

# Tele Switch

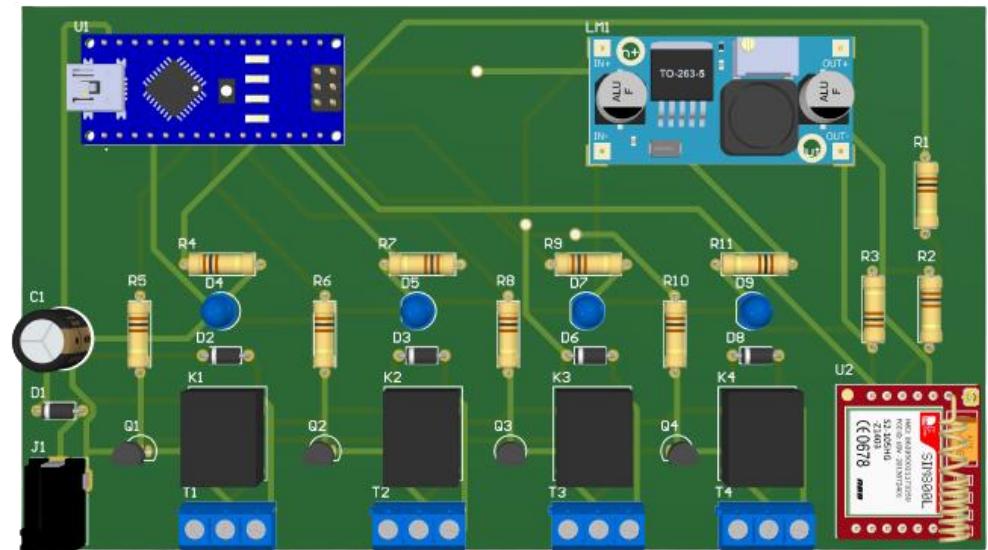
SMS-based remote control & monitoring platform

Arduino Nano

SIM800L (GSM/GPRS)

LM2596 Regulator

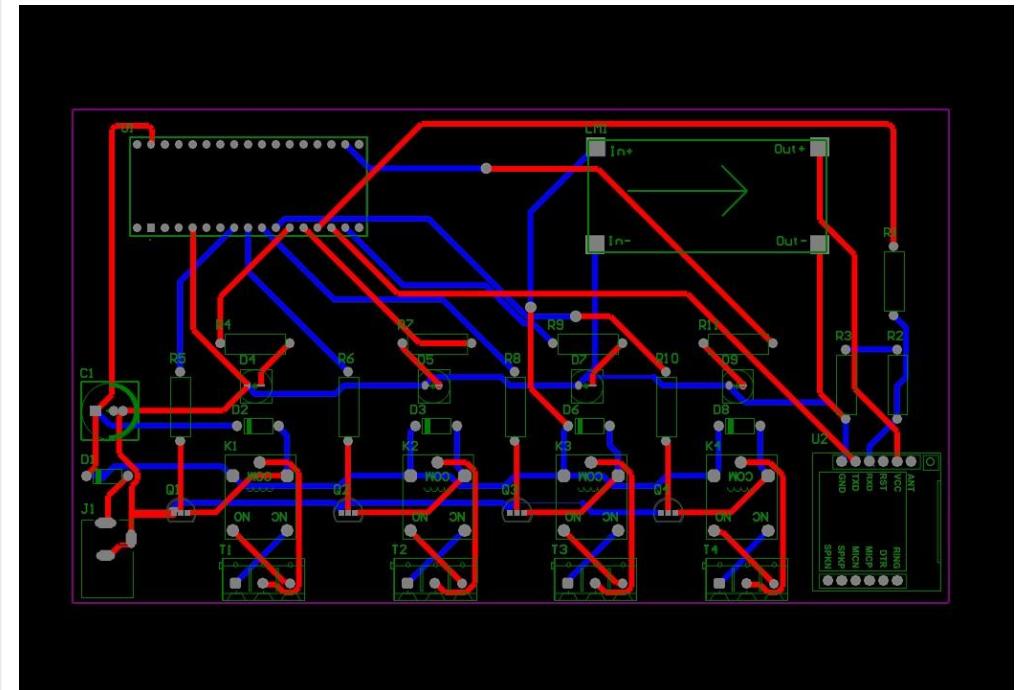
4 Relays



# Overview

What Tele Switch is and why it matters

A compact device built around an Arduino Nano microcontroller that can communicate via SMS. It provides an easy platform for remote control and monitoring of devices and systems. With its small size and low power consumption, Tele Switch is a practical choice for building connected, smart systems that can be controlled and monitored from anywhere.

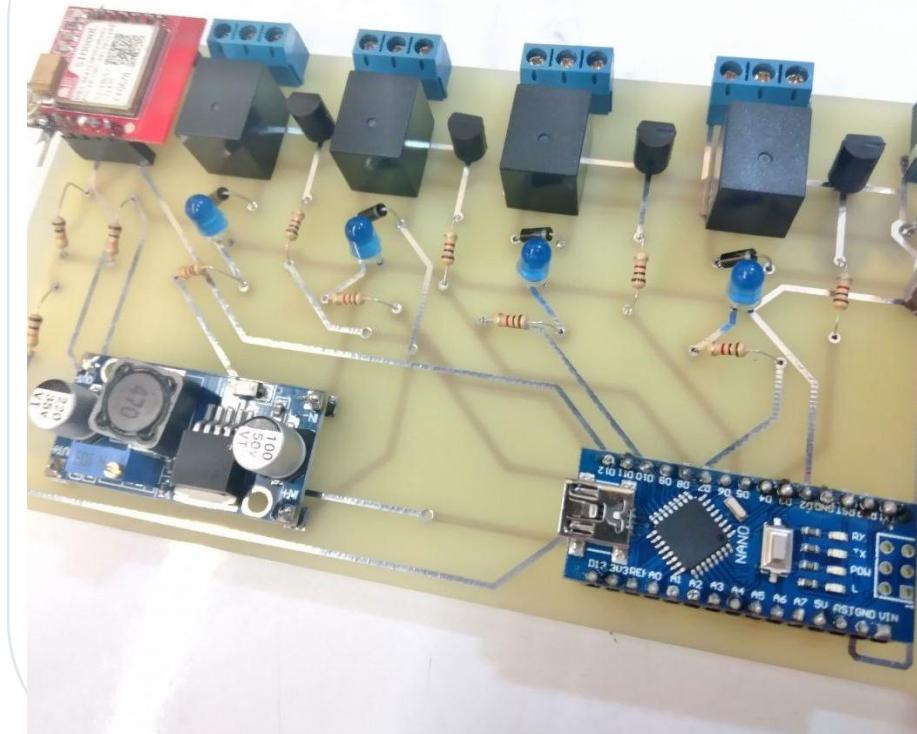


PCB layout (routing view)

# Core capabilities

Tele Switch enables remote control and monitoring for up to four devices, with an easy path to expand the number of outputs and the effective range.

- Control and monitor up to 4 devices remotely
- Expandable design (more devices / extended range)
- Programmable behavior (Arduino / C++)
- Low power consumption
- Compact form factor for space-constrained projects
- Manage devices anytime, from anywhere via SMS



Prototype (assembled board)

# Hardware building blocks

Key components that enable SMS control and stable operation

**Arduino Nano**



Microcontroller that runs the logic and controls outputs.

**SIM800L (GSM/GPRS)**



Handles SMS communication, even in low-signal areas.

**LM2596 regulator**



Provides stable power for reliable operation.

# Why SMS?

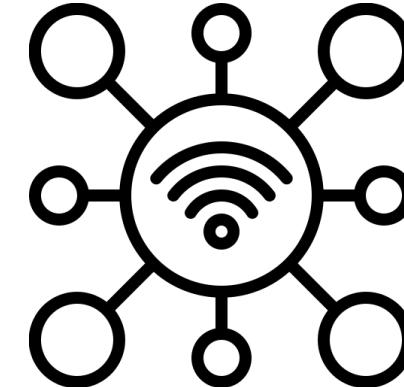
Reliable control and monitoring without requiring internet access

The SIM800L GSM/GPRS module enables a dependable way to control and monitor systems via SMS — even where coverage is weak or internet access is unavailable.

- Works in remote or low-signal areas
- Suitable for remote sensing and monitoring projects
- Supports alerts when specific conditions are met
- Helps save time and resources by enabling remote management
- Improves operational efficiency across many applications



SIM800L GSM/GPRS module



Simple connectivity

# Power & compact design

Using an LM2596 voltage regulator, Tele Switch is designed for stable power delivery and reliable operation while keeping power consumption low.

- Low power consumption
- Compact footprint for projects with limited space
- Great fit for small and remote applications
- SMS capability makes it practical for remote monitoring/control
- Versatile design suitable for many different projects



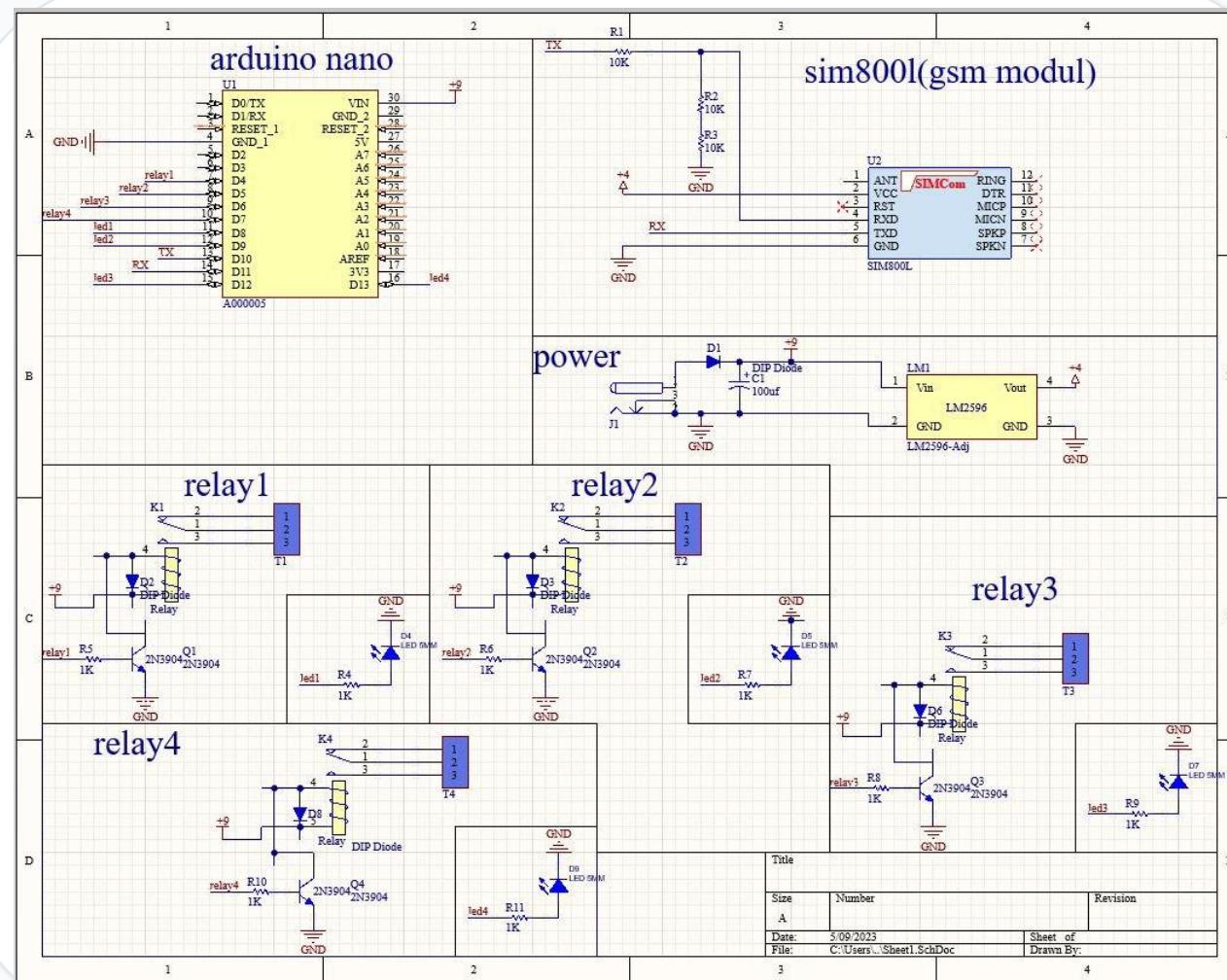
LM2596 step-down regulator

## Design focus

Stable power + compact hardware → a dependable platform for SMS-controlled automation.

# System design

Schematic view + functional blocks



## How signals flow

SMS network



SIM800L



Arduino Nano



Relays + LEDs

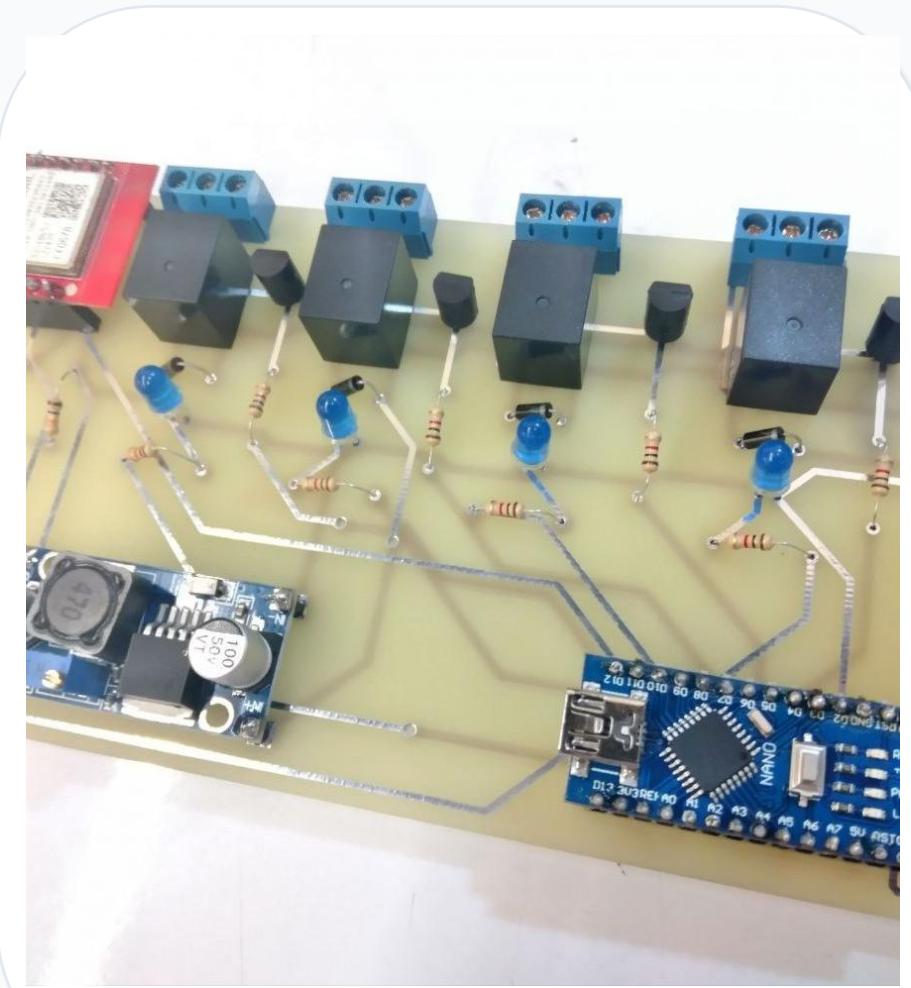
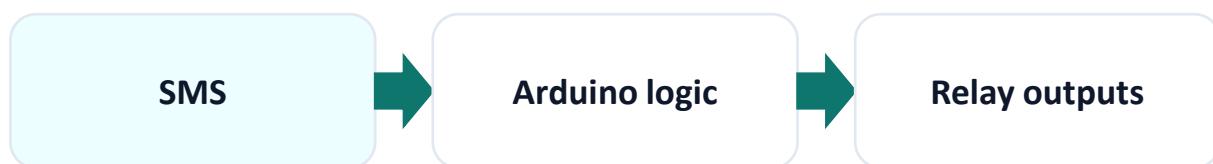
Incoming SMS messages are decoded by SIM800L, processed by the Arduino, and mapped to relay outputs with LED status indication.

# Operation

From SMS message to device control

## At a high level:

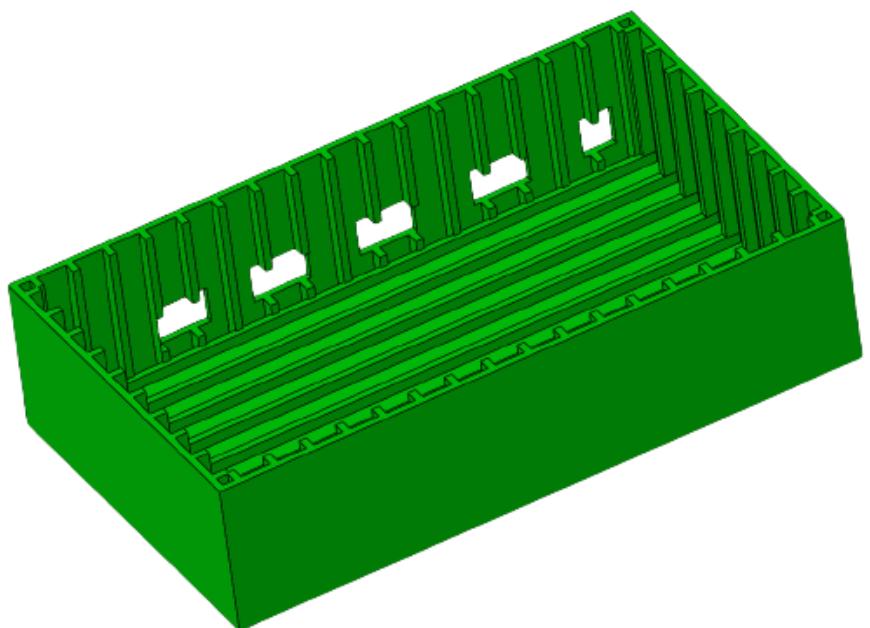
- Receive data from the SMS module
- Process it with the microcontroller
- Switch four relays (outputs) and drive four LEDs (status)
- Enable remote control of connected devices



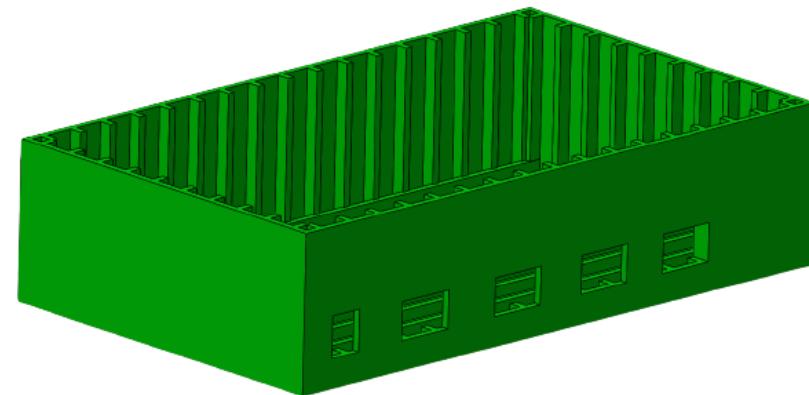
Assembled prototype board

# Enclosure design

Designed enclosure size:  $16 \times 9 \times 4$  cm



Internal base view



Outer box view

# Use cases

Tele Switch is a general-purpose SMS control & monitoring platform. Typical applications include:



Environmental monitoring



Home automation



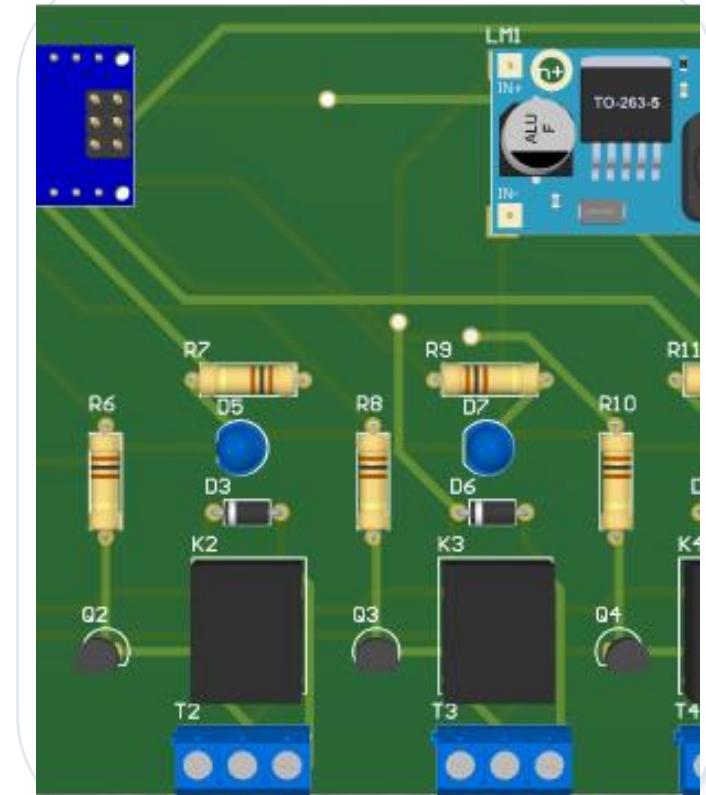
Security & surveillance



Industrial automation



Agriculture & farming

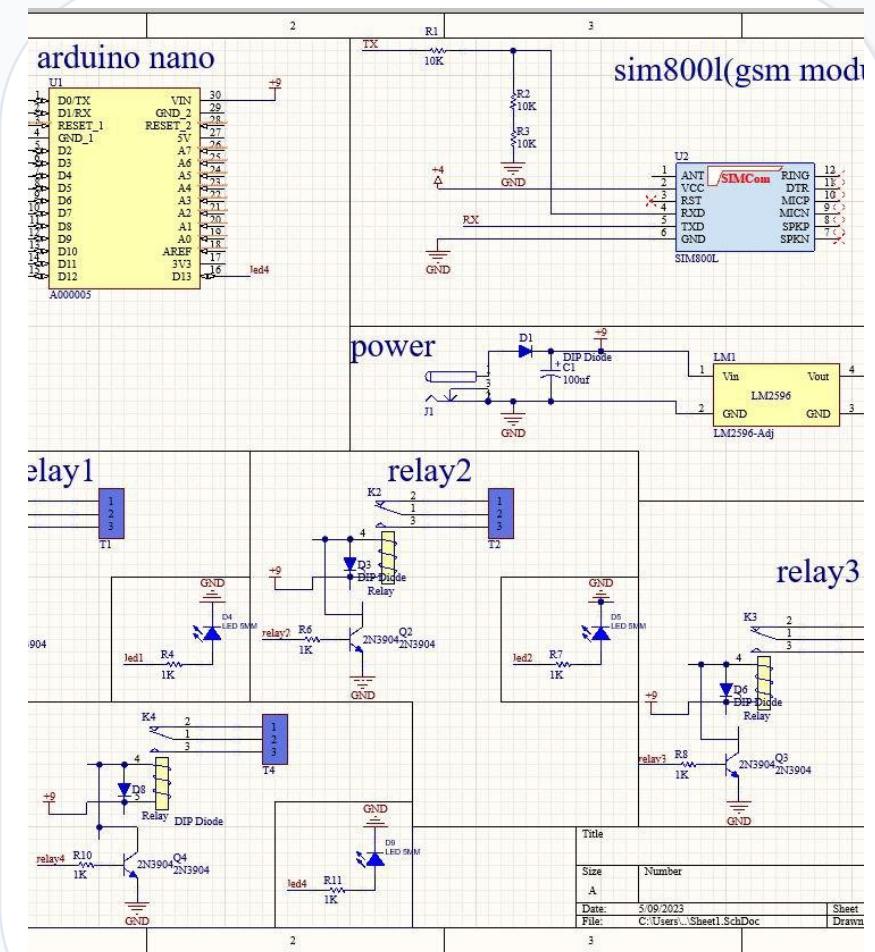


# Industrial automation



## Industrial automation

- Remote control and monitoring of industrial equipment and machinery
- Send SMS alerts when specific conditions occur (equipment failure, abnormal states)
- Helps reduce downtime by enabling quick response from anywhere



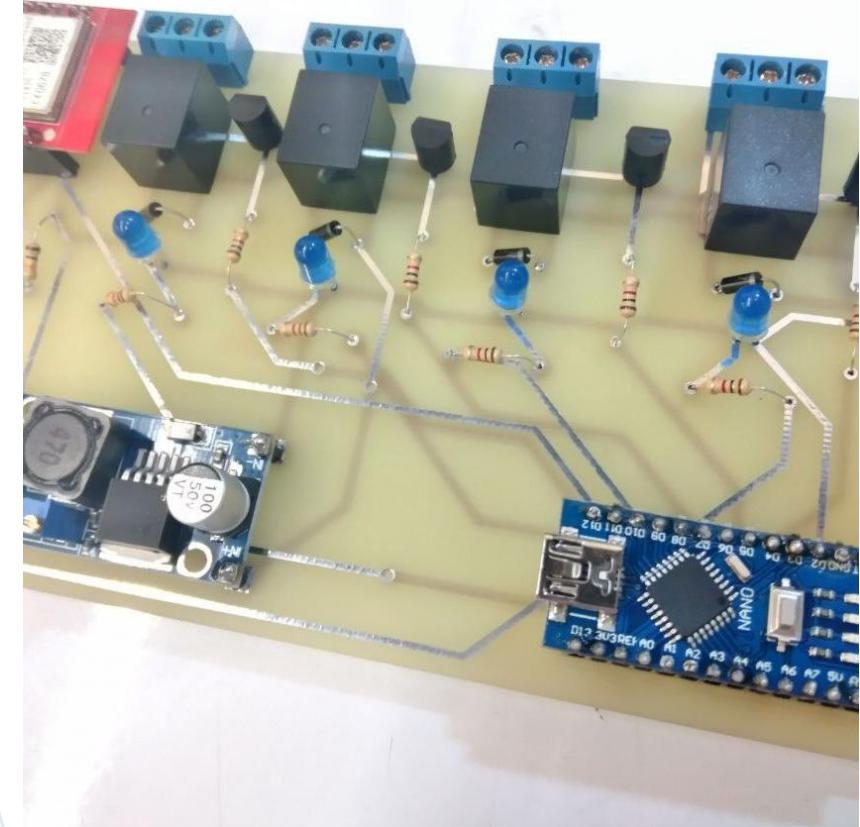
Circuit schematic

# Agriculture & farming



## Agriculture & farming

- Monitor and control factors such as humidity, temperature, and soil moisture
- Send SMS alerts for conditions like low soil moisture or high temperature fluctuations
- A practical building block for precision agriculture projects



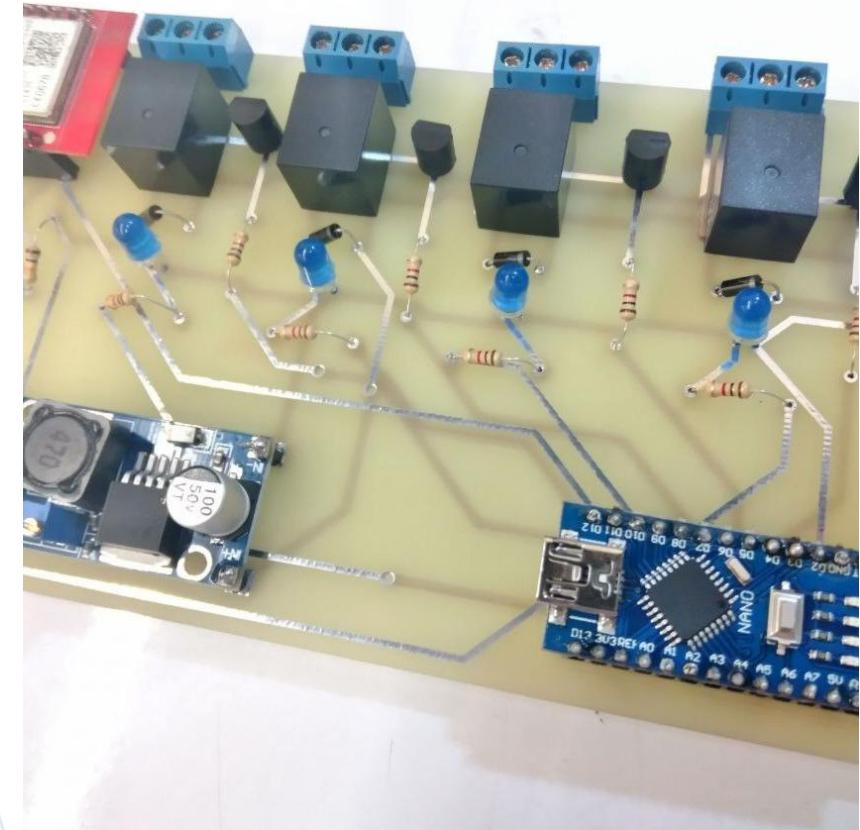
Prototype board

# Security & surveillance



## Security & surveillance

- Monitor security devices such as cameras and motion sensors
- Send SMS alerts when motion or intrusion is detected
- Useful for remote or hard-to-reach locations where quick alerts matter



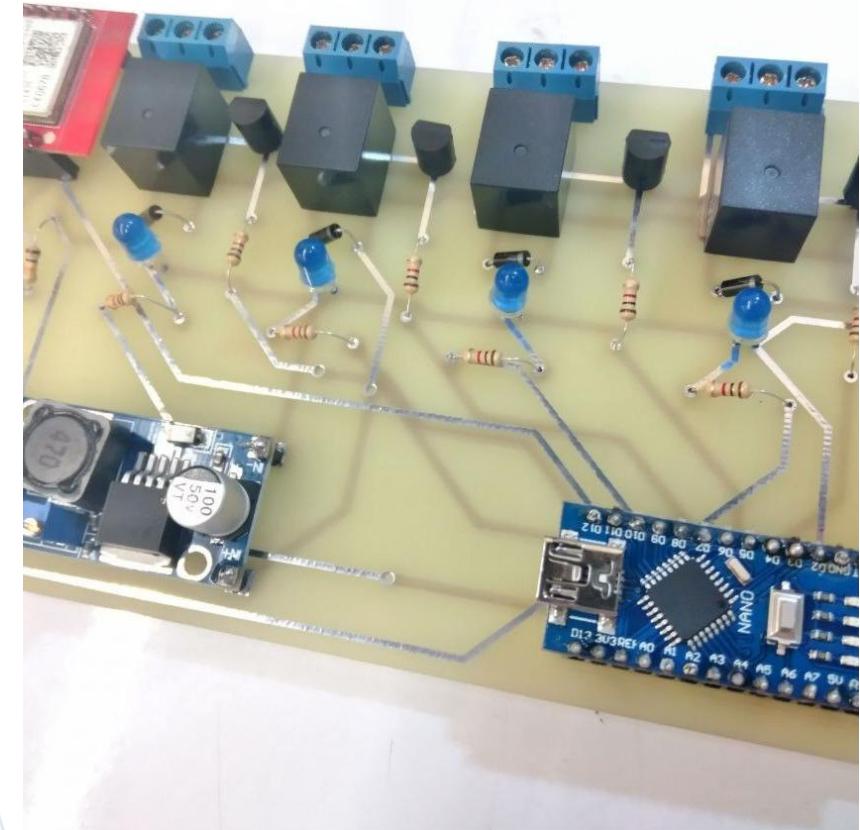
Prototype board

# Home automation



## Home automation

- Control and monitor appliances like lights and air conditioners
- Send SMS commands to turn devices ON/OFF or adjust settings
- Supports energy management by enabling scheduled or remote control



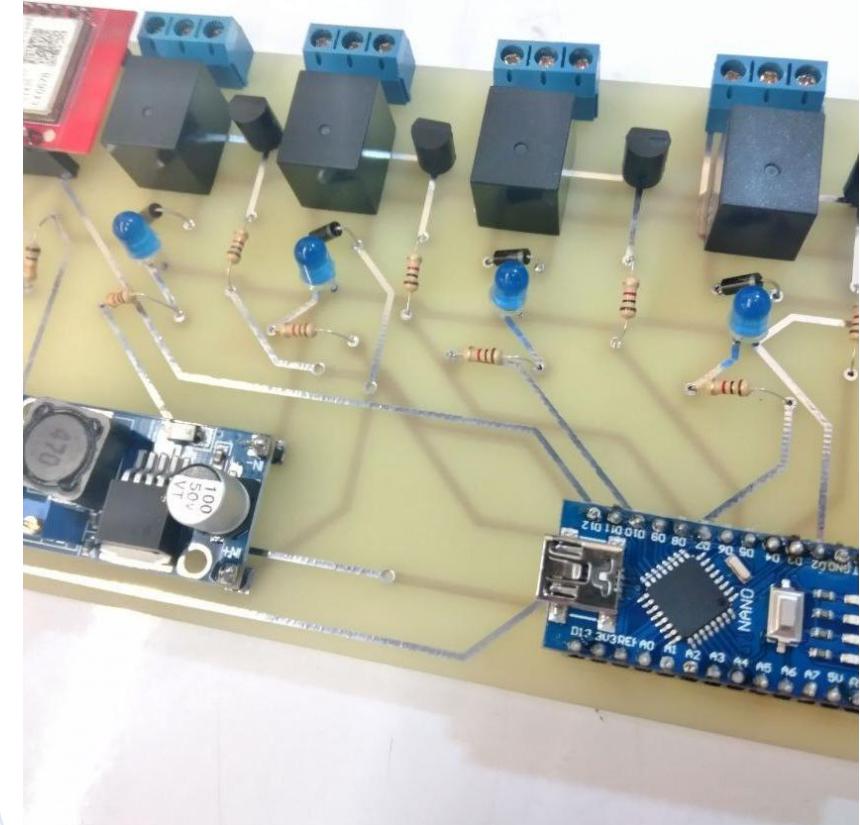
Prototype board

# Environmental monitoring



## Environmental monitoring

- Monitor environmental conditions such as air quality, temperature, and humidity
- Send SMS alerts for conditions like high pollution levels or temperature fluctuations
- Ideal for monitoring in remote regions without reliable internet connectivity



Prototype board

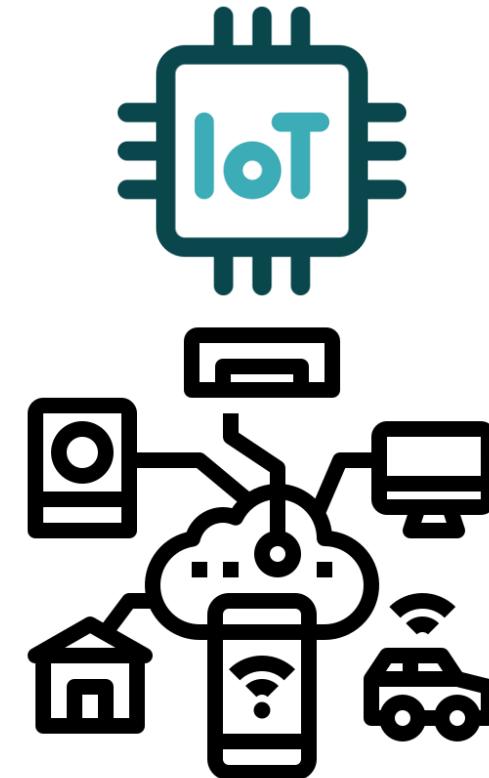
# IoT integration

How Tele Switch fits into larger connected systems

## IoT (Internet of Things)

By combining an Arduino-based controller with SMS communication, Tele Switch can connect and communicate with other devices and smart systems — activated by one or many users.

- Integrate into larger remote-monitoring systems
- Example: a smart-home setup that receives SMS commands to control lighting and temperature
- Example: agricultural monitoring that collects sensor data and forwards it to a central database for analysis
- C++ programmability enables customization for project-specific needs



Built for connected projects  
(without relying on Wi-Fi)

# Thank you

Tele Switch

## Team DYAD

### Members

- Shayan Doroudiani
- Sahand Khojasteh Ahmadi

### Date

**Spring 2023 (Spring 1402)**

"Spring 1402" refers to the Iranian Solar Hijri calendar.