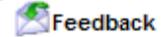


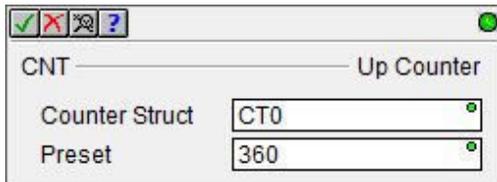


Topic: DMD0030



CNT - Up Counter

The Up Counter (CNT) instruction is a two input counter that counts from 0 up to the Preset value. Each time the UP input logic transitions from OFF to ON the counter structure's accumulator (.Acc) is incremented by one. The counter structure's .Done bit will turn ON once the .Acc value reaches the Instruction's Preset value.



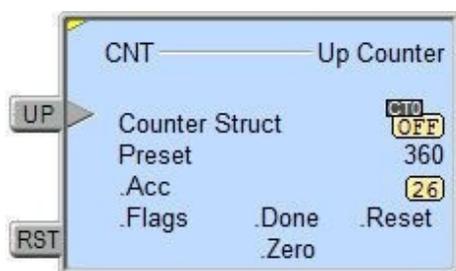
Parameters:

Note: Use the F9 key (Element Browser) or Down-Arrow key (Auto-Complete) at any time to see a complete list of the memory locations that are valid in the current field of the instruction.

Counter Struct - a counter structure that will be used by this Up Counter instruction. By default, there are 255 predefined counter structures, named CT0 through CT255. Refer to the [Memory Configuration](#) section of the [System Configuration](#) for information on adjusting the number of available counter structures.

Preset - the count value at which the Up Counter is said to be "done". Any time the value in the counter structure's Accumulator (.Acc) is greater than or equal to the Preset value the counter structure's .Done member will be ON. This can be any positive 32-bit constant value or any readable numeric location.

Inputs Legs:



The Up Counter (CNT) has the following two ladder logic inputs:

The first input leg is the Count Input ([UP](#)). The gray triangle at the right end of this input leg indicates the input is [edge-triggered](#), meaning that each time this input logic transitions from OFF to ON, the Up Counter's accumulator value will increment by one.

The second input leg is the Count Reset ([RST](#)). When this input logic is ON, the Up Counter will reset and the counter structure's accumulator value will return to 0 and will remain in this state as long as the Reset input remains ON.

Note: The Reset input has priority over the Up input, meaning that if the Up input is ON at the same time as the Reset input, the Up Counter will not count.

Termination Scan Behavior:

If the Up Counter instruction is contained within a [Program](#), a [Task](#), or a [Stage](#), the Up Counter will automatically be reset during the termination scan of that Program, Task, or Stage.

Refer to the Help topic on [Termination Behavior](#) for detailed information on the programming elements that have termination logic.

Status Display:

The yellow triangle in the upper left corner indicates this is a [Multi-Scan](#) instruction.

The counter structure contains several "dot" fields that can be used elsewhere in your ladder program. Their values are updated each time the Up Counter instruction is processed. The syntax for using them is <counter structure>.<flag name>.

- **.Acc** (Read/write) - a 32-bit integer value that represents the current number of counts that have accrued
 - **.Done** - (Read-only) is ON any time the value in the counter structure's Accumulator (.Acc) is greater than or equal to the Instruction's Preset value
 - **.Reset** - (Read-only) is ON if the RESET logic is ON, or if the Up Counter is being reset by a [Reset Counter \(RSTCT\)](#) instruction
 - **.Zero** - (Read-only) is ON any time the value in the counter structure's (.Acc) is 0
-

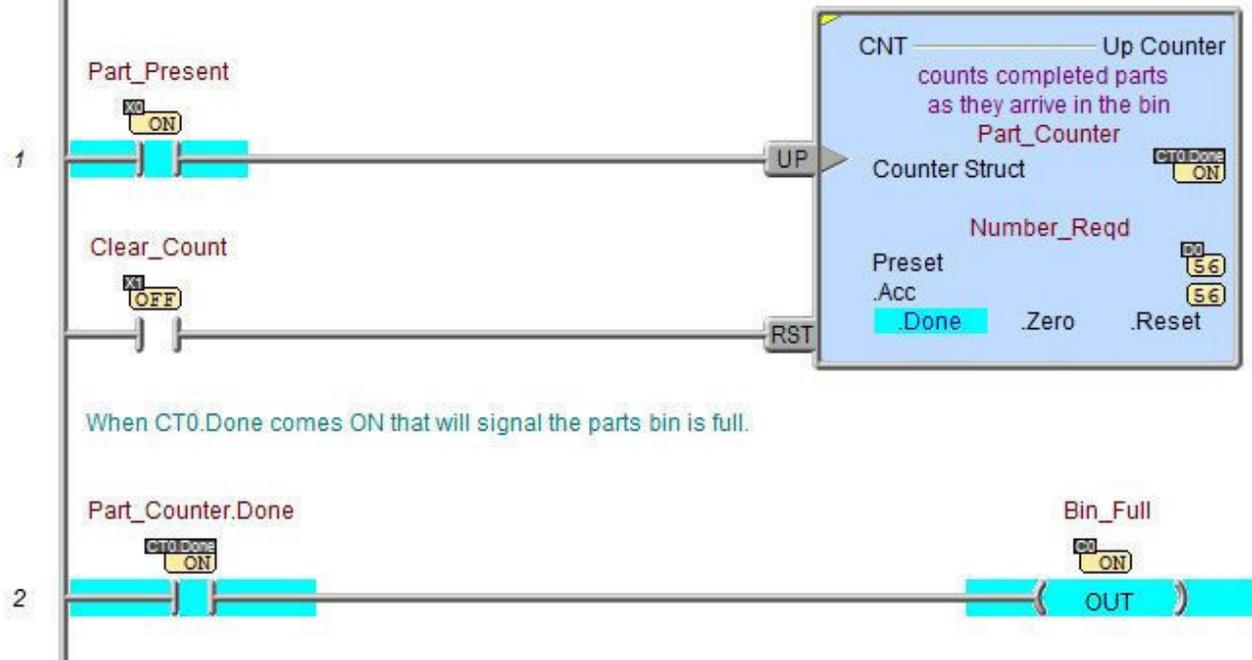
See Also:

- CNT - Up Counter
 - [CNTDN - Down Counter](#)
 - [UDC - Up/Down Counter](#)
 - [UDCG - Global Up/Down Counter](#)
 - [RSTCT - Reset Counter](#)
-

Example:

Each time a new part arrives (X0 turns ON), the Up Counter will increment the value in the counter structure's accumulator (CT0.Acc) by one.

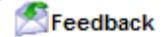
When the value in the counter structure's accumulator is greater than or equal to the instruction's Preset value CT0.Done will turn ON.



When CT0.Done comes ON that will signal the parts bin is full.

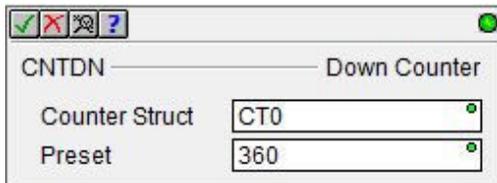


Topic: DMD0031



CNTDN - Down Counter

The Down Counter (CNTDN) instruction is a two input counter that counts down from the Preset value to 0. Each time the Down Counter is reset the counter structure's accumulator is initialized with the Instruction's Preset value. Then each time the DN input logic transitions from OFF to ON the counter structure's accumulator (.Acc) is decremented by one. The counter structure's .Done bit will turn ON once the .Acc value reaches 0.



Parameters:

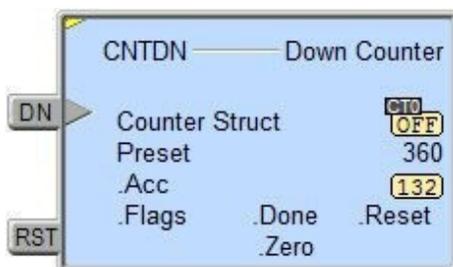
Note: Use the F9 key (Element Browser) or Down-Arrow key (Auto-Complete) at any time to see a complete list of the memory locations that are valid in the current field of the instruction.

Counter Struct - a counter structure that will be used by this Down Counter instruction. By default, there are 255 pre-defined counter structures, named CT0 through CT255. Refer to the [Memory Configuration](#) section of the [System Configuration](#) for information on adjusting the number of available counter structures.

Preset - the count value at which the Down Counter starts counting. Each time the Down Counter is reset the counter structure's accumulator is initialized with the instruction's Preset value. This can be any positive 32-bit constant value or any readable numeric location.

Inputs Legs:

The Down Counter (CNTDN) has the following two ladder logic inputs:



The first input leg is the Count Down ([DN](#)). The gray triangle at the right end of this input leg indicates the input is [edge-triggered](#), meaning that each time this input logic transitions from OFF to ON, the Down Counter's accumulator value will decrement by one.

The second input leg is the Count Reset ([RST](#)). When this input logic is ON, the Down Counter will reset and the counter structure's accumulator value will return to the Preset Value and will remain in this state as long as the Reset input remains ON.

Note: The Reset input has priority over the Down input, meaning that if the Down input is ON at the same time as the Reset input, the Down Counter will not count.

Termination Scan Behavior:

If the Down Counter instruction is contained within a [Program](#), a [Task](#), or a [Stage](#), the Down Counter will automatically be reset during the termination scan of that Program, Task, or Stage.

Refer to the Help topic on [Termination Behavior](#) for detailed information on the programming elements that have termination logic.

Status Display:

The yellow triangle in the upper left corner indicates this is a [Multi-Scan instruction](#).

The counter structure contains several "dot" fields that can be used elsewhere in your ladder program. Their values are updated each time the Down Counter instruction is processed. The syntax for using them is <counter structure>.<flag name>.

- **.Acc** (Read/write) - a 32-bit integer value that represents the current number of counts remaining
- **.Done** - (Read-only) is ON any time the value in the counter structure's accumulator (.Acc) is less than or equal to the 0
- **.Reset** - (Read-only) is ON if the RESET logic is ON, or if the Down Counter is being reset by a [Reset Counter \(RSTCT\)](#) instruction. At reset the counter structure's accumulator value will be set to the instruction's Preset value.
- **.Zero** - (Read-only) is ON any time the value in the counter structure's accumulator (.Acc) is 0

See Also:

- [CNT - Up Counter](#)
- [CNTDN - Down Counter](#)

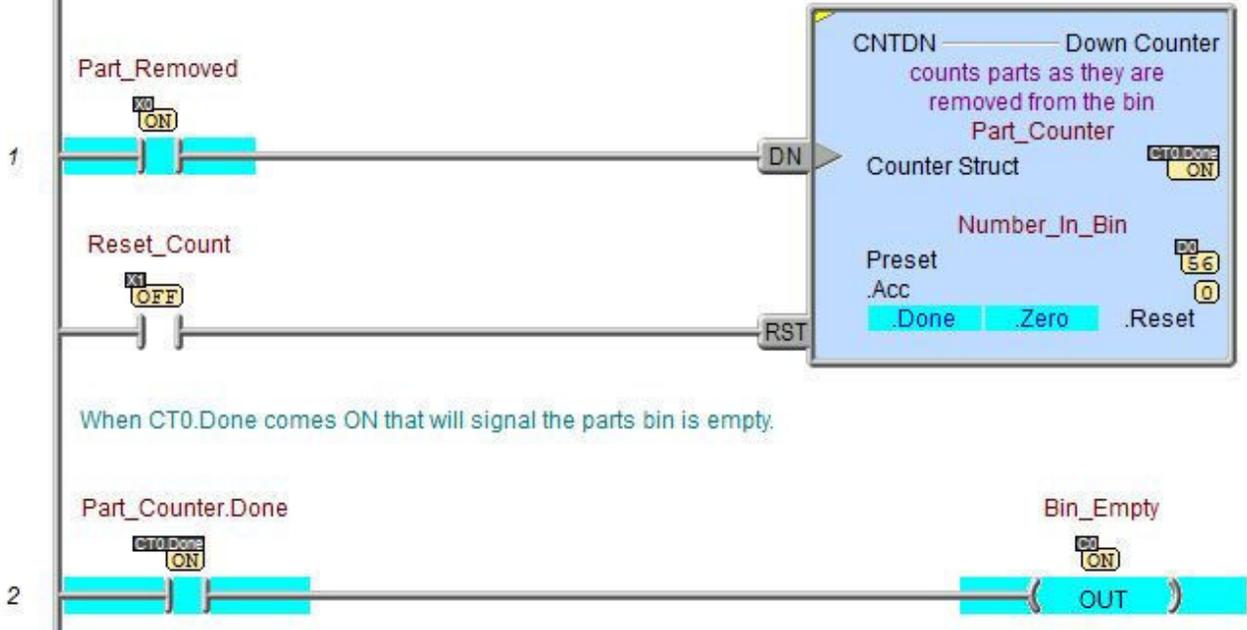
- [UDC - Up/Down Counter](#)
- [UDCG - Global Up/Down Counter](#)

- [RSTCT - Reset Counter](#)

Example:

Each time a part is removed from the Bin (X0 turns ON), the Down Counter will decrement the counter structure's accumulator (CT0.Acc) by one.

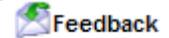
When the value in CT0.Acc is equal to 0, CT0.Done will come ON.



When CT0.Done comes ON that will signal the parts bin is empty.

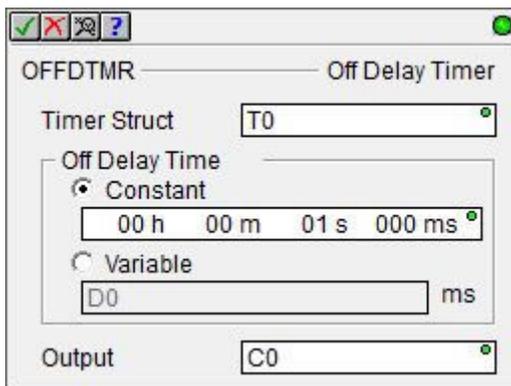


Topic: DMD0174

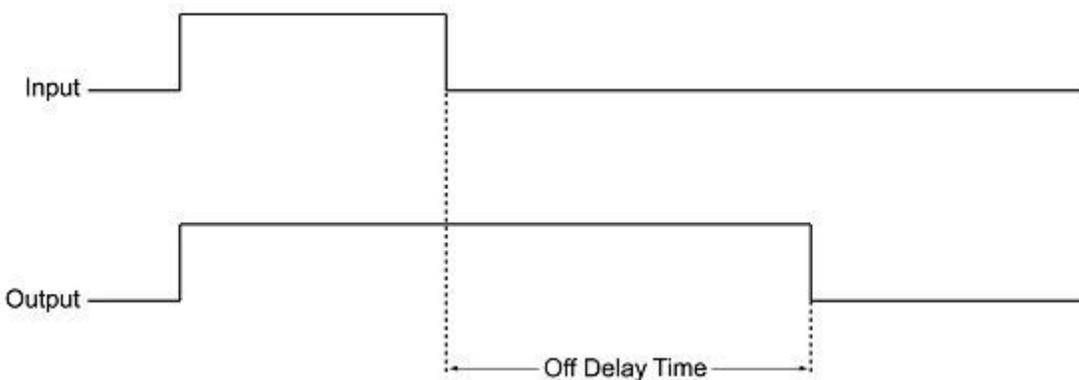


OFFDTMR - OFF Delay Timer

The Off Delay Timer (OFFDTMR) has one ladder logic input leg which enables and resets the Timer. This type of timer is the opposite of the On Delay Timer in that it "delays turning off" by the Off Delay Time. The Off Delay Timer times down.



If the input logic is ON, the Output will be latched ON. Then when the input logic transitions OFF, the Timer will begin timing. Once the Off Delay Time value is reached, the Timer will reset, setting the Timer's accumulator value to 0, and turning the Output OFF. Refer to the following timing diagram:



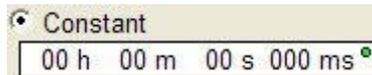
Parameters:

Note: Use the F9 key (Element Browser) or Down-Arrow key (Auto-Complete) at any time to see a complete list of the memory locations that are valid in the current field of the instruction.

Timer Struct - specifies a unique Timer structure that will be used by this instruction.

Off Delay Time - is the amount of time after which you want the specified Output to go OFF. The Off Delay Timer has a resolution of 1 millisecond. The maximum value for a Timer Preset is 2,147,483,647 milliseconds. The Off Delay Time value can be specified in one of two ways:

Constant - specified using the Time format (HH : MM : SS : mmm).



The maximum Time value in this form is 569 hours, 31 minutes, 23 seconds, and 647 milliseconds. If needed, the value entered for the Off Delay Time will be normalized to its standard value. For example, if you entered a value of 97 Seconds, that value will be converted and displayed as 1 Minute and 37 Seconds.

When editing the Constant Preset value, the following keystrokes are available to make entering the value easier and faster:

- **h** - takes you to the Hours field
- **m** - takes you to the Minutes field
- **s** - takes you to the Seconds field
- **mm** - takes you to the Milliseconds field

Variable - designates a location that contains the total number of milliseconds desired for the Off Delay Time. This can be any readable numeric location.



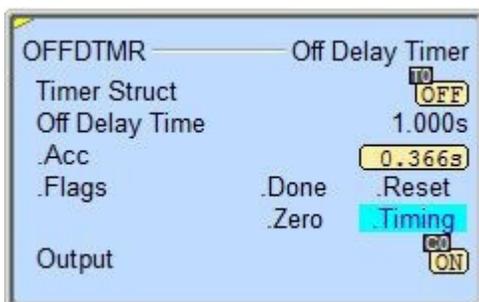
Output - designates the bit location that will be turned OFF after the Off Delay Time has expired. This can be any writable bit location.

Termination Scan Behavior:

If the Off Delay Timer instruction is contained within a [Program](#), a [Task](#), or a [Stage](#), the Timer will automatically be reset during the termination scan of that Program, Task, or Stage.

Refer to the Help topic on [Termination Behavior](#) for detailed information on the programming elements that have termination logic.

Status Display:



The yellow triangle in the upper left corner indicates this is a [Multi-Scan](#) instruction.

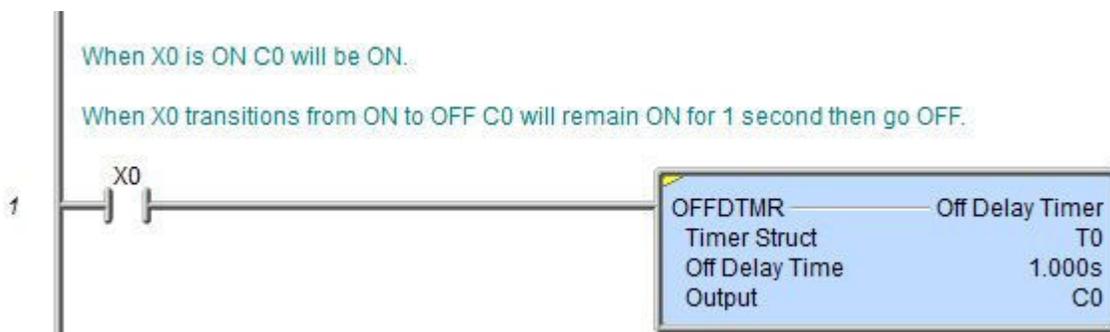
The Off Delay Timer instruction provides several status values that can be used elsewhere in your ladder program. Their values are updated each time the OFFDTMR instruction is processed. The syntax for using them is <timer structure>.<flag name>, for example, T7.Acc.

- **.Acc** (Accumulator) - a 32-bit signed value that represents the time remaining before the preset reaches 0
- **.Done** - is ON any time the Off Delay Timer is enabled and it's accumulator value (.Acc) is 0
- **.Reset** - is ON if the input logic is ON, or if the Timer is being reset by an RSTT instruction
- **.Zero** - is ON any time the Off Delay Timer's accumulator value (.Acc) is 0
- **.Timing** - is ON if the Off Delay Timer is enabled and the accumulator value (.Acc) is not 0

See Also:

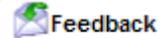
- [TMR - Up Timer](#)
- [TMRDOWN - Down Timer](#)
- [TMRA - Accumulating Up Timer](#)
- [TMRADOWN - Accumulating Down Timer](#)
- [TMRAG - Global Accumulating Up Timer](#)
- OFFDTMR - On Delay Timer
- [ONDTMR - On Delay Timer](#)
- [RSTT - Reset Timer](#)

Rung Example:



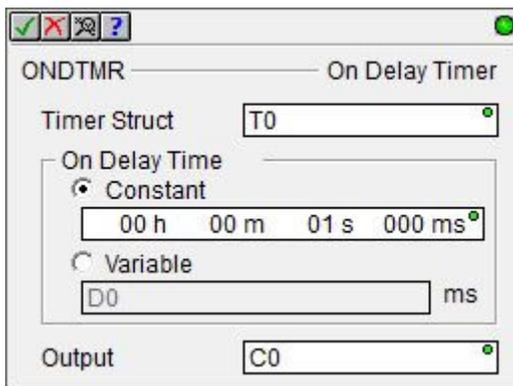


Topic: DMD0175

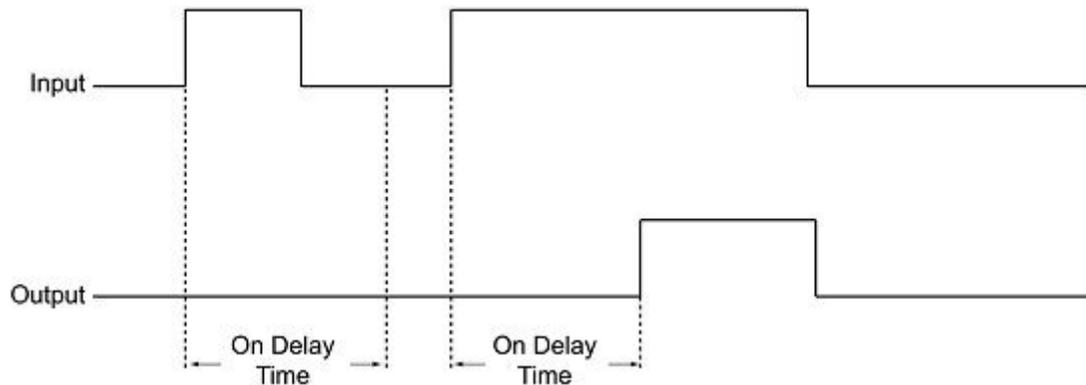


ONDTMR - On Delay Timer

The On Delay Timer (ONDTMR) has one ladder logic input leg which enables and resets the Timer. This Timer "delays turning on", that is, once the input logic turns ON, the Timer will delay turning ON the specified Output by the Timer's On Delay Time value.



If the input logic is ON, the Timer will begin timing, when the input logic is OFF, the Timer will reset, the Timer's accumulator value will return to 0, and the Output will go OFF. If the input logic goes OFF before the Timer preset is reached the output will remain OFF. On Delay Timer timing diagram:



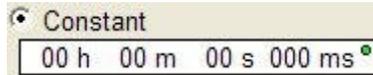
Parameters:

Note: Use the F9 key (Element Browser) or Down-Arrow key (Auto-Complete) at any time to see a complete list of the memory locations that are valid in the current field of the instruction.

Timer Struct - specifies a unique Timer structure that will be used by this instruction.

On Delay Time - is the amount of time after which you want the specified Output to go ON. The On Delay Timer has a resolution of 1 millisecond. The maximum value for a Timer Preset is 2,147,483,647 milliseconds. The On Delay Time value can be specified in one of two ways:

Constant - specified using the Time format (HH : MM : SS : mmm).



The maximum Time value in this form is 569 hours, 31 minutes, 23 seconds, and 647 milliseconds. If needed, the value entered for the On Delay Time will be normalized to it's standard value. For example, if you entered a value of 97 Seconds, that value will be converted and displayed as 1 Minute and 37 Seconds.

When editing the Constant Preset value, the following keystrokes are available to make entering the value easier and faster:

- **h** - takes you to the Hours field
- **m** - takes you to the Minutes field
- **s** - takes you to the Seconds field
- **mm** - takes you to the Milliseconds field

Variable - designates a location that contains the total number of milliseconds desired for the On Delay Time. This can be any readable numeric location.



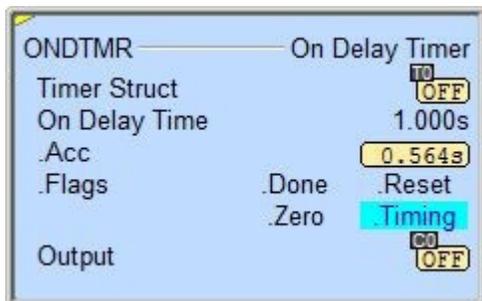
Output - designates a bit location that will be turned ON after the On Delay Time has expired. This can be any writable bit location.

Termination Scan Behavior:

If the On Delay Timer instruction is contained within a [Program](#), a [Task](#), or a [Stage](#), the Timer will automatically be reset during the termination scan of that Program, Task, or Stage.

Refer to the Help topic on [Termination Behavior](#) for detailed information on the programming elements that have termination logic.

Status Display:



The yellow triangle in the upper left corner indicates this is a [Multi-Scan](#) instruction.

The On Delay Timer instruction provides several status values that can be used elsewhere in your ladder program. Their values are updated each time the ONDTMR instruction is processed. The syntax for using them is <timer struct>.<flag name>, for example, T7.Acc.

- **.Acc** (Accumulator) - a 32-bit signed value that represents the total elapsed time since the On Delay Timer was enabled
- **.Done** - is ON any time the On Delay Timer is enabled and its accumulator value (.Acc) is greater than or equal to the On Delay Time value
- **.Reset** - is ON if the input logic is OFF, or if the Timer is being reset by an RSTT instruction
- **.Zero** - is ON any time the On Delay Timer's accumulator value (.Acc) is 0
- **.Timing** - is ON if the On Delay Timer is enabled

See Also:

- [TMR - Up Timer](#)
- [TMRDOWN - Down Timer](#)
- [TMRA - Accumulating Up Timer](#)
- [TMRADOWN - Accumulating Down Timer](#)
- [TMRAG - Global Accumulating Up Timer](#)
- [OFFDTMR - On Delay Timer](#)
- ONDTMR - On Delay Timer
- [RSTT - Reset Timer](#)

Rung Example:

