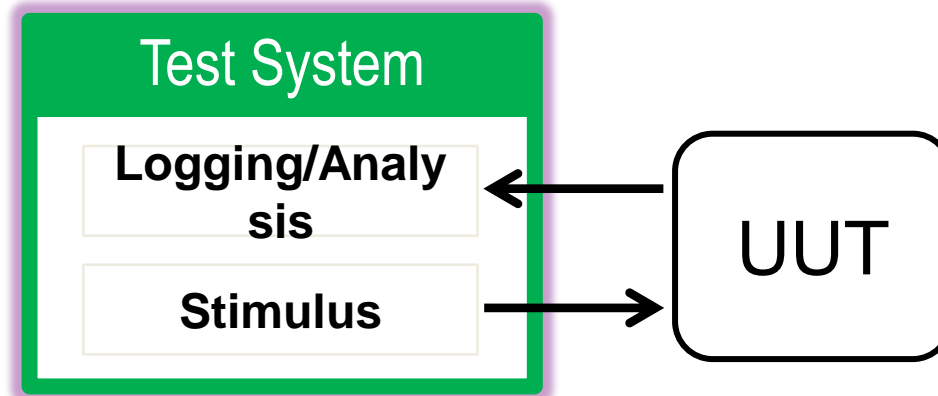


# Introduction to NI VeriStand

Real-Time Testing and Simulation Software

# What Is Real-Time Testing?



The use of a real-time environment as part of a test system to increase performance or reliability.

# Real-Time Testing Examples

Stimulus – Response Testing

Durability Testing

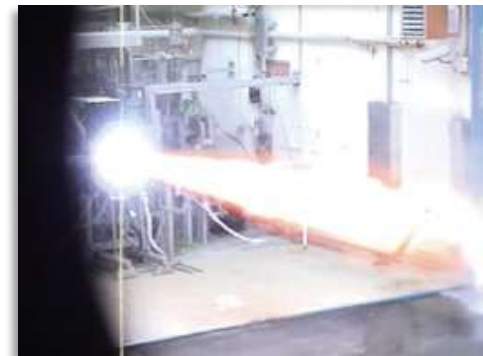
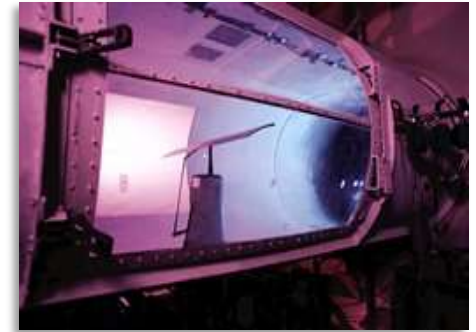
Environmental Testing

Wind Tunnel Testing

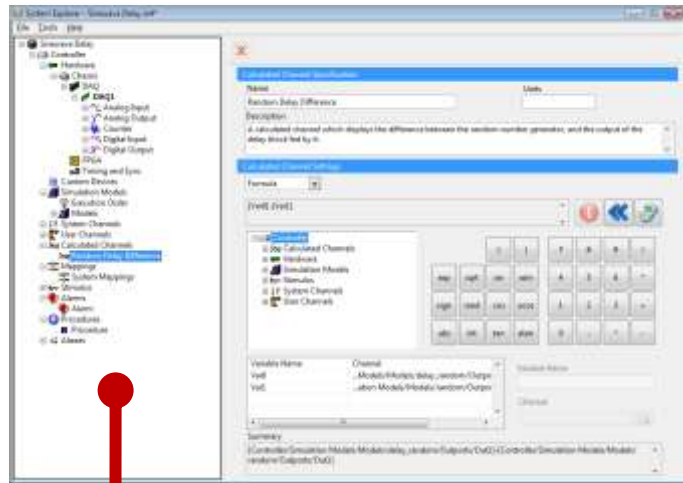
Dynamometer Testing

Hardware-in-the-Loop (HIL)  
Testing

Model-in-the-Loop (MIL) Testing



# Configure Real-Time Application System Explorer



I/O  
Calc  
Channel  
Alarms  
Controllers

Run-Time  
Editable



Create UI at Run Time

# Deploy Real-Time Stimulus/Logging Workspace

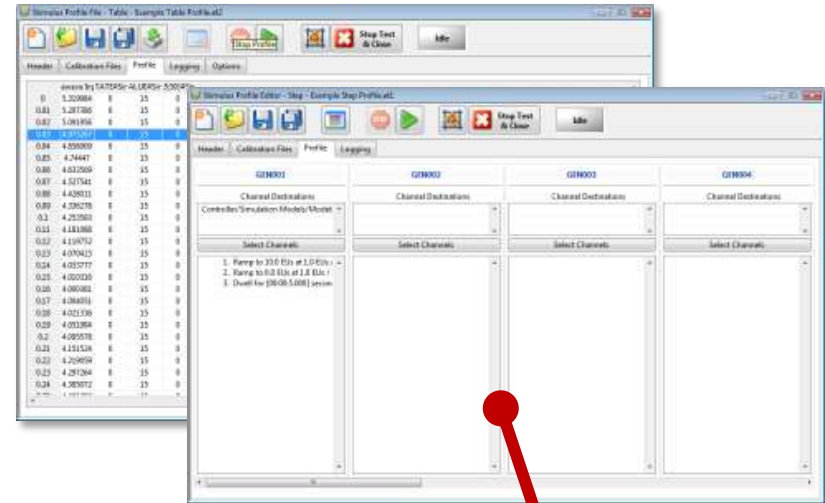
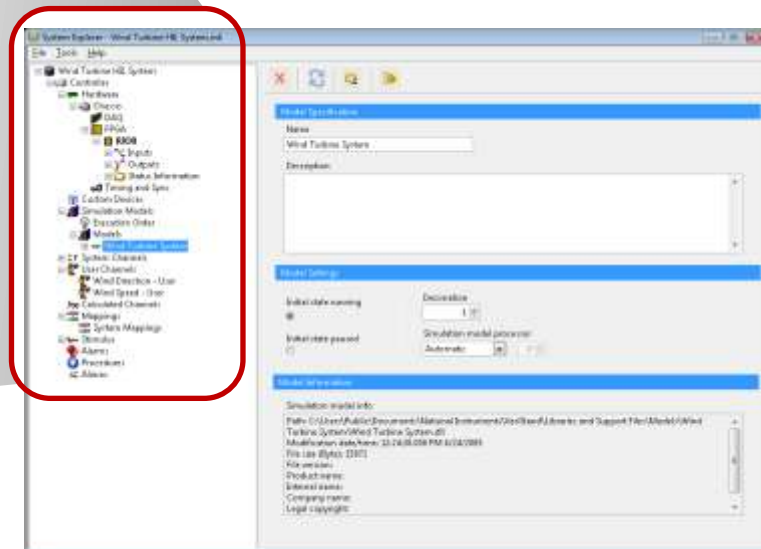
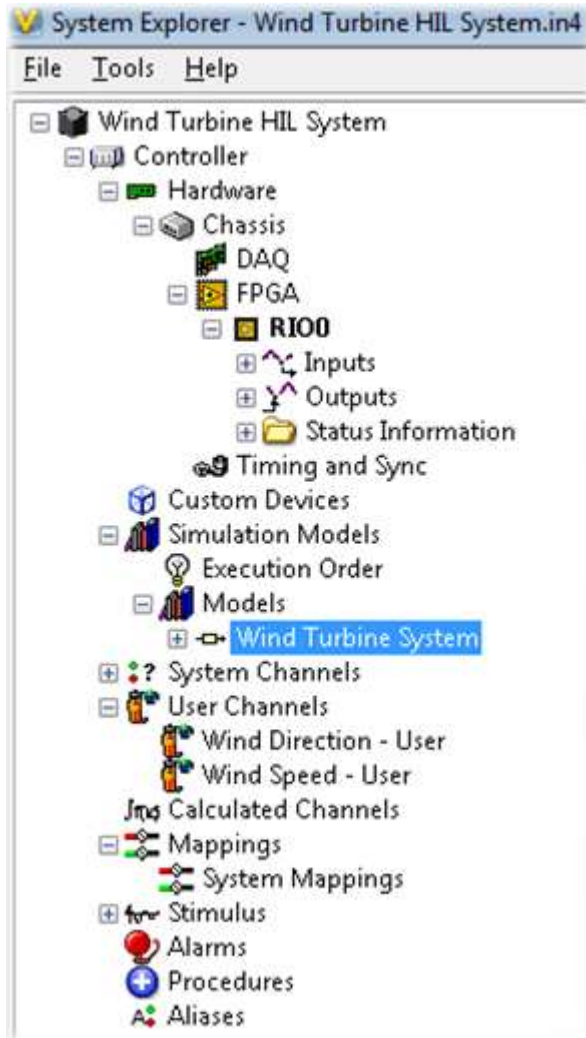


Table- and Step-Based  
Stimulus

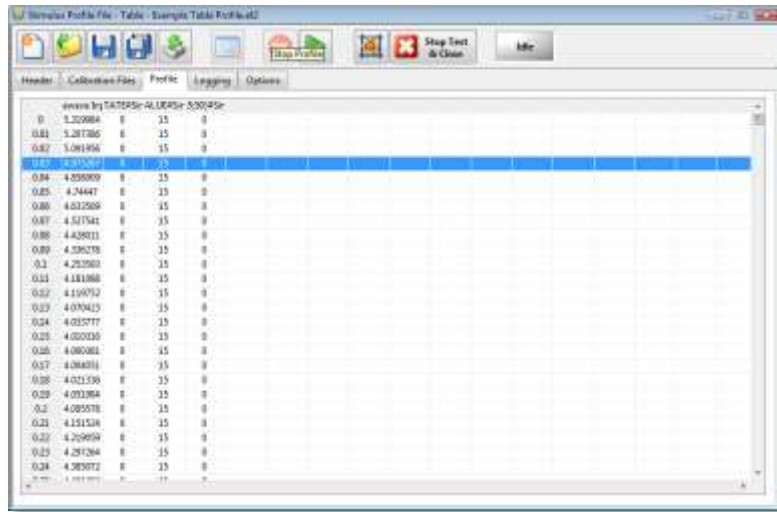
# NI VeriStand Framework

## SYSTEM EXPLORER

Engine Resources  
I/O  
Model(s)  
Calc Ch/User Ch  
Resource Mapping  
Alarms/Procedures  
Aliases

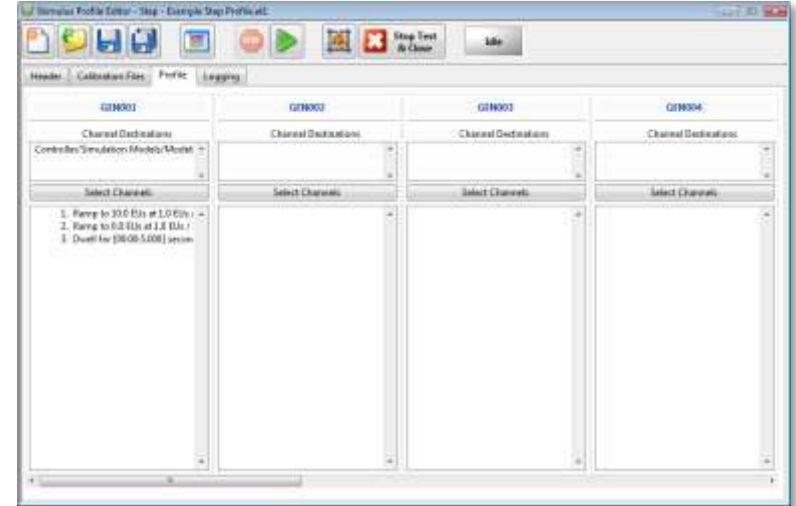


# NI VeriStand Stimulus Profiles



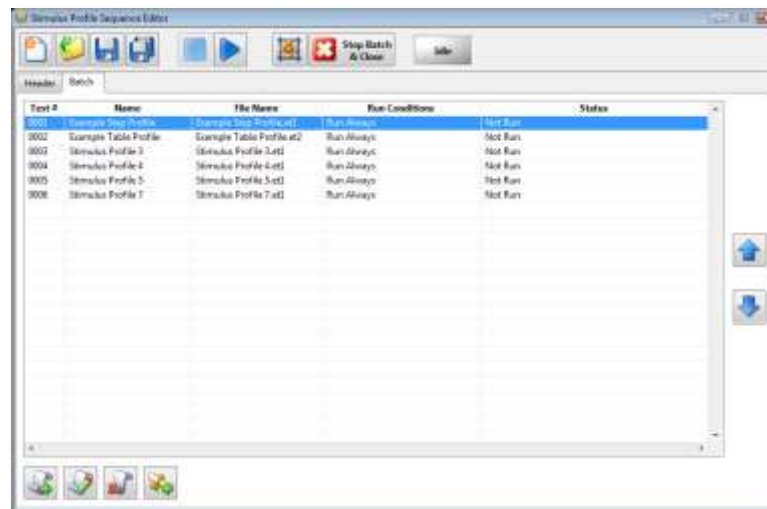
Time	Value	Units
0.00	4.329984	15
0.01	4.329984	15
0.02	4.329984	15
0.03	4.329984	15
0.04	4.329984	15
0.05	4.329984	15
0.06	4.329984	15
0.07	4.329984	15
0.08	4.329984	15
0.09	4.329984	15
0.10	4.329984	15
0.11	4.329984	15
0.12	4.329984	15
0.13	4.329984	15
0.14	4.329984	15
0.15	4.329984	15
0.16	4.329984	15
0.17	4.329984	15
0.18	4.329984	15
0.19	4.329984	15
0.20	4.329984	15
0.21	4.329984	15
0.22	4.329984	15
0.23	4.329984	15
0.24	4.329984	15
0.25	4.329984	15
0.26	4.329984	15
0.27	4.329984	15
0.28	4.329984	15
0.29	4.329984	15
0.30	4.329984	15
0.31	4.329984	15
0.32	4.329984	15
0.33	4.329984	15
0.34	4.329984	15
0.35	4.329984	15
0.36	4.329984	15
0.37	4.329984	15
0.38	4.329984	15
0.39	4.329984	15
0.40	4.329984	15
0.41	4.329984	15
0.42	4.329984	15
0.43	4.329984	15
0.44	4.329984	15
0.45	4.329984	15
0.46	4.329984	15
0.47	4.329984	15
0.48	4.329984	15
0.49	4.329984	15
0.50	4.329984	15

Table-Based Stimulus Profiles



Channel	Channel Destination	Select Channels
G1N001	Channel Destination	1. Ramp to 33.0 Hz at 1.0 Hz / s 2. Ramp to 6.0 Hz at 1.0 Hz / s 3. Dwell for [0.00-5.000] seconds
G1N002	Channel Destination	
G1N003	Channel Destination	
G1N004	Channel Destination	

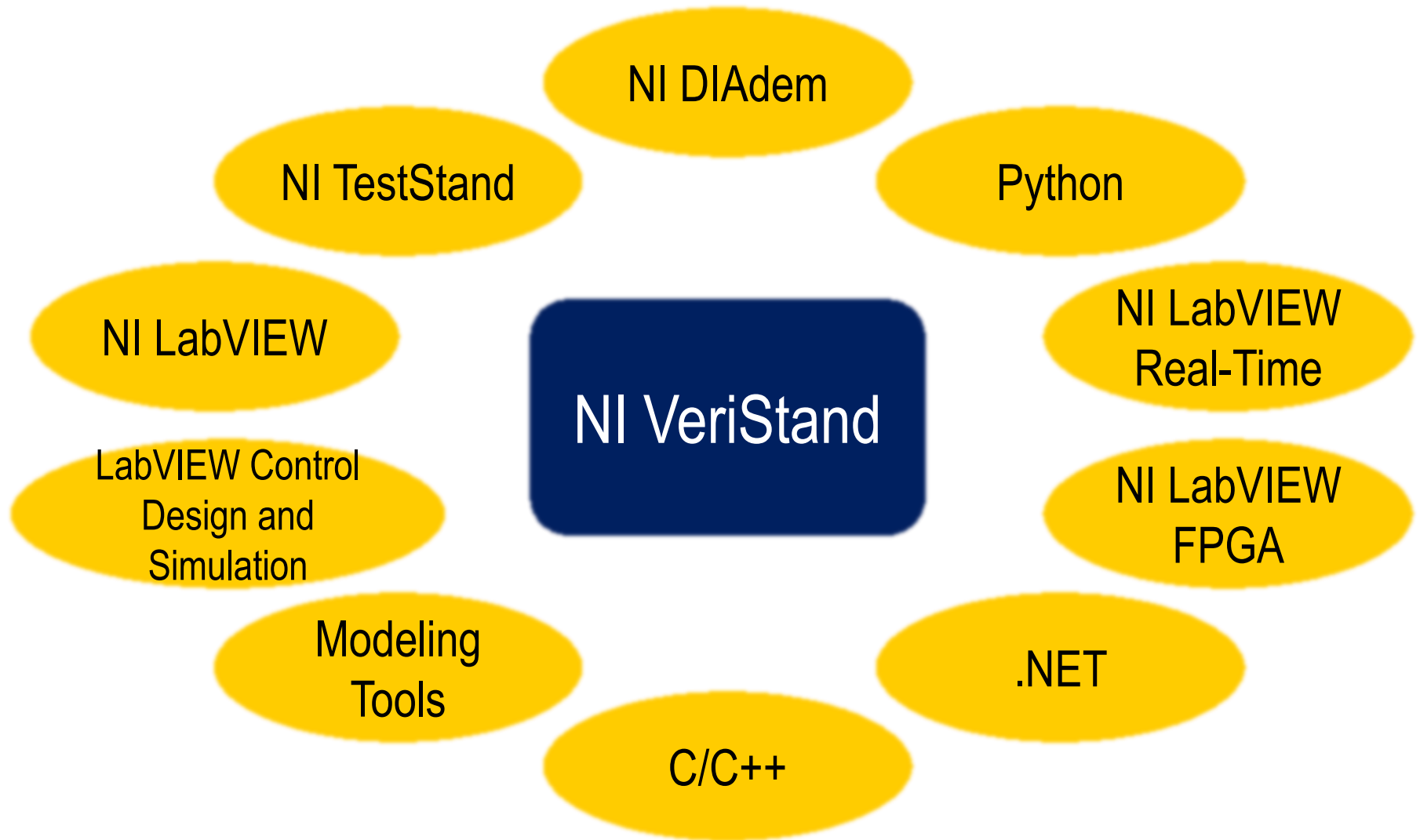
Step-Based Stimulus Profiles



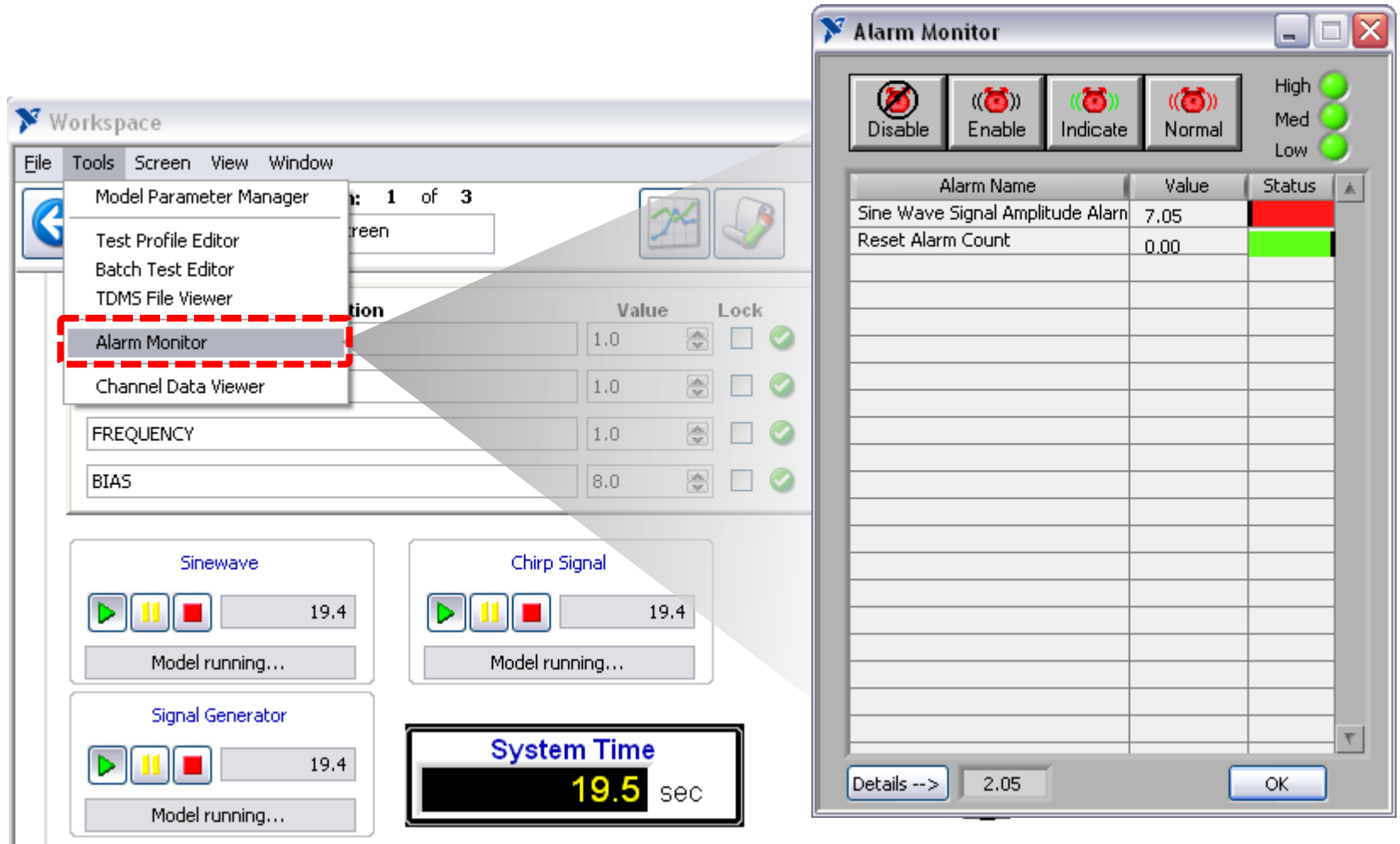
Test #	Name	File Name	Run Conditions	Status
0001	Example Step Profile	Example Step Profile.vi2	Run Always	Not Run
0002	Example Table Profile	Example Table Profile.vi2	Run Always	Not Run
0003	Stimulus Profile 3	Stimulus Profile 3.vi2	Run Always	Not Run
0004	Stimulus Profile 4	Stimulus Profile 4.vi2	Run Always	Not Run
0005	Stimulus Profile 5	Stimulus Profile 5.vi2	Run Always	Not Run
0006	Stimulus Profile 6	Stimulus Profile 6.vi2	Run Always	Not Run

Stimulus Profile Sequence

# Open Software Environment

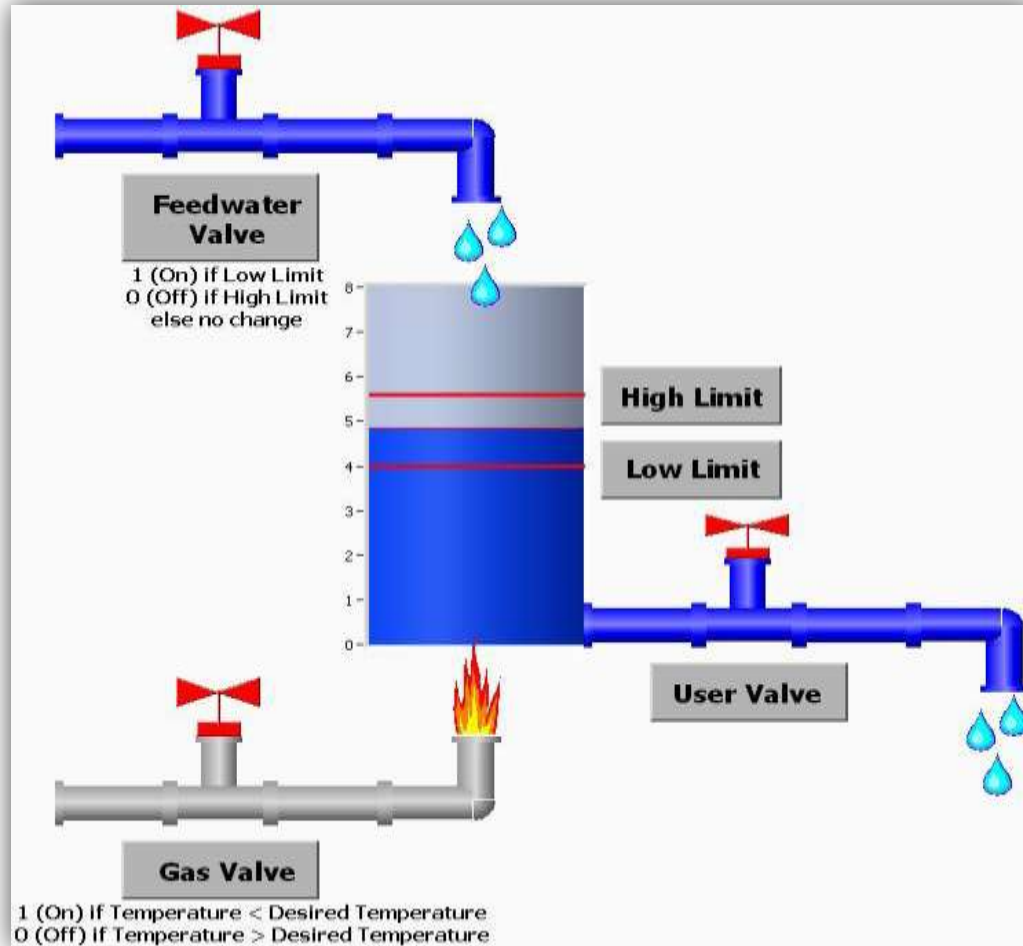


# Custom Workspace Tools





# Hot Water Heater System



- **Model = simulation of a real-world**
- **Models contain inputs and outputs**

Hot water heater simulation model:

- Maintains constant level & temp
- Opens User Valve:
  - water level < set value
  - adds **cold** water
  - temp < set value
  - signal to gas valve