

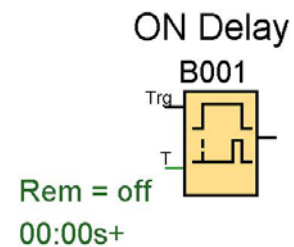
The Timing Blocks of the Siemens Logo PLC

Timing control is a very important and useful function for any PLC. This can be done using many kinds of timers which connect the PLC operations with the real time.

The Siemens Logo PLC offers twelve different types of Timers. In this report we will discuss the function of each timer in a little bit detail.

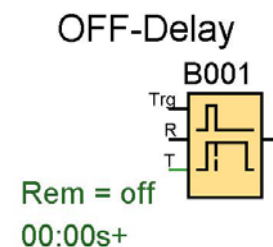
1. On-delay

- ❖ The On-Delay Timer is used to postpone the ON signal a period of time T.
- ❖ We can determine the delay time T by double-clicking on the timer block.
- ❖ As soon as the On-delay timer is triggered by 1, it starts counting the delay time T then gives On-signal (1) when finished.
- ❖ If the input signal at [Trg] becomes zero before delay time ends, the timer will reset again waiting for another trigger. That means it cannot be operated by a pulse trigger.



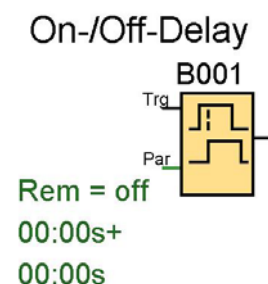
2. Off-delay

- ❖ Unlike the On-Delay timer, The Off-Delay is used to postpone the off signal for a period of time (T), i.e. it suspends the switching from 1 to 0 for a given time.
- ❖ Here also we can determine the delay time T by double-clicking on the timer block.
- ❖ By shifting the Off-delay's input from ONE to ZERO, it starts counting the delay time T (keeping the output 1) then gives Off-signal (0) when finished.
- ❖ We can use this to keep a pulse input for a specific period of time (T).
- ❖ Another important addition in the Off-Delay timer is the RESET which has the highest priority to turn both the timer and the output into zero.
- ❖ This reset connection port is added for safety reasons to force stopping the operation in some cases.



3. On-/Off-delay

- ❖ Adding the function of the On-Delay timer to that of the Off-Delay we get the third type of timers which is the On-/Off-Delay.
- ❖ We can see that it has two different time parameters: T_H for On-delay time and T_L for Off-delay.
- ❖ Another notice that it has no reset connection.



4. Retentive on-delay

- ❖ This timer is an On-Delay with a little different behavior:
 - When it is triggered by either pulse or continuous input ONE, it counts the delay time then turns the output on.
 - Once the output ONE appears, it can never be changed by changing Trg. It can only be reset by affecting the Reset connection with ONE.

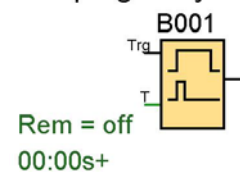
Retentive On-Delay



5. Wiping relay (pulse output)

- ❖ This timer gives only *one* pulse of length T when it is triggered by 1.
- ❖ The timer works as soon as the Trg is 1.
- ❖ It can't work with a pulse input.
- ❖ If the Trg becomes zero during the timing operation, the timer will reset.

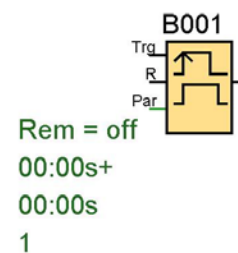
Wiping relay



6. Edge triggered wiping relay

- ❖ This timer has two important time parameters: T_H for the high output (1) duration, and T_L for the low output (0) duration.
- ❖ When the Trg connection port of this timer is triggered by a pulse, the output first remain zero for a fixed period of time T_L , then it turns into one for another period of time T_H , forming a pulse cycle.
- ❖ We can determine the number of pulse cycles by choosing a pulse cycles number from 1 to 9.
- ❖ This timer actually works on the positive edge of the Trg input; therefore it is called edge triggered.
- ❖ There is a reset connection for this timer which is used to reset both the output and the timer.

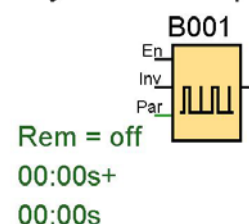
Edge triggered wiping relay



7. Asynchronous pulse generator

- ❖ Another very important timer is the Asynchronous Pulse Generator which gives an infinite number of pulse cycles.
- ❖ This timer works with two time parameters: T_H for the high output (1) duration, and T_L for the low output (0) duration. These two parameters can be in seconds, minutes or hours.
- ❖ The sequence of its function is: ON for T_H of time, then OFF for T_L of time, forming a pulse cycle.
- ❖ As soon as the Trg input is ONE, the pulse cycles are generated as the above sequence.

Asynchronous pulse generator

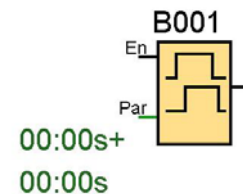


- ❖ The output level (High and Low) can be inverted by affecting the inv connection with 1. (Similar to put an inverter after this timer).

8. Random generator

- ❖ The Random Generator is simply an On-/Off-Delay timer, However there is one small difference in timing.
- ❖ The two time parameters here (T_H & T_L) represent the maximum duration for on and off delay respectively.
- ❖ The On-delay time will lie in between 0 and T_H .
- ❖ Similarly, the Off-delay time will lie in between 0 and T_L .
- ❖ No reset is exist.

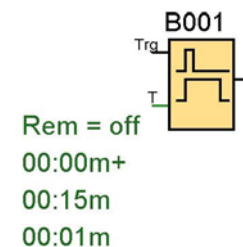
Random Generator



9. Stairway lighting switch

- ❖ This Timer acts as an Off-Delay Timer with time delay equals to T.
- ❖ It has another two parameters $T!$ for the pre-warning pulse cycle length and $T!_L$ for its ZERO part length.
- ❖ Pre-warning cycle is a pulse cycle inserted in the end of the off-delay time.
- ❖ As soon as this timer is triggered by one the output will be one.
- ❖ When the Trg input becomes zero, an off-delay will happen.
- ❖ That means the output will remain one for a period of time T.
- ❖ The last $T!$ time of this period T will be a Pre-warning cycle.
- ❖ So that, the output will be zero for $T!_L$ time, then one for $(T! - T!_L)$ time.
- ❖ At the end, the delay will expire so the output will become zero.

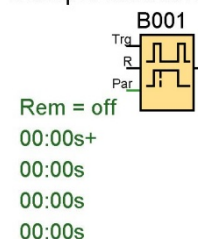
Stairway lighting switch



10. Multiple function switch

- ❖ The Multiple Function Switch is basically a stairway lighting switch, however it has one more ability; which is permanent –or continuous – ON function.
- ❖ Consequently, an additional time parameter called T_L will be used.
- ❖ T determines the off delay time.
- ❖ $T!$ and $T!_L$ are for pre-warning cycle.
- ❖ T_L is the time that when is exceeded, no off will occur even when resetting the Trg.
- ❖ In other words if Trg stills One for T_L or more, the output will be permanently ON. (neither off nor off-delay will occur.)

Multiple function switch

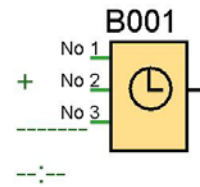


- ❖ This permanent ON can be ended by setting and resetting (pulse) the Trg respectively only one time, or by affecting the reset R with one.

11. Weekly timer

- ❖ Using this timer we can let the output be ONE for fixed periods on fixed days. For example from 1:30 pm to 2:45 pm on Sundays and Mondays.
- ❖ There are no inputs for this timer.

Weekly Timer



12. Yearly timer

- ❖ This timer gives one on fixed dates of the year which are its parameters.
- ❖ There are no inputs for this timer.

Yearly Timer

