra-low-power, presents great advantages over battery-powered applications with multiple power-optimizations including adjustable power level, multistage sleep mode, over-the-air wake up.

3.Reliable Data Transmission: Excellent Anti-interference



Intend to rectify the wrong code in the receiver timely, the Forward Error Correction Technology is adopted to add redundant information during the transmission. Combined with the Four-Faith technology of channel conflict detection optimization, it can effectively resolve the packet loss of node's concurrent data and greatly improve the link's robustness.

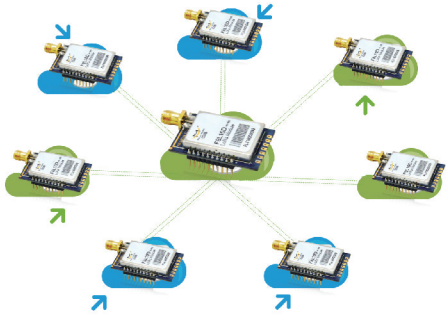


4.High Management Efficiency: Over-the-air update

The Four-Faith LoRa modules supports over-the-air update which offers great convenience to technicians by remote maintenance, greatly improved the management efficiency and reduced the labor costs.

5.Ultra-sensitivity Receiver: Up to -140dBm

Depend on the unique spectrum widening process to the signal, the receiver's sensitivity reaches -140dBm which makes it suitable for Long-range and reliable transmissions.



6. High Network Capacity, Flexible Deployment and Low Cost

Thousands of nodes are available in the LoRa network, adjustable with the demand of project and have great expansibility. With cheaper module and free data charge, the operating costs would be greatly reduced and have obvious advantage in large projects.

7. Easy to Embed and Develop

With a tiny size like a coin, the Four-Faith LoRa module provides a variety of different antenna connection forms and easy to embed into various of devices. Since the Four-Faith LoRa module has been packaged with complex underlying LoRa protocol, it's convenient for user's application data to transparent transmit through the serial port.

LoRa Wireless Communication Products

F8L10GW

As a wireless communication gateway (base station) based on LoRaWAN protocol, F8L10GW can connect with all kinds of LoRaWAN terminals and transfer the collected data to cloud server through 3G/4G cellular network or Ethernet. Integrated with high performance industrial grade 32bits CPU and wireless module and embedded with real-time OS as software platform, F8L10GW offers 1 LAN and 1 WIFI port, supports WIFI OTA configuration and upgrade, and other features include GPS, power supplied by 220V mains supply, solar, DC, POE, etc.

The F8L10GW measured up the standard LoRaWAN protocol and was appropriate to standard LoRaWAN terminals and Network server. It has been widely applied to M2M including smart grid, intelligent transportation, industry automation, smart building, fire-protection, public security, environmental protection and monitoring, digital medical treatment, telemetry, military, smart agriculture, space detection, water treatment, oil&gas, mining industry and so on.

LoRa Wireless Communication Product List

Module / Features	F8L10GW
Frequency	EU433、CN470-510、CN779-787、EU863-870、US902-928、AU915-928、AS923、KR920-923
Baud rate	300bps~5.5Kbps
Maximum Transmit Power	25dBm
Receiver Sensitivity	-142dBm
LoRa Antenna Gain	2dBi
Traffic Channel	8 upstream, 1 downstream
Working Mode	Full Duplex/Half Duplex, Common/Different Frequency
Base Station Real Time	GPS/BeiDou
Data Backhaul	4G/3G, FE(optional)
Power Consume	Less than 7W
Power Supply	Mains Supply, Solar, POE
Installation	Wall-mounted, Pole-mounted
Temperature	~40~+85℃ (-40~+185°F)
Relative Humidity	95%(Unfreezing)
Ingress Protection	IP65
Size	289.4x217.5x115.0 mm

LoRa Wireless Communication Products

Product List

Model / Features	F8L10D-E	F8L10D-N	F8L10S-N	F8L10-N	F8L10T-E/ F8L10T-N
Frequency	433/470/780/868/915 MHz	433/470/780/868/915 MHz	433/470/780/868/915 MHz	433/470/780/868/915 MHz	433/470/780/868/915 MHz
Indoor/Urban Range	2000m	1000m	1000m	1000m	2000m(1000m)
Outdoor/Line-of-Sight Range	11500m	3500m	3500m	3500m	11500m(3500m)
Transmit Power	1W	100 mW	100 mW	100 mW	1W(100 mW)
Bandwidth	6 levels (0.3,0.6,1.0,1.8,3.1,5.5Kbps)	6 levels (0.3,0.6,1.0,1.8,3.1,5.5Kbps)	6 levels (0.3,0.6,1.0,1.8,3.1,5.5Kbps)	–	6 levels (0.3,0.6,1.0,1.8,3.1,5.5Kbps)
Sensitivity	-140dBm	-140dBm	-140dBm	-140dBm	-140dBm
Channels	32	32	32	–	32
Max Serial Buffer Size	4K Bytes	4K Bytes	128Bytes	–	4K Bytes
RX Current	<22mA@ 5V DC	<22mA@ 3.3V DC	<19mA@ 3.3V DC	<12mA@3.3VDC	13.2~13.4mA@12 VDC 26.3~26.5mA@5 VDC
TX Current	180~200mA@5V DC (Maximum Pulse Current≤ 400mA)	127~129mA@3.3V DC (Maximum Pulse Current≤ 200mA)	115~122mA@3.3V DC (Maximum Pulse Current≤ 200mA)	108~115mA@3.3V DC (Maximum Pulse Current≤ 150mA)	110~125mA@12V DC 210~213mA@5V DC
Timing Wake Up Current	<3.0uA@ 5V DC	<3.0uA@ 3.3V DC	<3.0uA@ 3.3V DC	<3.0uA@ 3.3V DC	<3.0uA@ 3.3V DC
Deep Sleep Current	<2.0uA@ 5V DC	<2.0uA@ 3.3V DC	<2.0uA@ 3.3V DC	<1.0uA@3.3VDC	3.1~3.3mA@12 VDC 7.2~7.4mA@5 VDC
				(纯射频模块) 	

Model / Features	F8916L	F8926L	F8936L
Frequency	433/470/780/868/915 MHz	433/470/780/868/915 MHz	433/470/780/868/915 MHz
Indoor/Urban Range	2000m	2000m	2000m
Outdoor/Line-of Sight Range	11500m	11500m	11500m
Bandwidth	6 levels (0.3,0.6,1.0,1.8,3.1,5.5Kbps)	6 levels (0.3,0.6,1.0,1.8,3.1,5.5Kbps)	6 levels (0.3,0.6,1.0,1.8,3.1,5.5Kbps)
Sensitivity	-140dBm	-140dBm	-140dBm
Channels	32	32	32
Wireless Network	2.5G/3G/4G	2.5G/3G/4G	2.5G/3G/4G
Interface	1×RS232, 1×RS485 1×ADC,2×I/O	1×RS232(Or RS485/RS422), 1×LAN,1×WAN/LAN, 1×WIFI Port	1×RS232(Or RS485/RS422), 4×LAN,1×WAN, 1×WIFI Port
			

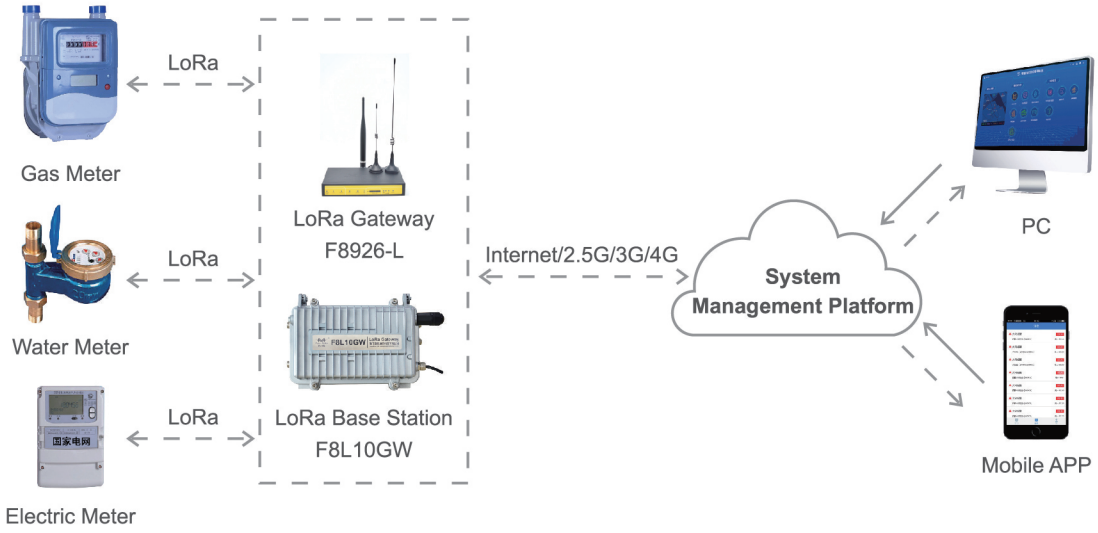
LoRa Wireless Communication Products

Typical Applications

LoRa & Wireless Smart Meter Reading

The smart meter system consists devices embedded with LoRa module, LoRa gateway/base station and system management platform. The data transmitted from meter to LoRa module timely and gathered to the LoRa gateway/base station via the LoRa wireless network, then the LoRa data would be converted to the TCP/IP data and transported to the system management platform through cellular network or Internet.

The LoRa-Based smart meter system owns the advantages of easy-integrated, high network capacity and low-power. Furthermore, the Four-Faith LoRa module has an ultra-sensitivity receiver of -140dBm, which performed outstanding in obstacle penetration with the 11.5Km measured communication distance. It provides a perfect solution to the ultra-long communication of low data rate in complex environment with an industry leading level.



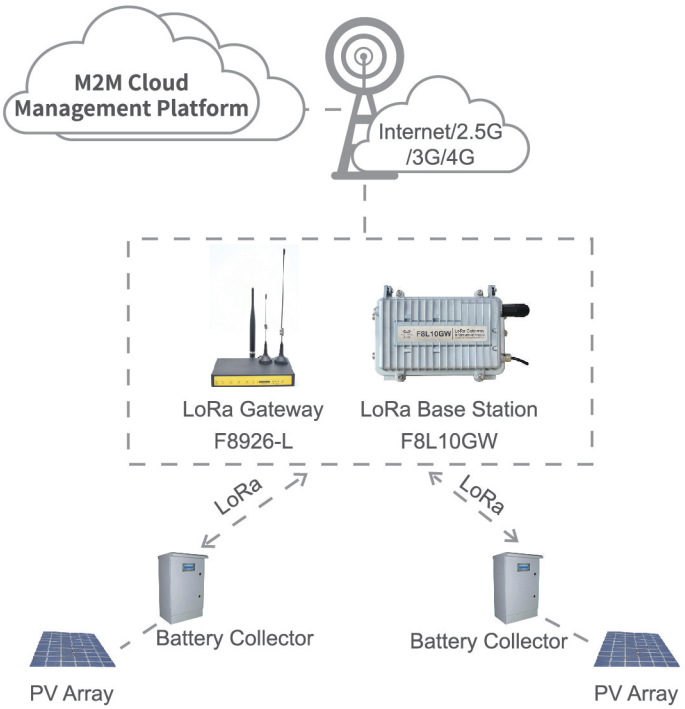
LoRa & Photovoltaic Array Monitoring

It's important in the management of solar power station that to monitor and control the huge PV array online remotely. The data acquisition units would collect the data from solar panels and upload to server via LoRa or 4G for monitoring and management.

1. With the combination of LoRa Terminal F8L10T and LoRa Gateway/Base station, the data of each solar array's working status, current, voltage, power and other parameters would be transferred to the server through cellular network for real-time monitoring and processing;

2. It's available to monitor the parameters including PV array status, humidity and temperature in local central control room also with local transmission through LAN, WIFI or RS232/485;

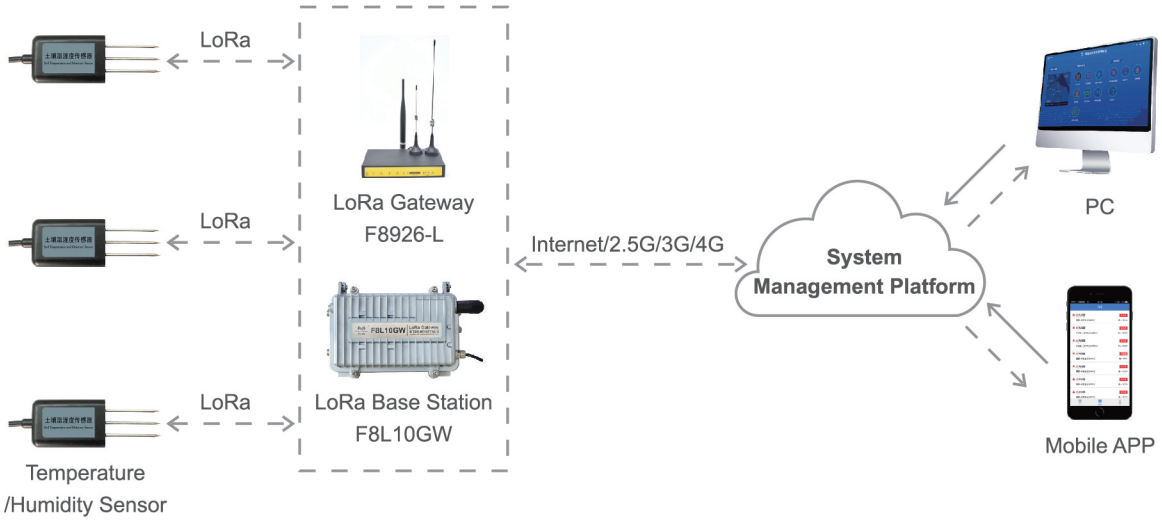
3. The manager can monitor the PV array on APP in anytime and anywhere through the mobile internet;



LoRa & Soil Temperature, Humidity Monitoring

Intend to increase the production and benefit, improve the quality and adjust the growth cycle, the Agriculture IoT creates the optimal conditions for plants by monitoring the physical parameters in the environment including temperature, humidity, pH value, illumination, soil nutrients and CO2 concentration.
These parameters would be collected by the low-power MCU and wake up the deep-slept Four-Faith LoRa module to transmit the data to LoRa gateway/base station. The gateway would send the data to remote or local servers for farmland management.

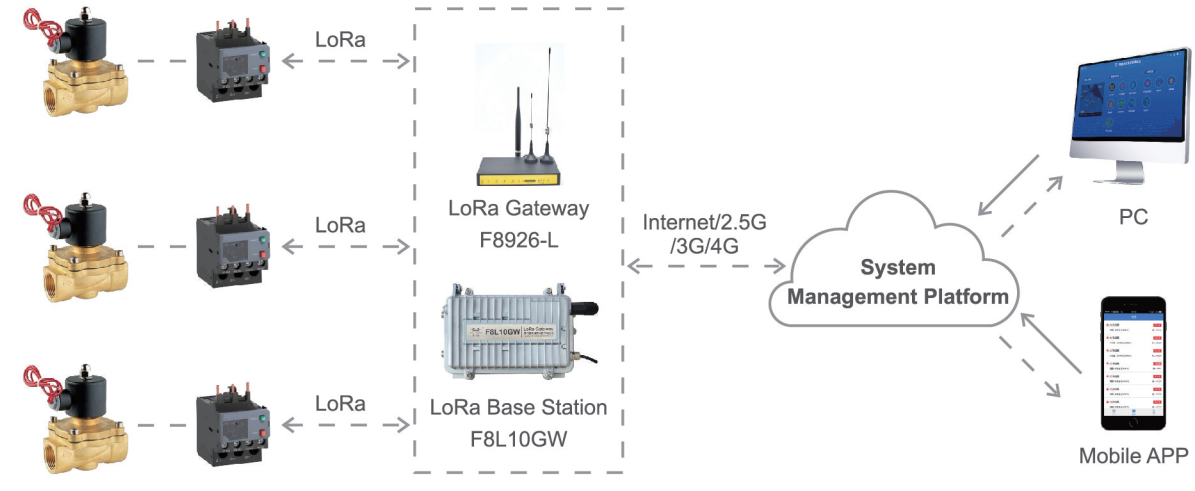
Since the outdoor applications are always supplied by battery or solar, the optimized Four-Faith LoRa module can realize ultra-long communication with ultra-low-power, presents great advantages over battery-powered applications with the feature of adjustable power level, multistage sleep mode, in-air wake up, power optimization.



LoRa & Smart Irrigation

The Smart Irrigation can realize auto-irrigate according to the growth cycle of plants and the soil moisture in different region or season. It raised the irrigation water utilization from 40% to 85% and greatly saved the labor costs. Combined with modern agriculture and irrigation, Internet of Things, cloud server and big data, the system is applicable for medium or large size irrigation, golf course, orchard, farmland and urban landscaping by different integrated mode of water-saving.

With the advantage of high network capacity, flexible deployment, great extensibility, ultra-range communication, low power and low cost, the system owns unparalleled advantages in agriculture IoT applications. The collected data would transfer to the cloud server by the wireless system made up of the Four-faith LoRa module and LoRa gateway/base station, realize data acquisition and analyze, remote control of solenoid valve and pump, and auto or manual irrigation with the support of expert decision system.



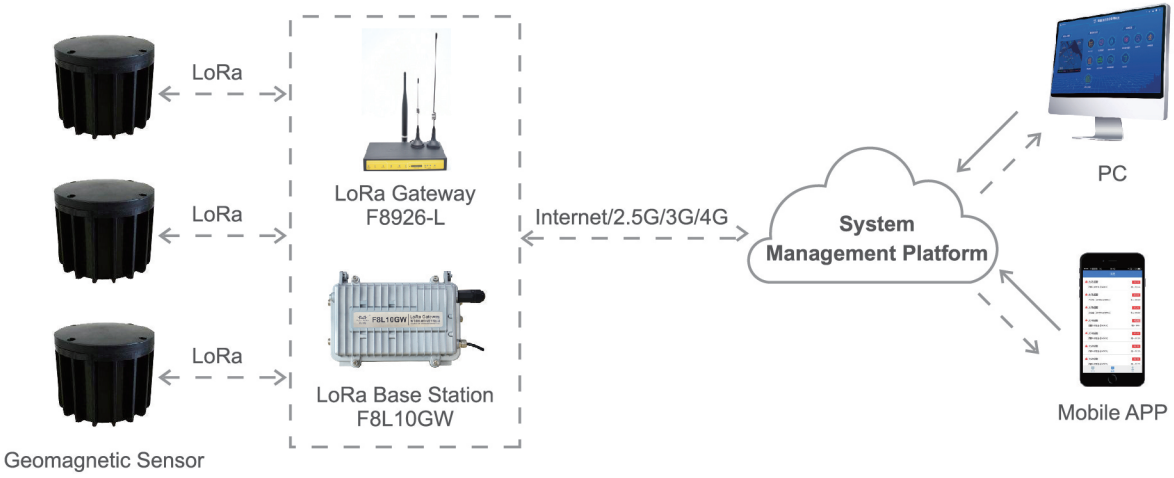
LoRa Wireless Communication Products

Typical Applications

LoRa & Smart Parking

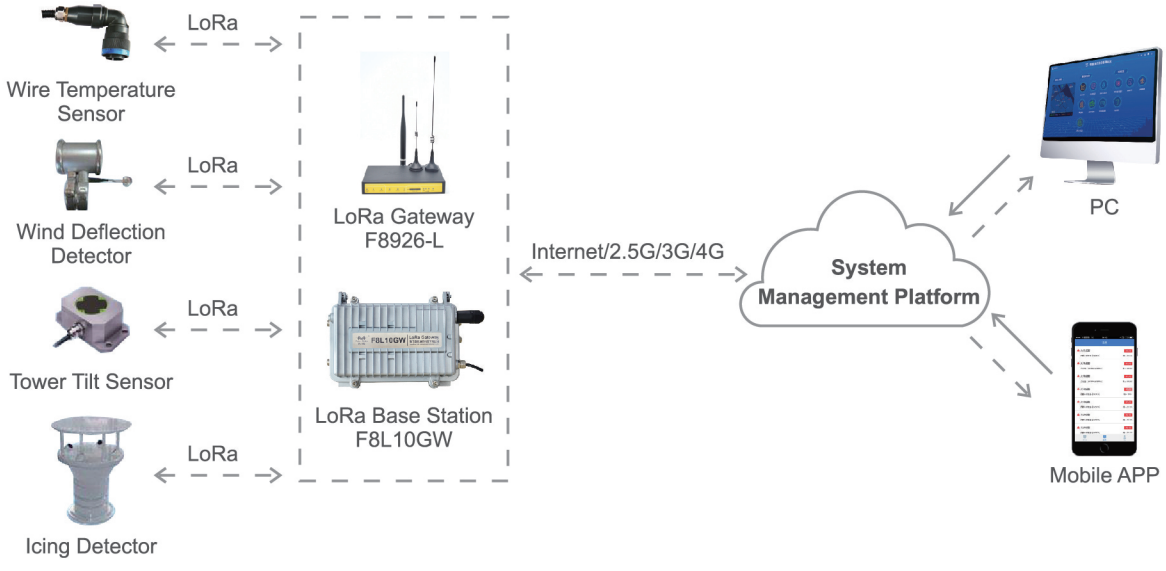
Intend to break the information isolation, the Smart Parking Lot realizes status monitoring, reservation, guidance, online-payment and remote management. The wireless network deployment based on LoRa owns the advantage of Free data charge, no wiring, high network capacity, long-range communication, strong anti-interference and low-power. The geomagnetic sensor embedded with the Four-Faith LoRa module would check the status of parking space by the change of Earth's magnetic field when the vehicle entered or out.

Transmission Process: The data of parking status would be transferred from the LoRa module to the LoRa Gateway/Base Station wirelessly and would be transmitted to the remote server via 3G/4G for the System Management Platform to realize rich management functions.



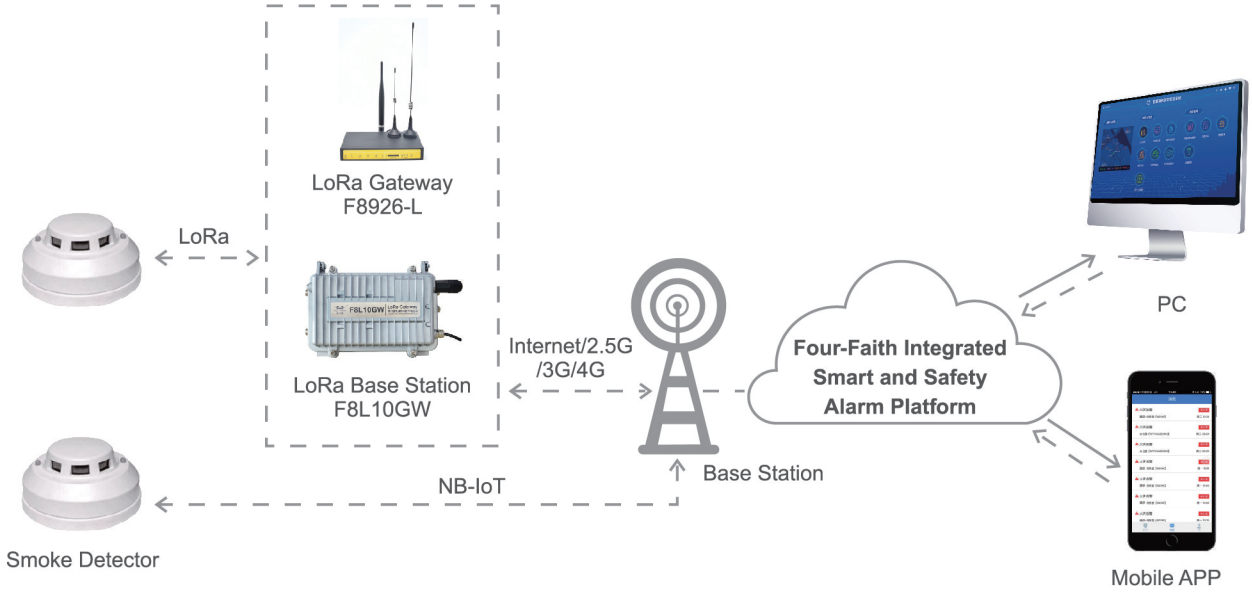
LoRa & Power Line Monitoring

The system is composed of sensors and detectors, including the wire temperature sensor, wind deflection detector, tower tilt sensor or icing detector, and the Four-Faith wireless device like LoRa wireless module F8L10D or LoRa gateway/base stations and the server. With the feature of long-range transmission and low-power, LoRa provides a perfect solution to the ultra-long communication in complex environment, realize reliable network deployment and wireless transmission with various of embedded sensor and detector.



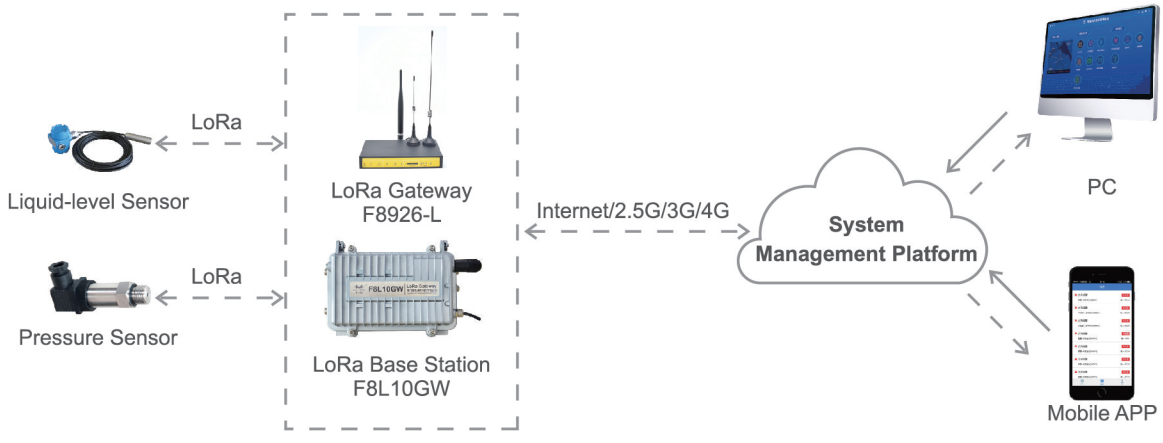
LoRa & Wireless Smoke Detecting

As an innovative fire-fighting system in new circumstance, the independent wireless smoke detecting system provides a prompt, accurate and convenience fire-fighting system with the support of latest advanced technologies including wireless network, cloud computing and mobile networks. The wireless warning system could transmit the fire-fighting data collecting from sensors or detectors to the WEP server or mobile APP promptly and inform the firefighters or start the automatic fire-fighting device to put out the fire timely which can greatly reduce the loss.



LoRa & Fire-Fighting Water System Monitoring in Smart Building

The pressure sensor would export standard current signal by 4~20 mA to the ADC I/O ports of the LoRa terminal after collecting the liquid level of the fire-fighting water, and the LoRa gateway/base station would send regular commands to collect the data from all the I/O ports of the LoRa terminal. After collecting, the LoRa gateway/base station would gather the data temporarily in a definite order and send to the server via ethernet or 3/4G cellular network in TCP/IP protocol. The server would save the data to present and apply it in rich ways, like using the curve graph to describe the real-time change of the liquid level and inform the manager through warming SMS for timely maintenance whenever there's overrun. Therefore, it changes the way of checking the hydraulic pressure manually to monitor the overall fire-fighting water status of the building remotely by the system running on a PC which provides great convenience.



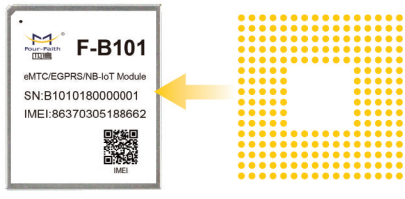
NB-IoT Wireless Communication Products

F-B101

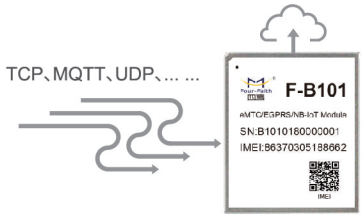
As a NB-IoT wireless communication module of four-faith, the F-B101 gains a size of 22.5mmx26.5mmx23.mm, it can greatly feed the small size demand of the terminal and help the customer to reduce the product cost and size effectively; F-B101 supports half-duplex LTE communication under the LTE-FDD, LTE-TDD and EGPRS network, with the function of GNSS and voice. Since it's a SMD module, the F-B101 is packaged with 103 pins by LGA which is easy to embedded into the product application, and the wireless application platform also; the F-B101 had integrated multiple protocols including TCP, MQTT and UDP, and the embedded expand-AT command would offer great help for customers to use these Protocols with faster and flexible product design and upgrade.

Product Advantages

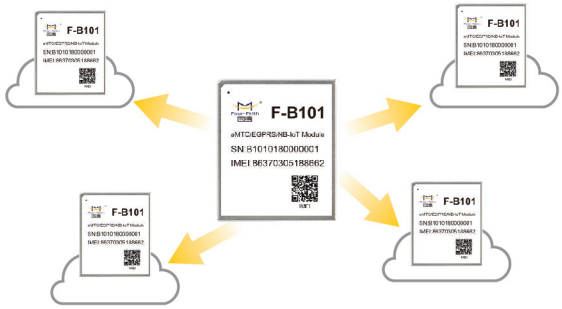
1.Packed with LGA, tiny module size, compact structure, easy for embedded application;



2.Integrated with abundant network transport protocol and network service protocol, easy to design and upgrade;



3.Wide range, multi-connection, low speed, low cost, less power consumes, optimized structure;



4.Compatible with LTE-FDD, LTE-TDD, GPRS, EGPRS, NB-IoT;

5.Support GNSS and Voice;

Application Area

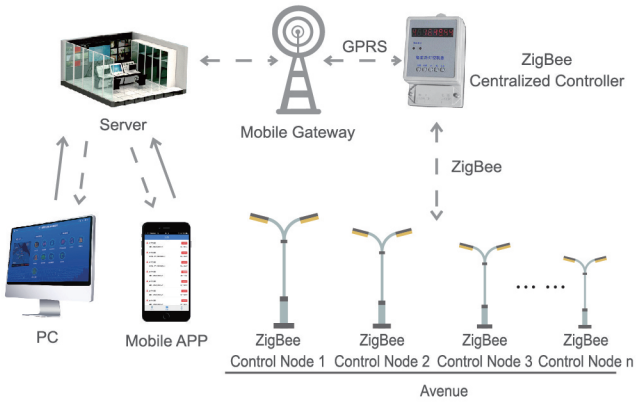
Relying on the compact size, ultralow consumption and great adaption, the F-B101 can almost feed all kinds of demand in M2M applications, provide its great data transmission service to many area, including smart city, smart community, smart parking, smart meter-reading, smart agriculture, shared bicycles, personal tracking and location services, wearable services, security and protection system, wireless POS, industrial PDA and wireless control.

Product List

Features \ Model		F-B101
Working Frequency Range	NB-IoT single frequency module	Cat M1 & NB1: LTE-FDD: B3/B5/B8 LTE-TDD: B39(Only Cat M1 support) GSM900/DCS1800
Antenna	Antenna Interface	1Master set RF interface, with 50Ω resistance antenna 1GNSS interface with 50Ω resistance antenna
Radio Frequency	Maximum Transmit Power	23dBm
	Sensitivity	-124.4dBm
Voltage	Working Voltage	3.3V ~ 4.3V (3.8V Recommended)
	PSM Current	10uA
Physical	Size (L x W x H)	22.5×26.5×2.3 (mm)
	Weight	About 3.1g
Connection	LCC pin	103 pins
Environment	Working Temperature	-35°C ~ +75°C
	Working Temperature	-40°C ~ +85°C
	Storage Temperature	-40°C~+85°C
	Relative Humidity	≤90%
Relative Humidity	Transmission Rate	LTE: Cat.M1：Maximum upgoing rate375kbps，Maximum descending rate 375kbps Cat.NB1：Maximum upgoing rate70kbps，Maximum descending rate 32kbps GSM: GPRS：Maximum descending rate 107kbps，Maximum upgoing rate85.6kbps EDGE：Maximum descending rate 296kbps，Maximum upgoing rate236.8kbps
	Transmission Protocol	TCP，UPD，PPP，etc.

ZigBee Wireless Communications Products

Typical Applications



ZigBee & Intelligent Street Light Control System

Intelligent street lighting control system was mainly used to achieve the remote control, unified management, remote diagnosis and maintenance of the street lite, which would improve the management, maintenance, overhaul capabilities and efficiency of the system effectively. Each street light node is composed of ZigBee wireless module, street light control panel, and headlight. With the help of relay function of ZigBee module, when there is a long distance between the last node and middle node, they can communicate by relay function of ZigBee module between to achieve the flexible networking capability, and eventually communicate with control center by 4G gateway. Each light collects the commands from control center, report the turn-on or turn-off status, achieve brightness adjustment, transmit electricity power load status, perform the pole damage alarm and leakage alarm function, receive inspect commands and control commands from the control center. With ZigBee, the system can access to a real time monitoring and controlling operation of the street light.

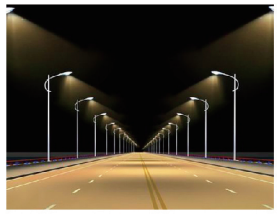
Network Characteristics

- Customized protocol for street lighting applications; More flexible and more scientific networking.
- Low power consumption with high and low-level trigger sleep or activate; Support for routing and terminal mode; Deep sleep power consumption is less than 0.4uA.
- WDT watchdog design, ensure system stability, self-healing ability.
- Miniature double 2.0mm pin package, more convenient operation.
- More scientific networking, combines short communication distance ZigBee module with 4G gateway to be a dual-band wireless network.
- With Intelligent data module, if it is power on, the data starts to be transmitted. Support more than 200 street light nodes networking.
- Flexible and variable work mode options, easy to use.

Successful Cases

Wireless lighting project in Xiamen City

Tunnel lighting project in Jiangsu Provice



Park Landscape Lights Project in Shenzhen City

Highway fog light induction project in Nanchang City

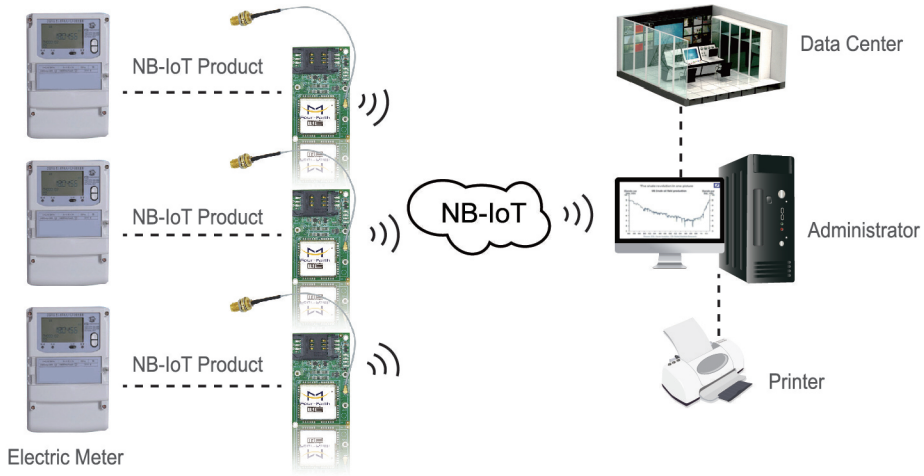
Customer Feedback:

Customer from Jiangsu Province: Four-Faith ZigBee module is suitable for street lighting industry, simple configuration, flexible networking, technical support is also in place, in line with networking needs of the street lighting industry. The next step will strengthen more cooperation with Four-Faith.

4.Strong Interlinkage

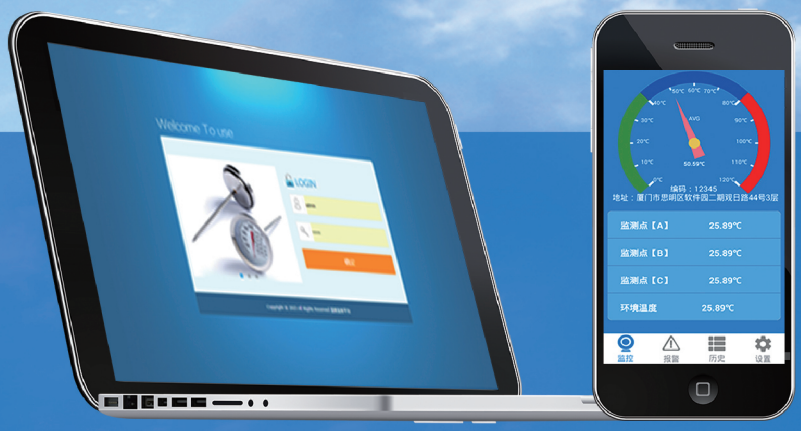
The NB-IoT could serve more than 50 to 100 times of access amounts with the same base station. A single section could support more than 100,000 connections with low latency sensitivity, ultra-low device cost and optimized network structure.

Typical Applications of NB-IoT Wireless Communication Products



Product List

Features \ Model		F2910	F2910-E
Wireless Parameters	Business Data	NB-IoT	NB-IoT
	Communication Protocol and Band	B5:850MHz; B8:900MHz; B20:800MHz	B5:850MHz; B8:900MHz; B20:800MHz
	Bandwidth	100bps~100Kbps	100bps~100Kbps
	Sensitivity	-129dBm	-129dBm
	TX Power	<23dBm	<23dBm
Interface Type	Serial	1 RS232 and 1 RS485	2 Serial Port（TTL）
	GPIO	5-way I / O, can realize 5 digital inputs and outputs, compatible with 2 pulse outputs, 2 analog inputs, 2 pulse counting function	4-way GPIO
	Antenna Connector	Standard SMA female antenna interface, the characteristic impedance of 50 ohms	IPEX connector, the characteristic impedance of 50 ohms
	SIM/UIM Interface	Standard SMA drawer card interface, supporting 1.8V / 3V SIM/UIM card, install 15KV ESD Protector	Standard clamshell deck connector, support1.8V/3V SIM/UIM card
Dimension		91x58.5x22mm	60x38x12mm
Power Input		DC 5~36V	DC 3.6~9V
Environmental limits	Working Temperature	-40~+75°C（-40~+167°F）	-40~+75°C（-40~+167°F）
	Storage Temperature	~40~+85°C（-40~+185°F）	~40~+85°C（-40~+185°F）
	Related Humidit	95%（unfreezing）	95%（unfreezing）
			



Wireless Monitoring System Introduction

- Preferred choice of Intensive, short range wireless monitoring application
- Combined with short-range network and 3G/4G long-range network deployment
- Integrated with data collection, transmission and application
- Provided with management platform on both PC and mobile APP

Overview

Nowadays, there's higher requirements to the monitoring system following the expansion and increase of the industrial products scale and complexity.

With the high reliability, low power consumption, flexible deployment and expansibility, the Four-Faith ZigBee wireless monitoring system has become the first choice of the dense high-capacity wireless monitoring system. The system consists of monitoring system platform, data collection and ZigBee monitoring terminal.

This system consists of monitoring system platform, data collection and ZigBee monitoring terminal composition.

All kinds of sensors deployed on the project site are monitored in real time. The data are collected and transmitted through the ZigBee network and then transmitted to the monitoring center through 3G / 4G network.

The management assistant units quickly achieve the goal of real-time monitoring, statistics, analysis and control of harsh working conditions.

ZigBee+2.5G/3G/4G Router

- Compatible with ZigBee, WIFI,2.5G/3G/4G
- Security Deployment of VPN
- Synchronous Transmission among Multiple Data Centers

ZigBee Wireless Monitoring Platform

- Real-time data display
- Multiple Alarm Method
- Customized Alarm Threshold

NB-IoT Wireless Communication Products

F2910 F2910-E

1.Low Power

Since the NB-IoT focus on applications with small mount and low rate data, the power consumption of NB-IoT device could reach extremely low and increase the endurance form months to years.

2.Low Cost

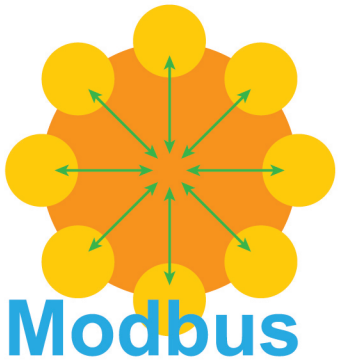
The NB-IoT network is deployed under the current LTE network, achieves maximum utilization of the spectrum and reduces the cost of operator. The complexity of the baseband module is low due to the 180kHZ narrow band adopted by the NB-IoT terminal. The low data rate, simplified protocol stack and single antenna in half duplex can reduce the cost effectively. Following the development of technology and network, the cost of module and data charge would be greatly reduced either.

3.High Coverage

With the extra 20dB gain which means 100 times coverage capacity comparing to LTE, the NB-IoT owns a better in-room coverage.

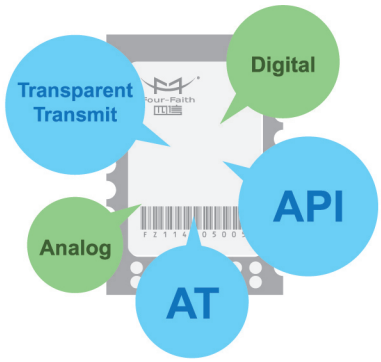
5.Compatible with multiple industry application protocols

Support various of industry application protocols including the Street Lighting or Digital Oil Field.



6.Integrated Standard Modbus Communication Protocol

PC can access the remote date acquisition and transmission by 4G/3G/2.5Gnetwork and ZigBee network.



7.Applicable and Flexible

Integrated with transparent transport, API and AT mode, the application mode could be modified depends on demand.

Support the automatic collect and report of the analog or digital quantities without secondary development which can greatly shorten the project development time.

8.Comprehensive wireless product line

Four-Faith is a leading wireless communication company in IoT and provides the most complete industrial-grade wireless communication products and solutions, including ZigBee communication products, 4G/3G/2.5G cellular communication products, GPS positioning products, RTU acquisition and transmission products to adapt to a variety of projects and one-stop service.

Wireless Monitoring System Introduction

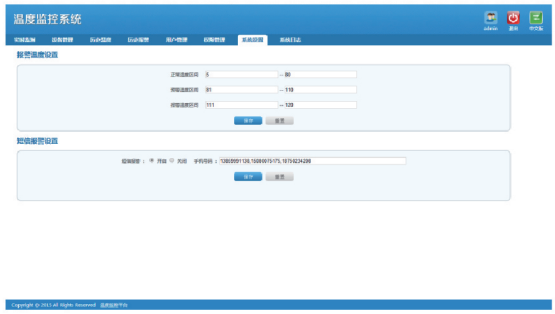
Unattended Real-time Monitoring

This system provides the real time monitoring of the scopes under coverage. With reliable network connection and intelligent anti-dropped, it ensures the online status of the monitoring equipment and working stability in the state of unattended.

Powerful Report Function

This system classifies and categorizes the data included in the monitoring system and provides various of inquiry and manifestation options like reports, graphs, histograms and so on. Vivid graphical report clearly presents the status of monitoring site to help operators grasp all dimensions of the scene information rapidly and accurately to make efficient decision.

The report can be exported or printed out directly, which is facilitated of work report of work and documentary classification.



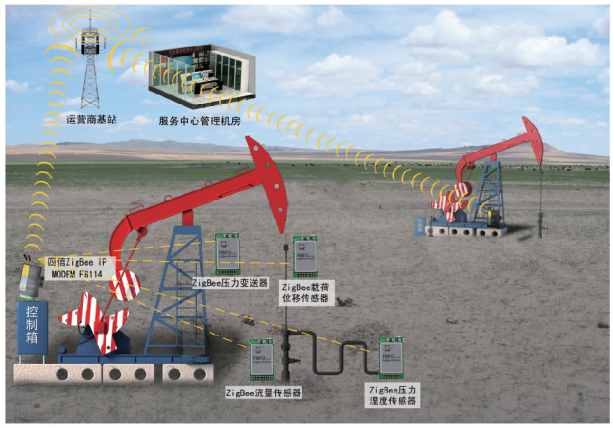
Automatic Alarm

This system supports customized alarm threshold settings, when the monitoring point value exceeds the alarm threshold, the system will automatically alarm in real time, to prompt regulatory staff to identify and solve problems. The alarm forms include sound and light alarm, SMS alarm, mail alarm.

Device Remote Management

It can monitor, configure, upgrade, diagnose, and maintain many communication terminals scattered in each project site. Technicians do not have to visit the scene to achieve remote maintenance, which reduces service costs and improves management efficiency.

ZigBee & Remote Monitoring and Control of Oil Well Production Status

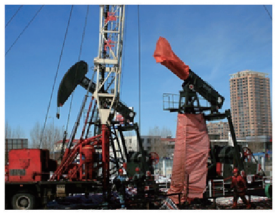


In recent years, intend to acquire the various parameters and working status of the well timely, Sinopec's oilfield information production has accessed the application of Internet of Things and solve the problem successfully. With continuous innovation and the wireless ZigBee technology, the oilfield information driven by Shengli Oilfield owned by Sinopec successfully applied to oilfield data collection. At the beginning, because of the dispersed distributed wells and different well distance, the RTU was installed in the well entrance to collect the data of the wellhead temperature, pressure, load, angular displacement, torque, work diagram and other data by the way of wire, which made a complex cable distribution in and out of the well and increased the difficulty of construction and network distribution. With the development of short-range communication module, Four-Faith F8913 ZigBee module has been successfully applied to the data acquisition of Sinopec oil well due to its maturity of short-distance networking, low power consumption, low cost and flexible application.

Network Features

- Flexible deployment, specific network design according to the requirements of the environment
- Low power consumption, high or low-level triggers sleep or activate, supports both routing and terminal mode; Deep sleep current is less than 0.4uA
- WDT watchdog design ensures the stability and self-healing ability of the system
- Miniature double 2.0mm pin package with more convenient operation
- More scientific dual-band wireless network combined with short communication distance ZigBee module and 4G gateway
- Intelligent data module, less deploy time by starting the transmission once powered on
- Flexible and variable work mode options for easy use

Successful Cases


Shengli Oilfield oil well wireless monitoring project


Zhongyuan Oilfield wireless monitoring project


Liaohe Oilfield wireless monitoring project


Xinjiang Oilfield wireless monitoring project

Customer Feedback:

From Zhongyuan oilfield: Four-Faith's ZigBee wireless communication terminal is suitable for us such a high security requirement, multiple data points well monitoring project. In recent years, Four-Faith's products are constantly optimized and the technical cooperation is also very smooth. The response is very fast and the module stability is very good. We hope Four-Faith will have more and better new products to help the oil field industry.

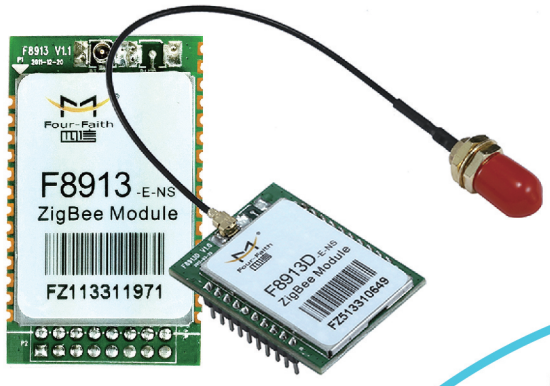



ZigBee Wireless Communication Products

Product Line

Xiamen Four-Faith Communication Technology Co., Ltd focus on industrial wireless communications, providing customers among 50 countries and regions in the world with "smart, standard, secure and reliable" wireless communications services.

ZigBee is a communication technology based on the IEEE802.15.4 protocol. It is an emerging wireless network technology with short distance, low power consumption, low data rate, low cost and low complexity.



ZigBee Data Transfer Unit

- Easy to configure
- Integrated and efficiency system
- Remote configuration management

Embedded ZigBee Module

- Easy to embed with tiny size
- Excellent Ability to communicate through walls
- Low-power with more endurance time

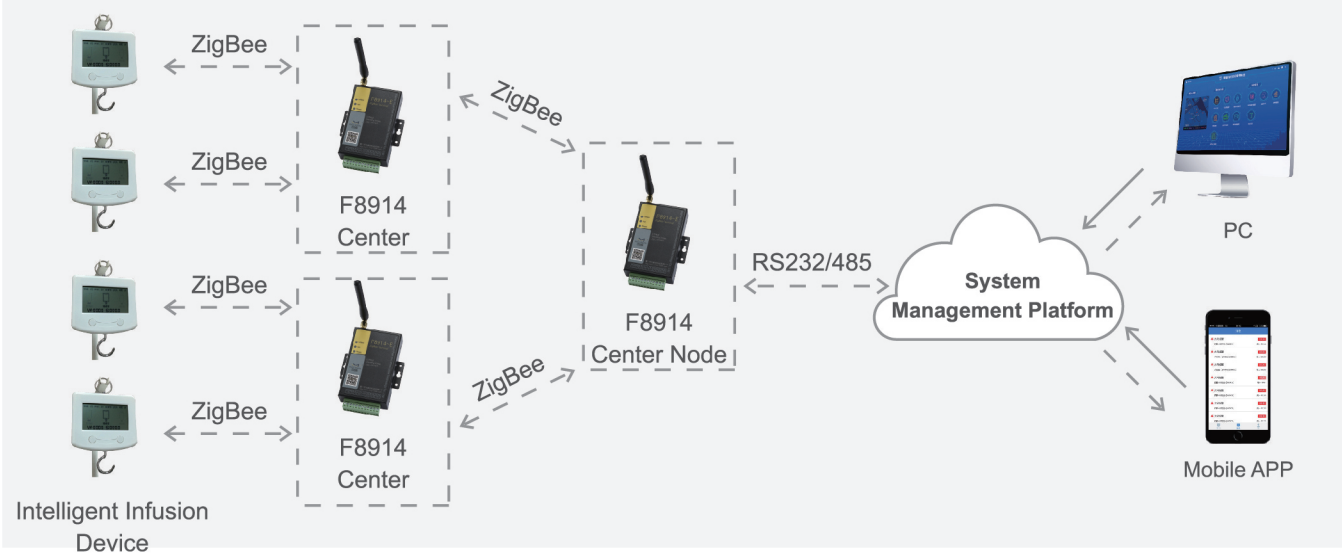
ZigBee+2.5G /3G/4G IP MODEM

- Mutual communication between ZigBee and 2.5G protocol
- Reliable networking and communication
- WDT watchdog design

Intelligent Infusion System Based on ZigBee Technology

The program was based on ZigBee technology networking, the system is mainly used for monitoring the patient's liquid infusion status, the liquid stock and infusion drip rate, and upload the data to the data management center. After receiving the data, the center would analyze the data and present the real-time status to the big screen of the medical station via the man-machine interface. Health care workers can clearly know the stock infusion corresponding to the hospital bed and alert the medical staff timely according to the blue, yellow and red display states to play a key role in foolproof management.

The terminal sensor, in this case, adopt Four-Faith embedded module F8913, which controlled the dormancy and activation of the F8914 by a single chip microcomputer. The data was flexibly sent according to the application state. And parts of F8914 were arranged as relays in the upper part of the hospital corridor so the further terminals can transfer the data via the relay.



Why Four-Faith?

- Small Radiation and Public Band

  No data charge with the global 2.4G public frequency band and small radiation which is more suitable for environment like hospital.

- High Sensitive

  Reliable transmission with higher receiver sensitivity which can transmit the signal rapidly in complex conditions.

- Excellent Penetration and Expansibility

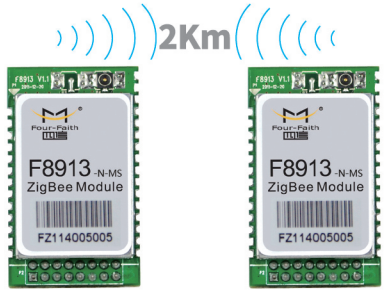
  F8913-E can penetrate two or three ordinary walls which could meet most of the point-to-point transmission demands, the network could enlarge by adding individual relay in the core area if necessary.

- Low Power Consumption

  Sleep or active mode is triggered by high or low-level signals, the power consumption in sleep mode is less than 0.5 uA which can support 3-month-long usage for the dry battery.

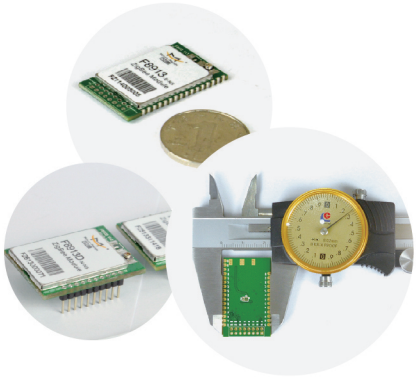
ZigBee Wireless Communications Products

Products Key Feature



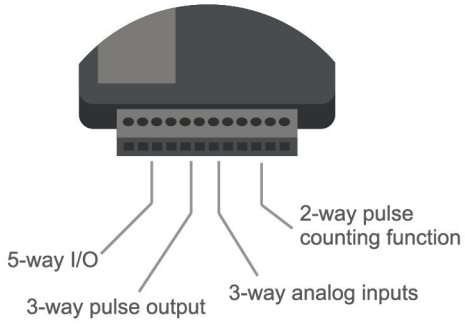
1.Communication range up to 2Km

The P2P communication of the Four-Faith ZigBee could reach 2Km, support multistage relay routers and applicable for the deployment of huge network with long distance.



2.Easy embedded with small size

It's convenient for developing with the small size and weight. It supports the UART secondary development with the encapsulated interface of stamp hole and pin.



3.Various Interfaces

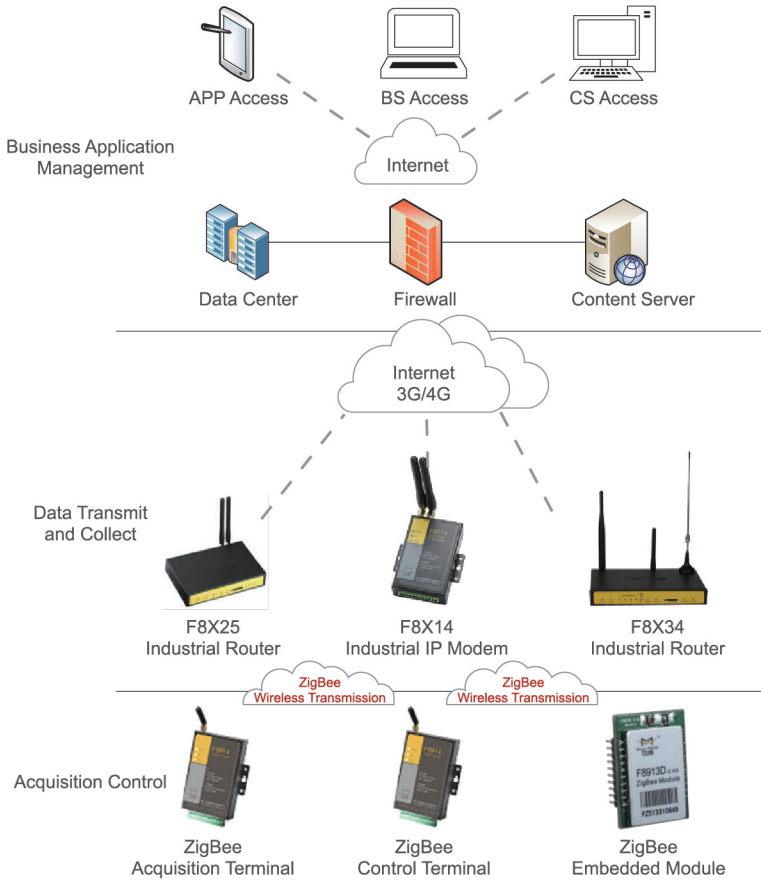
Provide 5 I/O ports for digital input/output;
Compatible with 3 pulse outputs, 3 analog inputs and 2 pulse counters;
Provides standard RS232, RS485 interface for serial devices.

4.Excellent Coordinate Ability

Features like advanced link budget technology, self-assembly and self-repair could greatly guarantee the communication quality.

System Composition

Four-Faith ZigBee wireless monitoring system consists of the monitoring system platform, data collection and ZigBee monitoring terminal.



According to customer requirements, the monitoring center would collect data for analytical processing and display such data in the monitor in real time;

With the realization of real-time data processing, classification, storage, the system achieves a variety of functions, like business interface query, statistics, printing, alarm and others.

After being collected by the Four-Faith ZigBee industrial wireless gateway, the data would be transmitted to the monitoring center by 3G / 4G or Internet;

Easy to be installed in various regions of the monitoring site to transmit the data with real-time, efficiency and stability.

Consists of ZigBee acquisition terminals and monitoring sensors, distributed at the scene of the monitoring points;

The industrial ZigBee acquisition terminals would monitor the field data in real time.

System Functions

With the expansion of the scale of production on the industrial site and the increase of complexity, sites of industrial production put forward higher requirements on the monitoring system.

Four-Faith ZigBee wireless monitoring system, with high reliability, flexible networking, low power consumption, low cost, flexible expansion, has become a dense choice of high-capacity wireless monitoring system.

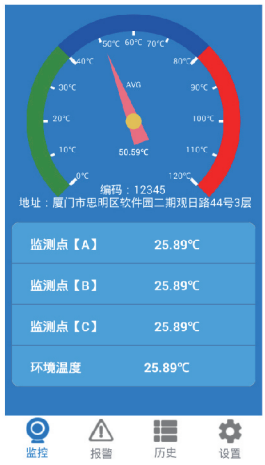
The system consists of monitoring system platform, data collection and ZigBee monitoring terminal.

All kinds of sensors, deployed on the project site, are monitored in real time. The data are collected and transmitted by the ZigBee network and then transmitted to the monitoring center through 3G / 4G network and helps the manager to achieve timely monitoring, counting, analyzing and management in harsh environment.

ZigBee Wireless Communications Products

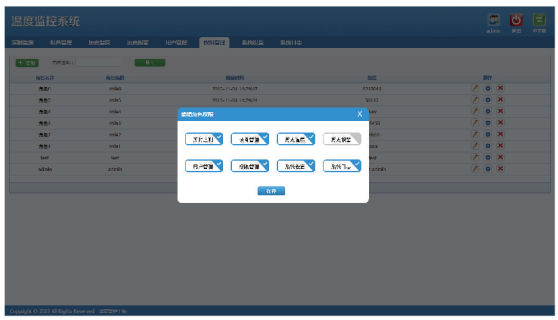
Product List

Model / Features	F8913 Series ZigBee Module	F8913D Series ZigBee Module	F8914 Series ZigBee Terminal	F8X14 Series ZigBee IP Modem	F8X26/F8X36 Industrial ZigBee Wireless Router
MCU	Industrial ZigBee Platform	Industrial ZigBee Platform	Industrial ZigBee Platform	Industrial ZigBee Platform	Industrial ZigBee Platform
Communication Protocol and Band	IEEE 802.15.4 ISM 2.4~2.5GHz	IEEE 802.15.4 ISM 2.4~2.5GHz	IEEE 802.15.4 ISM 2.4~2.5GHz	IEEE 802.15.4 ISM 2.4~2.5GHz	IEEE 802.15.4 ISM 2.4~2.5GHz
RF Data Rate	250 Kbps	250 Kbps	250 Kbps	250 Kbps	250 Kbps
Indoor/Urban Range	90 m (With PA)	90 m (With PA)	90 m (With PA)	90 m (With PA)	90 m (With PA)
Outdoor/RF Line-to-Sight Range	2000m(With PA)	2000m(With PA)	2000m(With PA)	2000m(With PA)	2000m(With PA)
Transmit Power	100 mW(+20dBm)	100 mW (+20dBm) (With PA)	100 mW (+20dBm) (With PA)	100 mW (+20dBm) (With PA)	100 mW (+20dBm) (With PA)
Receiver Sensitivity	-103 dBm (With PA)	-103 dBm (With PA)	-103 dBm (With PA)	-103 dBm (With PA)	-103 dBm (With PA)
Configuration	Local Configuration or Over-the air Update，AT、API Command	Local Configuration or Over-the air Update，AT、API Command	Local Configuration or Over-the air Update，AT、API Command	Local Configuration or Over-the air Update，AT、API Command	Local Configuration or Over-the air Update，AT、API Command
Network Topology	ZigBeePro2007 Protocol、HA Protocol、ZLL Protocol	Point-to-Point、Point-to-Multipoint, and Mesh Network	Point-to-Point、Point-to-Multipoint, and Mesh Network	Point-to-Point、Point-to-Multipoint, and Mesh Network	Point-to-Point、Point-to-Multipoint, and Mesh Network
Channel	11 to 26	11 to 26	11 to 26	11 to 26	11 to 26
Cellular Network	NA	NA	NA	2G / 3G	2G / 3G / 4G
Antenna Interface	U.FL RF connector, impedance 50 ohm	U.FL RF connector, impedance 50 ohm	SMA Interface	SMA Interface	SMA Interface
Recommended Power	DC 3.3V/0.5A	DC 3.3V/0.5A	DC 12V/0.5A	DC 12V/0.5A	DC 12V/0.5A
Power Range	DC 2.8~3.6V@20dBm	DC 2.8~3.6V@21dBm	DC 5~36V	DC 5~36V	DC 5~36V
Dimension (L*W*H) (mm) and Weight	25x17x2 mm；1.0g	32.9x24.4x3.4 mm；3.5g	91x58.5x22 mm;205g	91x58.5x22 mm;210g	157x97x25 mm；440g
Working Temperature	-40~+85℃ (-104~+185 ℉)	-40~+85℃ (-104~+185 ℉)	-35~+75℃ (-31~+167℉)	-35~+75℃ (-31~+167℉)	-35~+75℃ (-31~+167℉)
Storage Temperature	-40~+125℃ (-104~+257℉)	-40~+125℃ (-104~+257℉)	-40~+85℃ (-40~+185℉)	-40~+85℃ (-40~+185℉)	-40~+85℃ (-40~+185℉)
Related Humidity	95% (Unfreezing)	95% (Unfreezing)	95% (Unfreezing)	95% (Unfreezing)	95% (Unfreezing)
RX	28~30mA@3.3VDC	32.4~33.2mA@3.3VDC	<= 15mA/12V@21dBm	50~90mA @12V	<500mA (12V)
TX	41.2~42.5mA@3.3VDC (Maximum Current ≤200mA)	41.2~42.5mA@3.3VDC (Maximum Current ≤200mA)	<= 80mA/12V@21dBm	25mA @12V	<500mA (12V)
Timing Wake-up Current	1.0~1.5uA@3.3VDC	1.2~1.3uA@3.3VDC	<= 4.5mA/12V@21dBm	8mA @12V	<500mA (12V)
Deep Sleep Current	0.3~0.5uA@3.3VDC	0.3~0.5uA@3.3VDC	<= 3.5mA/12V@21dBm	4.6mA @12V	<500mA (12V)
					



Support PC Platform and Mobile APP Client, User-friendly

Besides PC-side platform, Four-Faith ZigBee wireless monitoring system also supports mobile APP, cloud remote control and global management. Customers can view and manage the project site status anytime, anywhere.



Graded Authorization Management, Avoid Illegal Intrusions

Administrators can classify the authority of operators according to actual needs to protect data, systems and devices from illegal viewing and changing intrusion, and ensure the safe operation of the system.

System Features

- **Free Data Charge**

  ZigBee is deployed between the collection terminal and the receiving device, so there's no any extra communication costs, which is much more cost-effective.

- **Designed for Harsh Environment Applications**

  Strong anti-interference, high-low temperature resistance ability. Wide voltage range for power supply and low-power consumption design which met the needs of low power consumption of battery-powered projects.

- **High Network Capacity**

  According to actual needs, many nodes have been put into the monitoring area to monitor the environmental information and get more and more accurate valued information in the area.

- **Flexible Deployment**

  Applicable for Staging network construction, and meet customer basic, small, midsize, or large application needs with constantly expansible, flexible and low initial investment solutions. With the decentralized, dynamic topology, peer-to-peer design, any nodes can join or leave the network at any time, without affecting the validity of other nodes, and the entire network topology changes dynamically.

- **Multi-relay, Self-organizing**

  Without any other auxiliary equipment, the monitoring network can complete the transmission through the nodes by self-organized agreement and algorithm and transmit the date among different replay points, which is good for the performance.

- **Open System**

  Users can use the data and develop their own PC system by open interface.

- **Easy to Build a Monitoring Environment, One-stop Solution**

  Four-Faith has a complete ZigBee wireless communication product line, 4G / 3G wireless communication product line, and provides wireless monitoring one-stop hardware terminal and system platform to help customers quickly build wireless monitoring system.

- **Customization**

  Customized deployment and function depends on customers' requirements and application features to meet the demand of system management.

Four-Faith
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