

Automated Railway Control System

Implemented using PIC 16F877A , Protius and MikroC



Objective

- The aim of this objective is to design a automated railway gate and traffic light control system using PIC microcontrollers.



Introduction

- Automated railway control system is a simple but very useful , which helps in automatically opening and closing railway gates and also informing the people by traffic light and Displaying information upon detecting arrival or departure of the train.
- In general railway gates are opened or closed manually by a gate keeper. The information of arrival of train for opening or closing of doors is received from nearby station. But some railway crossings are totally unmanned, and many railway accidents occur at these unmanned level crossings.
- To avoid the human intervention at level crossings completely we need to automate the process of railway gate control.

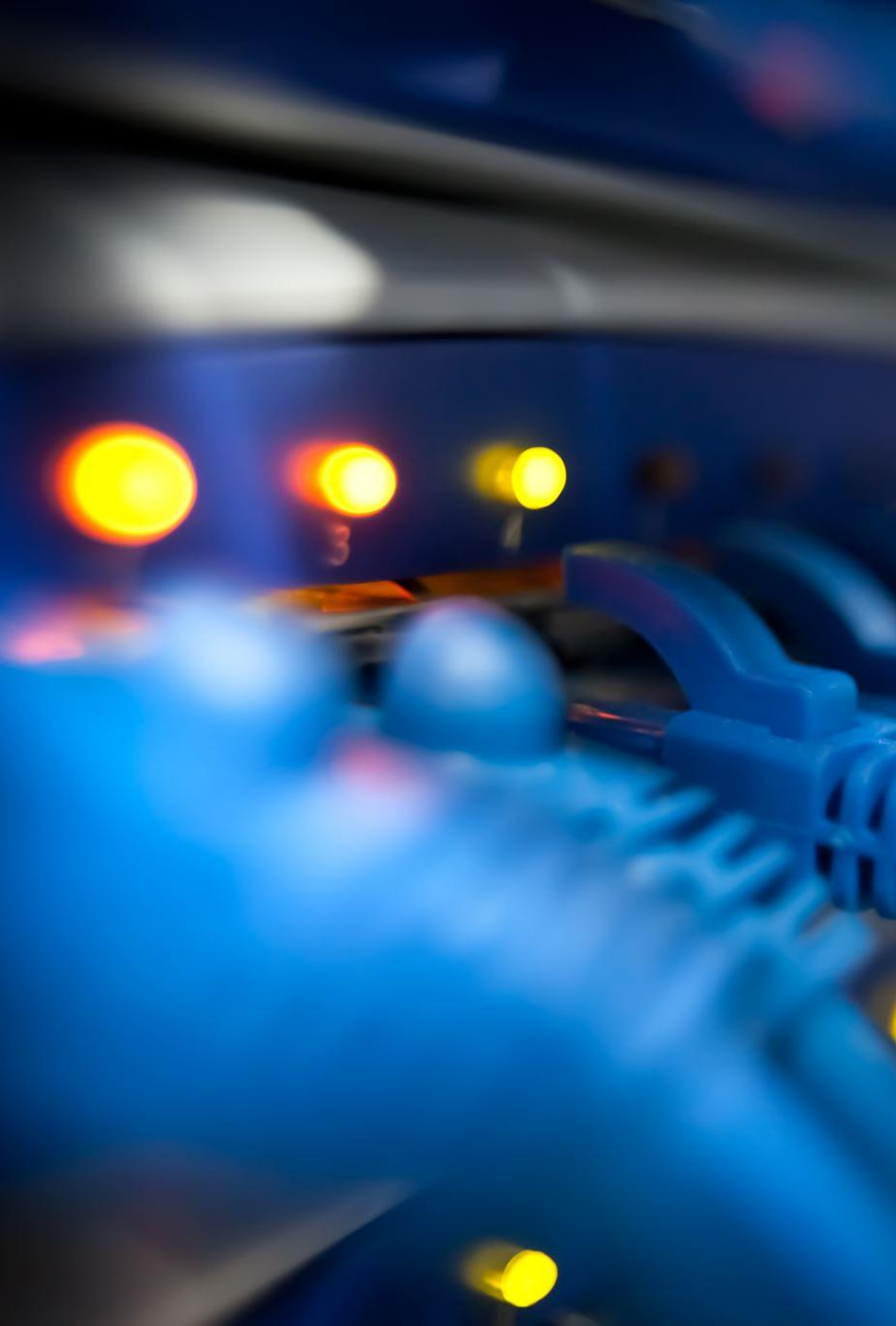
ADVANTAGES AND DISADVANTAGES

ADVANTAGES

- No human resource is required.
- Can be implanted in single railway road crossing stations.
- Prevents errors due to high number of sensor readings
- Reduce time which the gates remains closed.

DISADVANTAGES

- Energy requirements are high compared to manual control system
- Required skilled workforce to build



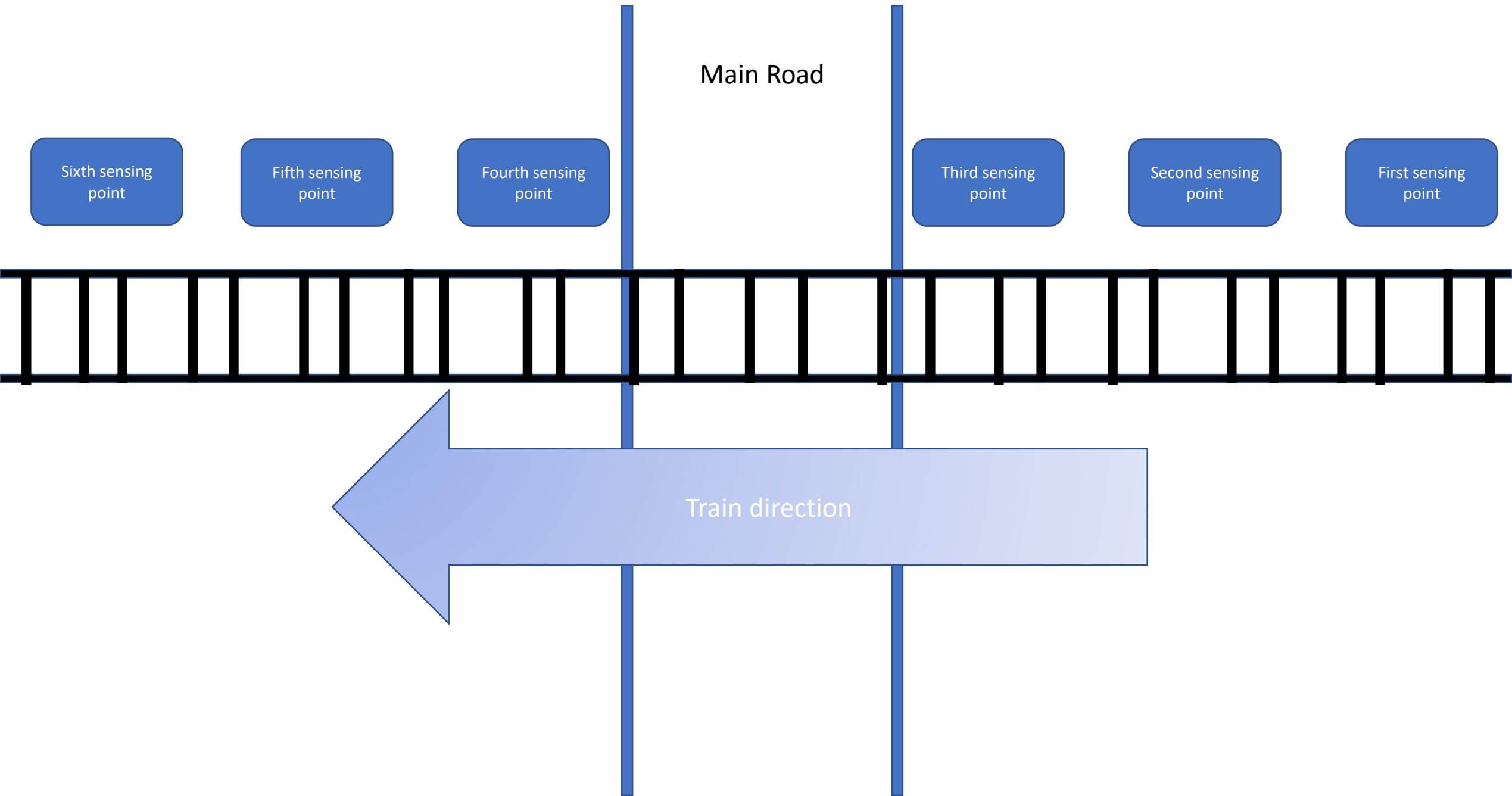
Components Used

- PIC 16f877A
- Sensors
- LCD Display (LM016L)
- Potentiometer
- Buzzer
- BC548 Transistor
- Servo Motor
- Resistors
- LED (red , green)
- Traffic Lights



Principle of Operation

- When the train arrives at second sensing point alarm is triggered at the railway crossing and the signal changes to yellow so that the people get informed that the gate is going to be closed.
- Only after passing both first and second sensing points signal lights changes to red and gates start to close.
- After the train completely passes the fourth sensing point signal changes to yellow and to green to open the railway gates.
- If the train direction changes to opposite, sensor indexing should be inverted.



Circuit Diagram

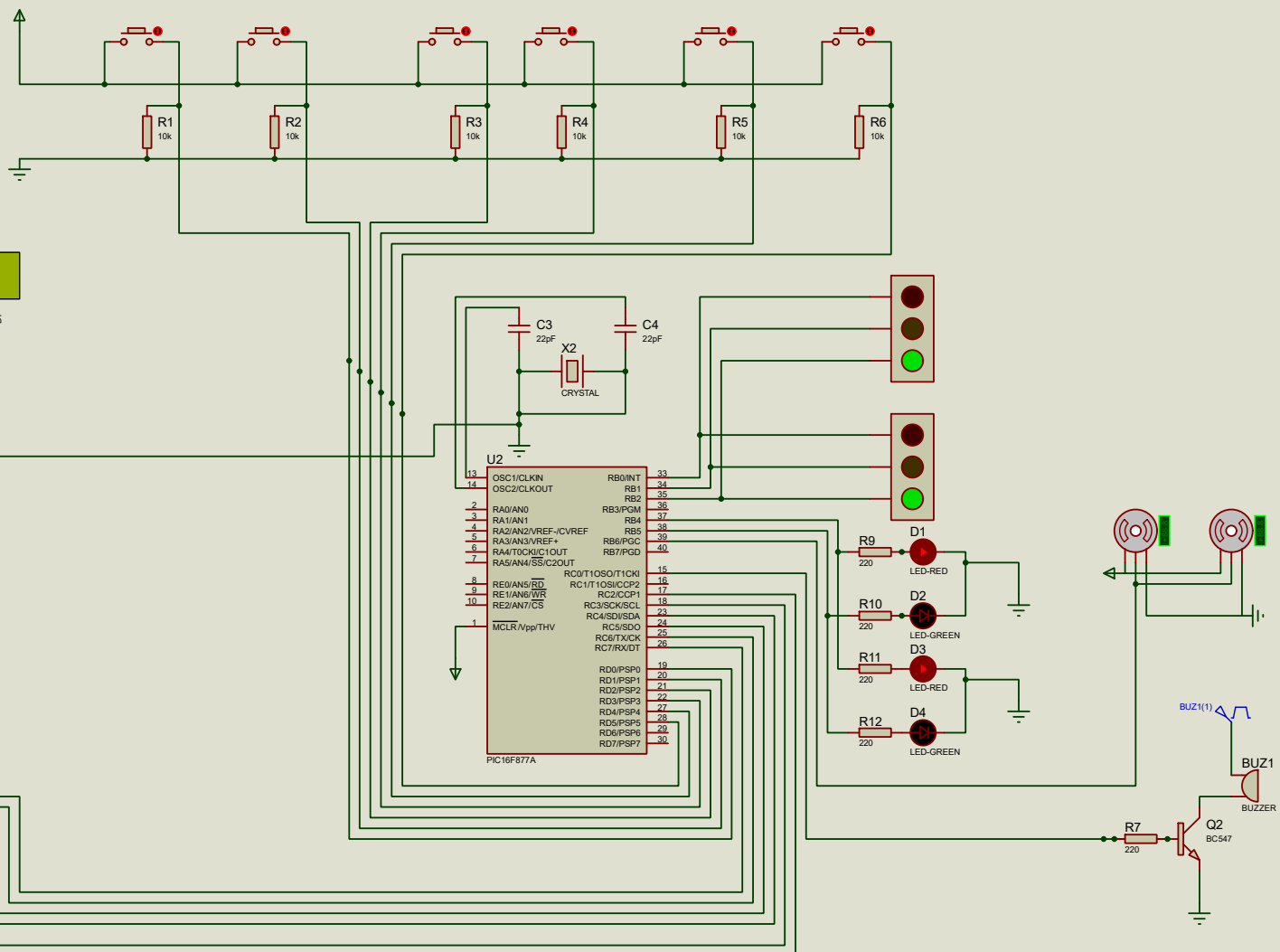
The circuit diagram illustrates the connections for a PIC16F877A microcontroller. The PIC is connected to an LCD2 LM016L display, a 1k resistor (RV1), and a 10k resistor (R1). It also controls six LEDs (D1-D6) through resistors (R9-R12) and a buzzer (BUZ1) through a transistor (Q2 BC547) and a resistor (R7). The PIC is powered by a 5V regulator (U1) and a crystal oscillator (X2).

Component List:

- PIC16F877A
- LCD2 LM016L
- RV1 1k
- R1 10k
- R2 10k
- R3 10k
- R4 10k
- R5 10k
- R6 10k
- R7 220
- R9 220
- R10 220
- R11 220
- R12 220
- U1 5V Regulator
- U2 PIC16F877A
- X2 CRYSTAL
- C3 22pF
- C4 22pF
- D1 LED-RED
- D2 LED-GREEN
- D3 LED-RED
- D4 LED-GREEN
- BUZ1 BUZZER
- Q2 BC547

Connections:

- PIC16F877A Pin 1 (MCLR) to GND.
- PIC16F877A Pin 2 (RA0/AN0) to RV1.
- PIC16F877A Pin 3 (RA1/AN1) to RV1.
- PIC16F877A Pin 4 (RA2/AN2/VREF-/ICVREF) to RV1.
- PIC16F877A Pin 5 (RA3/AN3/VREF+) to RV1.
- PIC16F877A Pin 6 (RA4/T0CKI/CIOUT) to RV1.
- PIC16F877A Pin 7 (RA5/AN4/SS/CS2OUT) to RV1.
- PIC16F877A Pin 8 (RE0/AN5/RD) to RV1.
- PIC16F877A Pin 9 (RE1/AN6/WR) to RV1.
- PIC16F877A Pin 10 (RE2/AN7/CS) to RV1.
- PIC16F877A Pin 11 (MCLR) to GND.
- PIC16F877A Pin 12 (MCLR) to GND.
- PIC16F877A Pin 13 (OSC1/CLKIN) to GND.
- PIC16F877A Pin 14 (OSC2/CLKOUT) to GND.
- PIC16F877A Pin 15 (RC0/T1OSO/T1CKI) to GND.
- PIC16F877A Pin 16 (RC1/T1OSI/CCP2) to GND.
- PIC16F877A Pin 17 (RC2/CCP1) to GND.
- PIC16F877A Pin 18 (RC3/SCK/SCL) to GND.
- PIC16F877A Pin 19 (RD0/PS0) to GND.
- PIC16F877A Pin 20 (RD1/PS1) to GND.
- PIC16F877A Pin 21 (RD2/PS2) to GND.
- PIC16F877A Pin 22 (RD3/PS3) to GND.
- PIC16F877A Pin 23 (RD4/PS4) to GND.
- PIC16F877A Pin 24 (RD5/PS5) to GND.
- PIC16F877A Pin 25 (RD6/PS6) to GND.
- PIC16F877A Pin 26 (RD7/PS7) to GND.
- PIC16F877A Pin 27 (RC4/SDI/SDA) to GND.
- PIC16F877A Pin 28 (RC5/SDO) to GND.
- PIC16F877A Pin 29 (RC6/TXCK) to GND.
- PIC16F877A Pin 30 (RC7/RX/DT) to GND.
- PIC16F877A Pin 31 (RB0/INT) to GND.
- PIC16F877A Pin 32 (RB1) to GND.
- PIC16F877A Pin 33 (RB2) to GND.
- PIC16F877A Pin 34 (RB3/PGM) to GND.
- PIC16F877A Pin 35 (RB4) to GND.
- PIC16F877A Pin 36 (RB5) to GND.
- PIC16F877A Pin 37 (RB6/PGC) to GND.
- PIC16F877A Pin 38 (RB7/PGD) to GND.
- PIC16F877A Pin 39 (RB8) to GND.
- PIC16F877A Pin 40 (RB9) to GND.
- PIC16F877A Pin 41 (RB10) to GND.
- PIC16F877A Pin 42 (RB11) to GND.
- PIC16F877A Pin 43 (RB12) to GND.
- PIC16F877A Pin 44 (RB13) to GND.
- PIC16F877A Pin 45 (RB14) to GND.
- PIC16F877A Pin 46 (RB15) to GND.
- PIC16F877A Pin 47 (RB16) to GND.
- PIC16F877A Pin 48 (RB17) to GND.
- PIC16F877A Pin 49 (RB18) to GND.
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- PIC16F877A Pin 130 (RB99) to GND.
- PIC16F877A Pin 131 (RB100) to GND.
- PIC16F877A Pin 132 (RB101) to GND.
- PIC16F877A Pin 133 (RB102) to GND.
- PIC16F877A Pin 134 (RB103) to GND.
- PIC16F877A Pin 135 (RB104) to GND.
- PIC16F877A Pin 136 (RB105) to GND.
- PIC16F877A Pin 137 (





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A dark, foggy railway track with a signal post on the right. The track recedes into the distance, and the signal post has two lights and a crossbuck.

Project file available at :

[https://github.com/Din96Boy/Automated Railway- Control System](https://github.com/Din96Boy/Automated_Railway-Control_System)



THANK YOU