

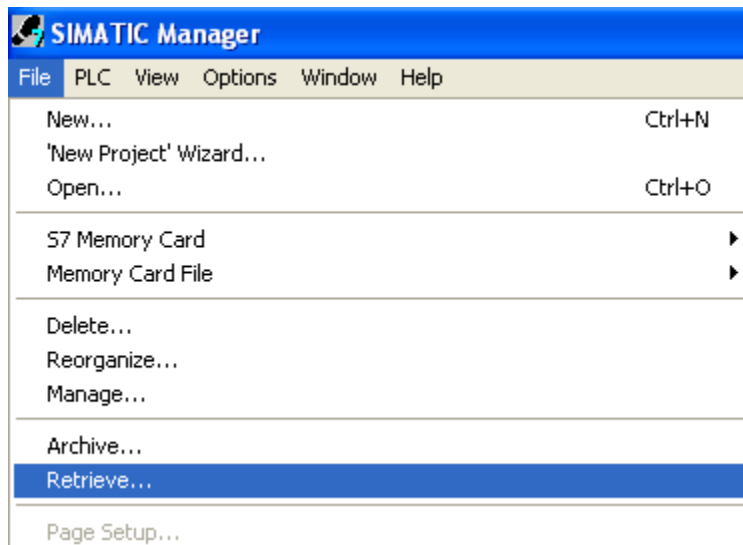
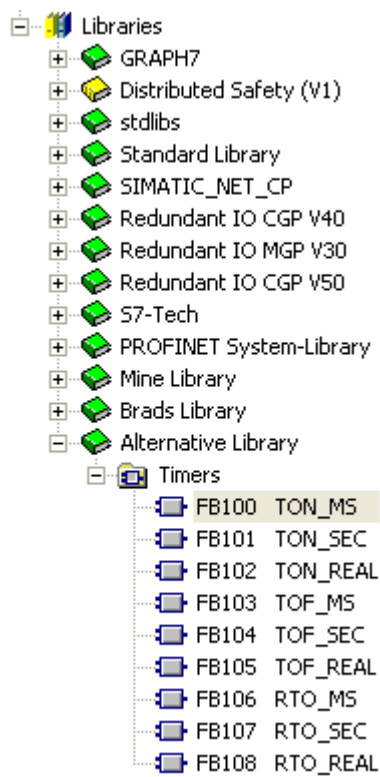


**Alternative Siemens Timers for
S7-300 and S7-400 PLCs**

March 13, 2009

This document provides an overview on timers that can be used as an alternative to the S5 style timers or even the IEC style times SFB4 and SFB5 (TON and TOF). The S5 style timers are count down timers, and require a preset time data type of S5TIME#10S for a 10 second count down timer. The IEC style timers are count up timer, and require a preset time data type of T#10S for a 10 second timer. If you are using a non-Siemens HMI, then these data types are sometimes difficult to use as a numerical input of a screen.

The following list of timers was created to provide a more user-friendly interface to work with. If you are familiar with Allen-Bradley timers, then you will appreciate the timers in FB100 through FB108. These timers can be accessed in the Libraries directory in the logic editor in STEP7 under the Alternative Library. This library has been archived from within STEP7 as a ZIP file. Please use the Retrieve function to install this library.

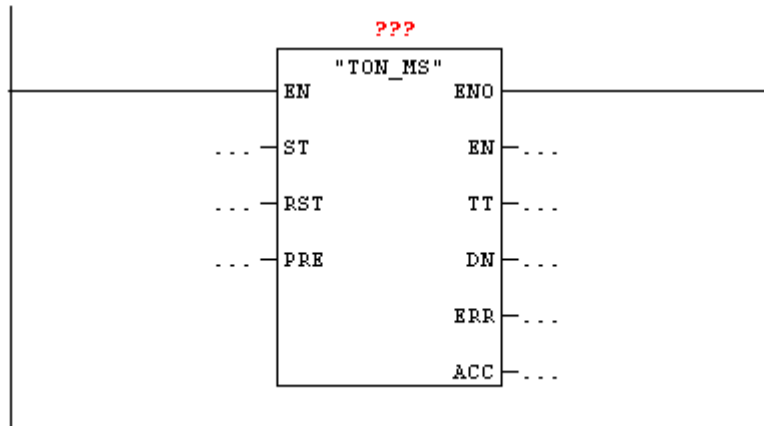


FB1 : Title:

Comment:

Network 1: Title:

Comment:



FB100 is an on-delay timer with a millisecond time-base. FB101 has a one second time base. FB102 has a REAL (floating point) time base. It does require an Instance Data Block (any of the alternative timers can be used as multi-instances).

Inputs

ST: Start Timer (BOOL)
RST: Reset Timer (BOOL)
PRE: Preset Time Value (DINT)

Outputs

EN: Timer is Enabled (BOOL)
TT: Timer is Timing/Running (BOOL)
DN: Timer is Done (BOOL)
ERR: Timer Detected an Error (BOOL)
ACC: Accumulated Time Value (DINT)

When the ST input is on, the EN and TT outputs are turned on, and the timer begins timing from 0. When the accumulated time ACC equals the preset time PRE, the TT output is turned off and the DN bit is turned on. If the ST input is off during the timing, or after the timer has finished, then all outputs are turned off and ACC goes to 0.

The ERR bit is turned on when the PRE value is either 0 or negative. Also, the timer operation is interrupted, and the EN, TT, and DN outputs are turned off. The timer can not be reset with RST input until the PRE value has been changed to a positive, non-zero value.

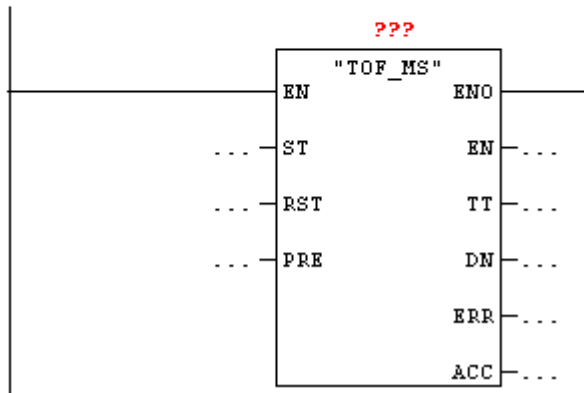
When the timer is running, if the RST bit is on, the timer operation will stop, the outputs will turn off, and the ACC value will go to 0.

FB1 : Title:

Comment:

Network 1: Title:

Comment:



FB103 is an off-delay timer with a millisecond time-base. FB104 has a one second time base. FB105 has a REAL (floating point) time base. It does require an Instance Data Block (any of the alternative timers can be used as multi-instances).

Inputs

- ST: Start Timer (BOOL)
- RST: Reset Timer (BOOL)
- PRE: Preset Time Value (DINT)

Outputs

- ENO: Timer is Enabled (BOOL)
- TT: Timer is Timing/Running (BOOL)
- DN: Timer is Done (BOOL)
- ERR: Timer Detected an Error (BOOL)
- ACC: Accumulated Time Value (DINT)

When the ST input is on, the EN and DN outputs are turned on. When the ST input is off, the timer begins timing from 0, the TT output bit is turned on, and the EN output bit is turned off. When the accumulated time ACC equals the preset time PRE, the TT and DN output bits are turned off.

The ERR bit is turned on when the PRE value is either 0 or negative. Also, the timer operation is interrupted, and the EN, TT, and DN outputs are turned off. The timer can not be reset with RST input until the PRE value has been changed to a positive, non-zero value.

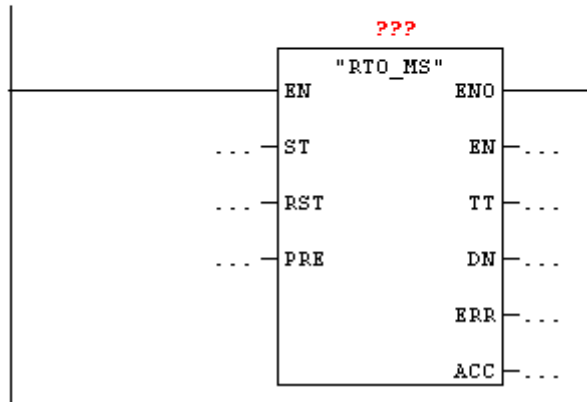
When the timer is running, if the RST bit is on, the timer operation will stop, the outputs will turn off, and the ACC value will go to 0.

FB1 : Title:

Comment:

Network 1: Title:

Comment:



FB106 is a retentive on-delay timer with a millisecond time-base. FB107 has a one second time base. FB108 has a REAL (floating point) time base. It does require an Instance Data Block (any of the alternative timers can be used as multi-instances).

Inputs

ST: Start Timer (BOOL)
RST: Reset Timer (BOOL)
PRE: Preset Time Value (DINT)

Outputs

ENO: Timer is Enabled (BOOL)
TT: Timer is Timing/Running (BOOL)
DN: Timer is Done (BOOL)
ERR: Timer Detected an Error (BOOL)
ACC: Accumulated Time Value (DINT)

When the ST input is on, the EN and TT outputs are turned on, and the timer begins timing from 0. When the accumulated time ACC equals the preset time PRE, the TT output is turned off and the DN bit is turned on. If the ST input is off during the timing, the TT output is turned off and the timer retains the ACC accumulated time.

The ERR bit is turned on when the PRE value is either 0 or negative. Also, the timer operation is interrupted, and the EN, TT, and DN outputs are turned off. The timer can not be reset with RST input until the PRE value has been changed to a positive, non-zero value.

When the timer is running, if the RST bit is on, the timer operation will stop, the outputs will turn off, and the ACC value will retain the last value before the error occurred.

All of the timers were built using the IEC timers SFB4 and SFB5. The Alternative Timers are not locked. Therefore, you can view the code and modify it accordingly.

The Alternative Timers were not built by Siemens and are subroutines that can be built like any other subroutines. The timers are an example of what can be accomplished with Siemens and STEP7 software.