



# Setting Up Scope Displays in Simulink

Lecture 74, v02

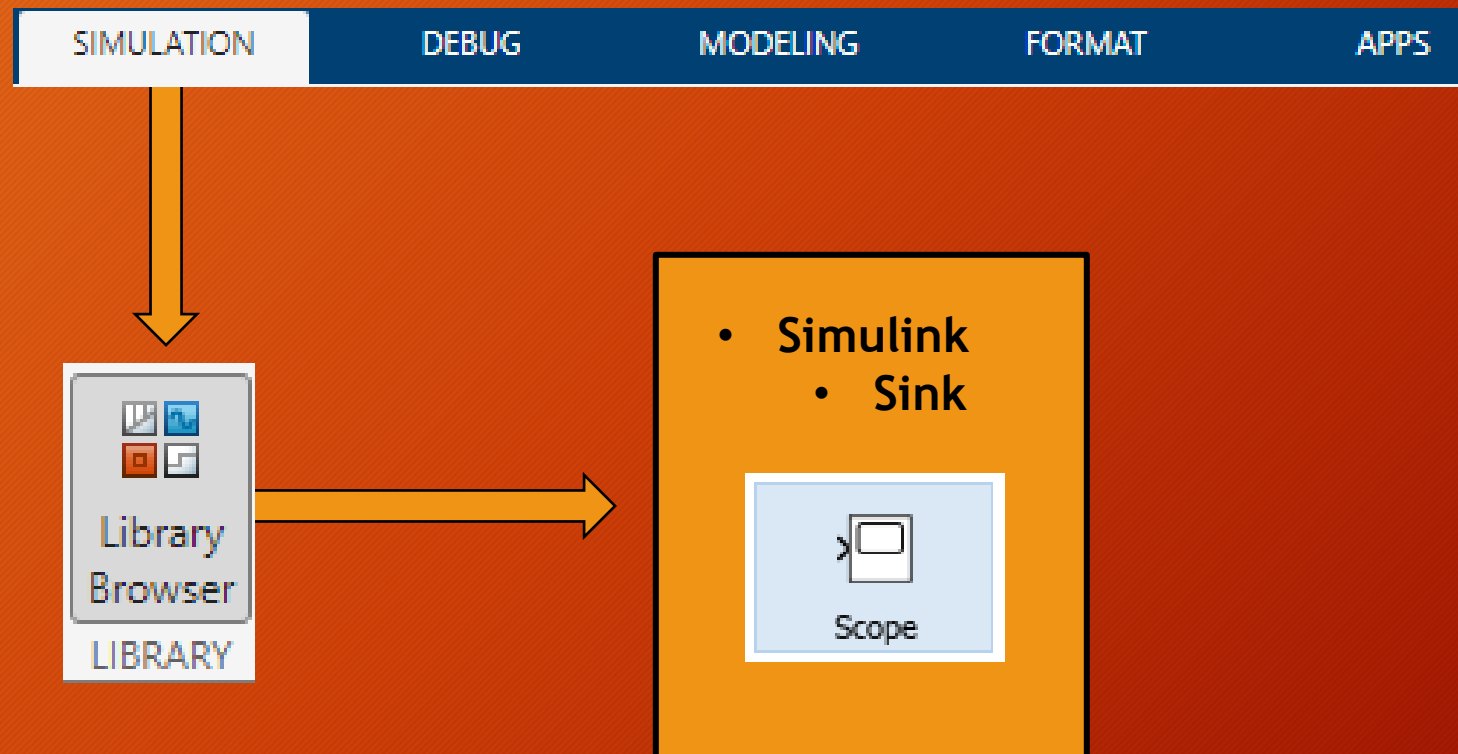
- Set Up the Simulink Scope to View Multiple Signals
- References

# Set Up the Simulink Scope to View Multiple Signals



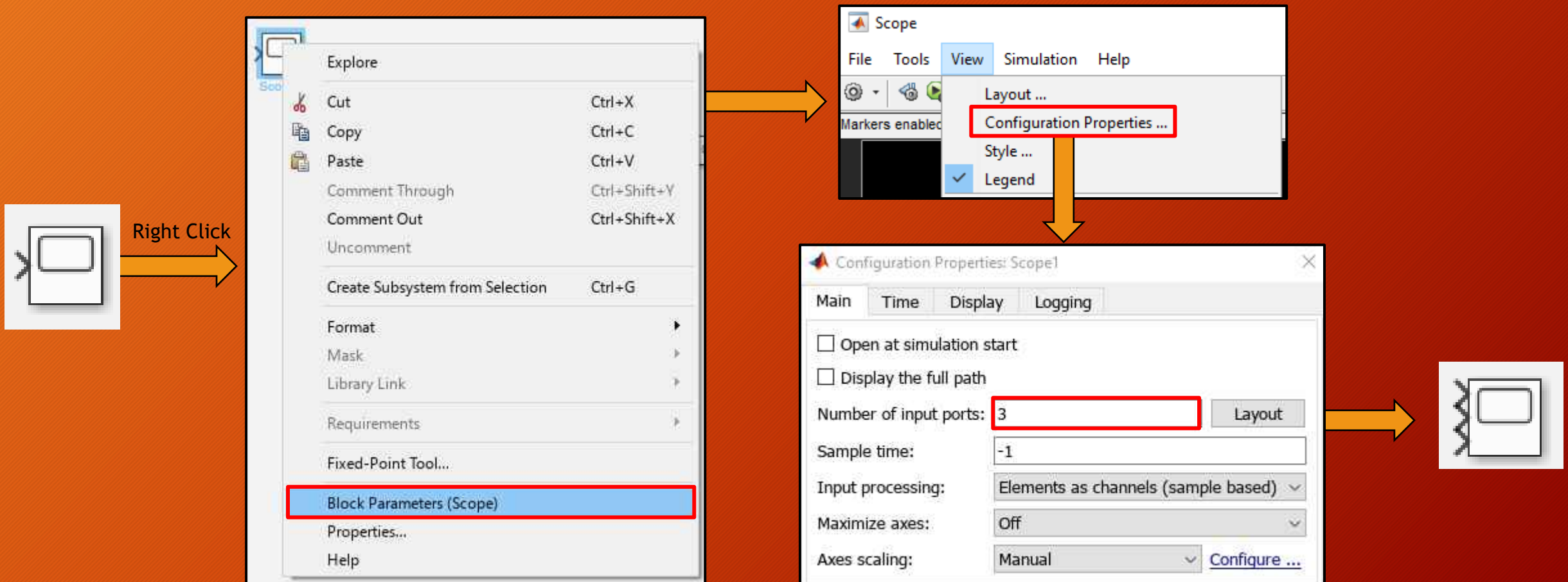
# Simulink Blocks Used in this Setup

- The blocks shown here are found in the Simulink Library Browser under the sections as indicated below



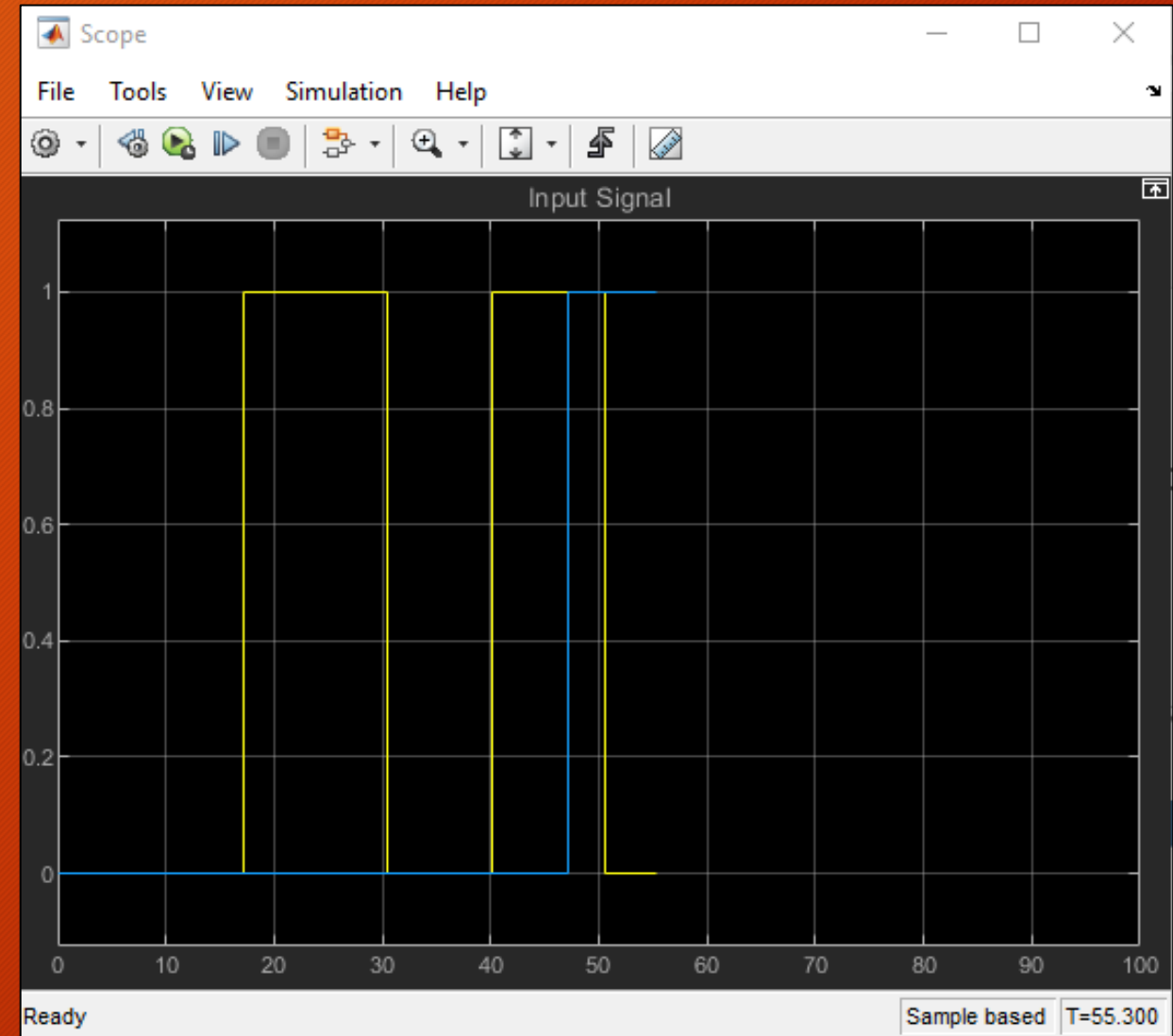
# Set Up the Scope to View Multiple Signals

- Initially, the Scope has only one signal input
- By accessing the Block Parameters, the actual Scope opens up
- Go to View -> Configuration Properties... to change the number of input ports



# Set Up the Scope to View Multiple Signals (continued)

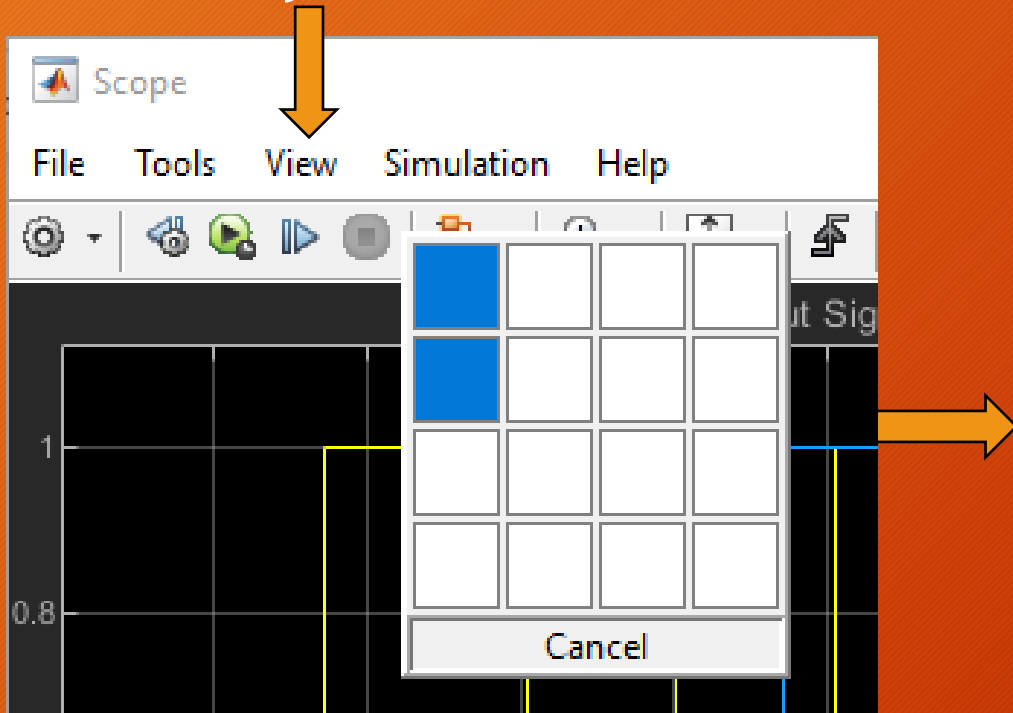
- As set up by default, the Simulink Scope overlaps signals
  - This arrangement makes it difficult to see signals overwritten by other signals
  - Which makes it difficult to clearly see relative start /stop times of multiple signals
- The solution is to break out multiple signals into their own individual traces



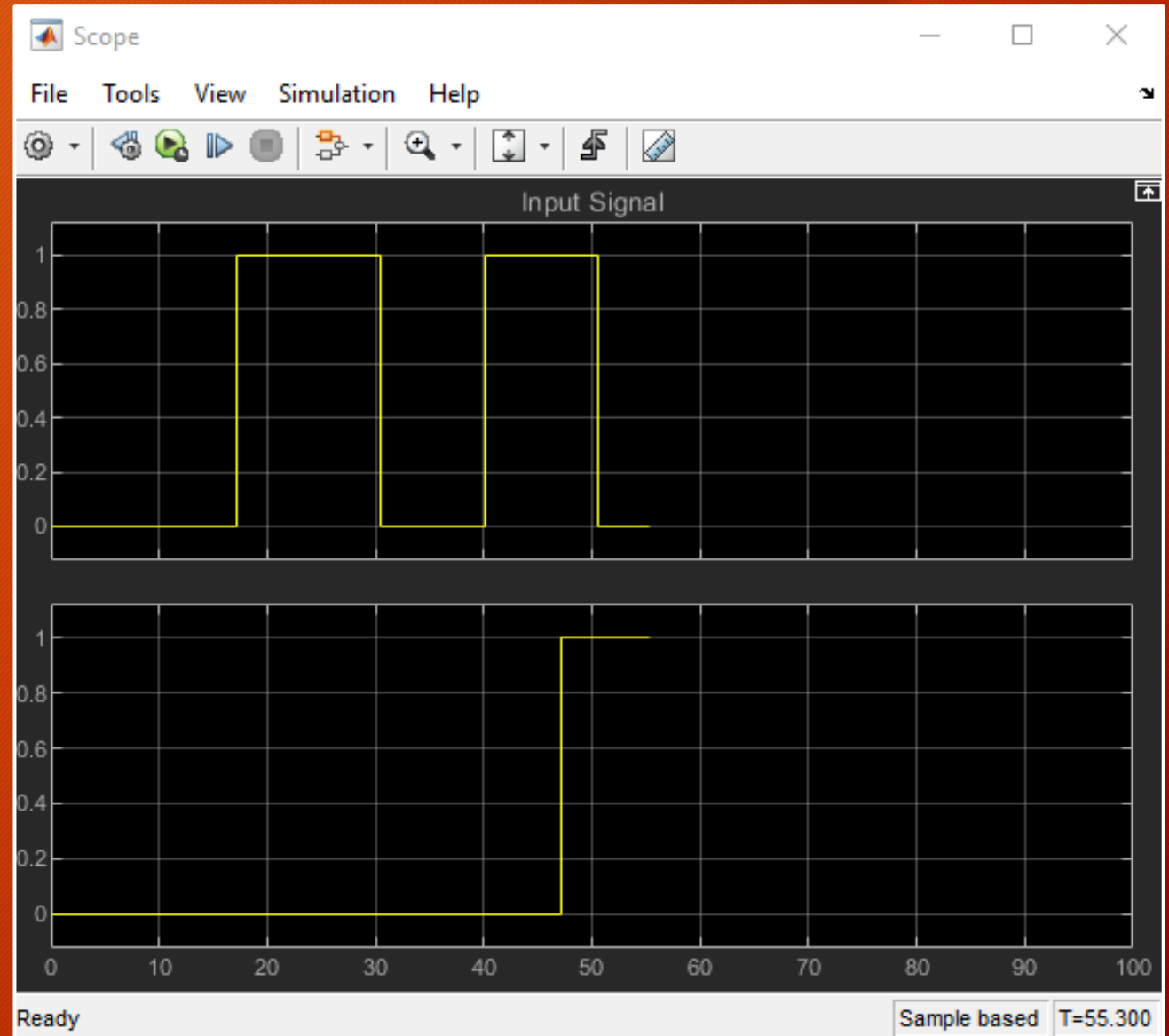


# Expand Number of Scope Traces

- To break out multiple signals into their individual traces, go to View -> Layout

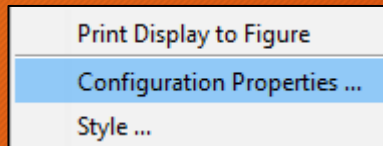


- Use the layout graphic to plot the number and layout of the individual scope traces

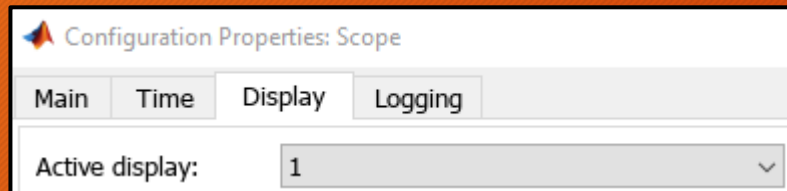


# Set Up Scope Y-Axes

- Do this to better read Boolean traces, so that the extreme limits of the y-values do not overlap the upper and lower y-value limits of the scope
- To do this, right click inside a trace in the Scope

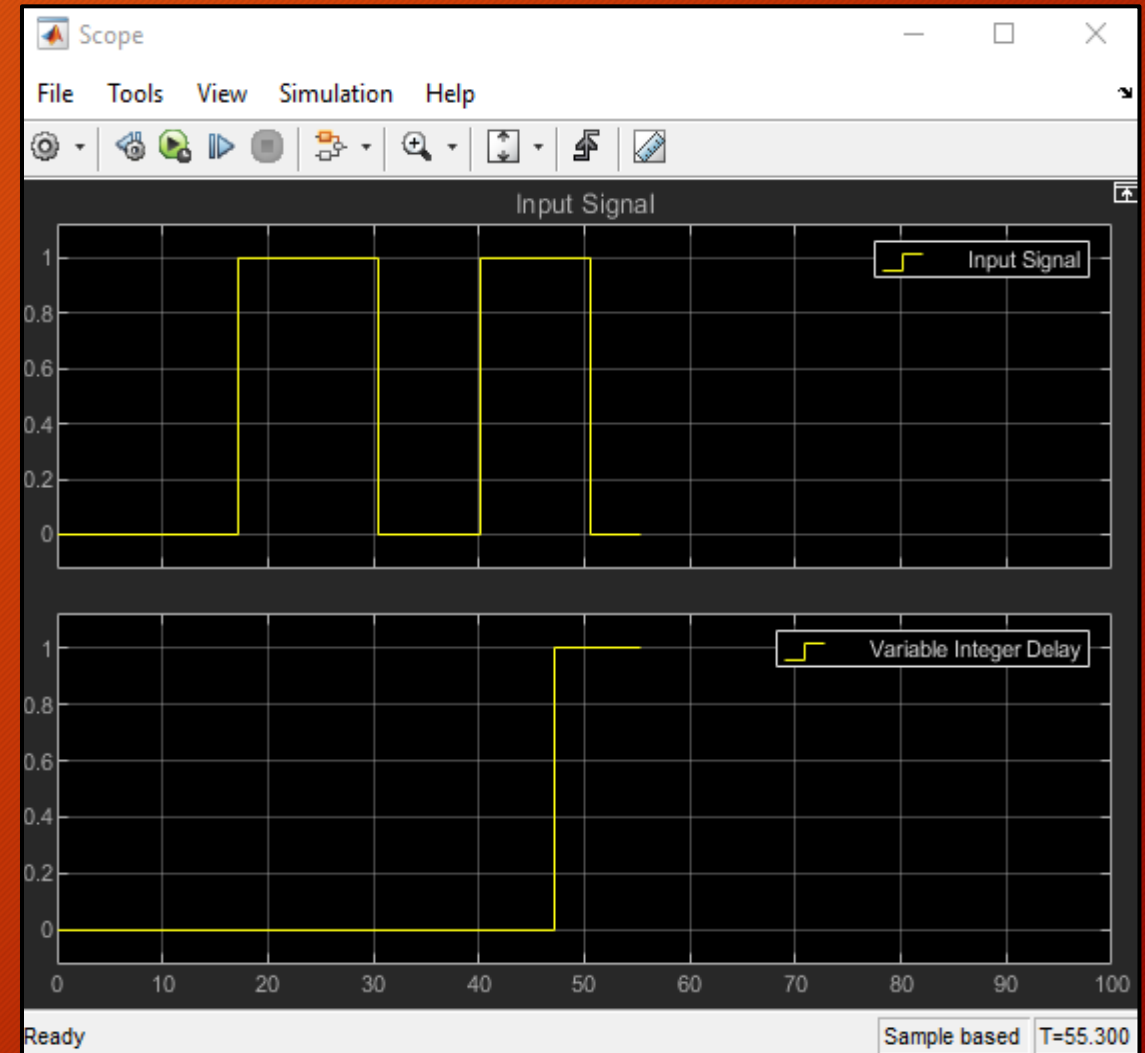


- Select the trace number you wish to set up



- Set the Y-Limits (Min) to -0.1
- Set the Y-Limits (Max) to 1.1

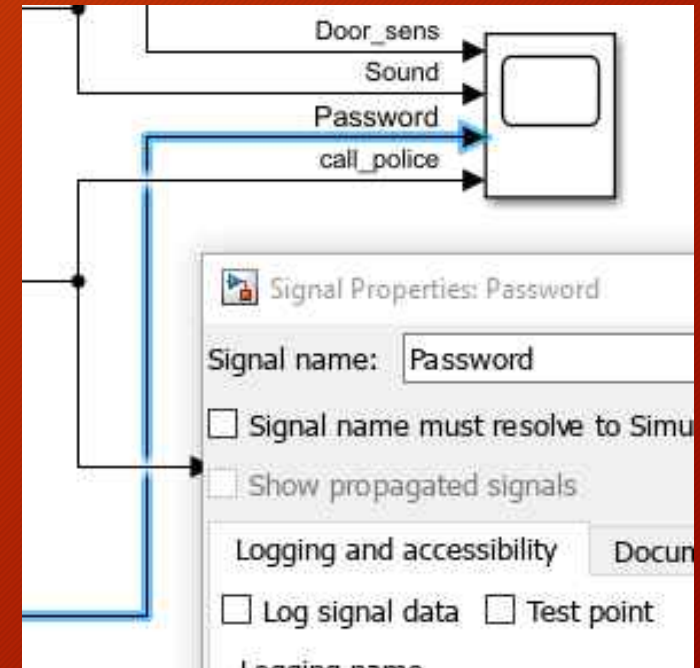
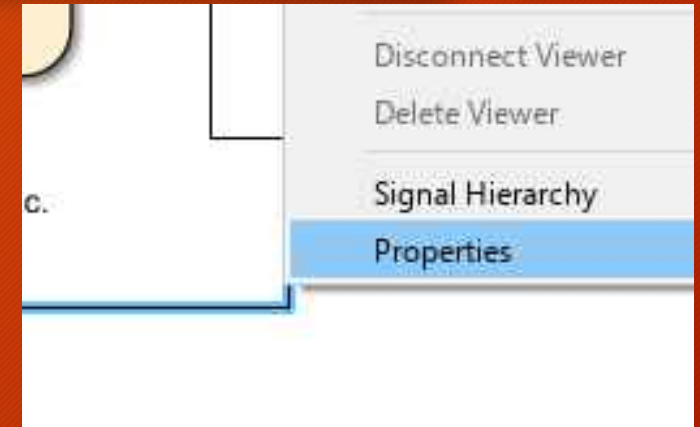
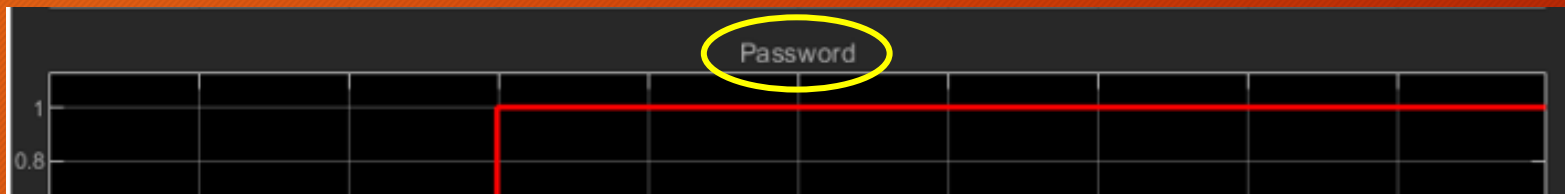
|                     |      |
|---------------------|------|
| Y-limits (Minimum): | -0.1 |
| Y-limits (Maximum): | 1.1  |





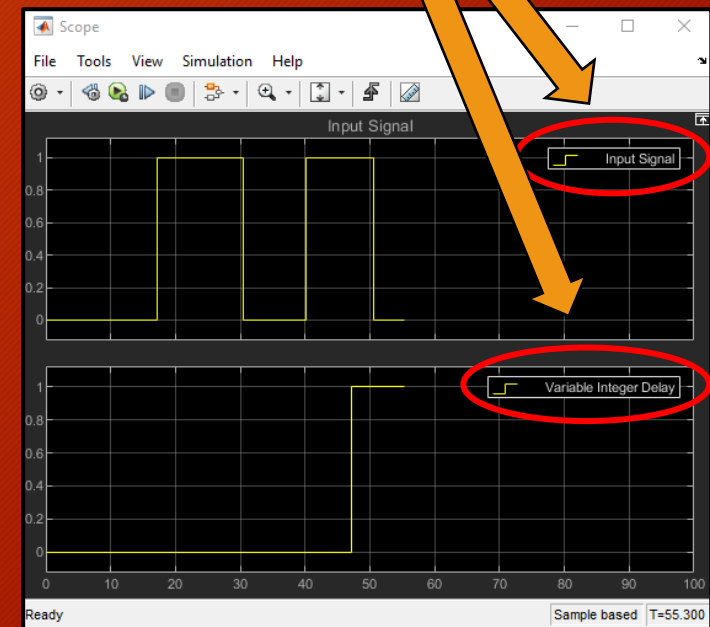
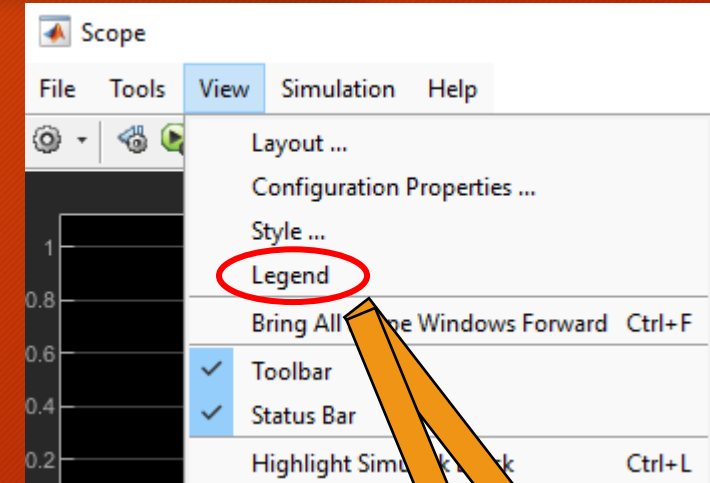
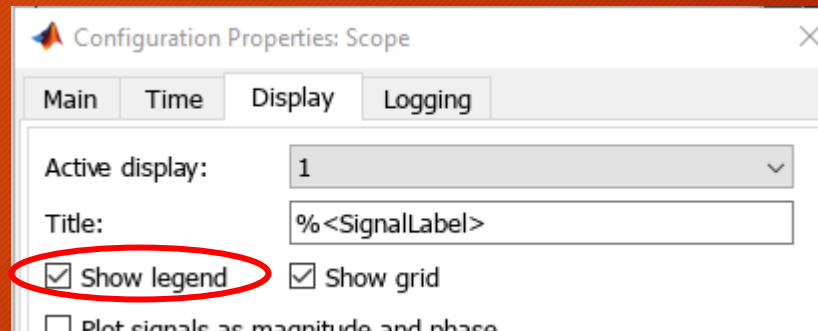
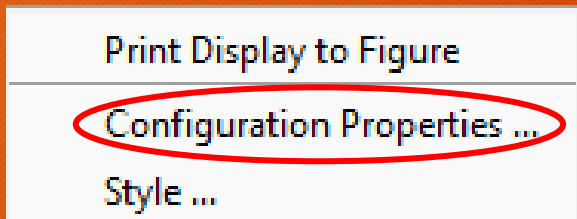
# Set up Display of Signal Name at Top of Trace

- This is my preferred method of viewing the name of the trace on the Scope
- The Scope is already set up to show the trace name at the top of the scope trace for each signal
- What is required is for the signal to have a name
- Right click on the signal connector in the Simulink Editor
- The signal connector will turn blue
- Select “Properties”
- Inside the Properties dialog, enter the signal name
- The signal name will show up on the Scope above the signal trace



# Add Legends to Better Read the Scope Output

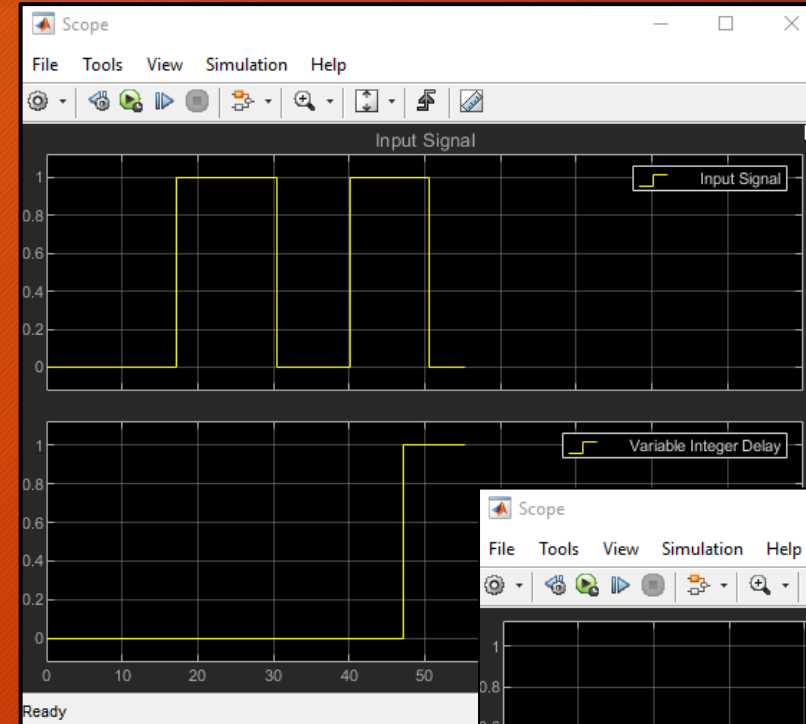
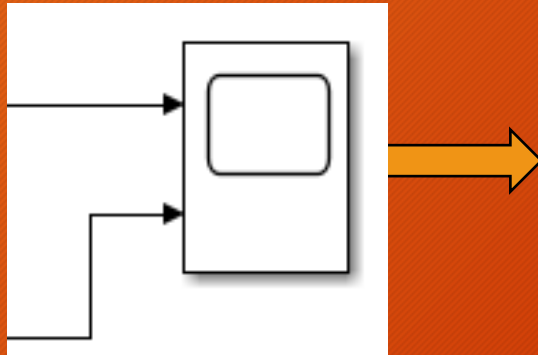
- Personally, I do not like to do this, since you can specify the signal trace name to be written above the Scope trace
- Also, at times, this legend will cover up the signal trace
- But, if you wish to also add a legend, then you can set this up in
- View -> Legend
- This will apply the legend to all traces at once
- Or you can turn off/on legends on individual traces by right clicking inside an individual trace and select Configuration Properties:



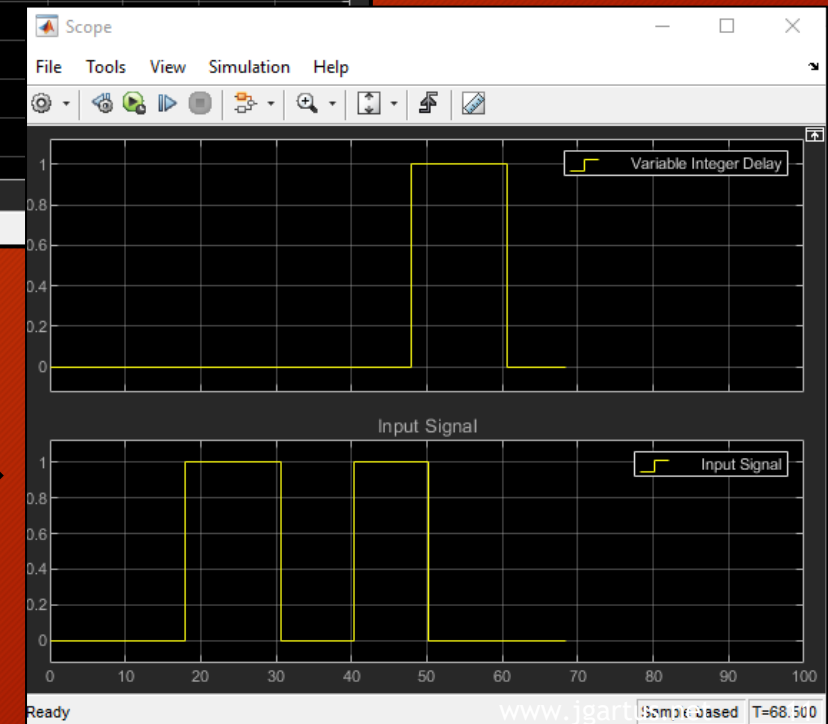
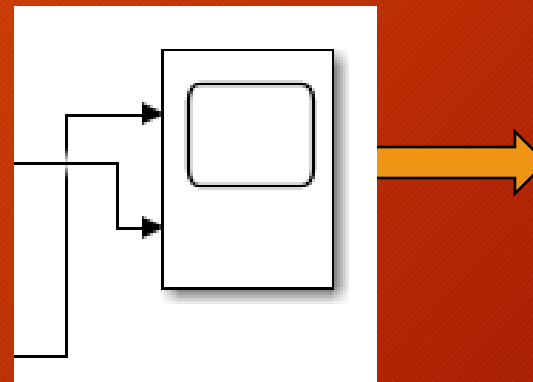


# The Order of Scope Inputs is Reflected in Traces

- Recommended order:
  - Inputs on top
  - Outputs below



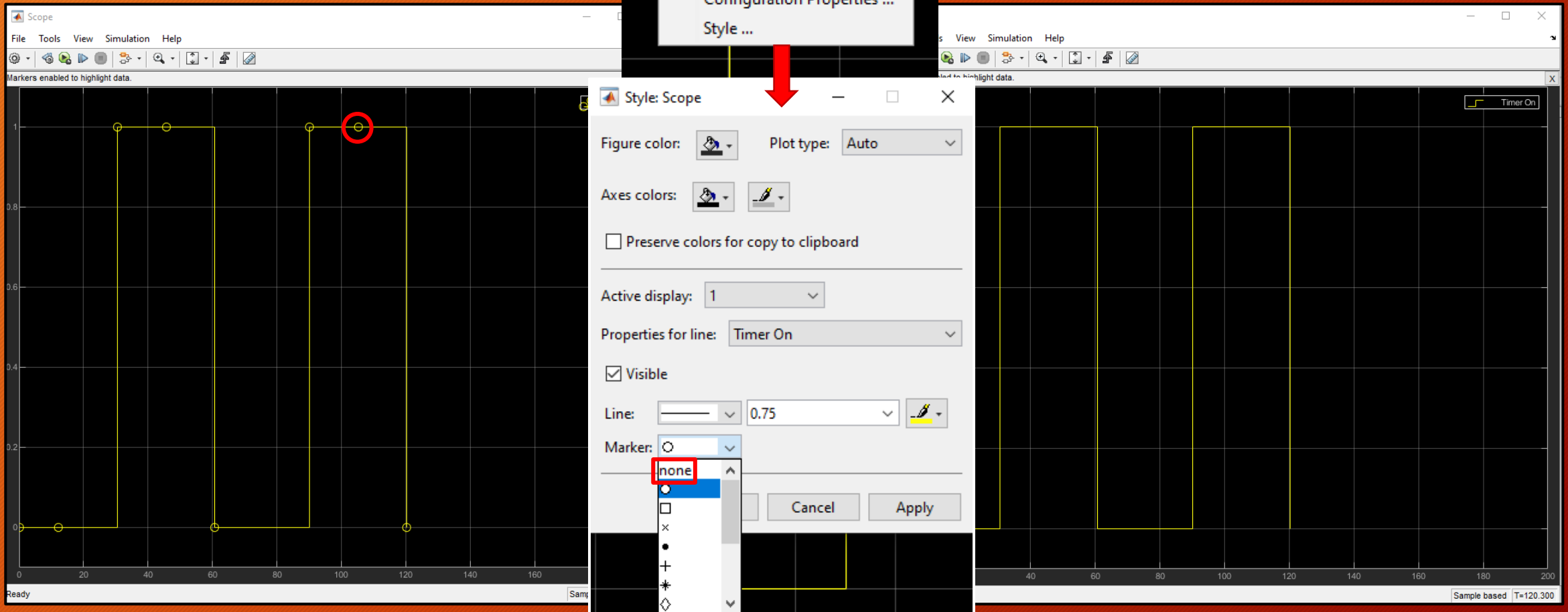
- Reversing order of inputs changes order of scope traces





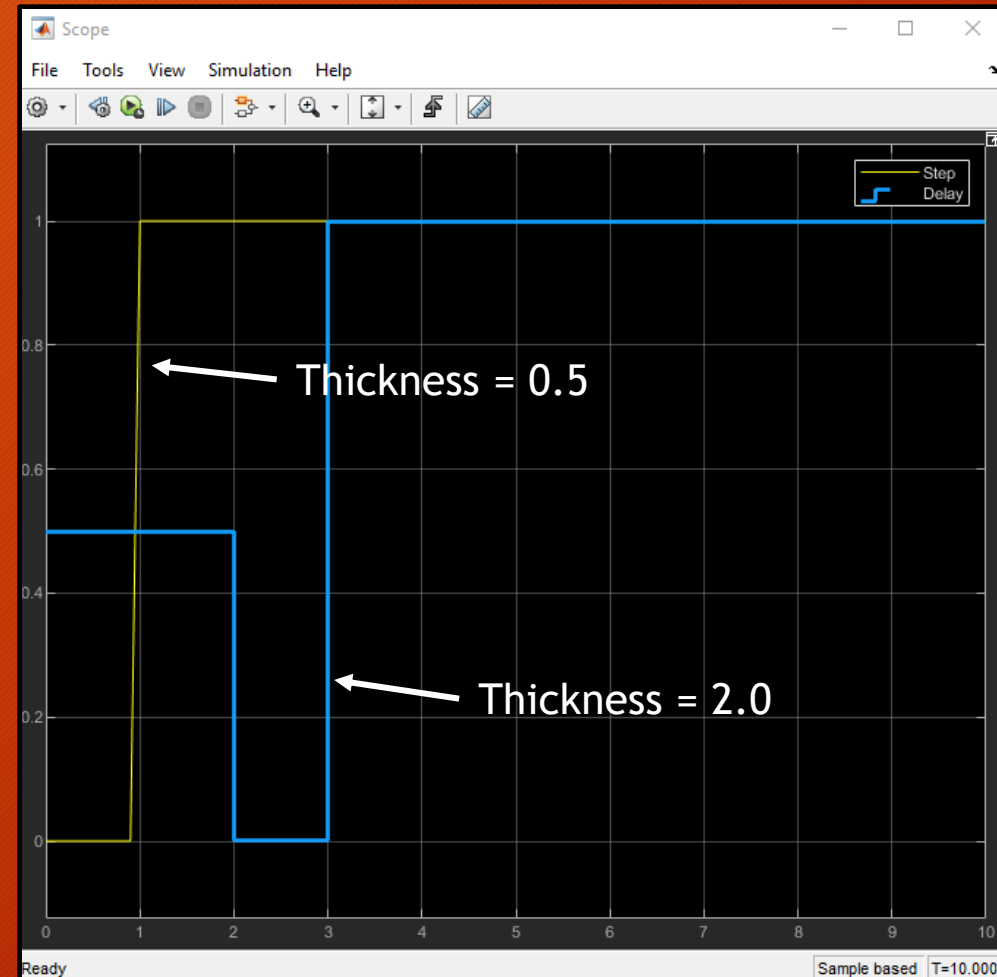
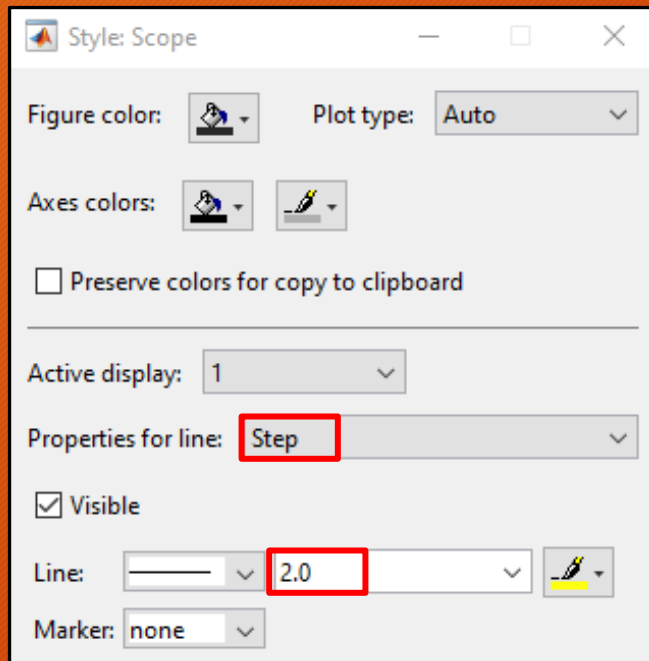
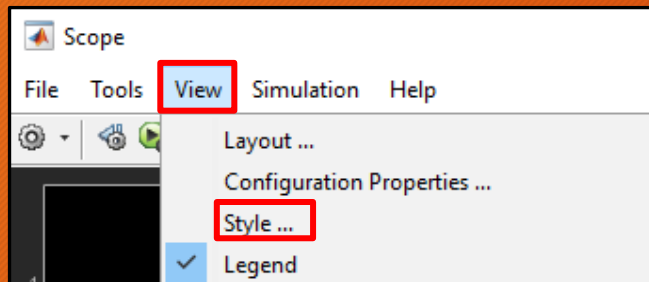
# Remove Markers on Scope Display

- Click in background of scope display
- Select “Style ...”
- Set “Marker:” to “None”



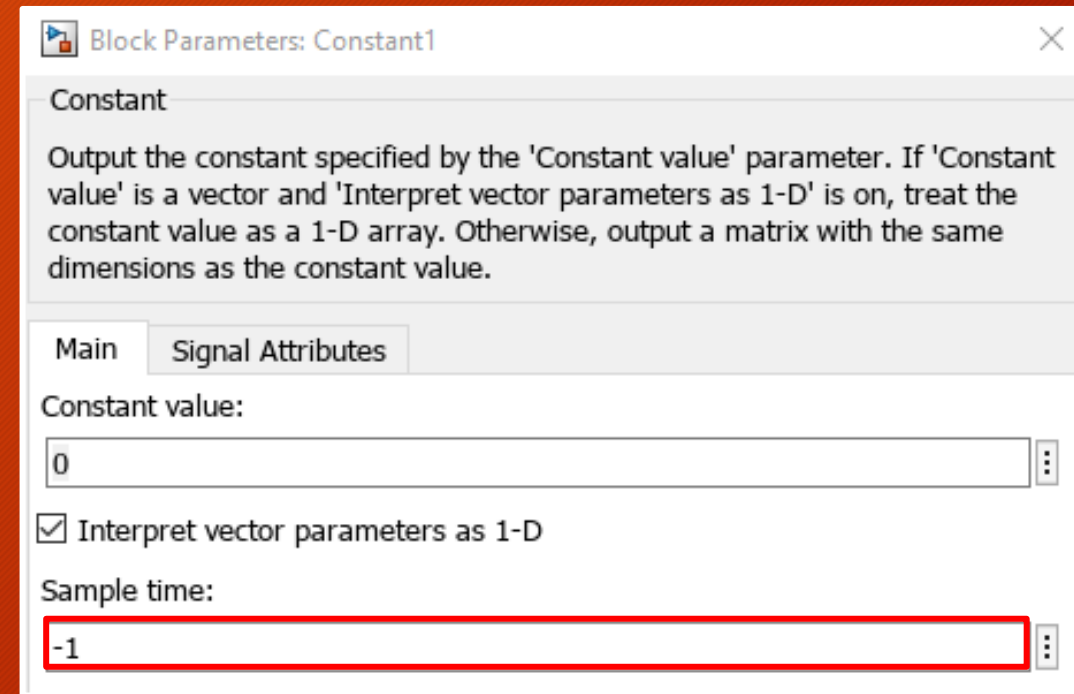
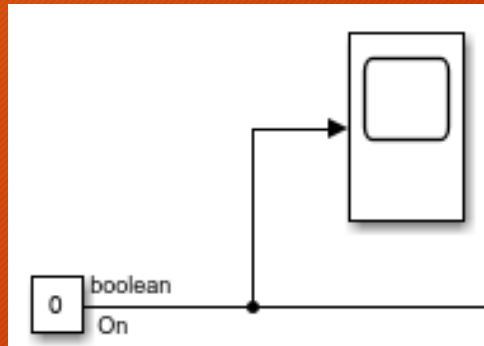
# Adjust Trace Width as Needed

- If a copy of the Scope will be reduced in size for use in documentation, it is often beneficial to widen the trace lines for easier viewing



# Scope Taking Input from Constant Block

- If your scope is taking input from a Constant Block, as shown here, be sure to make the indicated adjustment to the Constant Block to prevent the Scope from displaying strange behavior

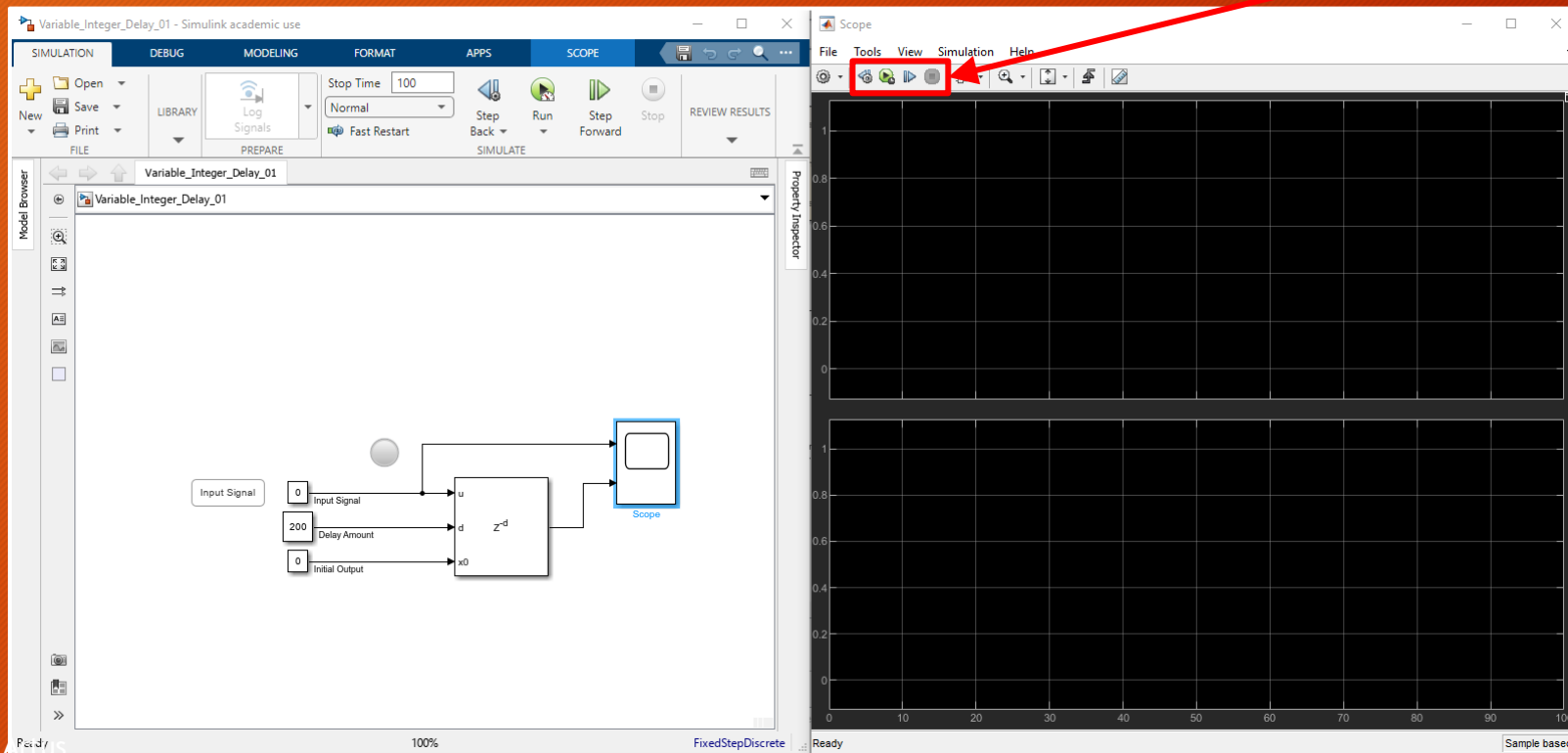


Change Sample time from “inf” to “-1”



# Use Scope Controls to Run the Simulation

- The Scope has controls that allow you to run the simulation
  - Before executing the simulation, double click on the Scope icon
  - The Scope will pop up
  - Position the scope so you can see both the Dashboard Controls and the Scope
  - Control the execution with the Scope controls (if that work for you)
  - Use Dashboard controls to control the simulation dynamically



# References

## 1. The MathWorks' User Guide for Simulink

[https://www.mathworks.com/help/pdf\\_doc/simulink/simulink\\_ug.pdf](https://www.mathworks.com/help/pdf_doc/simulink/simulink_ug.pdf)