```
PROGRAM PLC_PRG
VAR
//        PID_SERVO_X : fbdiscretePID;
    PID_XServoControl  : fbdiscretePID ;
    MoveX_enable       : BOOL ;
    cmdEnable_Servo    : R_TRIG ;         // for testing purposes
    Toggle             : BOOL ;
    LocationNr         : INT ;
    SaturationWarning  : BOOL ;

    isMotorOn          : BOOL ;
    TestArray          : ARRAY [ 1 .. 5 ] OF INT := [ 0 , 40 , 20 , 60 , 30 ] ;
    State              : SeqState := SeqState . State0 ;
    Index              : INT := 1 ;
END_VAR
VAR CONSTANT

END_VAR
```

```
// ========= User application ===============

cmdEnable_Servo ( CLK := MoveX_enable ) ;  // button
IF ( cmdEnable_Servo . Q ) THEN
    Toggle := NOT Toggle ;
    END_IF

    IF ( Toggle OR isMotorOn = 1 ) THEN
        CASE State OF
            SeqState . State0 :
            Index := 1 ;
            State := SeqState . State1 ;

            SeqState . State1 :
            isMotorOn := 1 ;
            IF ( Toggle = 0 AND Index = 1 ) THEN
                Index := 1 ;
                isMotorOn := 0 ;
            END_IF
                PID_XServoControl . Setpoint := TestArray [ Index ] ;
                State := SeqState . State2 ;

            SeqState . State2 :
                IF ( PID_XServoControl . i_Process_value > PID_XServoControl .
Setpoint - 0.5 AND PID_XServoControl . i_Process_value < PID_XServoControl .
Setpoint + 0.5 ) THEN
                Index := Index + 1 ;
                IF ( Index > 5 ) THEN
                    Index := 1 ;
                    END_IF
                State := SeqState . State1 ;
```

```
30                      END_IF
31                  END_CASE
32      END_IF
33      // == State Machine ===
34
35      // PID parameter settings
36      PID_XServoControl . Auto_Mode := TRUE ;
37      PID_XServoControl . Kp := 0.06 ;  // 1.8
38      PID_XServoControl . Ki := 0 ;
39      PID_XServoControl . Kd := 0 ;
40      PID_XServoControl . MV_max_sat := 10 ;
41      PID_XServoControl . MV_min_sat := - 10 ;
42      PID_XServoControl . PrGain := 10 ;
43      // Executing the PID COntroller
44      PID_XServoControl ( i_Process_value := SERVO_XPOS2 . Yout ,
45                  q_MV_out  =>  SERVO_XPOS2 . Xin ,
46                  qx_Saturation => SaturationWarning ) ;
47
```