TYPE 661: DELAYED OUTPUT DEVICE

General Description

This component models a "sticky" controller where the outputs are set to the input values from a user-defined previous time step. For example, the user could decide to have the outputs to another component be based on the zone temperatures from the previous hour or even from the previous day.

Detailed Description

Physical systems have time delays and non idealities inherent in them that are often not included in their simulation model representations. For example, a thermostat does not turn on a furnace immediately upon sensing a temperature below it's set point. It has an internal time constant and perhaps even some control logic that causes there to be a few seconds delay before the furnace is activated. As a second example, there is a time delay between energy being added to a real room and a thermostat sensing the temperature increase; air convection, relative location of the thermostat and heat source and other factors act to create the time delay. Since these effects are beyond the input complexity level of most models, whether they are rooms and thermostats or other system components, the end result in simulation is a less stable system than in reality. The addition of a sticky controller (delayed input device) can build back these non idealities and significantly increase the stability of a control strategy.

As parameters, Type661 takes the time delay and initial value for as many inputs as are desired. By default the component is able to store up to 50 inputs, each for as much as 25 time steps. These defaults may be changed by modifying and recompiling the Fortran source code. The initial value of each input is maintained until the appropriate time step for output is reached. At that point, the input value is released. Figure 1 graphically shows the input and output for a component that is set up to store a single input value for 5 time steps.

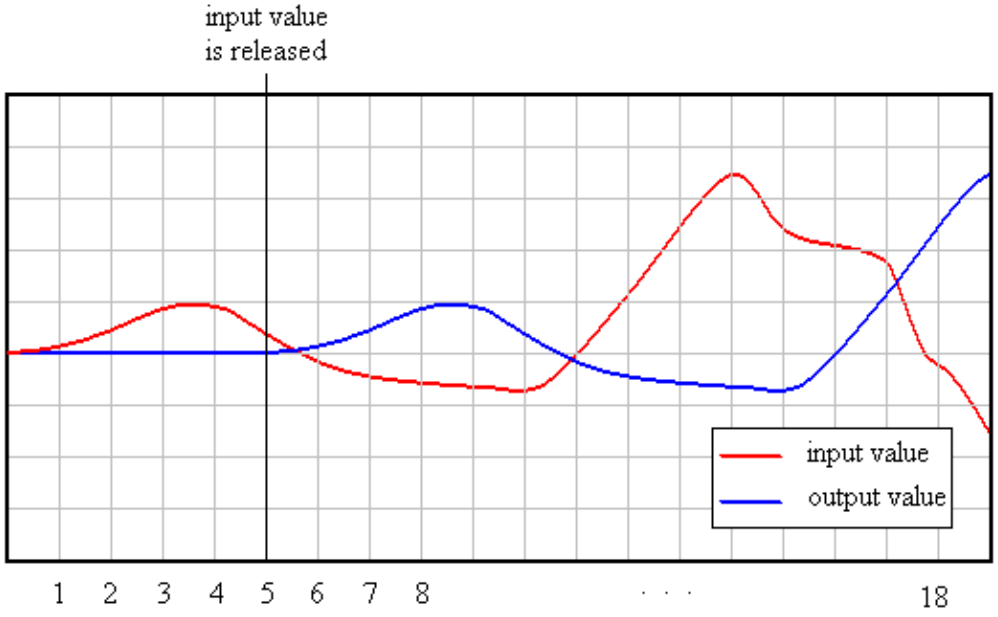


Figure 1: Input Values Held for 5 Time Steps

Example

Type661 is used in an example that can be found in:
“ ..\trnsys16\TESS Models\Studio Projects\Controllers Library\Lots of Controllers.tpf”