Timers - TMR and TMRF

Seconds

0   1   2   3   4   5   6   7   8

X1

T1

Current Value   0   10   20   30   40   50   60   0

1/10 Seconds

X1
TMR   T1
K30
Timer preset

T1
(Y0
OUT)
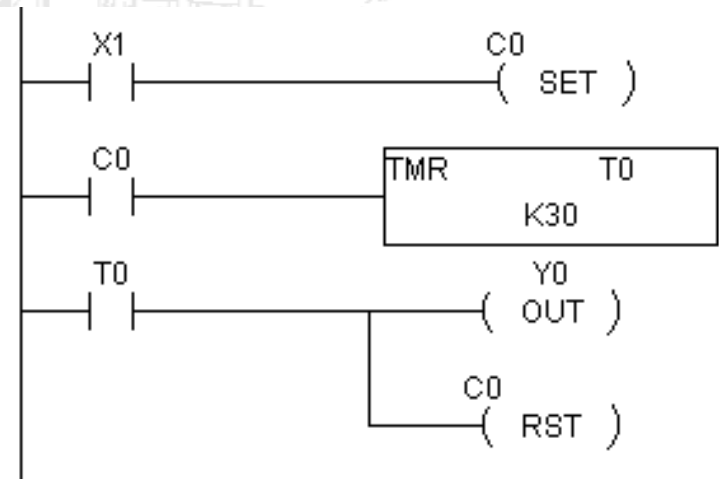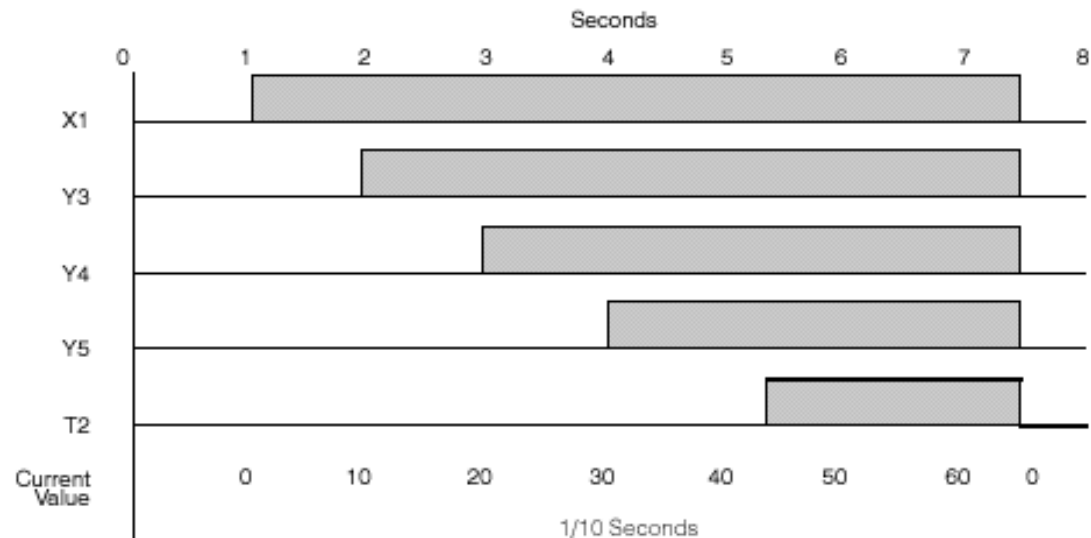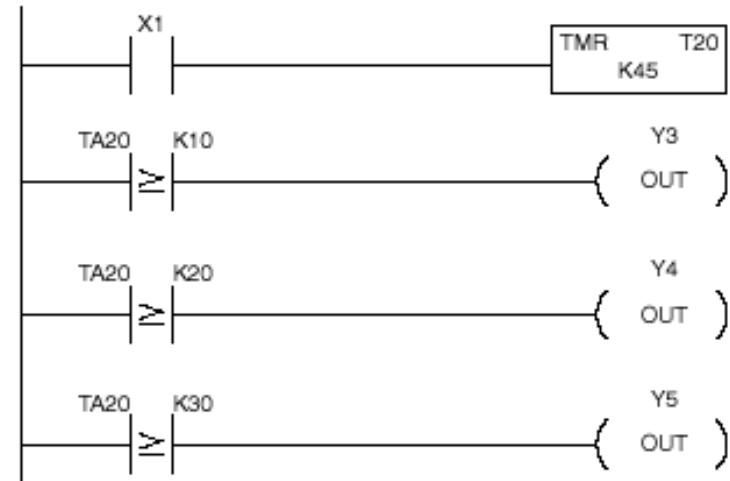
Latch timer input if it may go low before timeout!

TMR: 0.1s to 999.9s

TMRF: 0.01s to 99.99s

X1
C0
(SET)

C0
TMR   T0
K30

T0
(Y0
OUT)

C0
(RST)

TIMERS - TMR AND TMRF

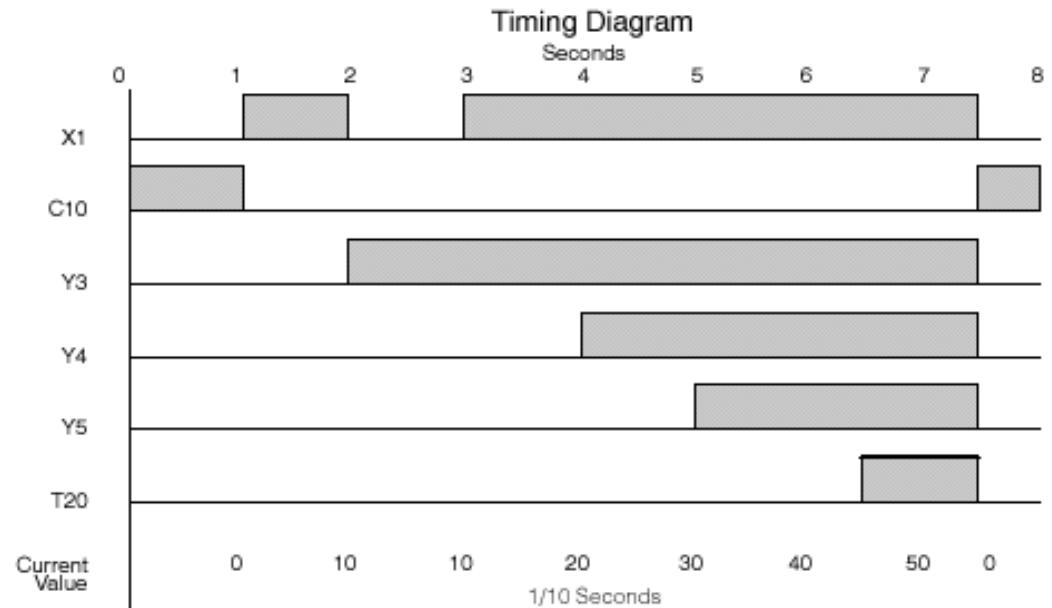*You can use the current timer value to trigger events.*
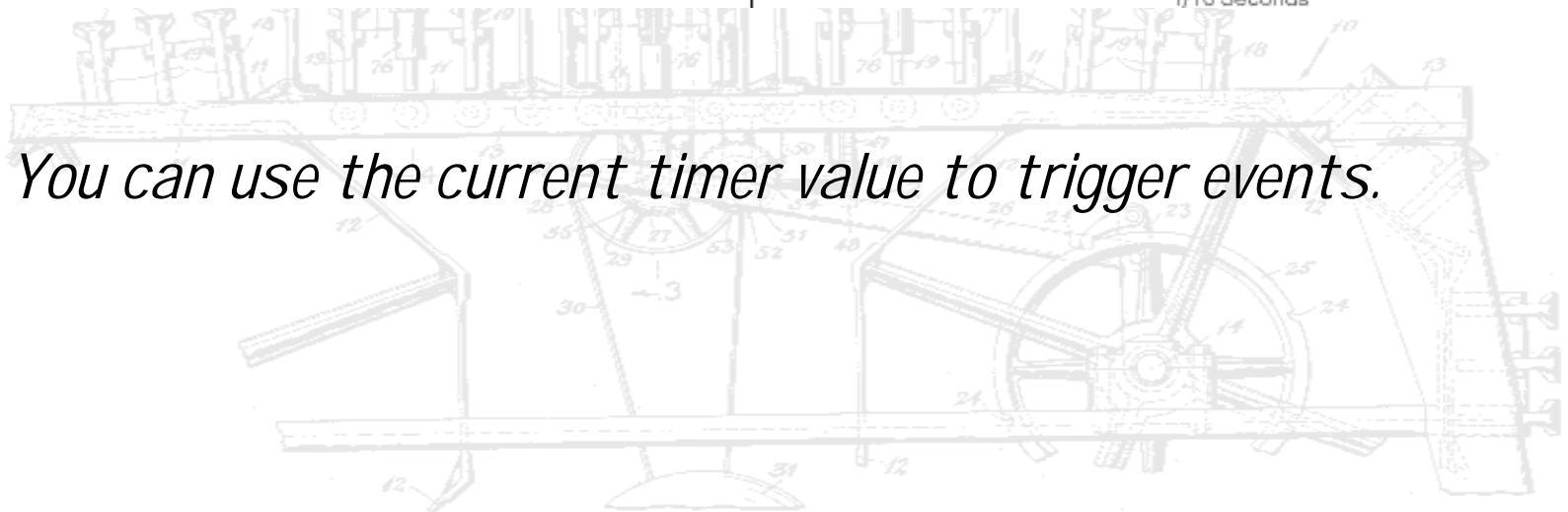
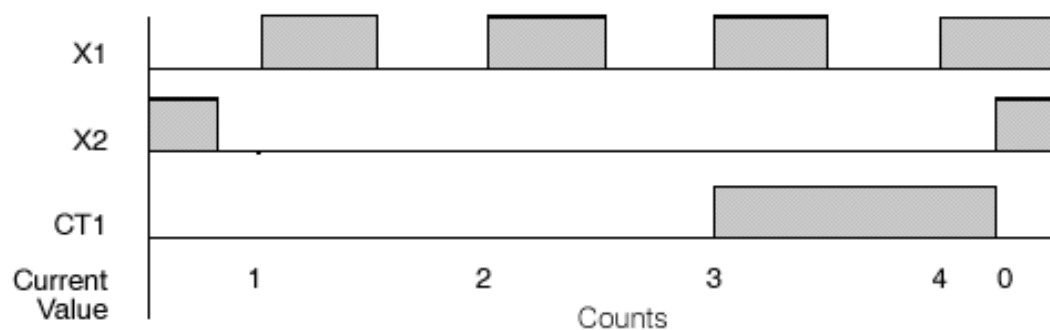*Accumulative Timer (TMRA)*

- Can be started, stopped and reset
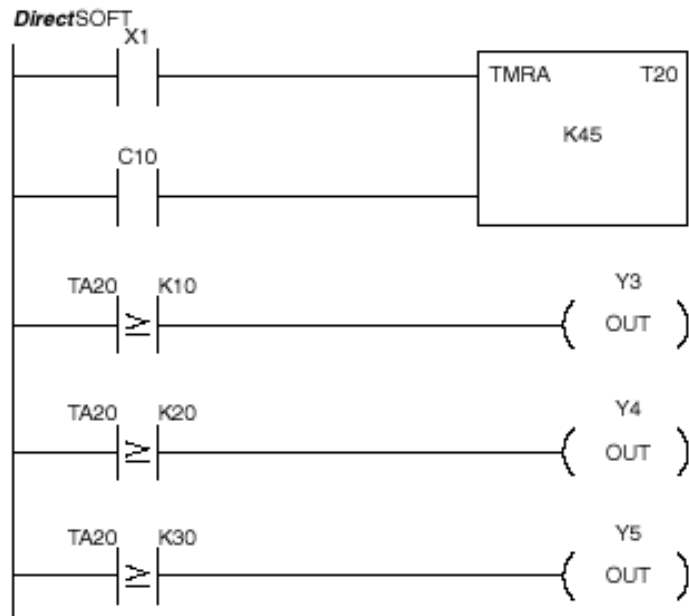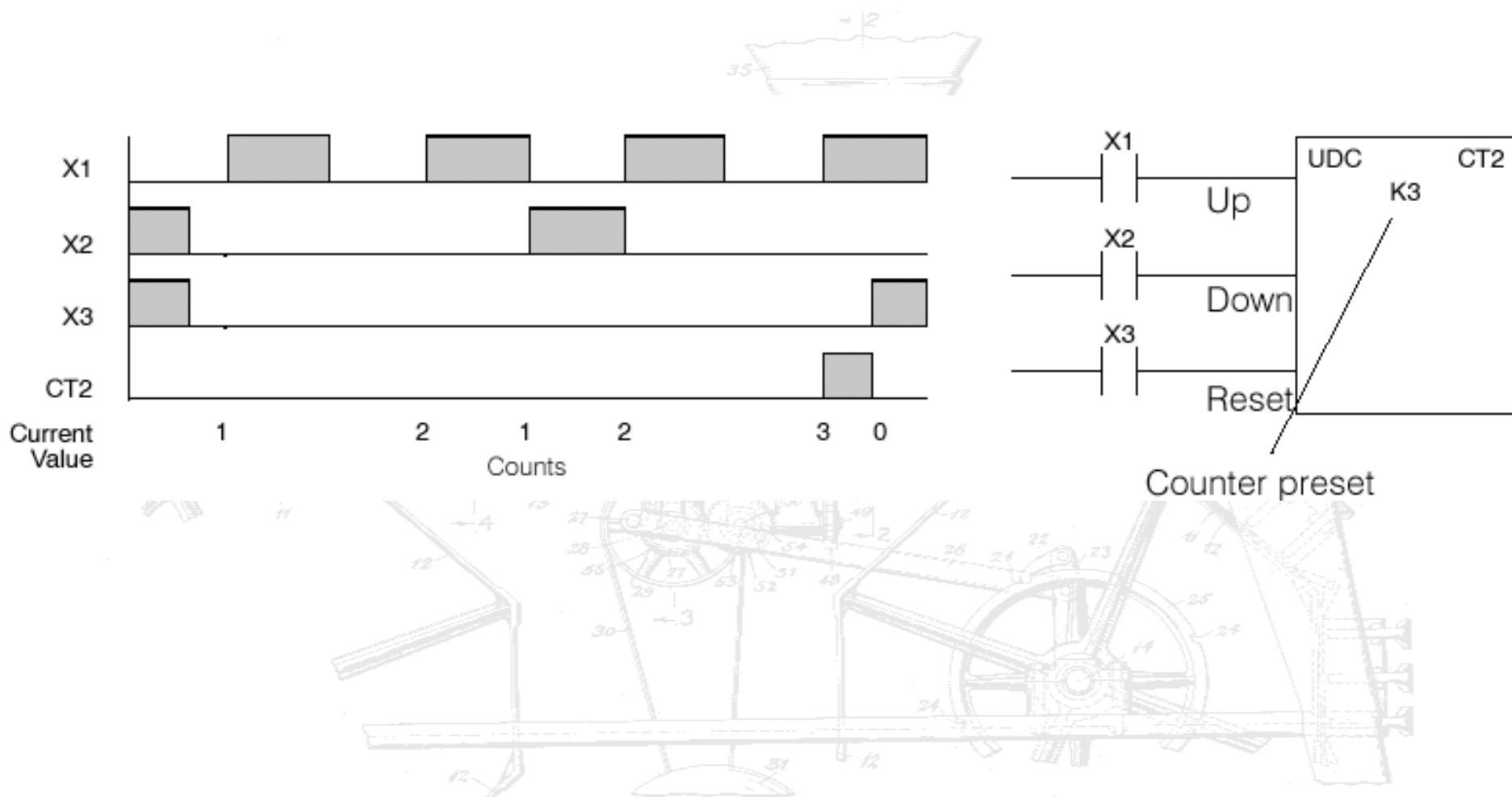
Counters - CNT
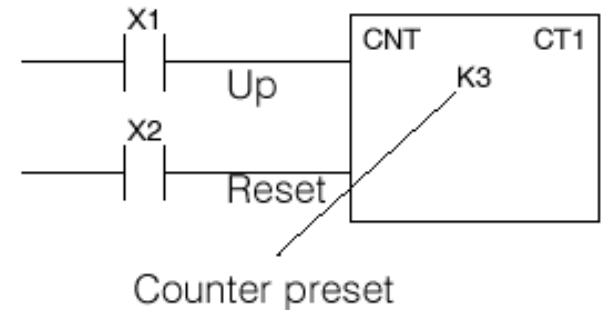
Counter preset
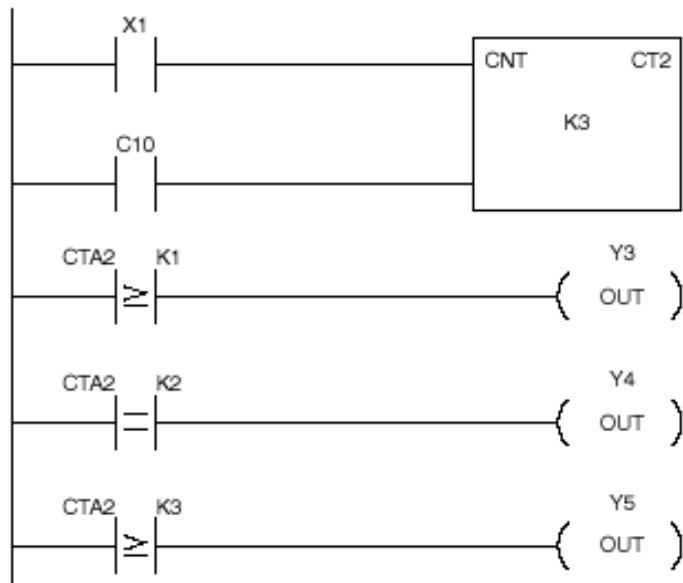
*Direct*SOFT

Counting diagram
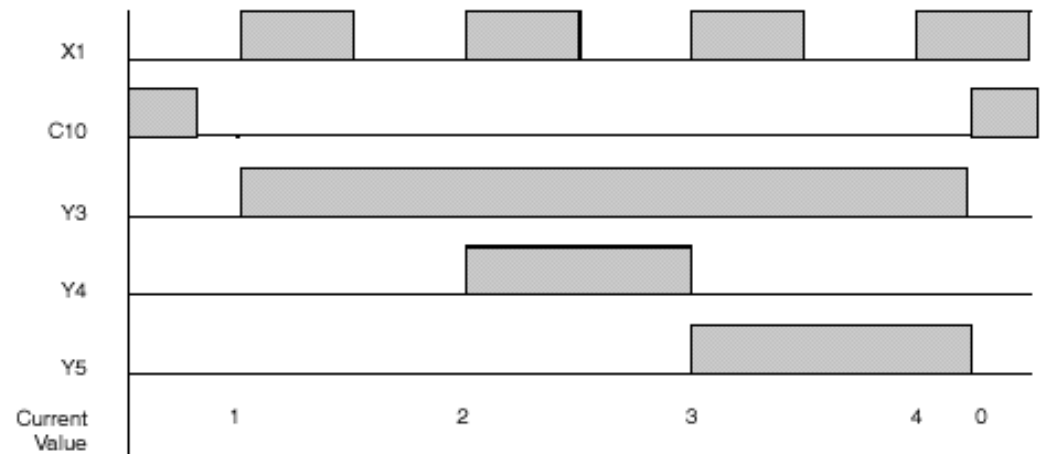
Counters - UDC

What if you need to reset a counter after you have left the stage?

```
        |
      ┌─────────────┐
      │ SG          │
      │     S4      │
      └──────┬──────┘
             │
             │       X0                ┌────────────────────────────┐
  30         ├────────┤ ├──────────────┤ CNT                  CT0   │
             │                         │                            │
             │       X1                │           K3               │
             ├────────┤ ├──────────────┤                            │
             │                         │                            │
             │                         └────────────────────────────┘
             │       CT0                                   S5
  31         ├────────┤ ├────────────────────────────────( JMP )
             │
      ┌──────┴──────┐
      │ SG          │
      │     S5      │
      └──────┬──────┘
             │
```
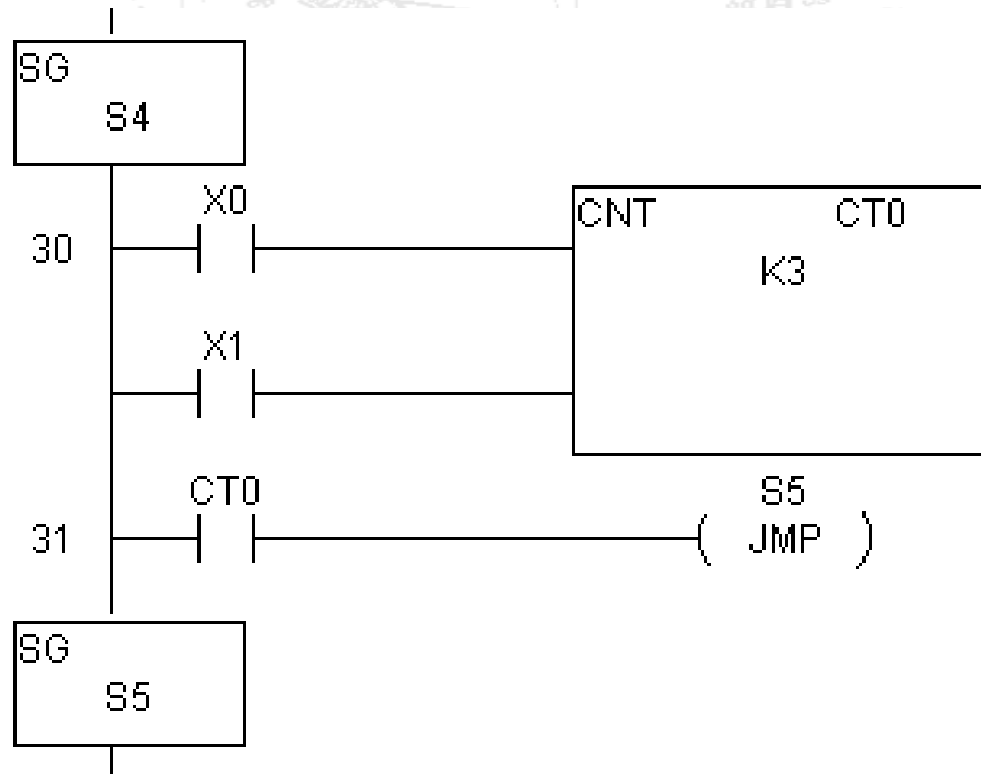
Stage Counter
-Reset with a special RST coil.

```
SG
  S4

      X0                              SGCNT      CT0
30 ---] [-------------------------      K3

      CT0                                         S5
31 ---] [---------------------------------------( JMP )

SG
  S5

      X1                                         CT0
33 ---] [---------------------------------------( RST )
```

DirectSOFT

```
    X1                    SGCNT    CT7
 ---] [------------------    K3

    CT7                            Y7
 ---] [-----------------------( OUT )

    C5                             CT7
 ---] [-----------------------( RST )
```

Counting diagram

```
X1

Y10

Current    1        2        3      4   0
Value

RST
CT7
```

Garage Door Opener Example

Up limit switch

Motor — Raise
— Lower

Door Command

Down limit switch
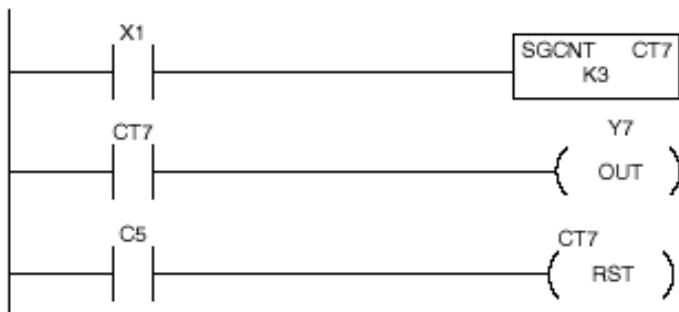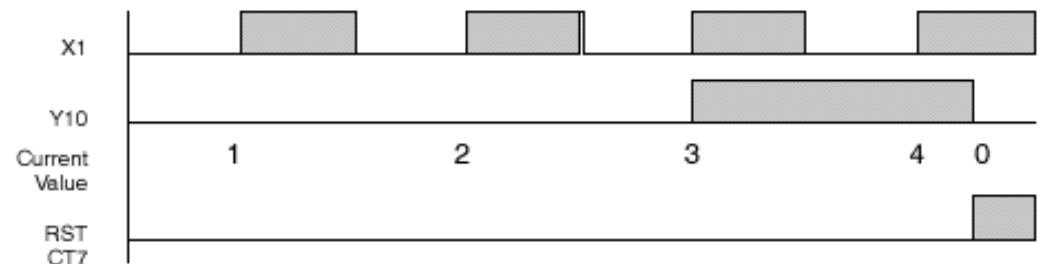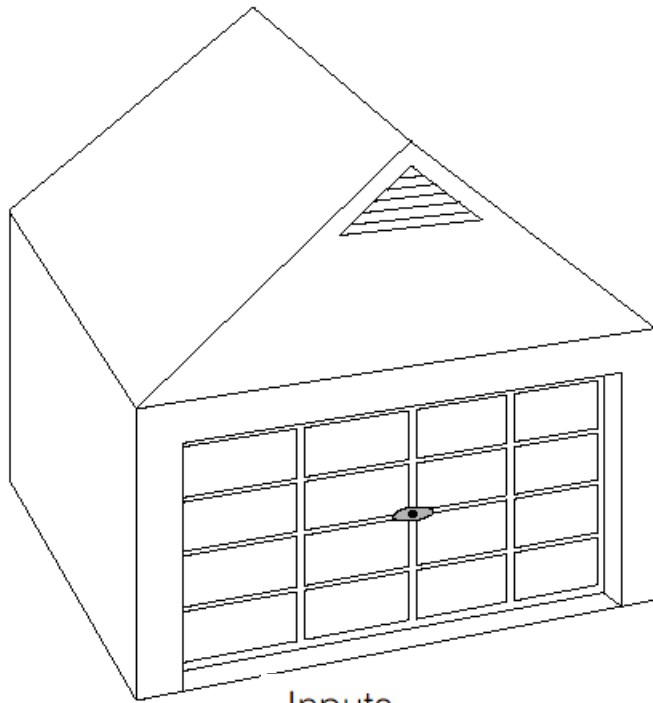
Inputs

Outputs

Toggle — X0
Up limit — X1
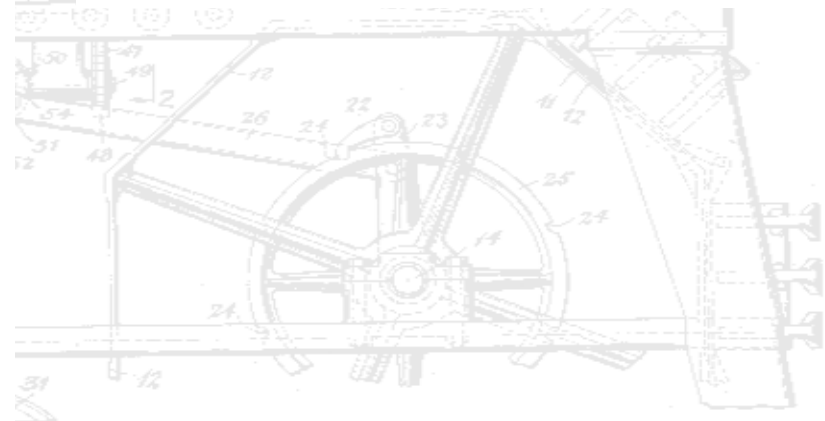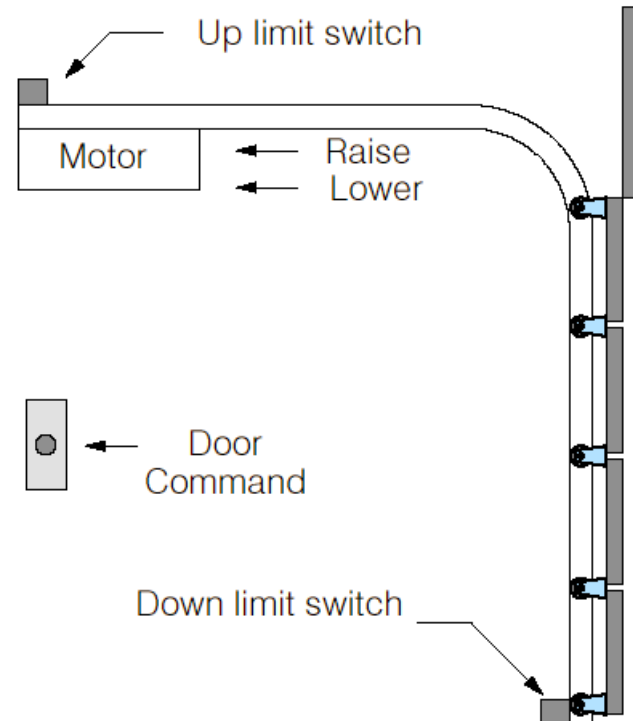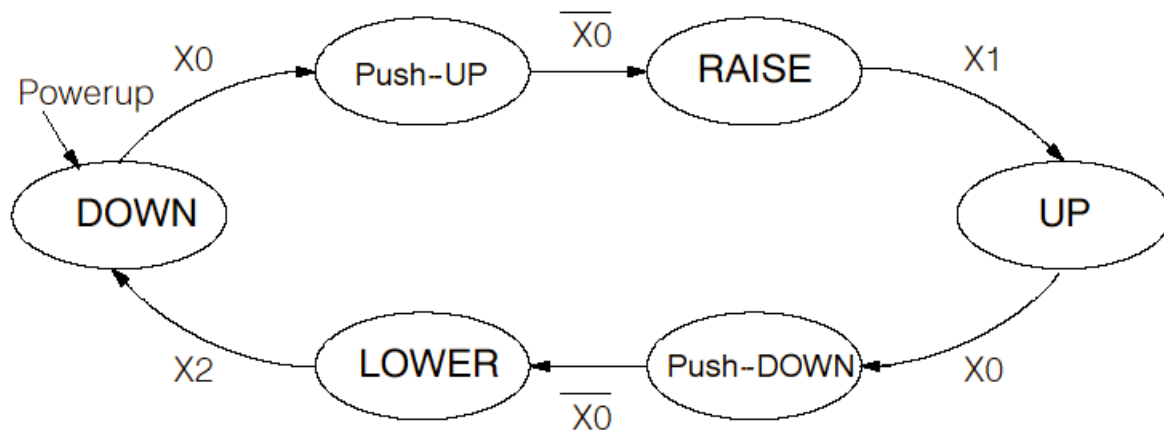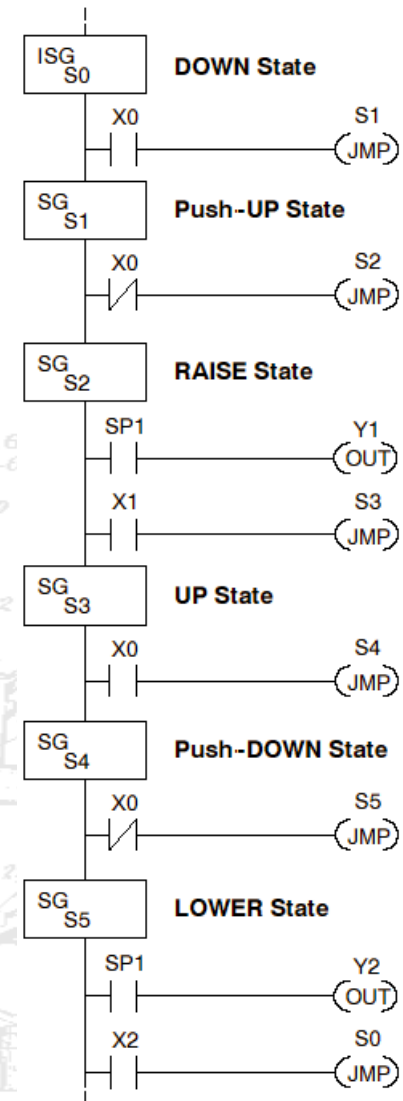Down limit — X2

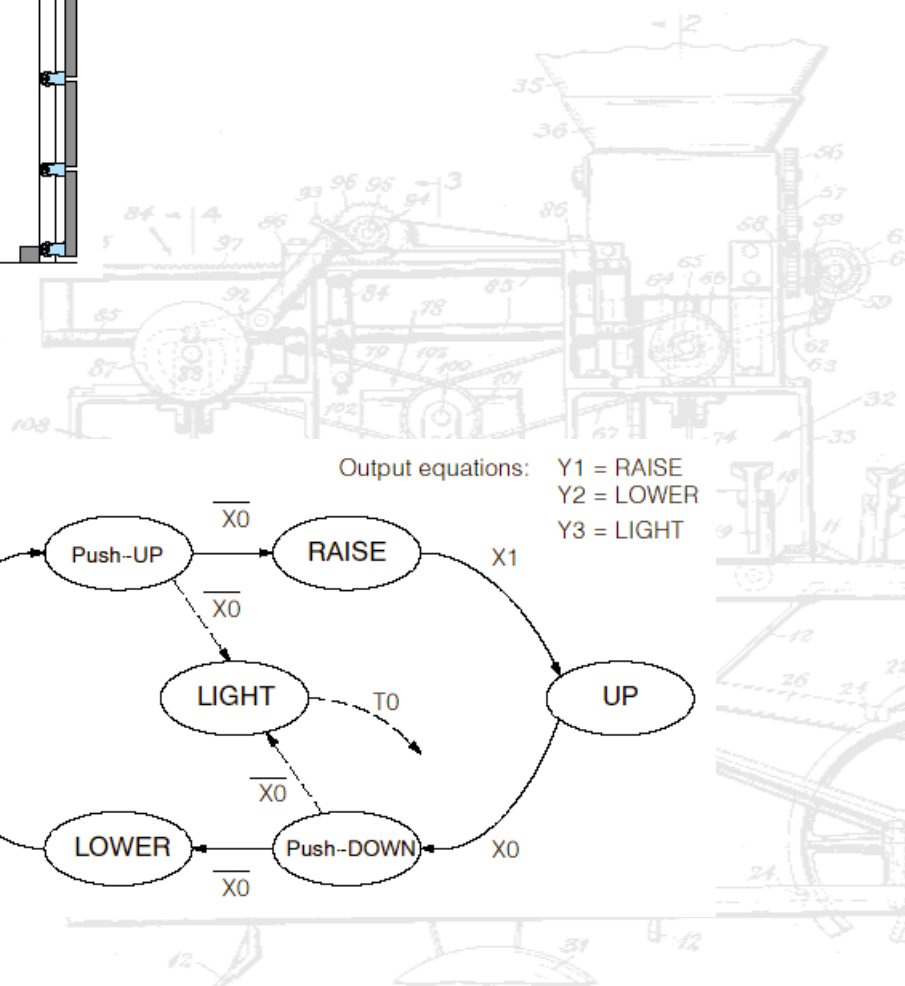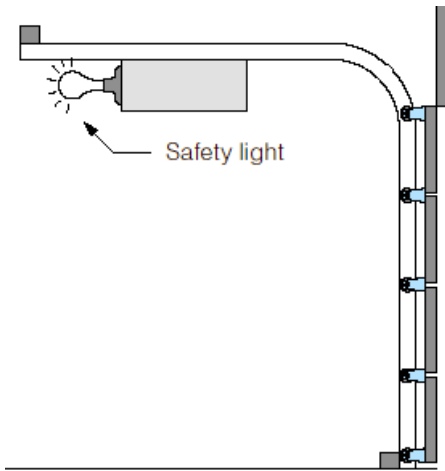Ladder Program

To motor:
Y1 → Raise
Y2 → Lower

Garage Door Opener Example

Output equations: Y1 = RAISE   Y2 = LOWER

Garage Door Opener Example

Safety light

Output equations:
Y1 = RAISE
Y2 = LOWER
Y3 = LIGHT

ISG S0	DOWN State
SG S1	Push-UP State
SG S2	RAISE State
SG S3	UP State
SG S4	Push-DOWN State
SG S5	LOWER State
SG S6	LIGHT State