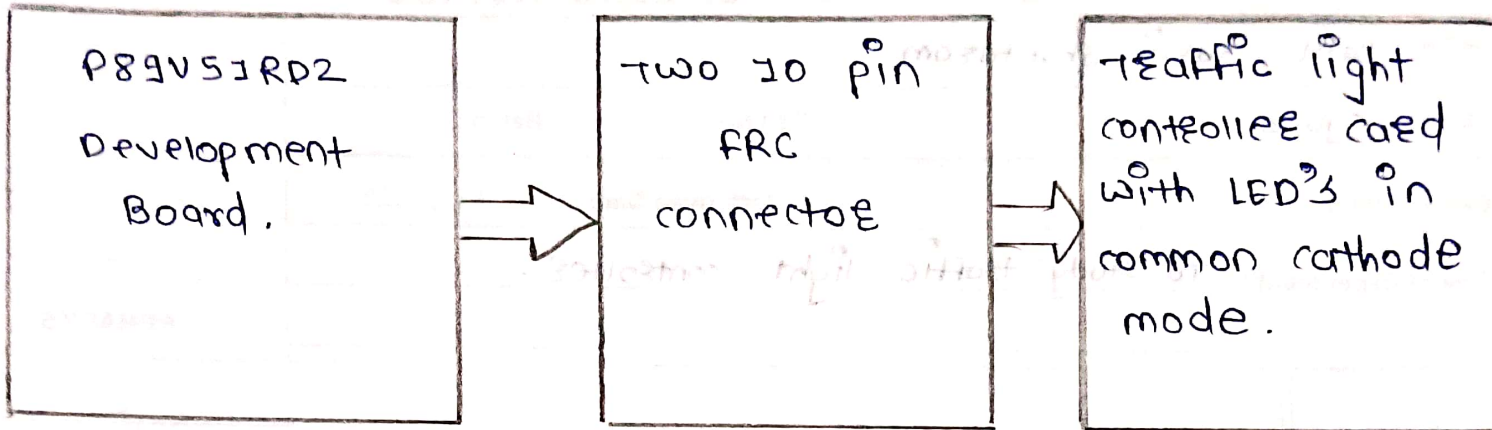Name : Patil Suraj Shantaram.

Class : Sybcs   Roll No. :   Batch :

Experiment No. :   Performed Date :   /   /20

Title of Experiment : To study traffic light controller.

REMARKS

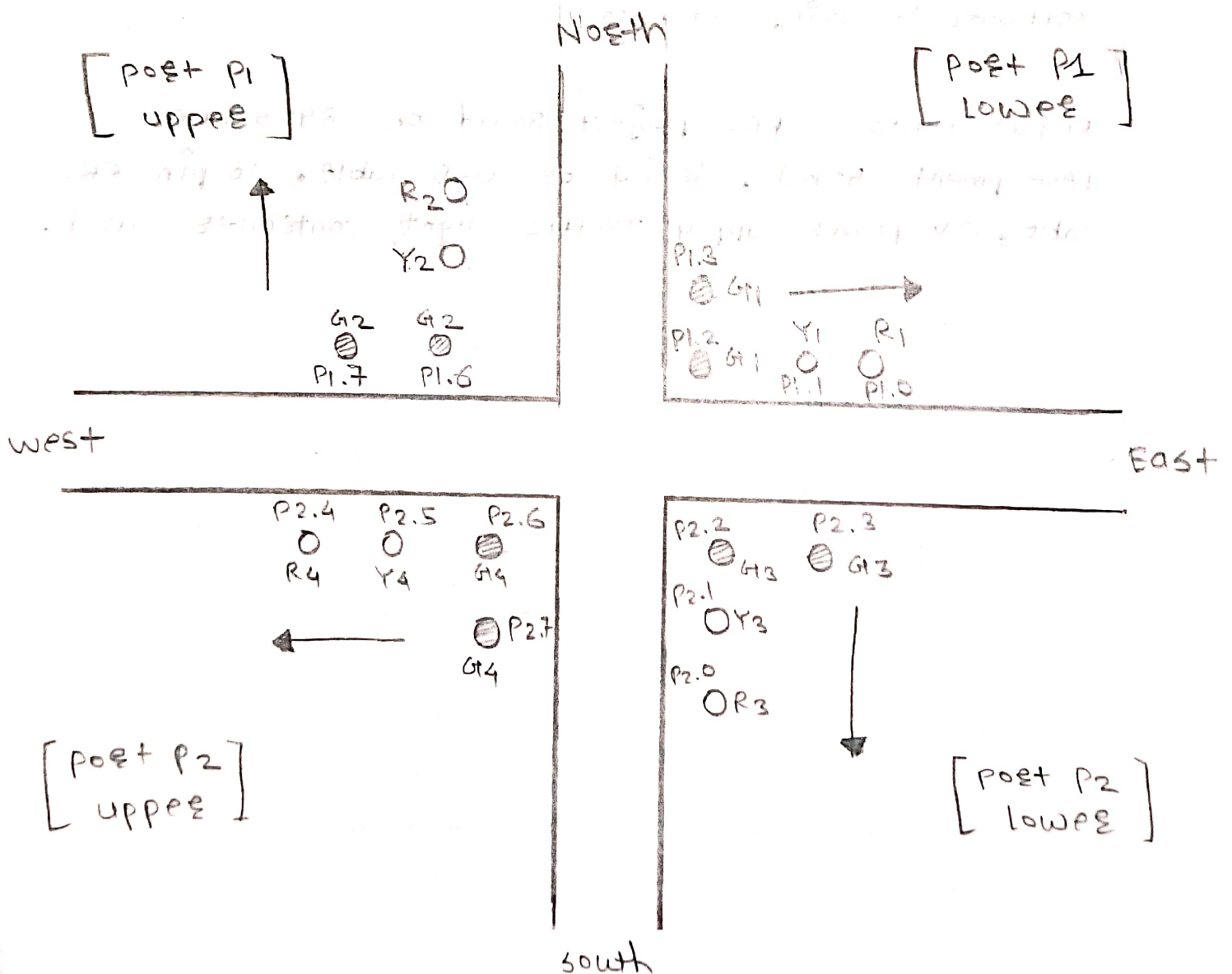Aim :- To study traffic light controller.

Software :- Keil, SST

Requirements :- RD2 project Board on 89E516RD2 Development Board, serial or USB cable, 10 pin FRC cable, 12V power supply traffic light controller card.

circuit Diagram :-

```
┌─────────────────────┐        ┌─────────────────────┐        ┌─────────────────────┐
│  P89V51RD2          │        │  Two 10 pin         │        │  Teaffic light      │
│                     │  ⟹    │       FRC           │  ⟹    │  controller card    │
│  Development        │        │   connector         │        │  with LED's in      │
│     Board.          │        │                     │        │  common cathode     │
│                     │        │                     │        │  mode.              │
└─────────────────────┘        └─────────────────────┘        └─────────────────────┘
```

Teaffic Light Demo Kit :-

North

[Port P1] | [Port P1]
[upper] | [Lower]

           R2 ◯   P1.3
           Y2 ◯   ⊜ G1 ⟶
                                P1.2   Y1   R1
      G2   G2   ⊜ G1 ◯   ◯
      ⊜   ⊘   P1.1 P1.0
     P1.7 P1.6

West ─── East

   P2.4   P2.5   P2.6   P2.2   P2.3
   ◯   ◯   ⊜   ⊜ G3   ⊜ G3
   R4   Y4   G4   P2.1
                              ◯ Y3
              ⊜ P2.7   P2.0
              G4   ◯ R3

[Port P2]   [Port P2]
[upper]   [lower]

South

theory :- In traffic light card which is interfaced with 74LS245 is composed of 16 LED's to display almost all signals used in the actual traffic light system to acheive this we have used 16 I/O lines of IC 89E516RD2 (port 1 and 2).

All LED's are connected in common cathode mode (i.e all cathodes are grounded.

The delay used in the program is very low as compared to actual system so as to have proper demonstration of controller card.

calculations of the values to be transfer on ports :
Give High (1) logic for LED and Low (0) logic for LED off.

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procedure :-

connect +12V supply to board.

connect the USB cable of the micro controller kit to the pc.

connect 10 pin FRC cables to the traffic light interfacing card.

switch ON the power supply.

open the software "SST" to establish the USB communication.

click the "option" of SST software and select the com port and baud rate as 9600 click ok.

Reset the device.

click to Pnload / Run usercode.

now Browse Hex file that is to be download then click ok.

FRC connector details :

Pin No	Details		Pin.No	Details.
01	P2.4		07	P3.6
02	P2.5		08	P3.7
03	P2.2		09	P3.4
04	P2.3		10	P3.5
05	P2.0		11	P3.2
06	P2.1		12	P3.3
			13	P.3.0

Pin.No	Details		Pin.No	detail
14	P3.1		21	P1.0
15	P1.6		22	P2.6
16	P1.7		23	P2.7
17	P1.4		24	
18	P1.5		25	GND
19	P1.2		26	VCC
20	P1.3			

Port bits	7	6	5	4	3	2	1	0	Hex value
North Green and other Red									
P1	1	1	0	0	0	0	0	0	01
P2	0	0	0	1	0	0	0	1	11
North Yellow									
P1	0	0	1	0	0	0	0	1	21
East Green and other Red									
P1	0	0	0	1	1	1	0	0	16
P2	0	0	0	1	0	0	0	1	11
East Yellow									
P1	0	0	0	1	0	0	1	0	12
South Green and other Red									
P1	0	0	0	1	0	0	0	1	11
P2	0	0	0	1	1	1	0	0	10
South Yellow									
P2	0	0	0	1	0	0	1	0	12
West Green and other Red									
P1	0	0	0	1	0	0	0	1	11
P2	1	1	0	0	0	0	0	1	01
West Yellow									
P2	0	0	1	0	0	0	0	1	21

program :-

```c
#include <reg51.h>
msdelay (unsigned int);
main ()
{
    P1 = 0x00;
    P2 = 0x00;
    while (1)
    {
        // North
        P1 = 0x01;
        P2 = 0x11;
        msdelay (500);
        P1 = 0x21;
        msdelay (200);
        // east
        P1 = 0x10;
        P2 = 0x11;
        msdelay (500);
        P1 = 0x12;
        msdelay (200);
        // south
        P1 = 0x11;
        P2 = 0x10;
        msdelay (500);
        P2 = 0x12;
        msdelay (200);
        // west
        P1 = 0x11;
        P2 = 0x10;
```

```
            msdelay (200);
         }
   }
   msdelay (unsigned int itime)
      {
         int i, j;
         for (i=0; i<itime; i++);
         for (j=0; j< 2000; j++);
      }
```

Result :-

1. we have studied and executed traffic light program and verify the output.
2. according to the given direction green, yellow and red LED's are ON in sequence.
3. for example, east direction 1st the given LED's ON, for specific time at the same time, all the direction. red LED's on then yellow LED's will be on for specific time then after that green LED's for neat diagram.
4. In the eight mode all LED's of yellow colour are blinking.

conclusion :-

1. LED can be interfaced to any one of the part.
2. Here part 1 and part 3 for LED interfacing
3. LED can be ON when particular part bit is 1.