# Self-Introduction and My Researchs

- Research student : Zhou Xihong
- Research Lab : 503

LOGO

# Self-Introduction

**Nime:** Zhou Xihong(Syuu Sai Kou)
**Birthday:** October 2nd
**Hometown:** Meitan, Zunyi, Guizhou, China
**Education:**Graduated from Beihua University in July 1, 2016
**Major:**Communication Engineering
**Skilled:**I am skilled at the application of C programming language in commonly-used microcontrollers.

Familiaring with Wireless Communication technology include ZigBee, GPRS, WiFi ,Blooteeth and other commonly used communication technologies.

Next I will introduce my graduation project

# 1.Design background—" **wireless smart home control system**"

1. Many devices use different wireless communication protocol.
2. In order to connect such devices into the network.

a gateway that can support many wireless communication protocols is useful.

Video surveillance

Smoke alarm

Combustible gas alarm

Human body inductive alarm

Remote open door

Ant-theft door

Televsion remote

air conditioner remote

Audio remote

Light control

Socket control

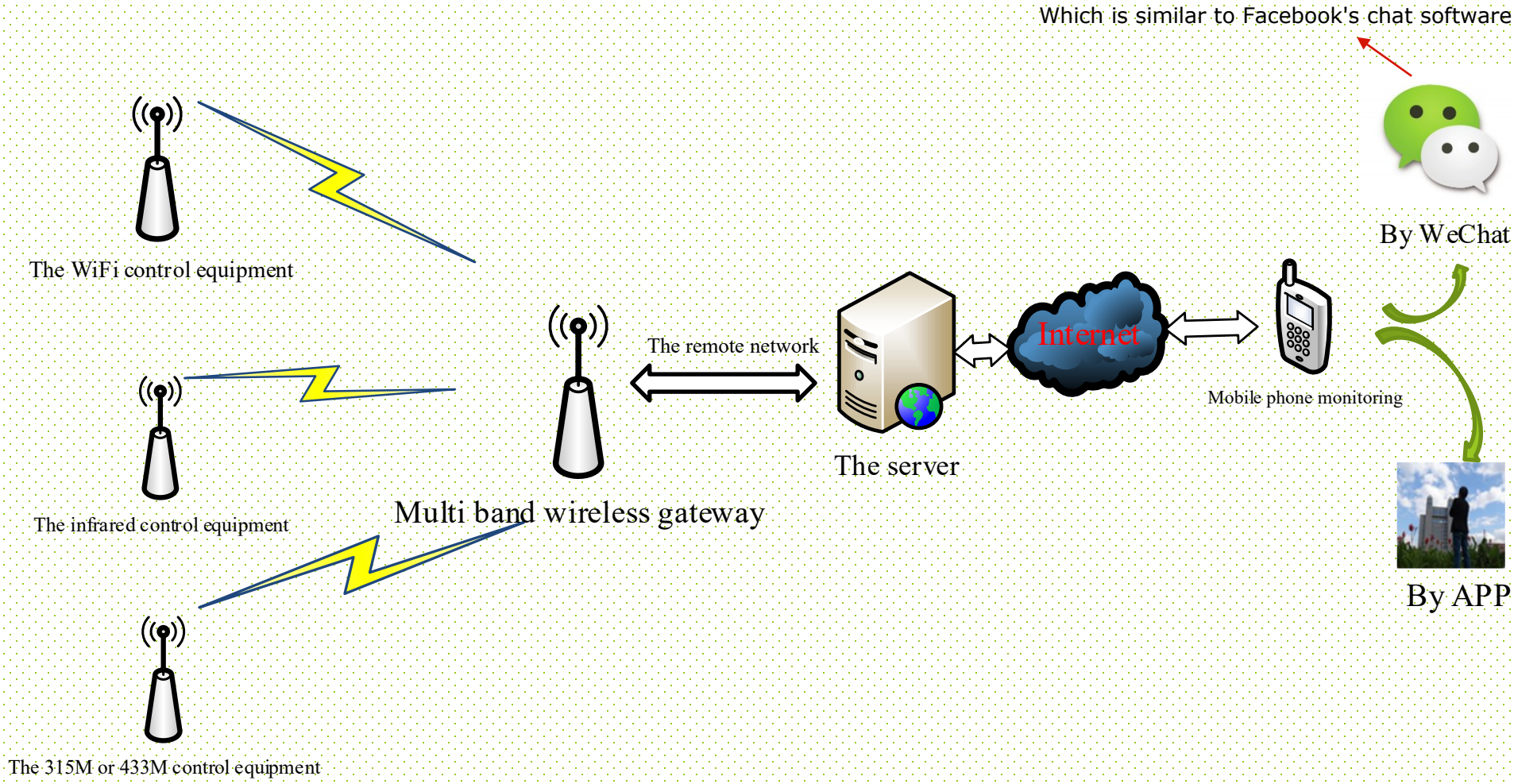
relay gateway

mobile terminal

# My graduation project

So in my research, I have designed a smart home system using a gateway with multi-band wireless functional, and developed the application software to control the system by smart phone.

# 2. the contents of this research



# 3.The design of the multi band wireless gateway

| Parameters of The HLK-RM04 module | |
|---|---|
| Operating voltage | DC5V |
| Operating temperatures | -20-70℃ |
| Wireless standard | IEEE 802.11b/g/n |
| Transmission rate | 11n:up to 150Mbps<br>11g:up to 54Mbps<br>11b:up to 11Mbps |
| Channel number | 1-14 |
| Frequency range | 2.4-2.4835G |
| Transmit power | 12-15DBM |
| Receive sensitivity | -70dBm |

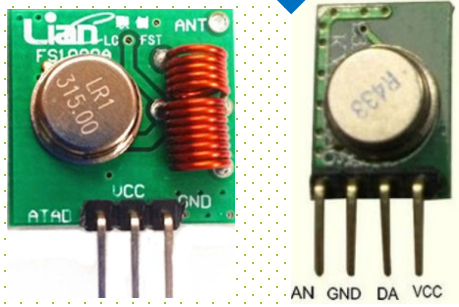
The infrared transceiver module

| Parameters of The 315/433M module | |
|---|---|
| Operating voltage | DC2.7-5.5V |
| Operating temperatures | -20-70℃ |
| Transmission rate | 100b/s |
| frequency range | 38K |
| Transmission distance | Up to15 metre |


The WiFi module

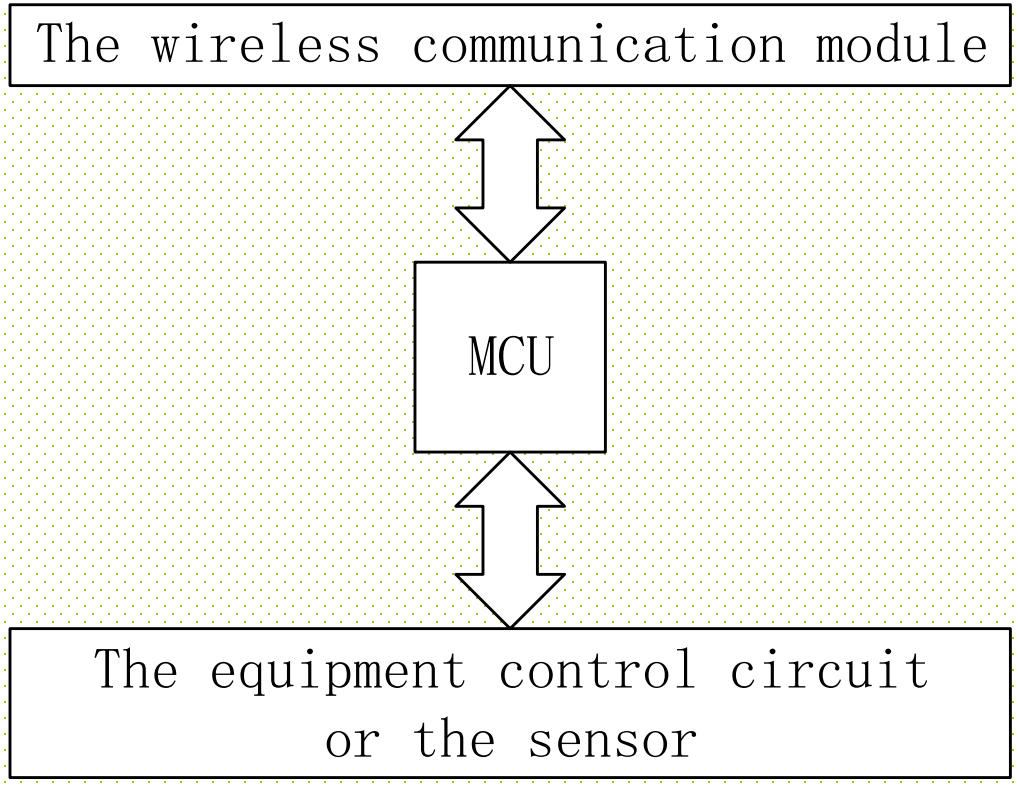

| The high-performance ARM Cortex-M3 32-bit RISC core | |
|---|---|
| Flash memory | 512K bytes |
| SRAM | 64 bytes |
| Timers | 4 General-purpose,2 Advanced-control,2 Basic |
| comm | 13 communication interfaces |
| GPIOs | 112 |
| 12-bit ADC | 3 ADC (21 channels) |
| 12-bit DAC | 2 ADC (2 channels) |
| CPU frequency | 72 MHz maximum frequency |
| Operating voltage | DC2.0 to 3.6 V |
| Operating temperatures | –40 to +105℃ |

| Parameters of The 315/433M module | |
|---|---|
| Operating voltage | DC5V |
| Operating temperatures | -20-70℃ |
| Transmission rate | 4kb/s |
| frequency range | 315M/433M |
| Receive sensitivity | -105dBm |
| Transmission distance | Up to 200 metre |

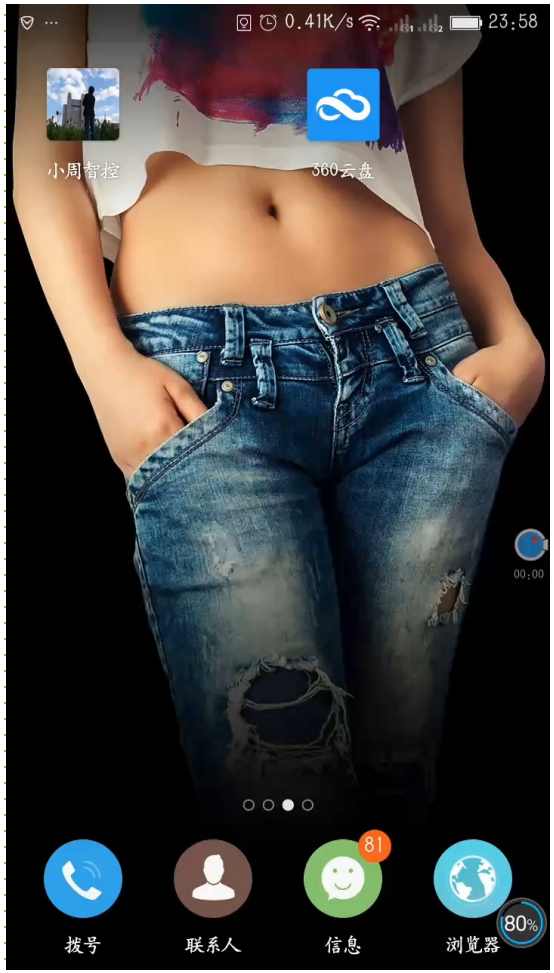


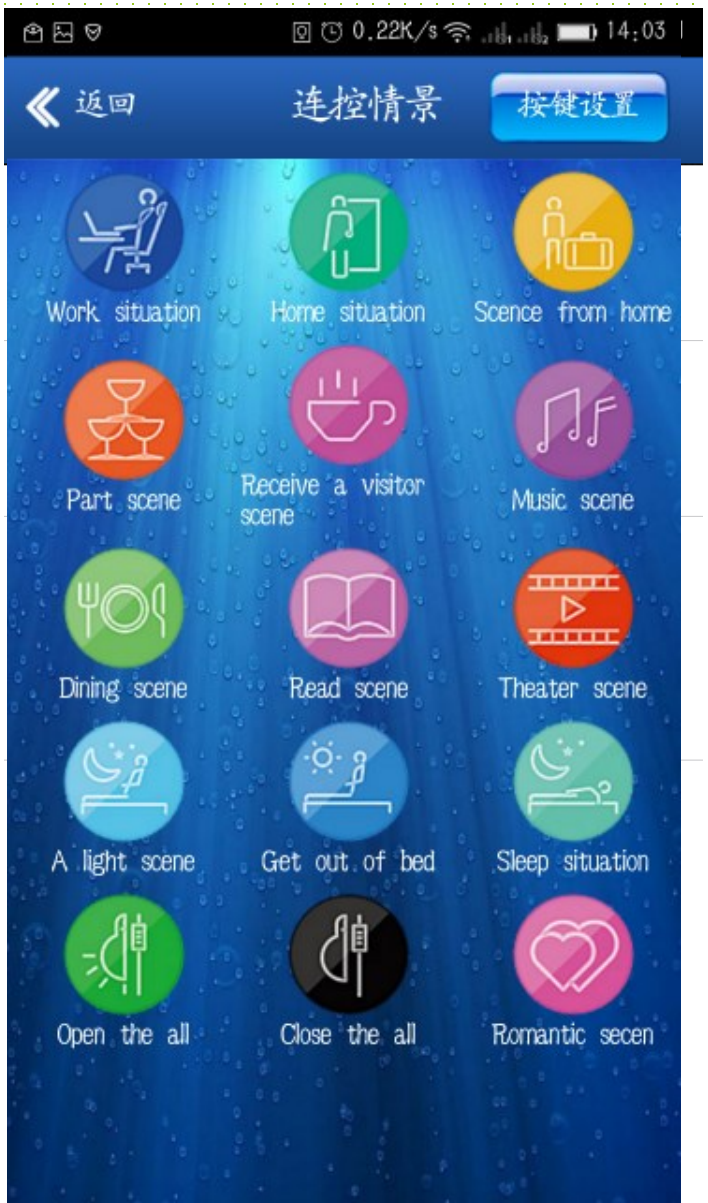

315M or 433M transceiver module

## 4.The design framework of wireless terminal control equipment



# 5. The design of software

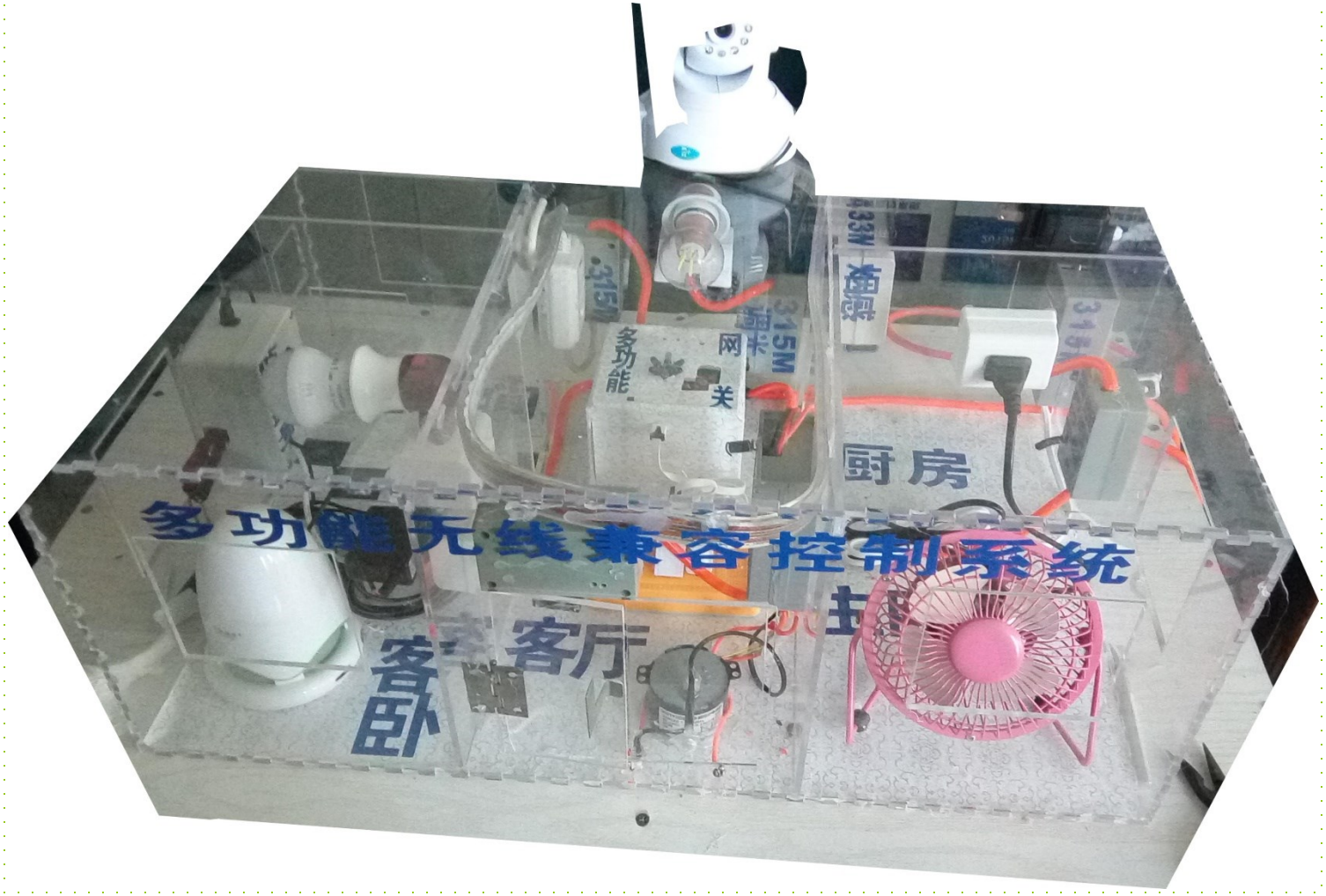


# 6.The WeChat chat control

## 7. Presentation of system

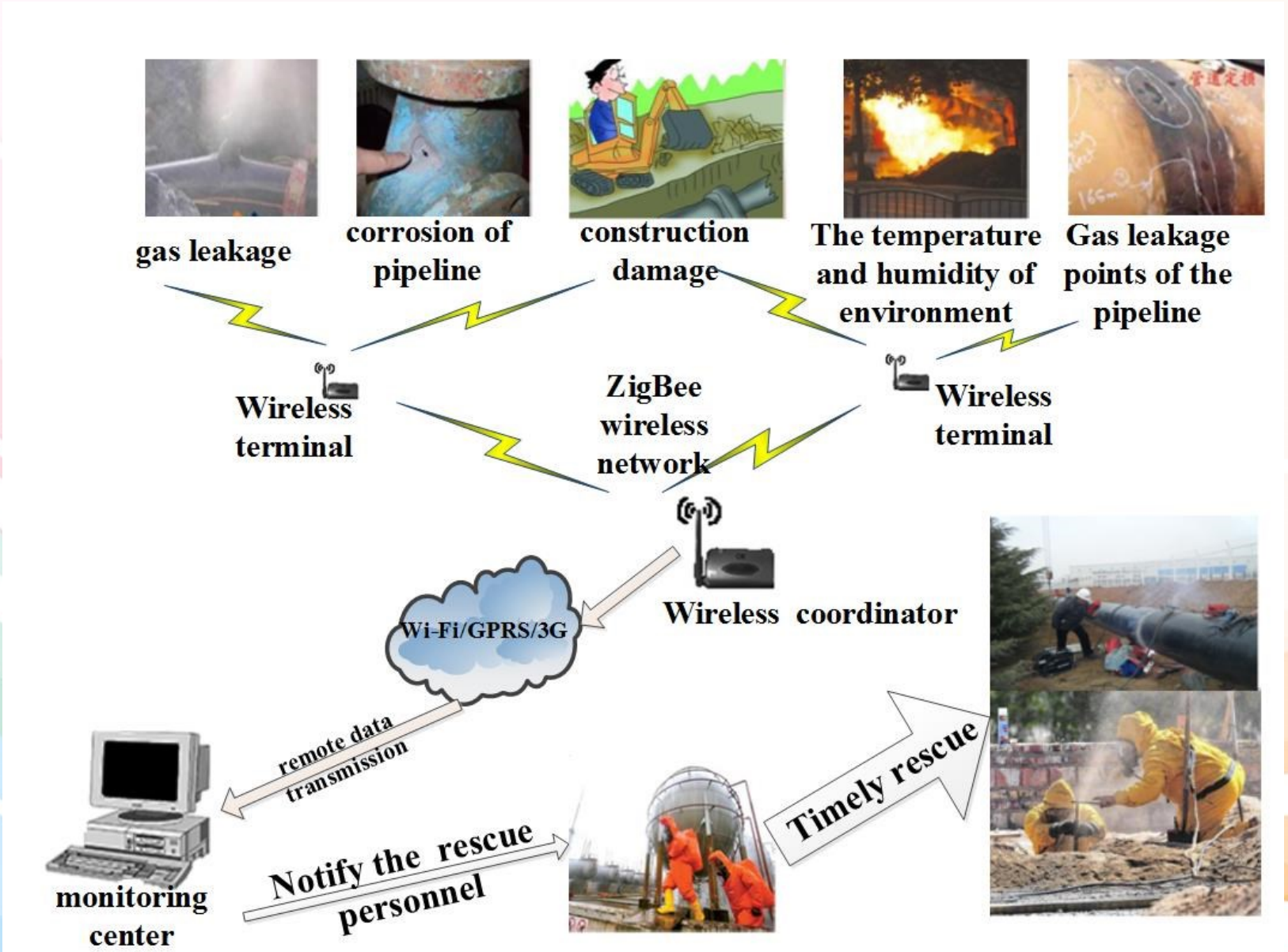
I took about three months to design the whole system.

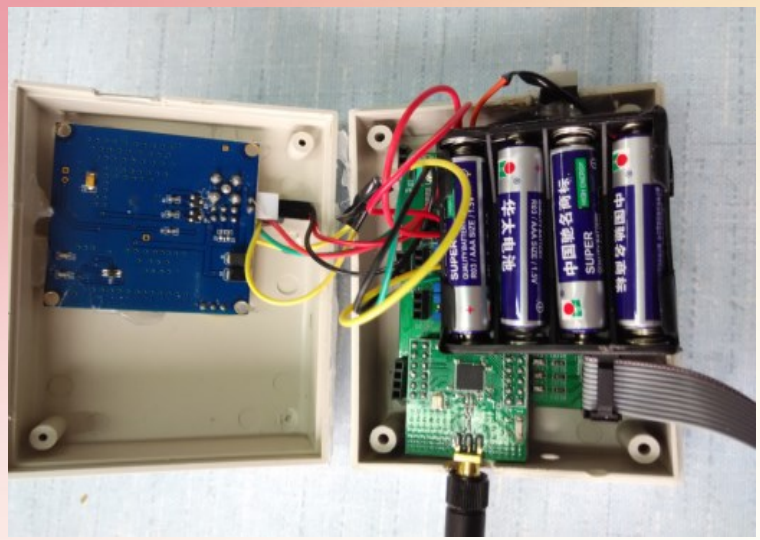


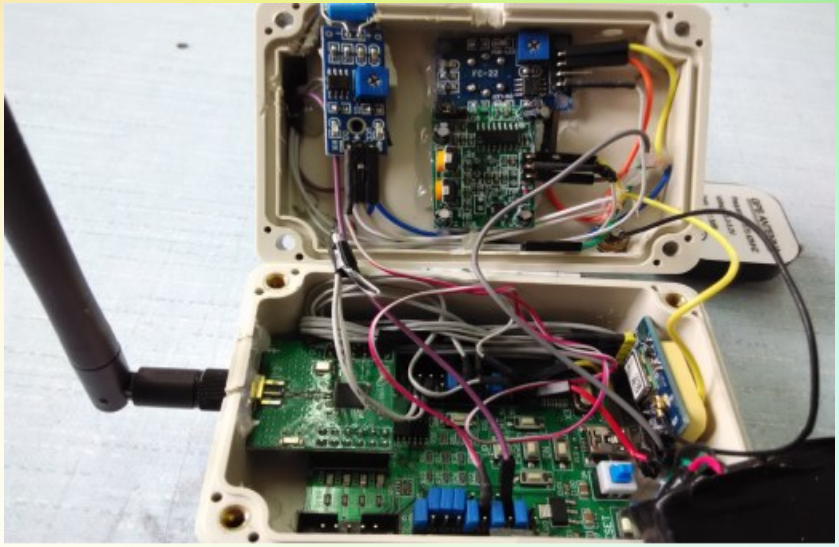
Next is the part about the projects I have done

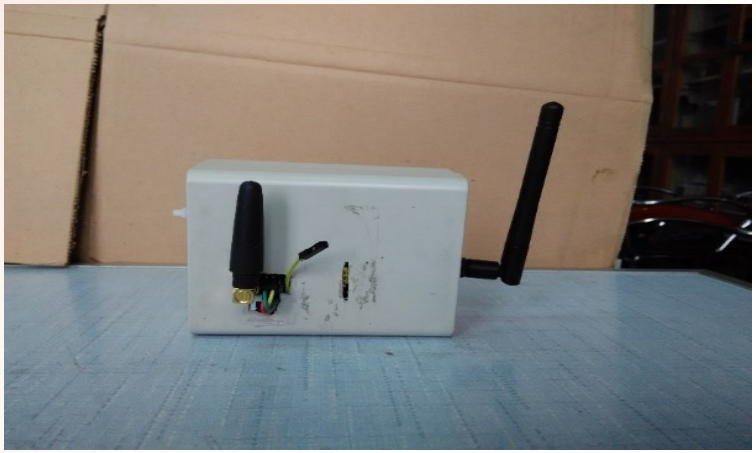
# Project（1）

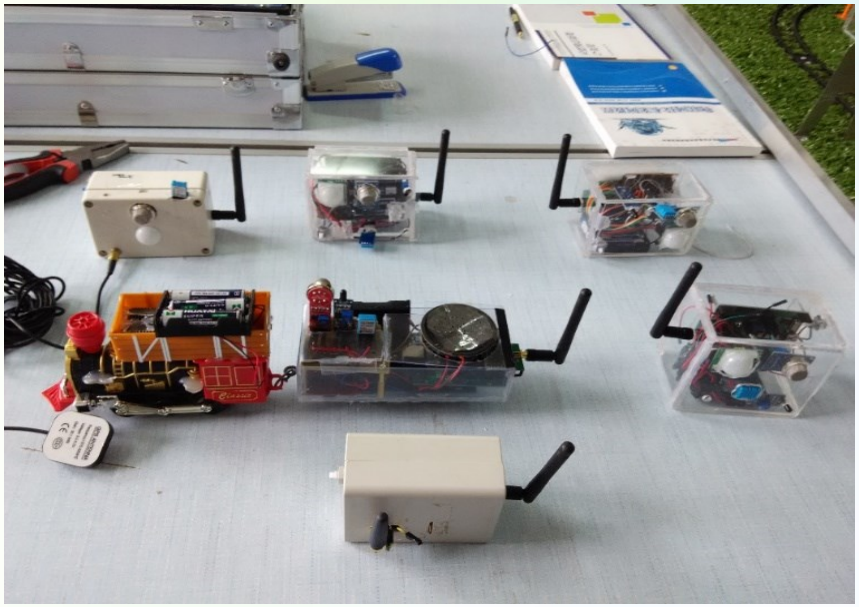
## A Real-time Monitoring System For Natural Gas Pipeline Based on ZigBee Technology











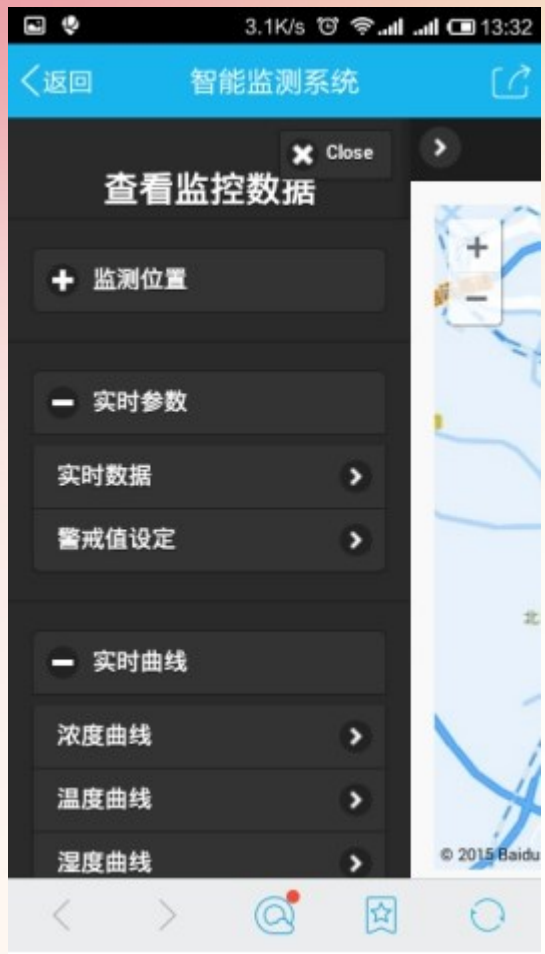
The wireless coordinator

The wireless terminal nodes

# PC monitoring software

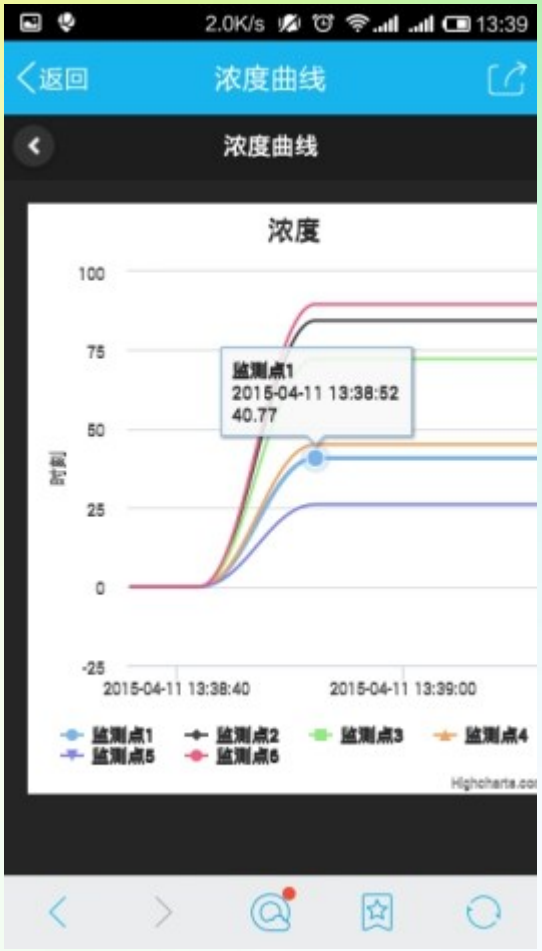

The PC monitoring software of the real-time monitoring system for natural gas pipeline

# APP software




The main interface


Real time data display




Concentration curves

# On-site test

This project is given a 15-day field test in the China Kunlun Gas Company.

# Presentation of the system


The development cycle of the entire system is 6 months.

# Project（2）

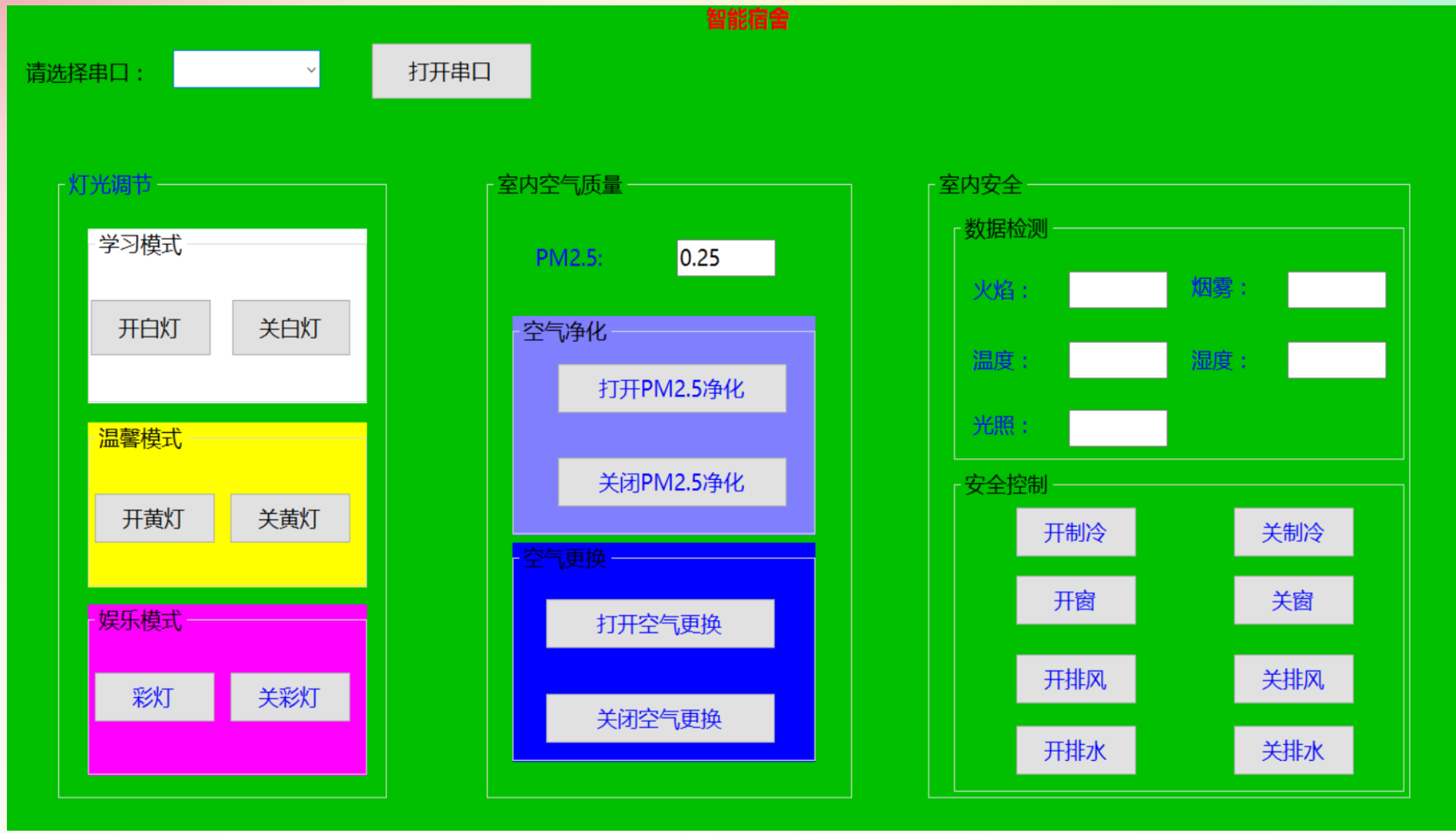
## An agricultural management system


Presentation of the system

Presentation of the system

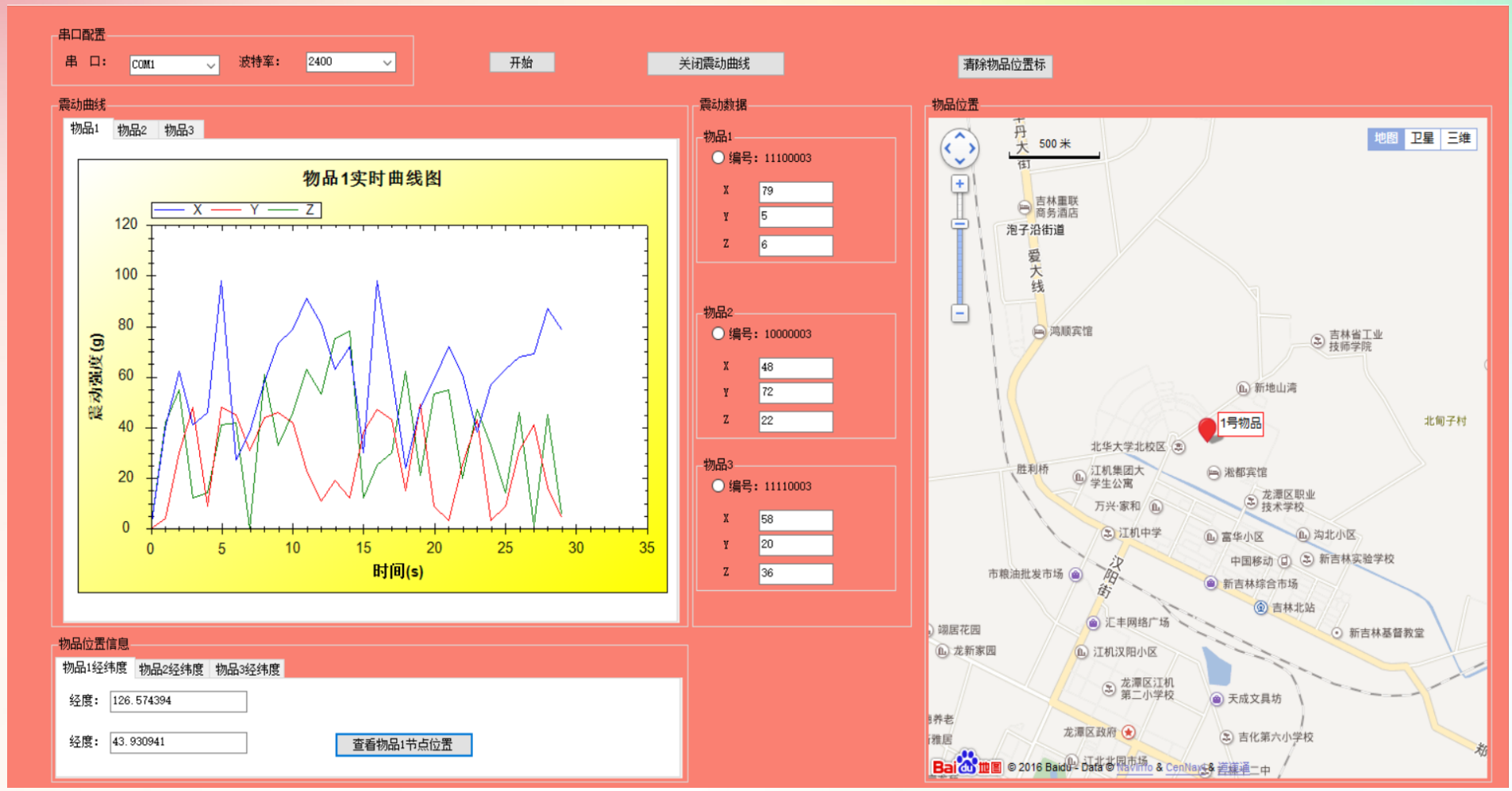
# Project（3）

# An intelligent dormitory control system

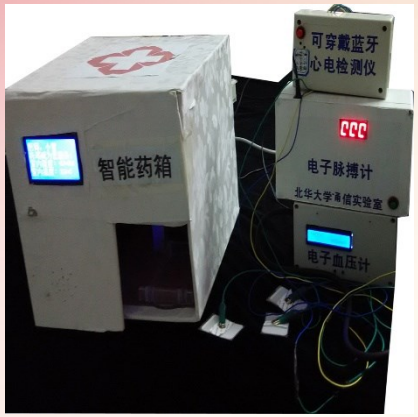


# Project（4）

## a vibration recording system for objects transported vehicles



# other projects

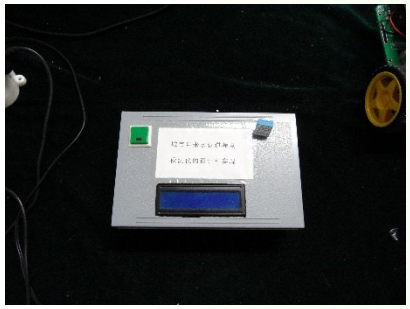



Intelligent medical system

Intelligent bus station system

Wind Pendulum Based on PID Algorithm

Community environmental testing system



Tap water leak detector

Short - range wireless analog video transmission system

# THE END

# Thank you very much !