



The Design of a Treadmill Trainer's Protection System

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How the idea popped out?



Treadmill

Sport

Medical science



You can
use
it at
home,

in a gym,



with friends...



or families.



However.....

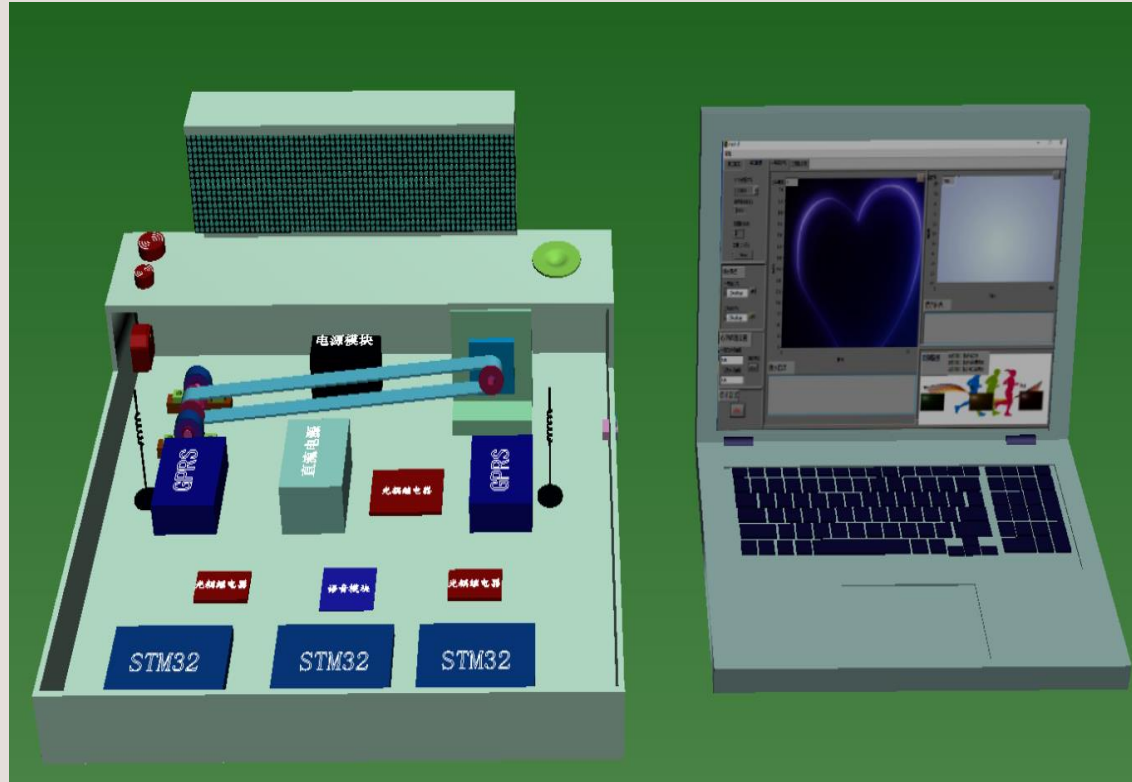


So?

- The Treadmill Trainers' Protection System

Treadmill Trainers' Protection System

- Sensor technology
- SCM
- GSM
- Labview
- Data-collecting module, Real-time database
- STM32 MPU
- SON7015
- ADXL345 Sensor
- GPRS
- Monitoring Platform
- Flash and tweet

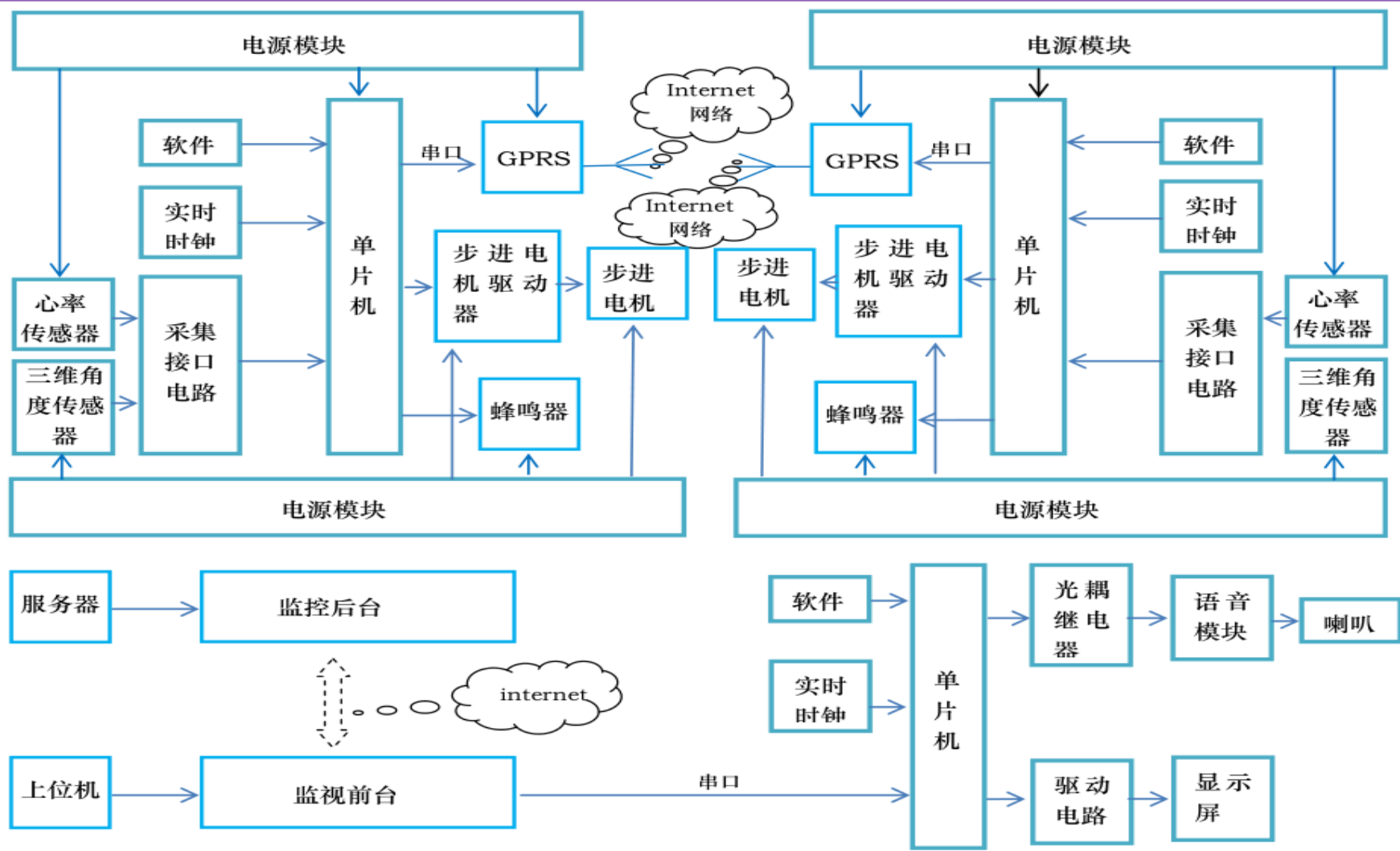


The method

- 1** **Structure Diagram**
- 2** **Design No.1: The Acquisition and Transmission of Data**
- 3** **Design No.2: The Panel of Data Monitoring**
- 4** **Design No.3: Warning and Protection**

1

Structure Diagram



2

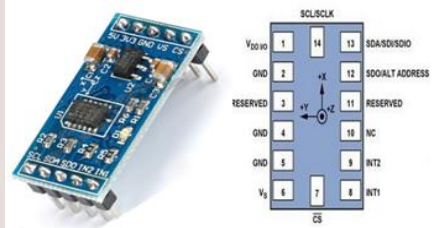
Design No.1: The Acquisition and Transmission of Data

•Task

- 1.Get the imformation
- 2.Transfer the information
- 3.The microcontroller sends the data by using GPRS

Component

- STM32microcontroller
- SON7015heart rate sensor
- ADXL345three-dimentional angle sensor
- AM2301 humiture sensor
- USR-GPRS232-720 GPRS DTU Data transforming module

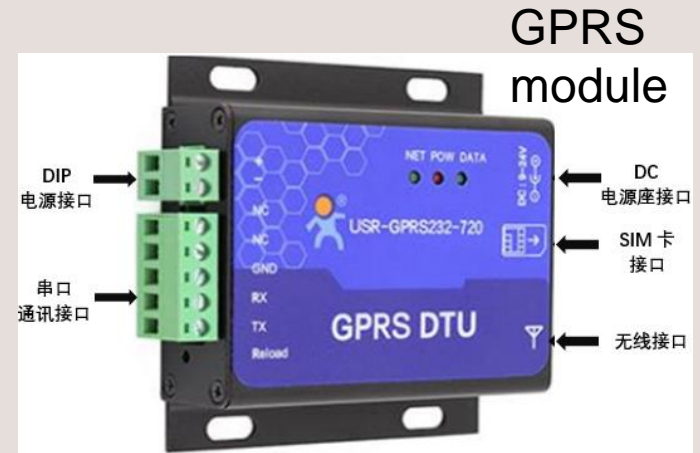


角度传感器
Angle sensor

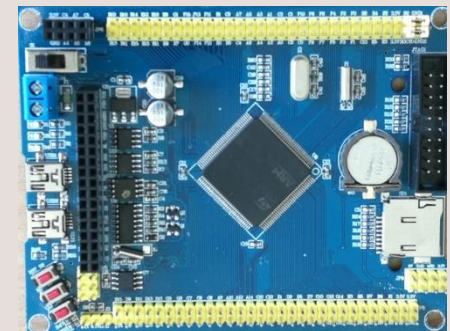
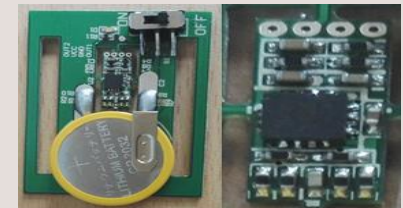


温度传感器
Humiture sensor

引脚	颜色	名称	描述
1	红色	VDD	电源 (3.1V-5.5V)
2	黄色	SDA	串行数据, 双向口
3	黑色	GND	地
4	白色	SCL	串行时钟, 输入口 (单总线时接地)

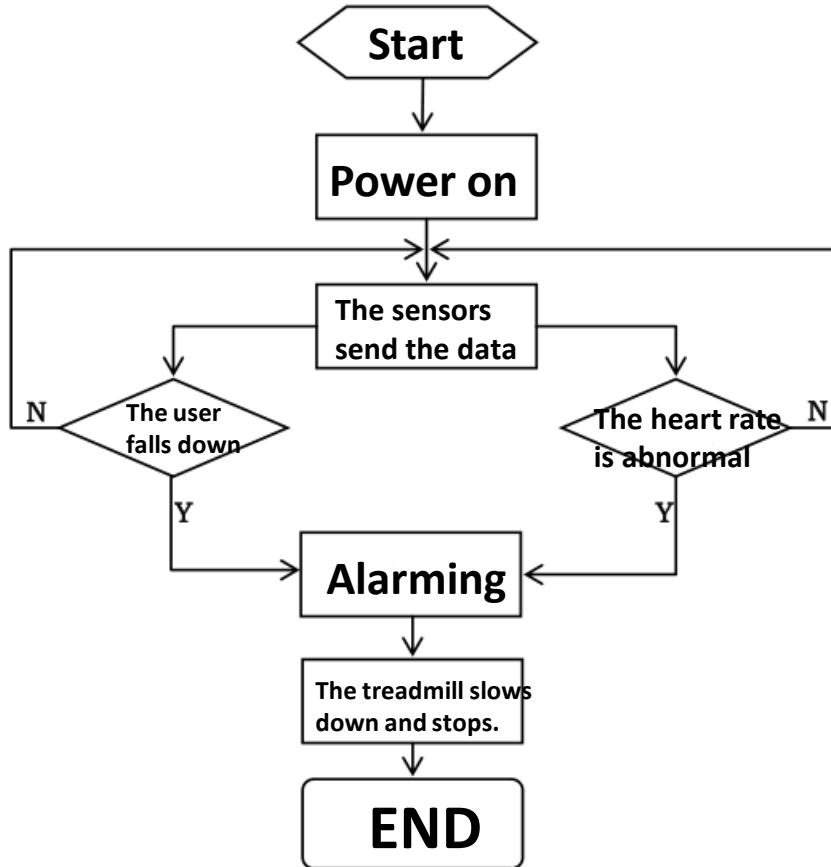


Heart
rate
sensor

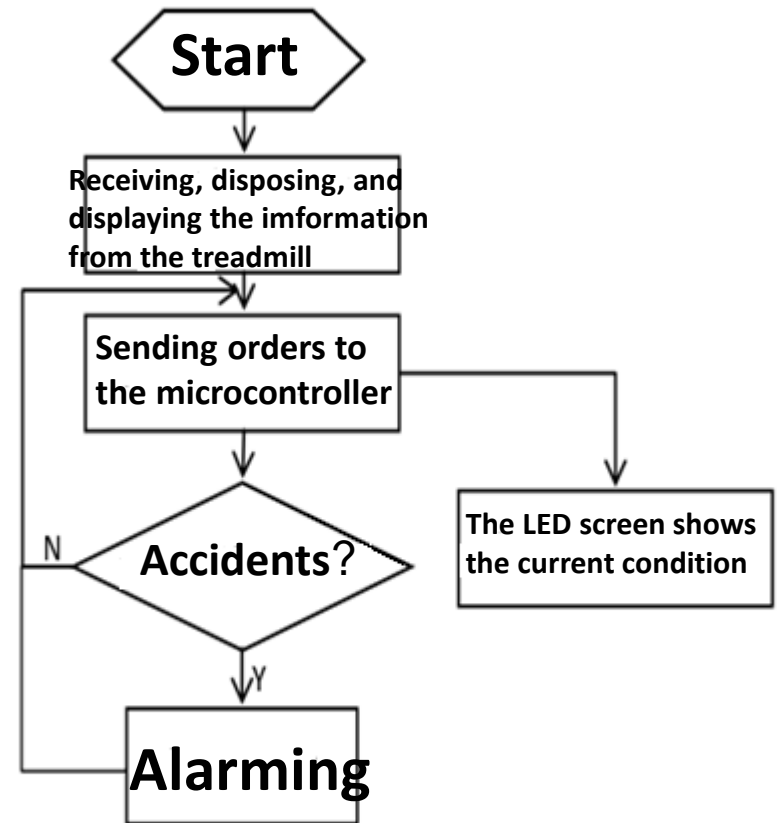


Microcontroller

Algorithm



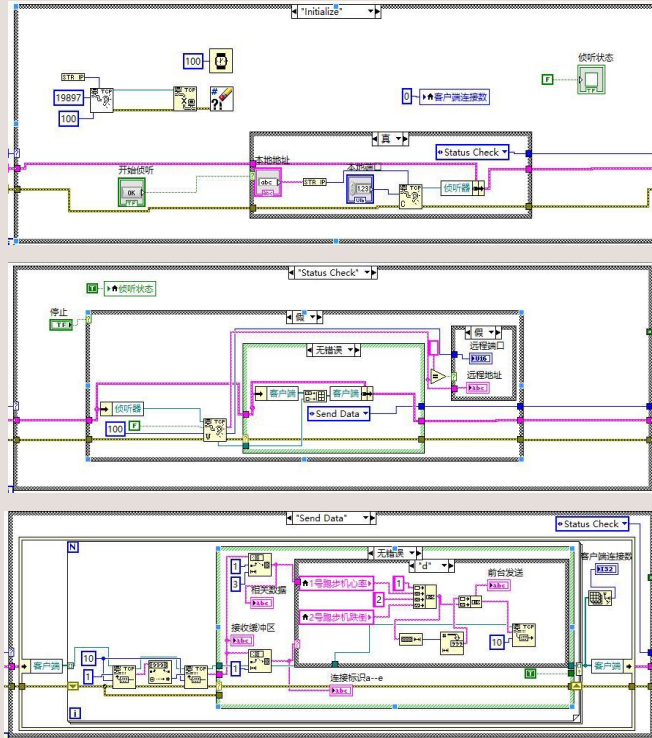
Treadmill



Monitoring panel

3

Design No.2: The Panel of Data Monitoring



TCP/IP网络通讯
跑步机系统后台

☒ 侦听 ☐ 停止

本地地址
192.168.5.197

本地端口
3707

客户端连接数
0

接收缓冲中
0

连接标识a--e
0

远程地址
0

远程端口
0

1号跑步机心率
0

2号跑步机跌倒
0

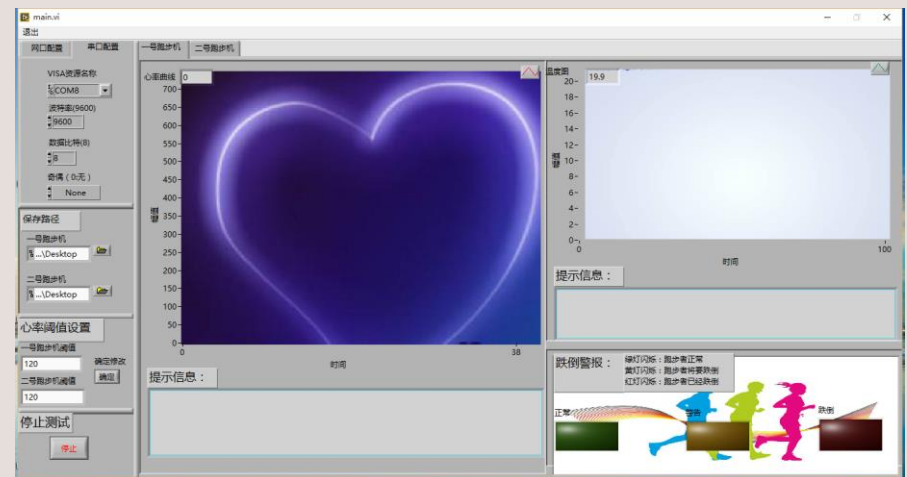
室内温度
0

前台发送
0

服务器端“前面板”

Tasks:

- Set up local address and ports
- Set up threshold value
- store user information



监视前台“前面板”

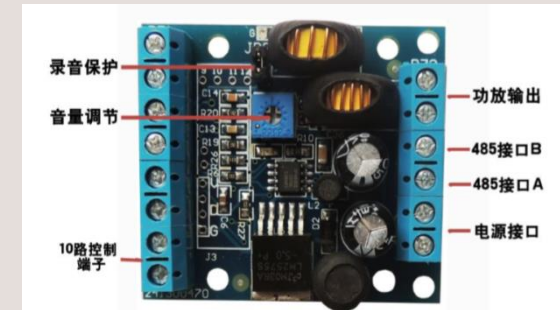
4

Design No.3: Warning and Protection

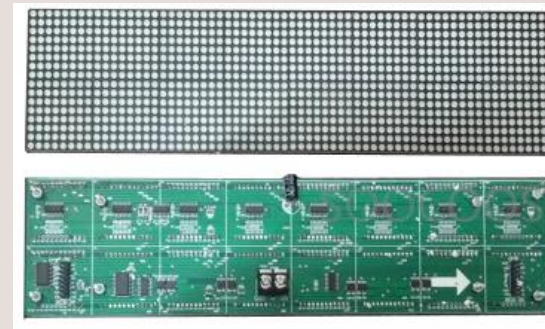
Flashing
buzzer



Optocoupler
relay

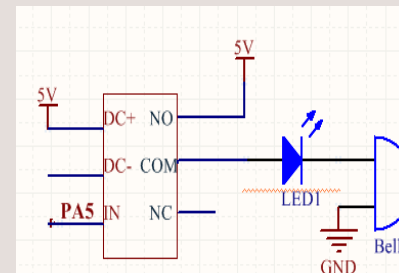


LMD112
Voice
module

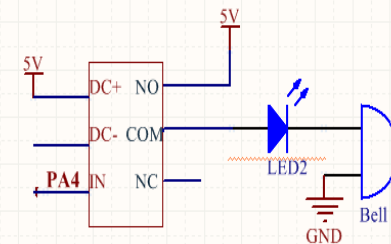


LED
screen

- **Tasks:**
- Show the condition of the user
- Give alarms and stop the running machine when accidents happen.

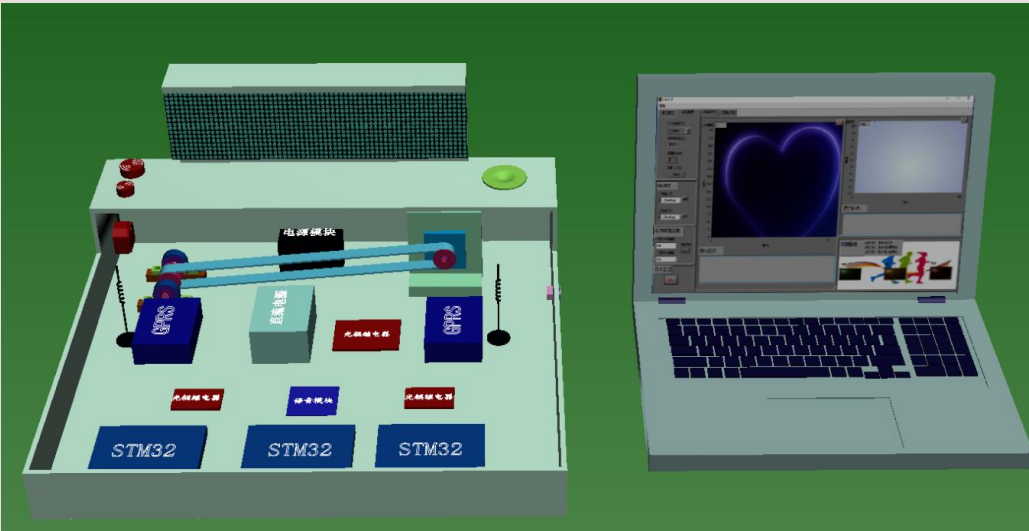


一号跑步者声光警示



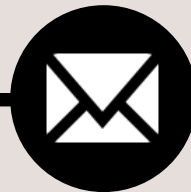
二号跑步者声光警示

Prototype



We use 3DMax to show the prototype of the protecting system.

3DMax is a software in which people can design and create virtual objects.



The uniqueness of our project



- Multiple microcontrollers
-
- Wireless transmission



- Data transtion
- Sampling parameters



Both the treadmill and the monitoring panel
LED screen
Alarms
Protect the trainer as best at it can

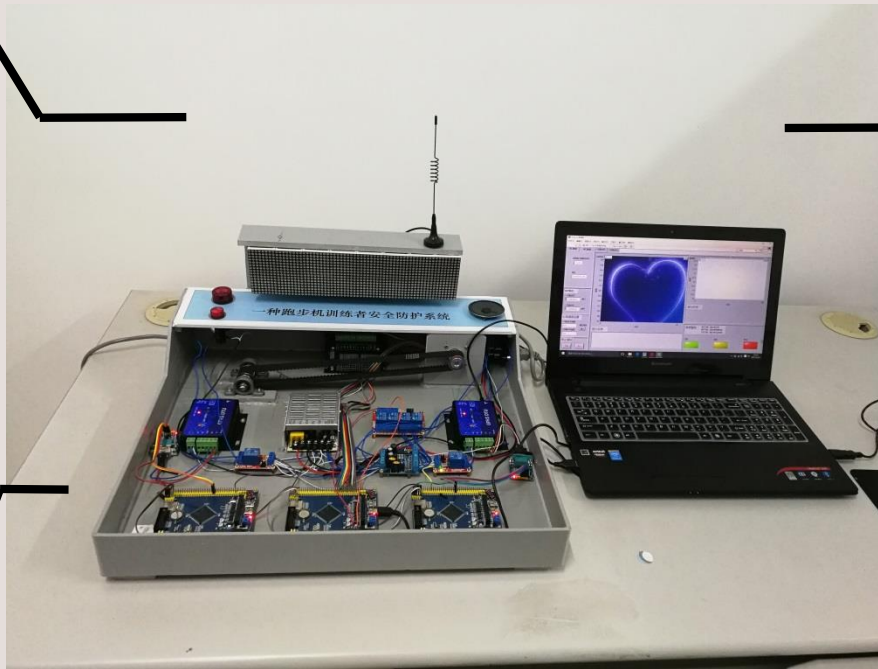


What are you waiting for?

Advantages

available for both
standalone and
networking

functional and practicable



easy to handle

the price is reasonable



**Thank you for listening and please give your
comments!**