# On/Off Delay




The **On/Off Delay** node applies separate delays to the activation and deactivation of a logic signal.

When the **Input** connector changes from **0** to **1**, the node waits for the configured ON delay before sending **1** to the **Output** connector.

When **Input** changes from **1** to **0**, the node waits for the configured OFF delay before sending **0** to **Output**.

This node can be used, for example, to:

- delay the activation of a device;
- keep an output active for a specified time after the input has been deactivated;
- prevent immediate switching after a signal change;
- apply different delay times to activation and deactivation.

## Connectors

| Connector | Direction | Data type | Description |
|---|---|---|---|
| **Input** | Input | 1 bit | Logic signal to which the ON and OFF delays are applied. |
| **Reset** | Input | 1 bit | When it receives the value **1**, it stops the current timing operation and immediately forces **Output** to **0**. |
| **Output** | Output | 1 bit | Provides the input value after the configured delay has been applied. |

The **Reset** connector takes effect when its value is **1**. Normal operation can resume when the value returns to **0**.

## Main properties

| Property | Description |
|---|---|
| **Factor for ON delay** | Defines the factor used for the delay applied when **Input** changes from **0** to **1**. |
| **Factor for OFF delay** | Defines the factor used for the delay applied when **Input** changes from **1** to **0**. |
| **Gate** | When enabled, adds the **Gate** connector, which can be used to enable or disable node processing. |

| Property | Description |
|---|---|
| **Await all inputs** | When set to **True**, the node waits until all connected inputs have received at least one value before starting the calculation. |

For the general operation of the **Gate** connector, refer to Gate connector.

# Operation

## ON delay

When **Input** receives a rising edge, therefore changing from **0** to **1**:

1. the node starts the ON delay;
2. during the delay, **Output** maintains its previous value;
3. when the delay expires, **Output** changes to **1**.

## OFF delay

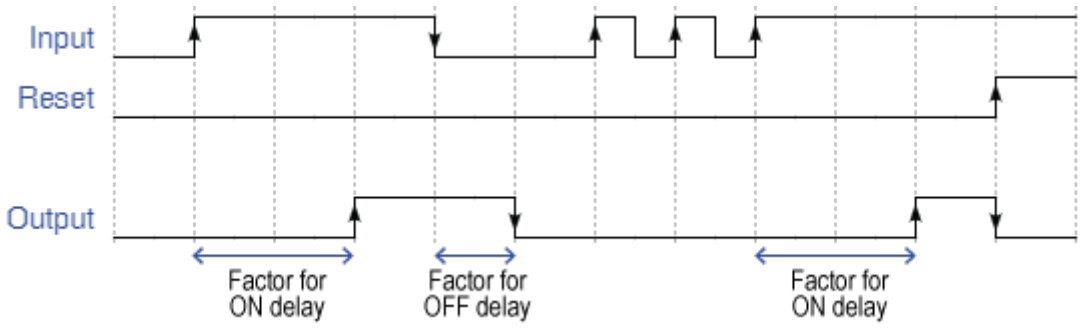
When **Input** receives a falling edge, therefore changing from **1** to **0**:

1. the node starts the OFF delay;
2. during the delay, **Output** maintains its previous value;
3. when the delay expires, **Output** changes to **0**.

## Reset

When **Reset** is set to **1**:

1. any timing operation in progress is stopped;
2. the value **0** is immediately sent to **Output**;
3. the configured delays are not applied to the reset operation.




Behavior of the On/Off Delay node

# Example

Assume the following delays are configured:

- ON delay: **5 seconds**;
- OFF delay: **10 seconds**.

The node operates as follows:

| Event | State during the delay | Result |
|---|---|---|
| **Input** changes from 0 to 1 | **Output** remains at 0 for 5 seconds. | After 5 seconds, **Output** changes to 1. |
| **Input** changes from 1 to 0 | **Output** remains at 1 for 10 seconds. | After 10 seconds, **Output** changes to 0. |
| **Reset** changes to 1 | Any timing operation in progress is stopped. | **Output** immediately changes to 0. |

One possible application is the delayed control of a fan:

- the fan is activated only after the command has remained active for the configured time;
- when the command is deactivated, the fan remains active for the configured OFF delay before switching off.

# Verification through simulation

To verify the operation of the node using **Offline Simulation**:

1. Connect an input node to the **Input** connector.
2. If required, connect a second input node to the **Reset** connector.
3. Start Offline Simulation.
4. Set **Input** to **1**.
5. Verify that **Output** changes to **1** only after the ON delay.
6. Set **Input** to **0**.
7. Verify that **Output** changes to **0** only after the OFF delay.
8. While a delay is in progress, set **Reset** to **1**.
9. Verify that the timing operation is stopped and **Output** immediately changes to **0**.



During Offline Simulation, input values must be set manually. The simulation does not communicate with the KNX bus or with the real system objects.

# Configuration notes

- The ON and OFF delays can be configured independently.

- The **Reset** connector can be used to immediately return the output to the inactive state.
- Verify that the node receives an initial value on **Input** before evaluating its behavior.
- If the **Gate** connector is used, make sure that it receives a valid value; otherwise, the node may remain disabled.
- Use **Await all inputs** when processing must start only after all connected inputs have been initialized.

## Related pages

- Logic Module
- Timer nodes
- Continuous Pulse Generator
- Pulse Train Generator
- Stairwell Lighting Switch

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Last update: **2026/09/21 11:56**