

**A(F)X PLC each element function description**  
**A(F)X PLC setiap deskripsi fungsinya elemen**



**Stonehenge**  
**Amesbury, England**

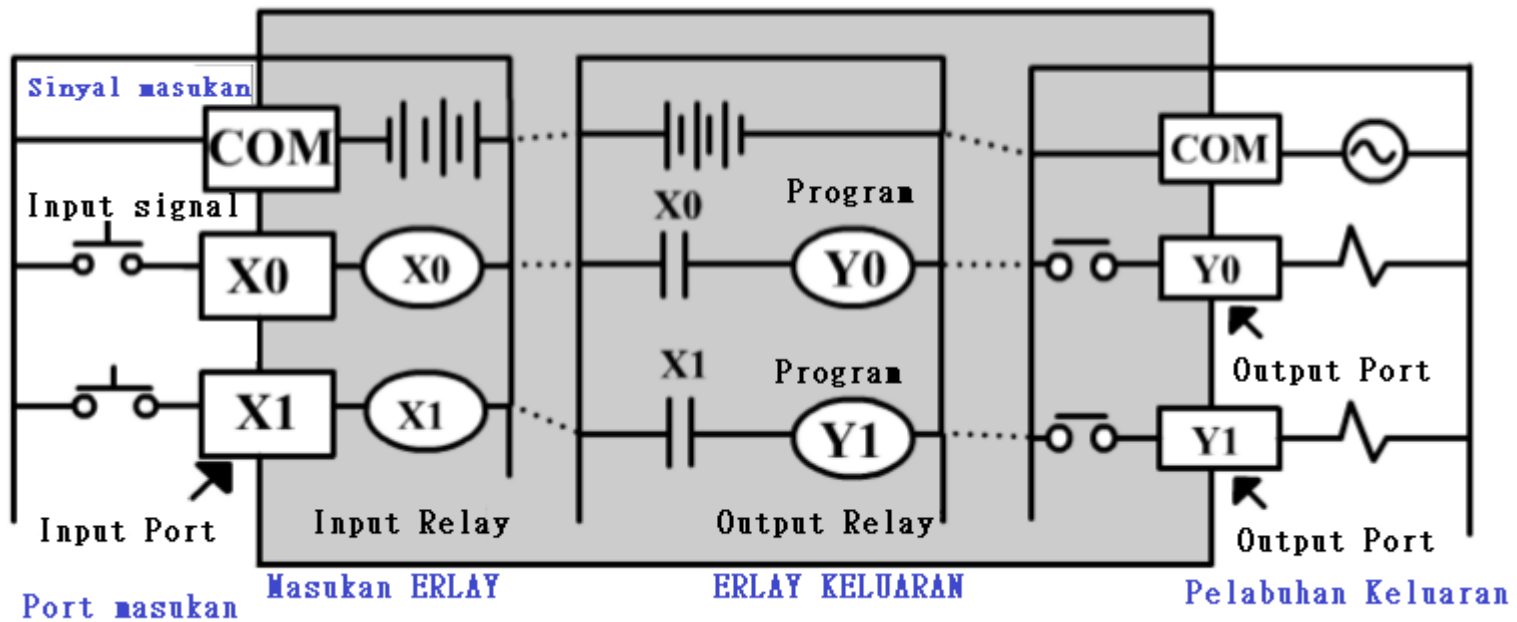
## Element description of FX PLC

### Deskripsi elemen FX PLC

<b>Input/output contacts</b>	<b>Kontak masukan/keluaran</b>	<b>• X/Y</b>
<b>Relay</b>	<b>relaimagnetik</b>	<b>• M (Memory)</b>
<b>Timer</b>	<b>pengaturwaktu</b>	<b>• T (Timer)</b>
<b>Counter</b>	<b>PenghitungListrik</b>	<b>• C(Counter)</b>
<b>Status relay</b>	<b>Relai status</b>	<b>• S (State)</b>
<b>Data register</b>	<b>Daftar data</b>	<b>• D (Data)</b>
<b>Index register</b>	<b>Daftarindeks</b>	<b>• V/Z</b>
<b>index</b>	<b>indeks</b>	<b>• P/I (Index)</b>
<b>constant</b>	<b>konstan</b>	<b>• K/H</b>

# I/O and program logic architecture

## I/O dan arsitektur logika program



## I/O contacts and relays

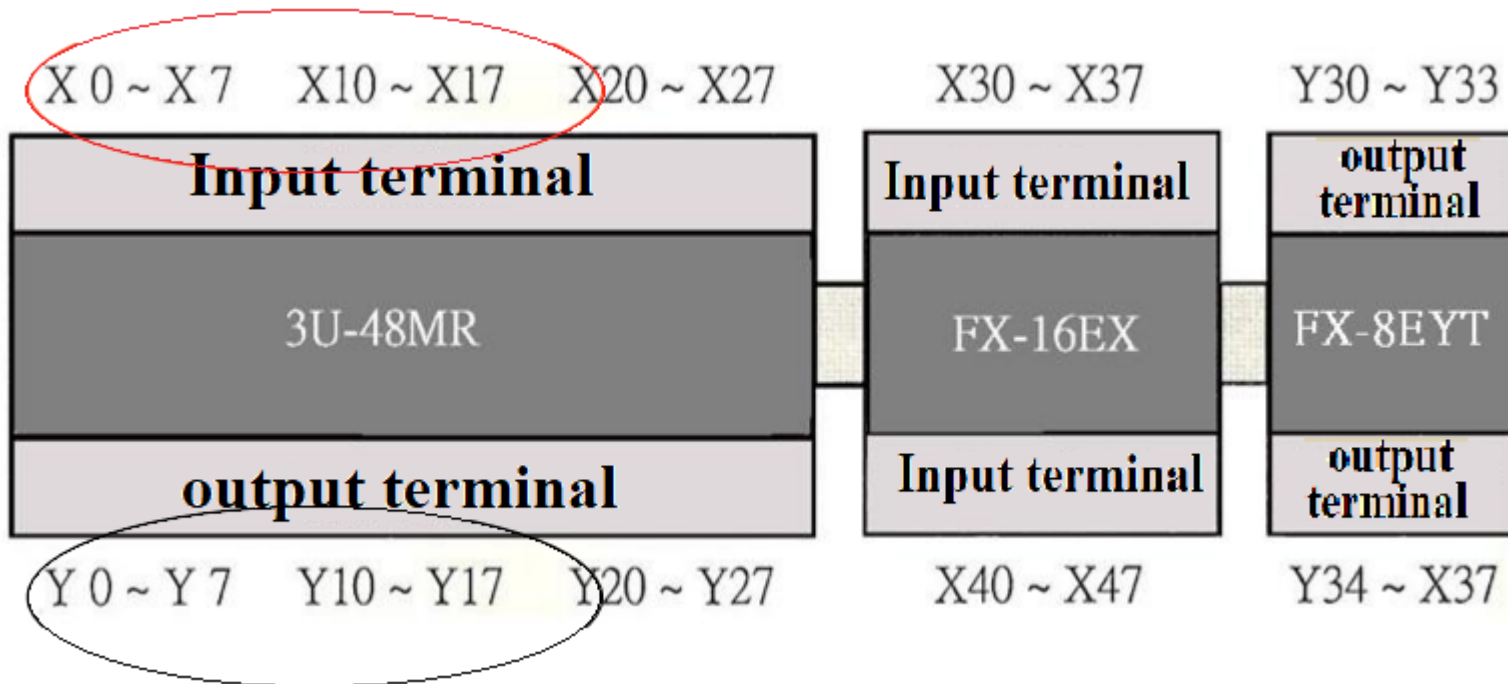
### Kontak dan relai I/O

- **Input Relay : X0 ~ X367 , 128 ( 3U248) ( NO8 、 9 )**
- **Output Relay : Y0 ~ Y367 , 128 ( 3U248) ( NO8 、 9 )**

**Total maximum points-256 I/O contacts**

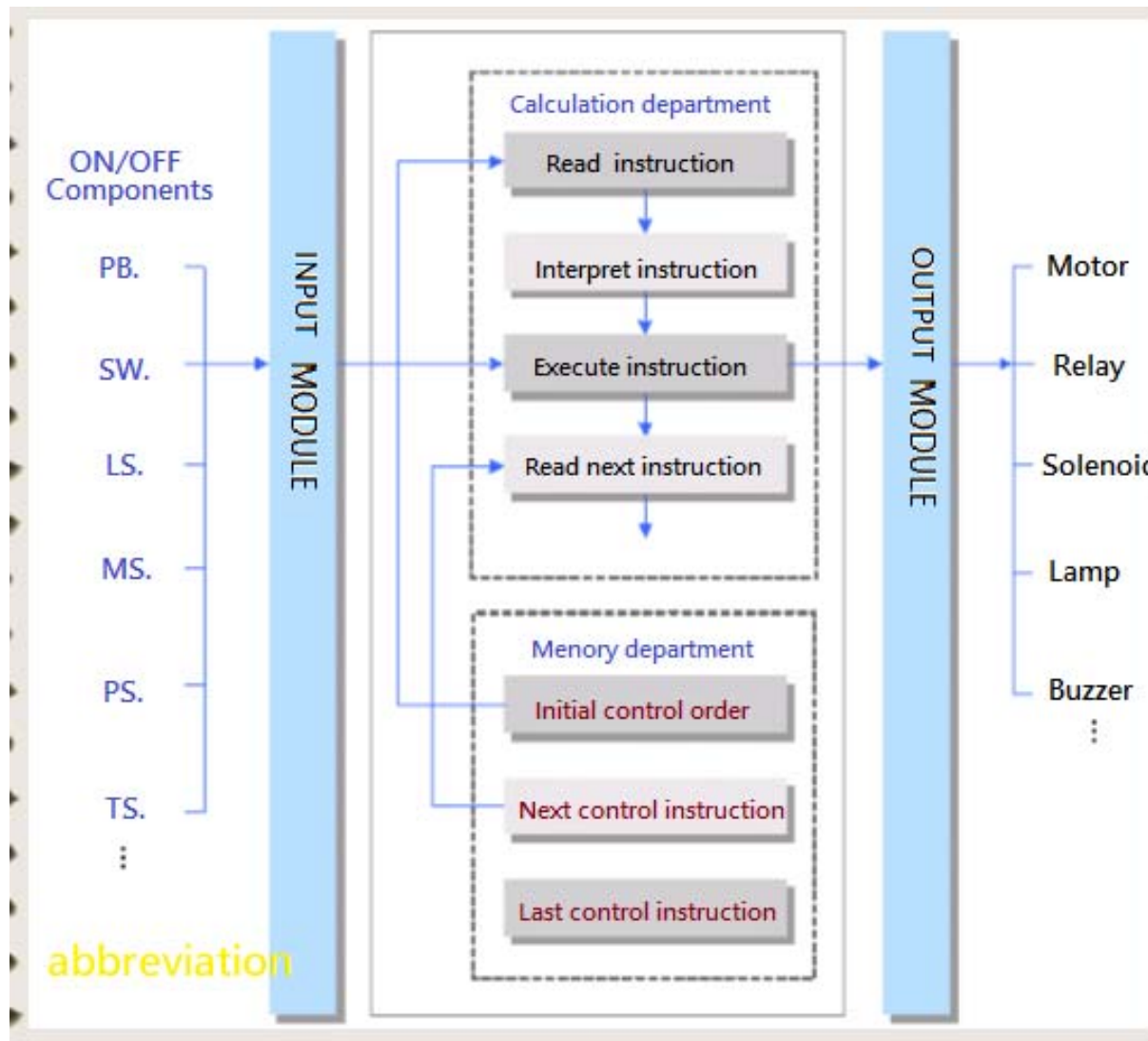


# Input/output number Nomormasukan/keluaran NO8,NO9 (8 Bits)

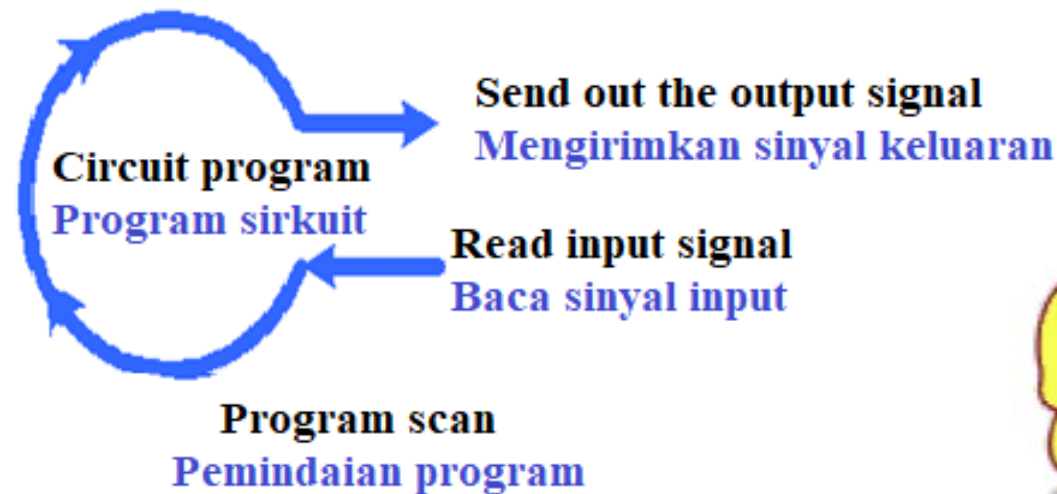


# PLC input/output(I/O) signal and program processing procedure

## Sinyal input/output(I/O) PLC dan prosedur pemrosesan program



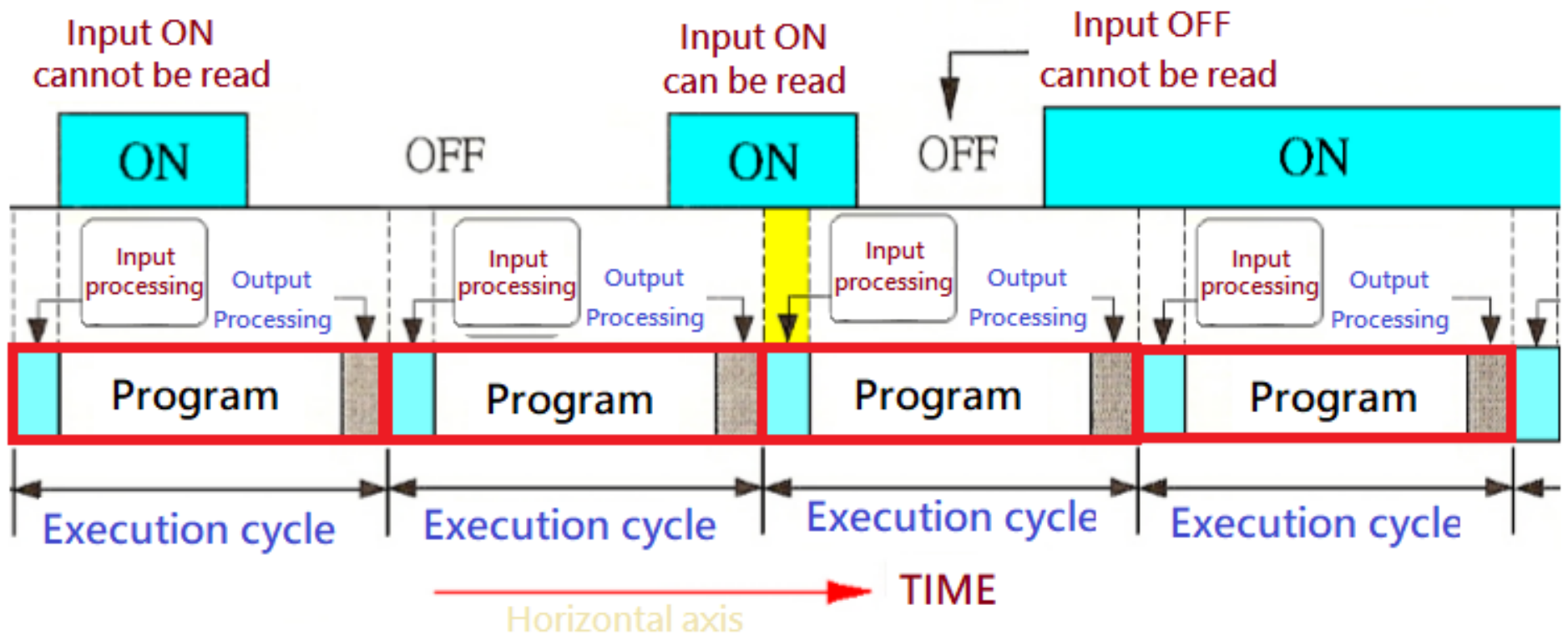
# PLC input/output(I/O) signal and program processing procedure Sinyal input/output(I/O) PLC dan prosedur pemrosesan program



**Processing speed : 0.065  $\mu$ S/Instruction  
=15,384,615 Instruction/sec**

# PLC calculation cycle

## Siklus perhitungan PLC





# PLC Instructions

## instruksi PLC

### PLC Instructions

name	Symbol	Points	serial number
Input Relay	X	128	X0~X177 ( 8 bits )
Output Relay	Y	128	Y0~Y177 ( 8 bits )
Timer ( 256 Points )	T ( 0.1 SEC )	206	T0~T199 T250~T255 ( Power-off hold )
	T ( 0.01 SEC )	46	T200~T245
	T ( 0.001 SEC )	4	T246~T249 ( Power-off hold )
Counter ( 256 Points )	C (Add calculation)	200	C0~C99 C100~C199 ( Power-off hold )
	C (Add/Subtract) calculation	35	C200~C219 C220~C234 ( Power-off hold ) M8200~M8234 ( Add/Subtract calculation switch )
	C ( High Speed )	21	C235~C255
Assist Relay	M	1024	M0~M499 ( Normal ) M500~M1023 ( Power-off hold )
State Relay	S	900	S0~S899

## Auxiliary relay

### Relay bantu

**For general use (M0 ~ M499) 500 points (decimal)**

**Tujuan umum (M0 ~ M499) 500 poin (desimal)**

- **Power-off hold (M500 ~ M1023) 524 points,**

- **Retensidayamati (M500 ~ M1023) 524 poin,**

**a total of  $500+524=1,024$  points relay**

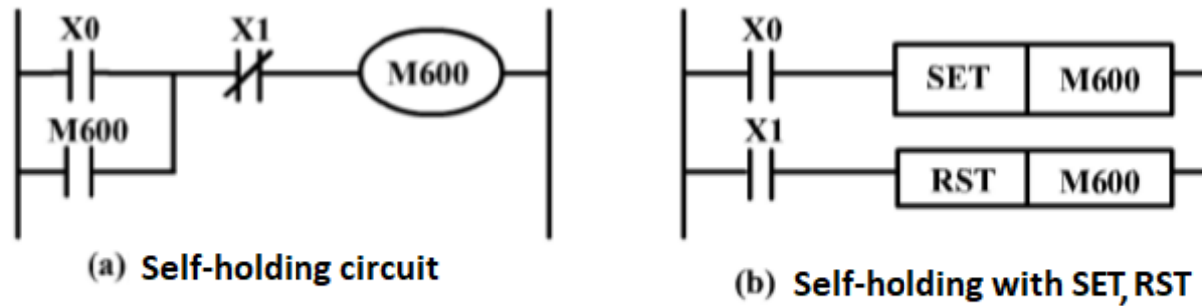
**Total  $500+524=1024$  poin stafet**

**(3rd generation high-function type: 7,680 points)**

**(Tipe fungsitinggigenerasi ketiga: 7.680 poin)**

# Power-off hold

## Penahanan dayamati



Power-off hold circuit



**Special Relay (M8000-M8511 , 512)**  
**estafet khusus (M8000-M8511 , 512)**

- **M8000 Operation monitoring (ON during program RUN)**

**Pemantauan operasi (ON selama program RUN)**

- **M8002 Initial pulse (a SCAN is ON when the program is RUN)**

**Pulsa awal (SCAN aktif saat program berjalan)**

- **M8011 0.01 second pulse (100HZ)**

**0,01 detik pulsa (100HZ)**

- **M8012 0.1 second pulse (10HZ)**

**0,1 detik pulsa (10HZ)**

- **M8013 1 second pulse (1HZ) /1 detik pulsa (1HZ)**

- **M8014 1 minute pulse (1/60HZ)**

## 1 menit pulsa (1/60HZ)

- **M8030 BATTERY.LOW LED OFF**

## BATERAI RENDAH LED OFF

- **M8033 PLC stops running, all outputs are maintained**

## PLC berhenti berjalan, semua output dipertahankan

- **M8034 All output prohibited**

## Semuakeluarandilarang

- **M8039 Fixed scan (D8039)**

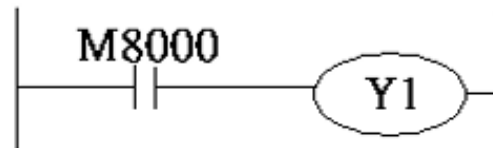
## Pemindaian tetap (D8039)

- **M8040 Execution prohibition**

## Larangan eksekusi

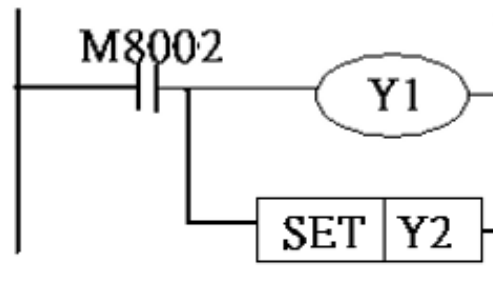
Special relay program example

## Contoh program relaikhusus



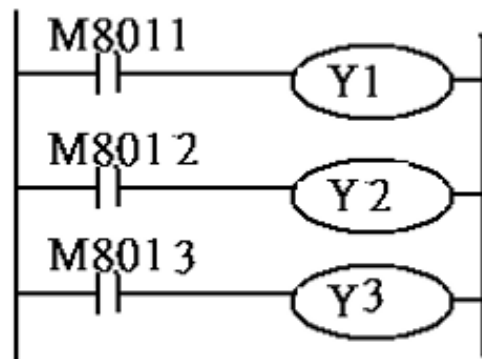
```
0 LD M8000  
1 OUT Y1  
2 END
```

RUN  
SEE Y1  
STOP  
SEE Y1



```
0 LD M8002  
1 OUT Y1  
2 SET Y2  
3 END
```

RUN  
SEE Y1



```
0 LD M8011  
1 OUT Y1  
2 LD M8012  
3 OUT Y2  
4 LD M8013  
5 OUT Y3  
6 END
```

RUN  
SEE Y1 - Y2 - Y3

# Timer pengaturwaktu

**General timer (T0~T245) 246 points (decimal)**

## **Pengaturwaktuumum**

**T0~T199, 200 points is 100mS(0.1 second) timer :  
0.1~32,767 Seconds. Example: K10=1 second**

**T200~T245, 46 points is 10mS(0.01 second) time:  
0.01~32,767 Seconds. Example: K100 = 1 second •**

# Timer pengaturwaktu

**Power failure retention timer (T246 ~ T255) 10 points (decimal)**

**Wakturetensi kegagalan daya**

**T246 ~ T249, 4 points is 1mS( 0.001 second) timer:  
0.001 ~ 32,767 seconds. Example: **K1000 = 1 second****

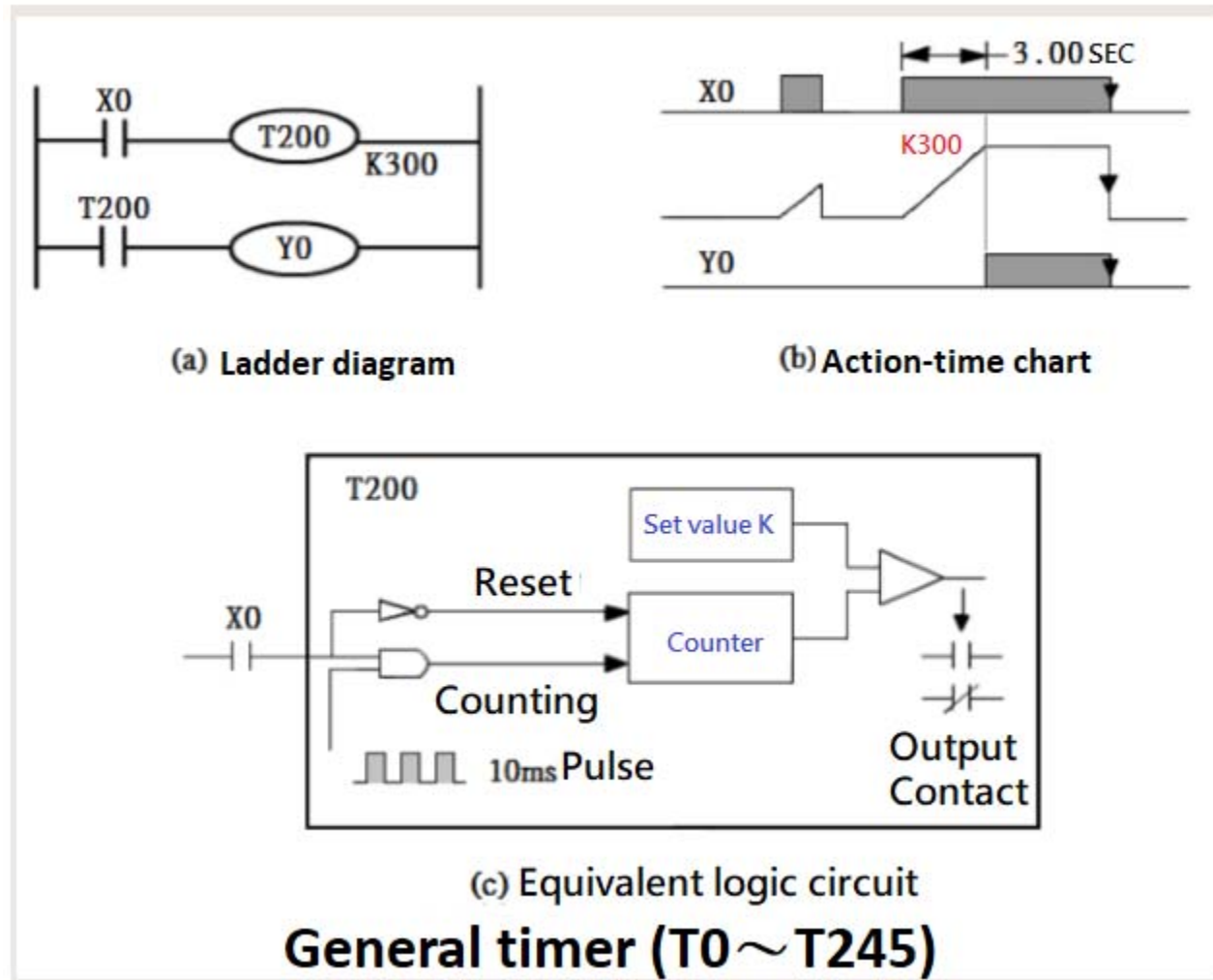
**T250 ~ T255, 6 points is 100mS(0.1 second) timer**

**Totally has 256 points  
(the third generation of high-function type: 512 points )**



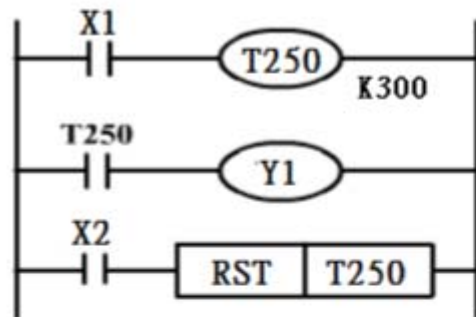
# General timer

## Pengatur waktu umum

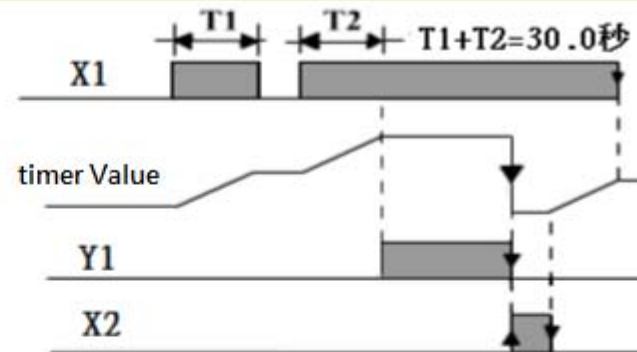


# Power failure retention timer

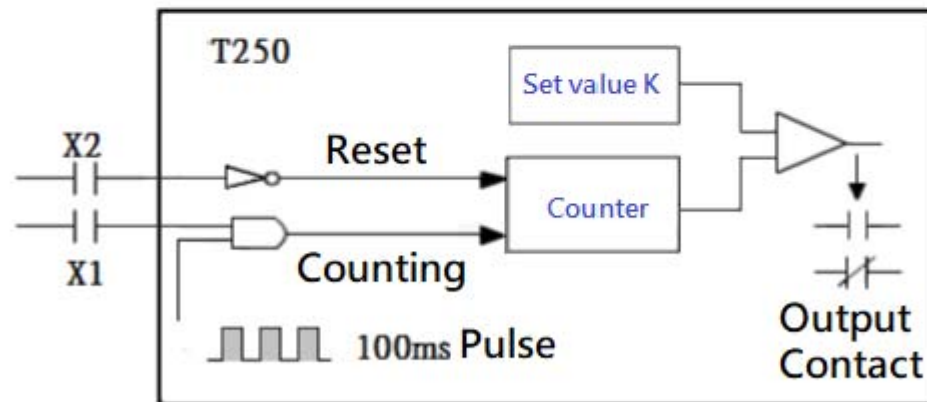
## Wakturetensi kegagalan daya



(a) Ladder diagram



(b) Action-time chart



(c) Equivalent logic circuit

**Power failure retention timer (T246 ~ T255)**

## Counter

### MENANGKAL

For general use (C0 ~ C99) 100 points (decimal),

Untuk penggunaan umum (C0 ~ C99) 100 poin (desimal),

For retention of power failure (C100 ~ C199) 100 points (decimal)

Untuk retensi kegagalan daya (C100 ~ C199) 100 poin (desimal)

Counting: 1 to 32767 times

Menghitung: 1 hingga 32767 kali

## Counter

### MENANGKAL

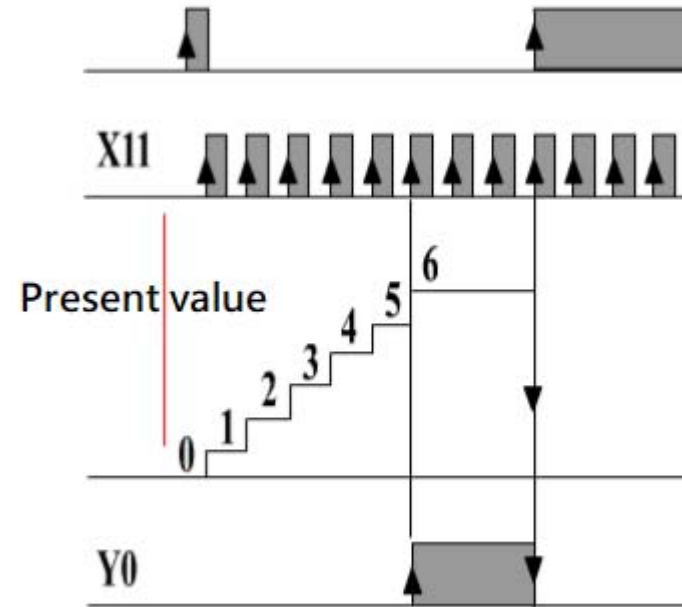
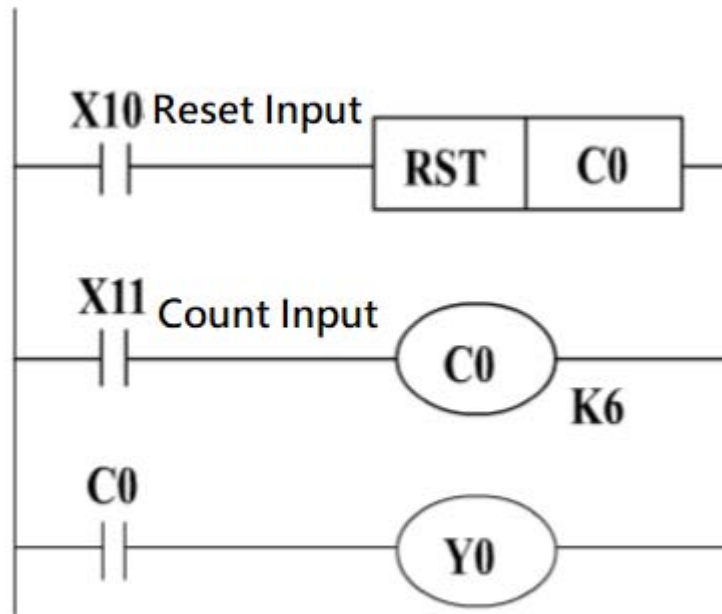
- 32-bit up/down counter 35 points for general use
- Penghitung atas/bawah 32-bit 35 poin untuk penggunaan umum (C200 ~ C219) 20 points (decimal)  
(C200 ~ C219) 20 poin (desimal),
- power failure retention (C220 ~ C234) 15 points (decimal)
- retensi kegagalan daya (C220 ~ C234) 15 poin (desimal)
- High-speed counter (C235 ~ C255) 21 points (decimal)
- Penghitung kecepatan tinggi (C235 ~ C255) 21 poin (desimal)

**Totally: ±2,147,483,647**

**Total: ±2.147.483.647**

# Count and reset

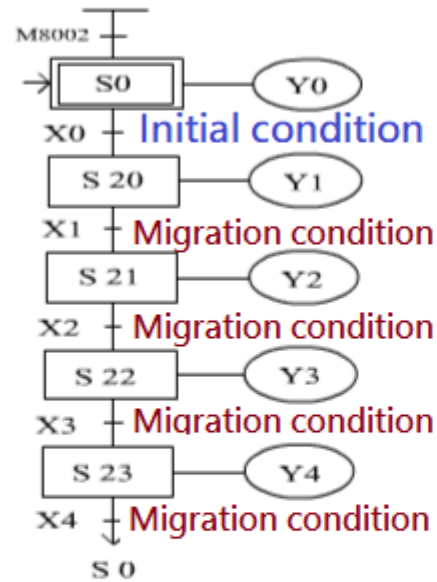
## Hitung dan setel ulang



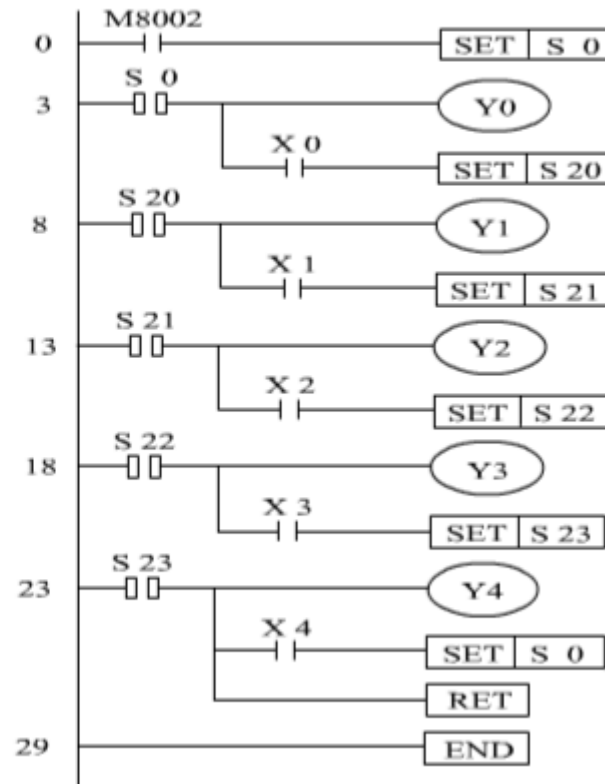
# State Relay

## Relay Negara

1. SFC Chart



2. STL Diagram



FIN

馬特洪峰(Matterhorn)』

Zermatt-瑞、義邊境

