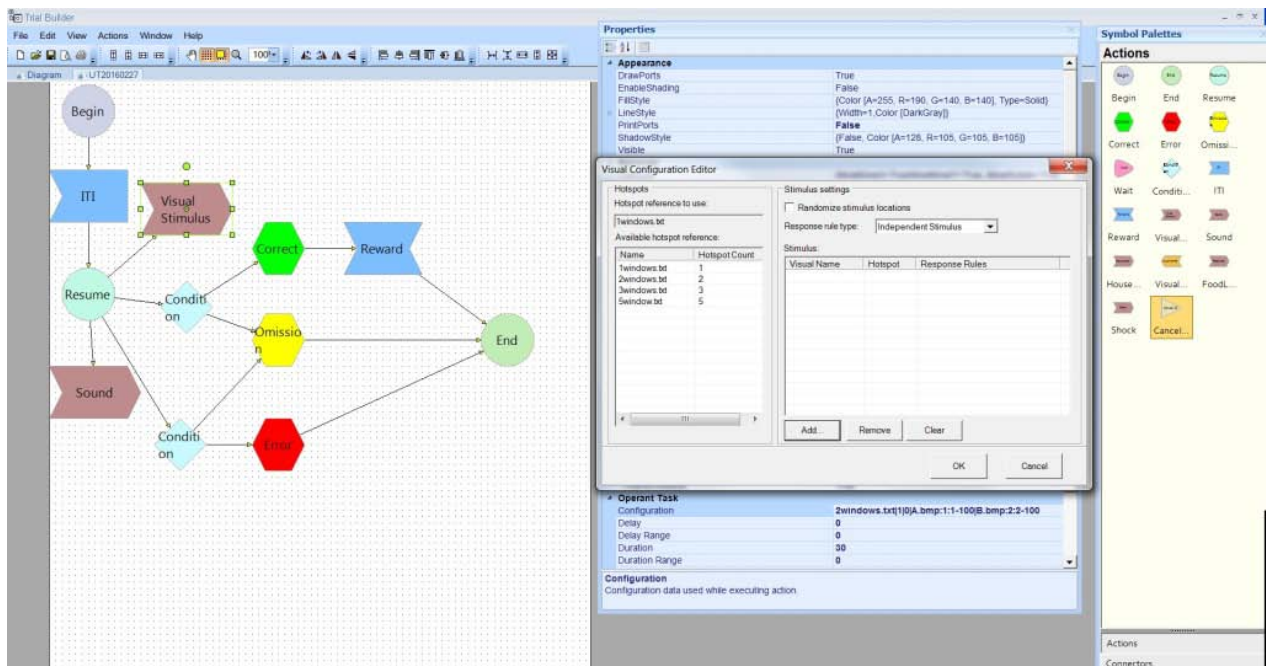


User Guide of Operant Task Studio V2

Outline of Operant Task StudioV2

You can design tasks freely by combining the hardware icon by Operant Task StudioV2. The software consists of 2 kinds of software. One is “Trial Builder” for designing tasks, and another is Operant Task Executor for executing tasks. With Trial Builder, you can design tasks by connecting icons of events. Operant Task Executor can execute tasks build by Trial Builder, and record all events.

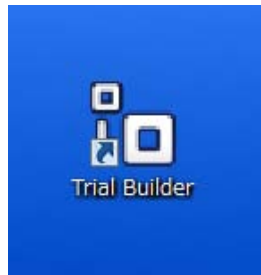


Trial Builder

Outline

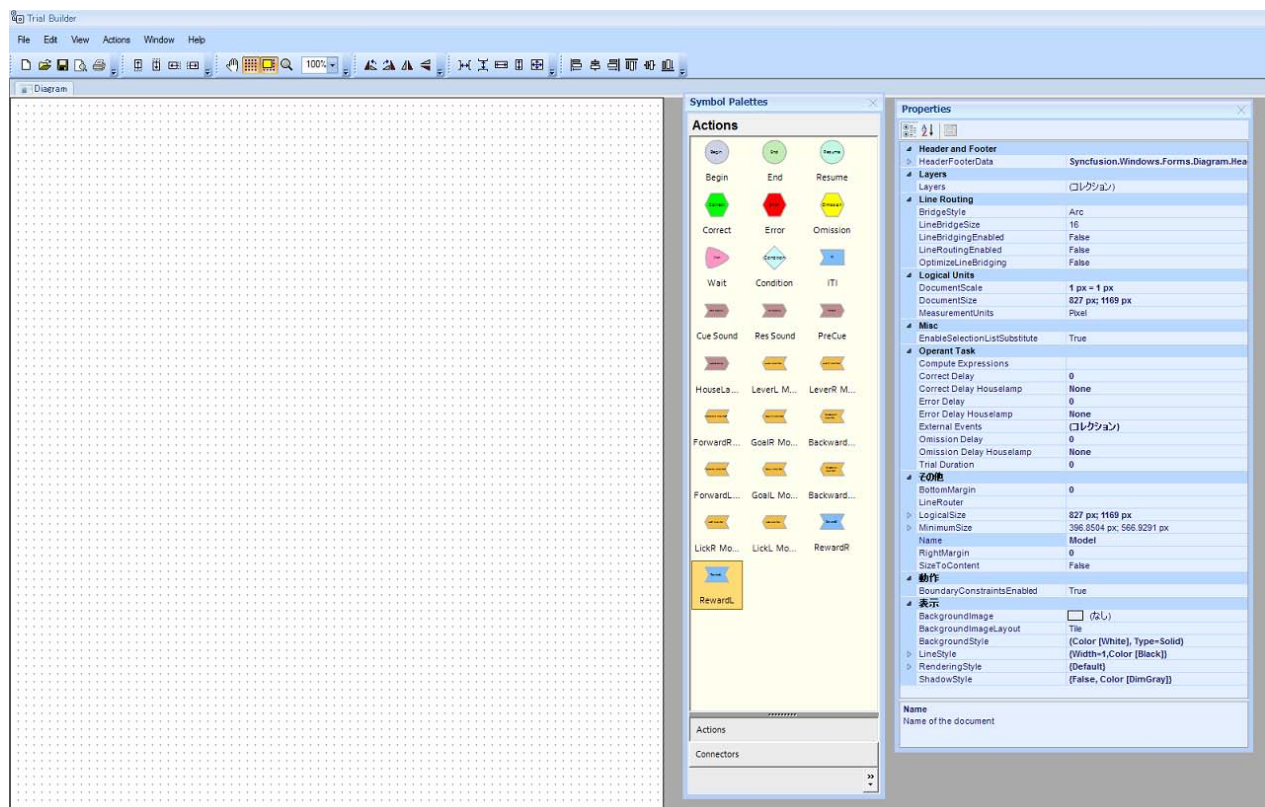
This software is for building Trial graphically by combining each Action. Design the entire trial by Flow Chart format, and set details of behavior at Property of each Action. Available Action is different between Hardware.

Start Trial Builder by clicking its icon at Desktop.

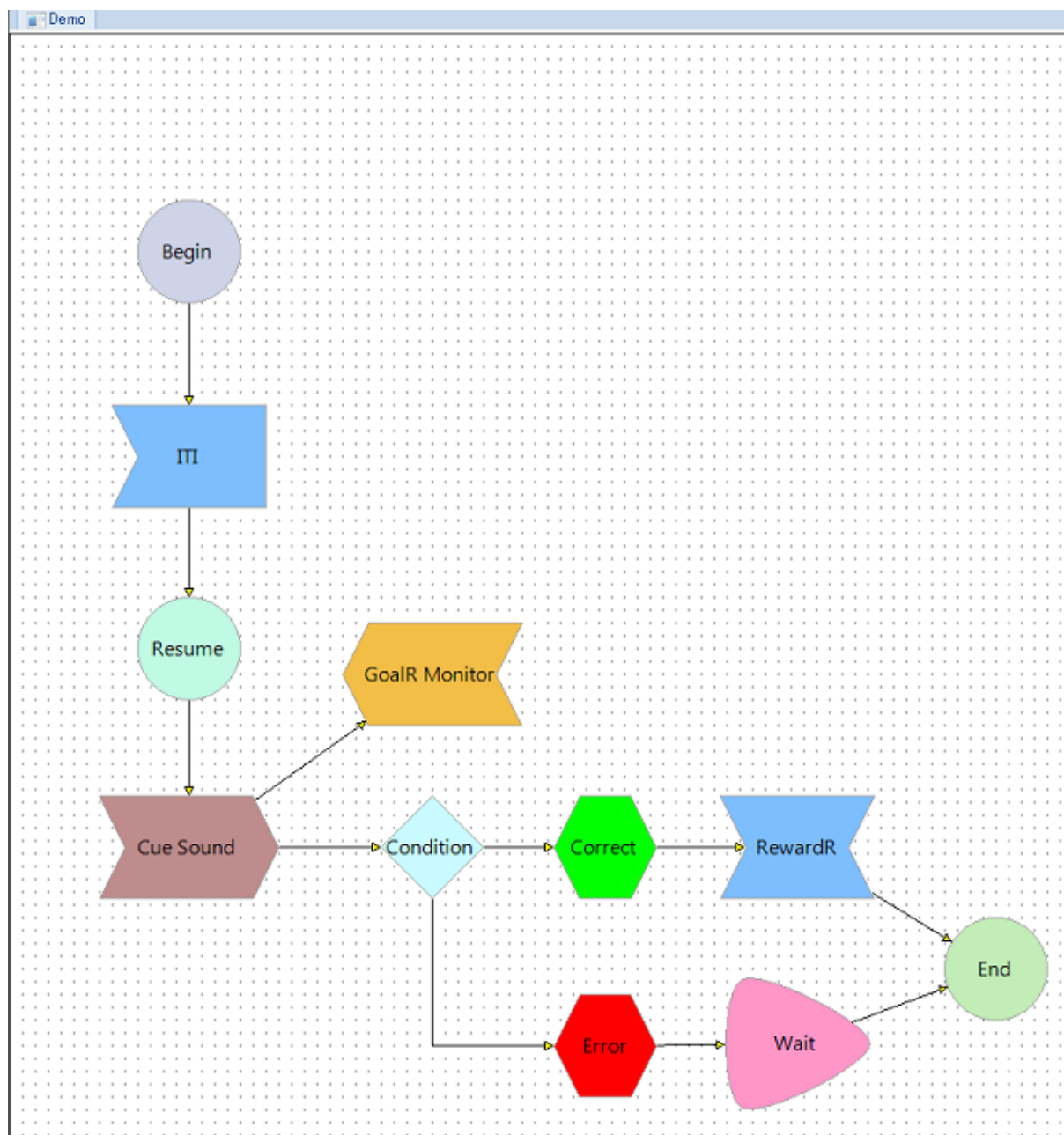


When you activate the software, the below window appears.

Arrange icons of Symbol Palettes on white pallet (Diagram) which is left side of window and design Tasks. Each icon works depending on the settings of Properties.

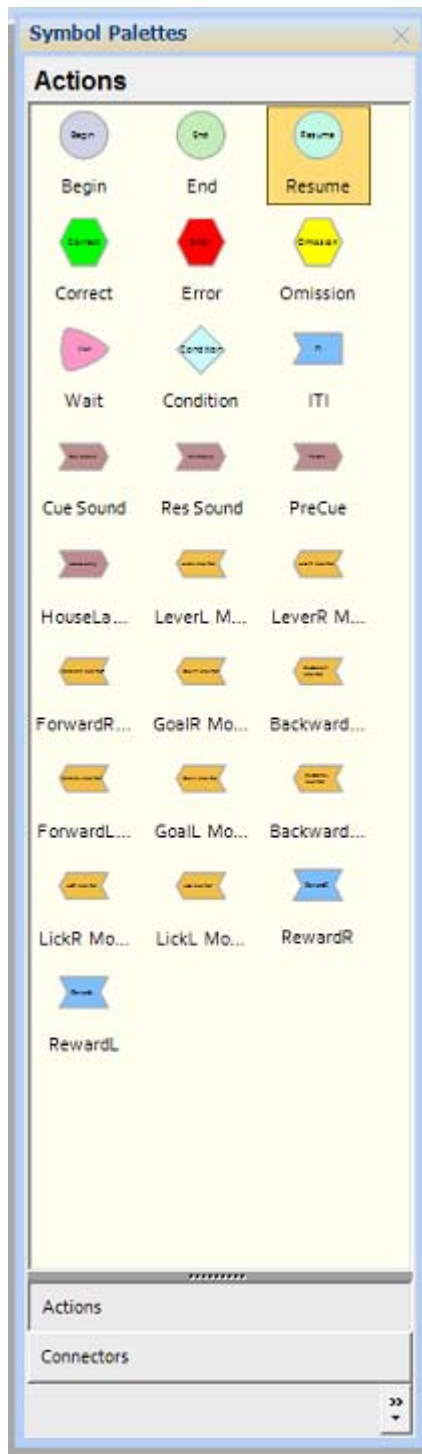


Example of Diagram

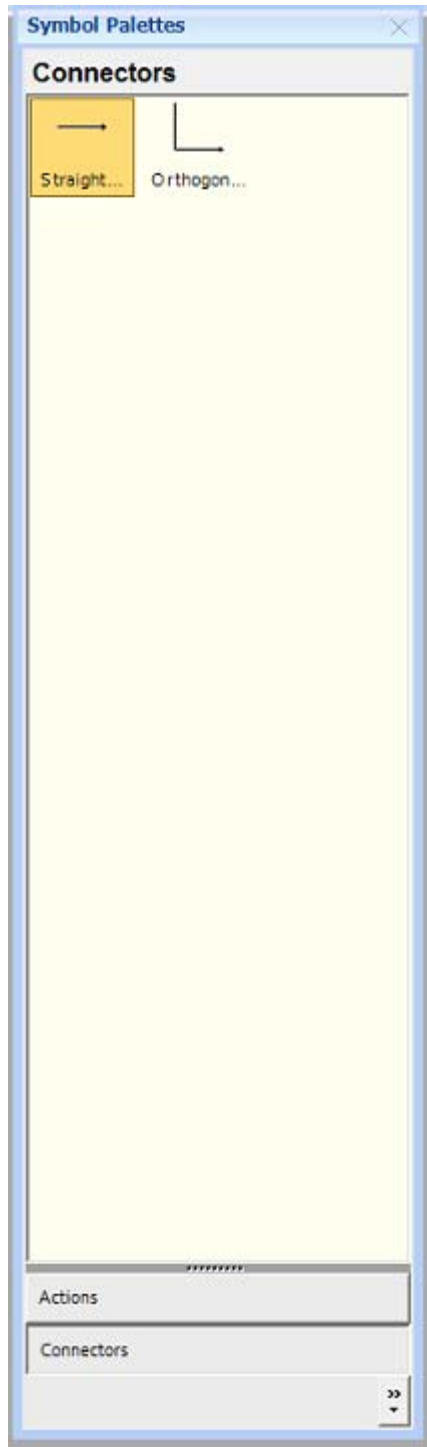


Symbol Palettes (Actions)

*Components are different depending on the hardware you use.

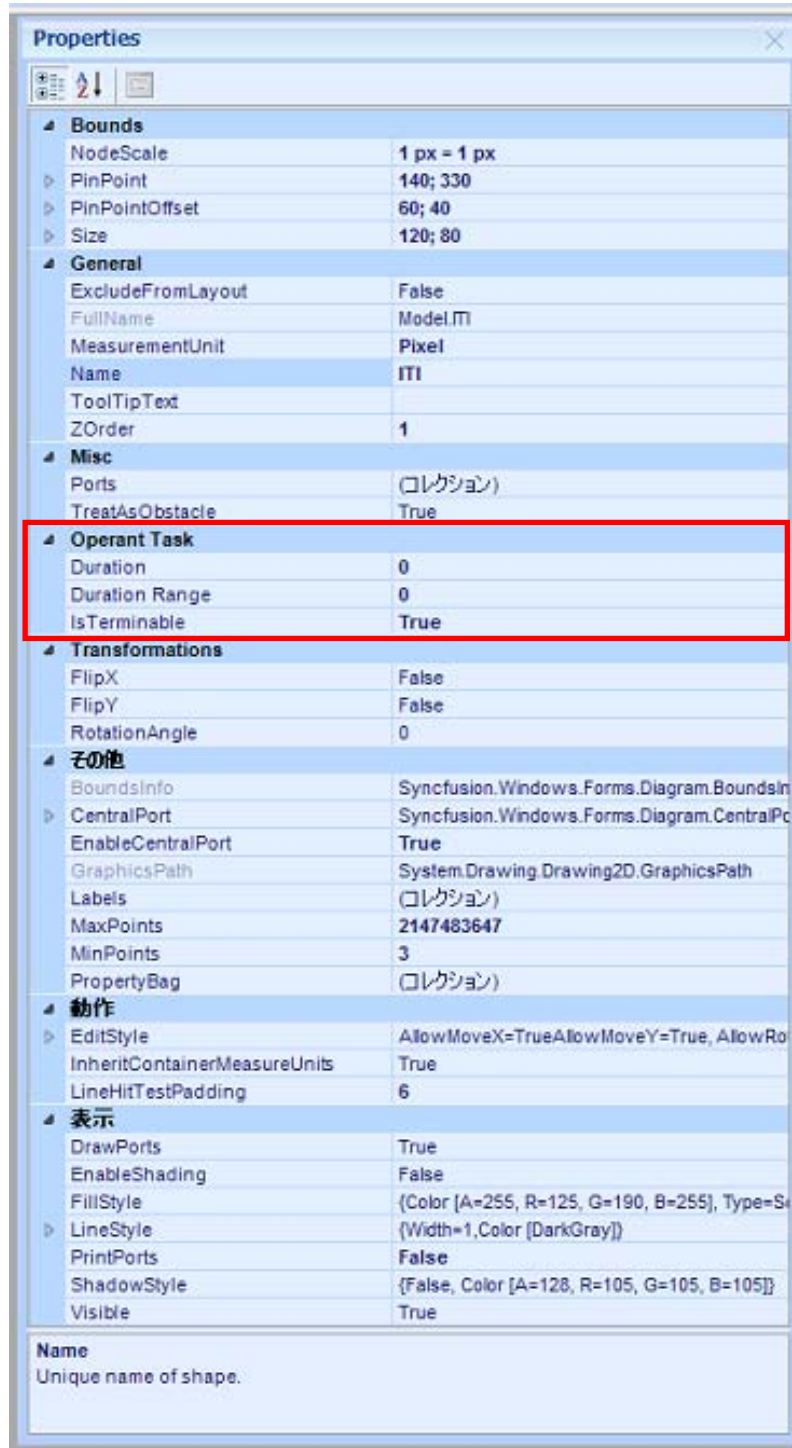


Symbol Palettes (Connectors)



Properties

Set detail of each Action to item of OperantTask inside of Properties. When you select Action at Diagram, each property appears. Item which you can set are different depending on each Action.



When you create a Diagram, you need to start from “Begin” and finish “End”

Operant Task

Selectable items are different depending on each selected Action, Connector, and Diagram.

Symbol Palettes (Action)

- Duration : enter duration of “Action” continue (unit is sec.)
- Duration Range : enter randomize Duration (unit is sec.)
e.g. When you set Duration for 5 sec and Range for 3 sec, then it is randomized between 2 sec to 8 sec. The duration can be set for 0.1 sec.
- Is Terminable: when you set it True and trial reaches “End” at Diagram, the “Action” will be terminated as well. When you set it False, the trial will not end until “Action” ends by reaching a certain duration or trial number. (setting is True or False)
- Delay: make start timing delay as you set (unit is sec)
- Delay Range: enter the range of randomize “Delay” (unit is sec)
- Type: when Action has several types (frequency difference of sound stimulus et al.), select one
- Condition: when it meets to input condition, connected Action will be start. Available command is different depending on the settings of the machine. Please refer to other documents.
- IsTerminateRunningAction: Terminate executing Action (Select True or False).
- IsWaitInfinity: When it is set, wait to execute Action / establish condition, without time-limit. (Select True or False)
- RewardQuantity: When “RewardRuleType” is Fixed, enter the reward unit. (unit is number of supply)
- RewardRuleType: Select from 3 kinds of settings, fixed value (Fixed), certain ratio (Ratio), randomize (Random).
- RewardRule: Enter it, when the manner of supplying reward changes (Ratio, Random). When you choose ratio(%): No. of supply; ratio(%): No. of supply [Summation of ratio shall be 100(%), e.g. 50:1;40:2;10:4], when it choose “Random”, minimum supply number: maximum supply number.
- IsResetSignalProperties: Reset intensity of Signal at start or finish of Action (True or False)
- Condition: The available Condition Command is different from each system. Usable text is described to RunTimeProperty of Operant Task StudioV2. Set condition to activate Action by using “>”, “<”, “=” at the end of Action. The detail command is in a separate sheet.
- Configuration: By configuration, other panel for detail setting appears (at Visual, sound[wav files])

Symbol Palettes (Connectors)

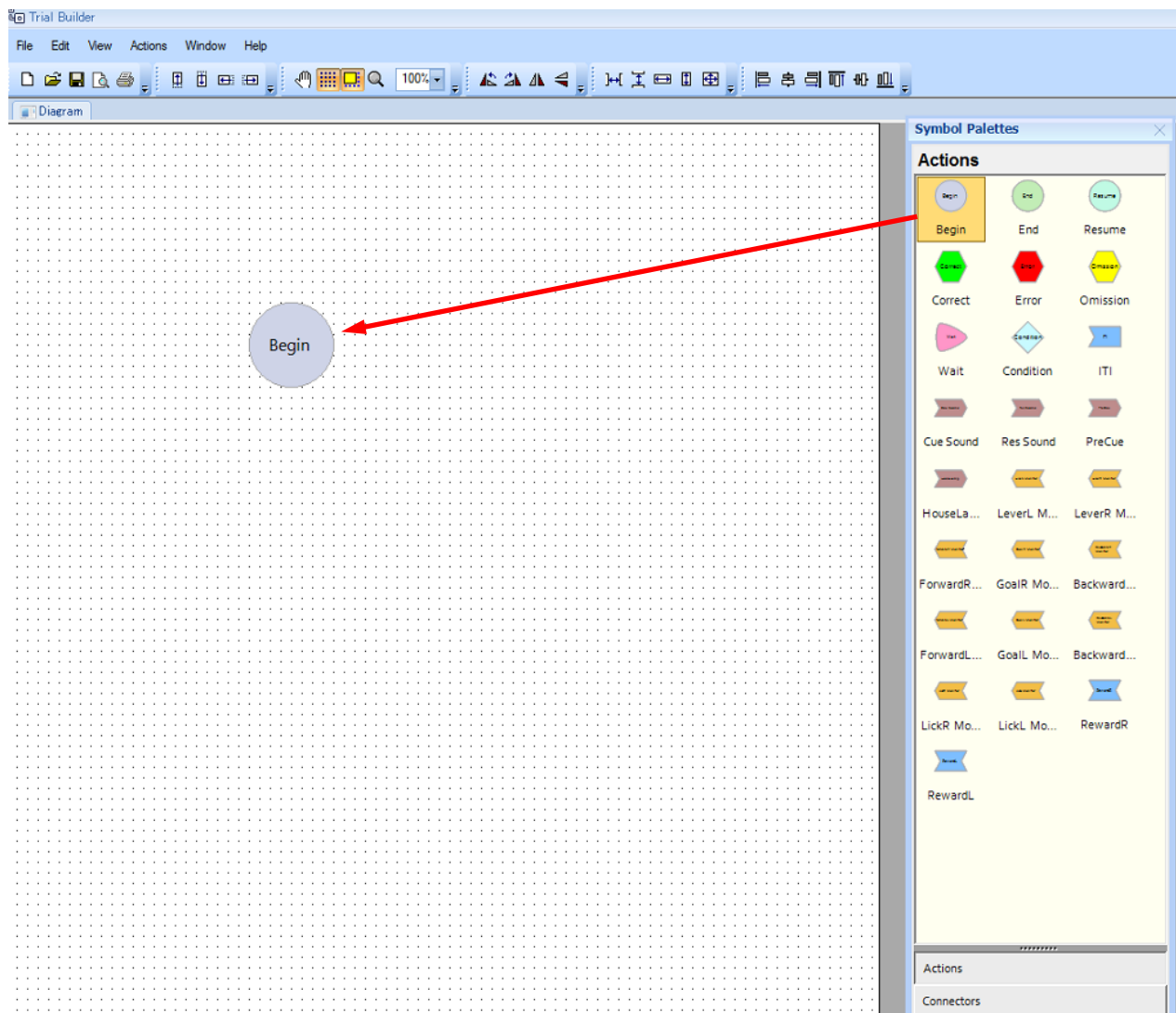
- ConnectedEvent : Select from End, Timeout & None. End: when all active Actions are finished, move to connected Action. Timeout: when active Action reaches to setting time, move to connected Action.

Diagram

- Compute Expressions: Calculate duration of interval of time between certain Action and fill in Trial file.
- Correct Delay: When it is judged Correct at Judgment, insert prescribed time after End Action (unit is sec)
- Correct Delay Houselamp: Assign the setting of Houselamp at Correct Delay. When you set None, status will not change. When you set On, Houselamp will be turned on. And when you set Off, it will be turned off.
- Error Delay: When it is judged Error at Judgment, insert certain delay after End Action (unit is sec).
- Error Delay Houselamp: Assign the setting of Houselamp at Error Delay. When you set None, status will not change. When you set On, Houselamp will be turned on. And when you set Off, it will be turned off.
- Omission Delay: When it is judged Omission at Judgment, insert certain delay after End Action (unit is sec).
- Omission Delay Houselamp : Assign the setting of Houselamp at Omission Delay. When you set None, status will not change. When you set On, Houselamp will be turned on. And when you set Off, it will be turned off.
- Trial Duration: Assign duration of Trial. When you set the duration, Trial will not continue beyond the duration.

The way of arrangement

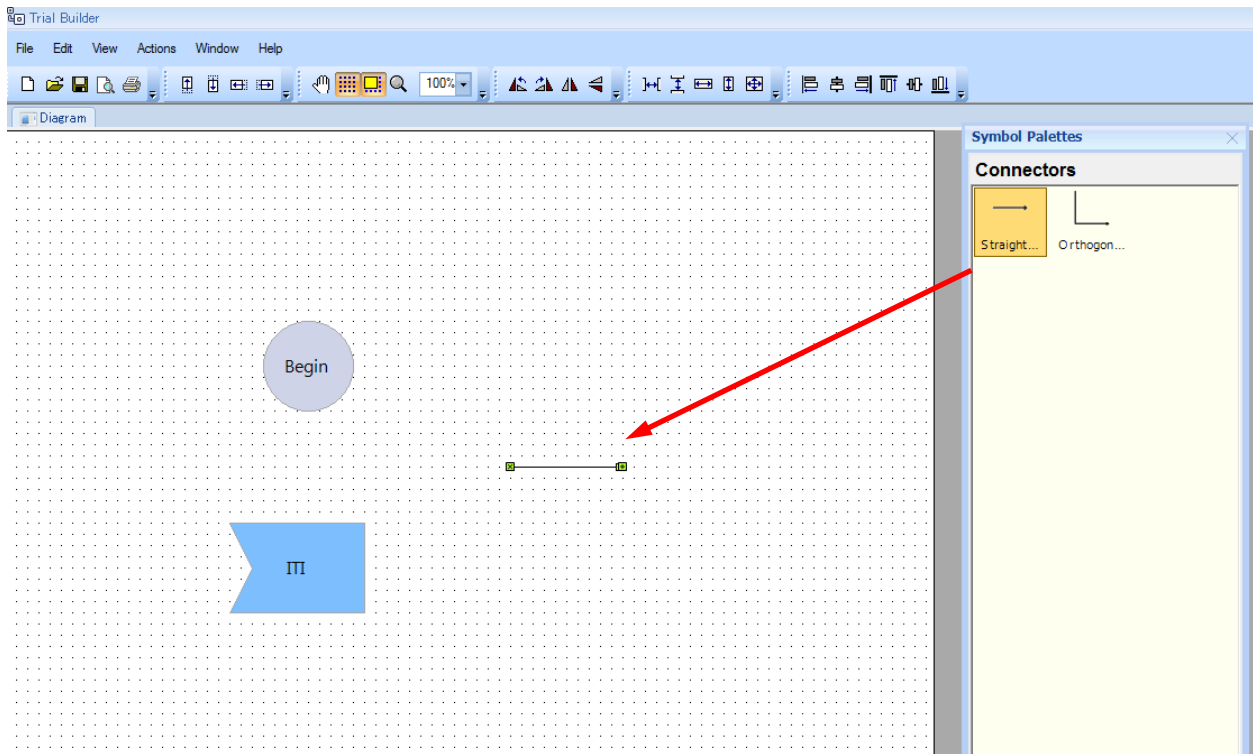
Drag objective icon from Symbol Palettes and paste any place of Diagram.



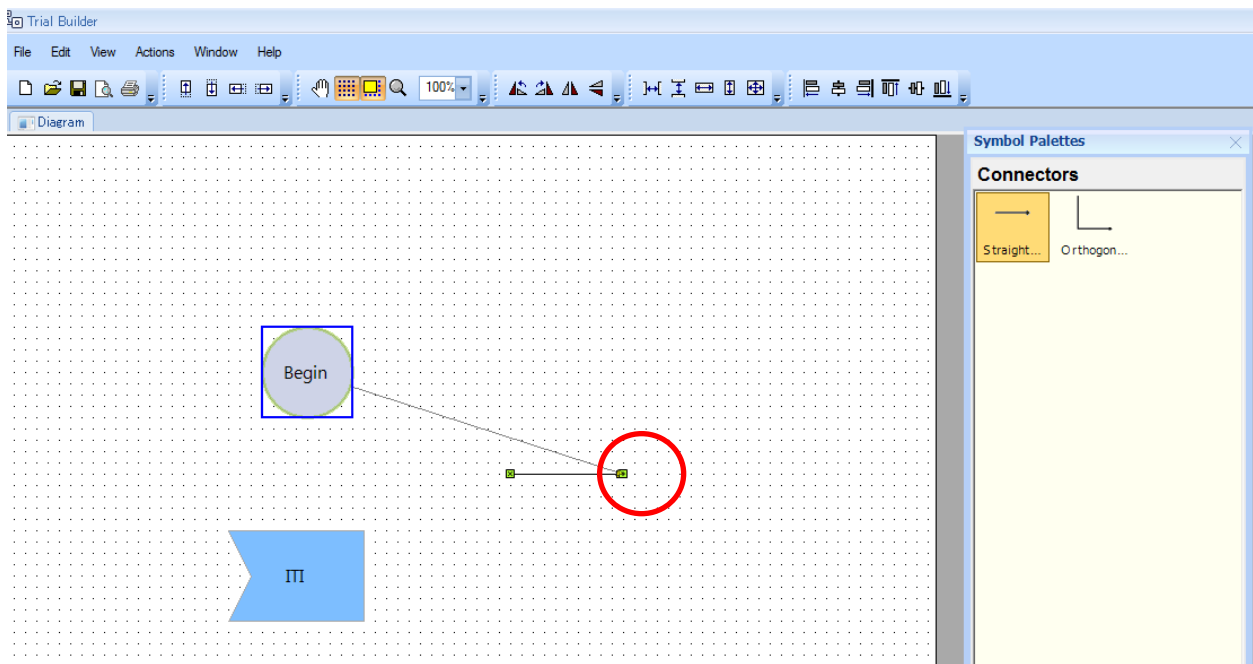
Switch between Actions to Connectors at Tab bottom part of Symbol Palettes.



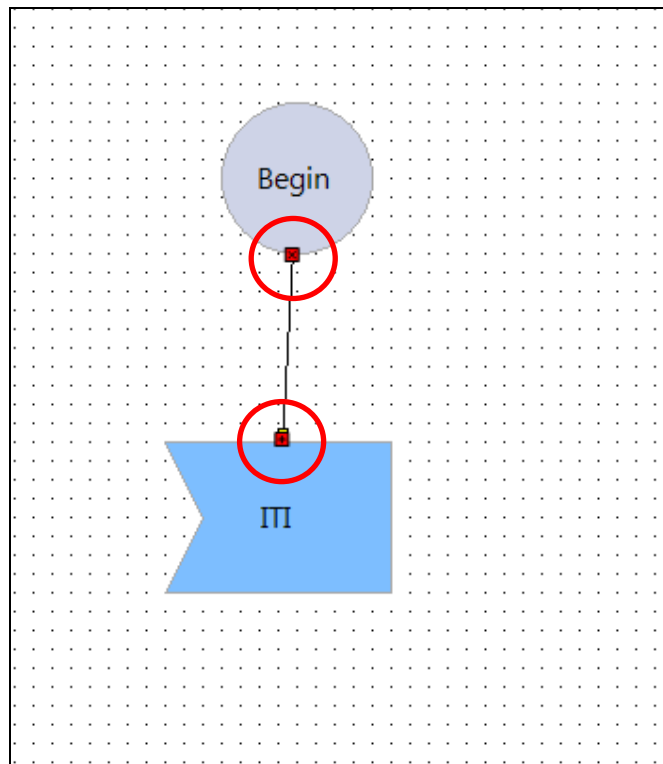
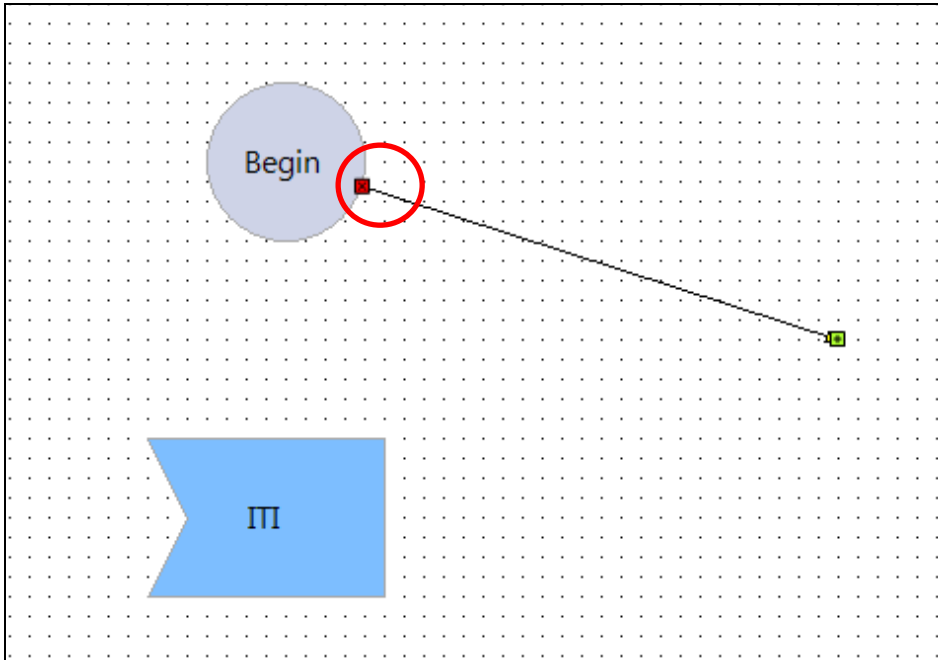
Drag arrow of Connectors and paste any place at Diagram.



Drag tip of arrow and connect to objective icon.

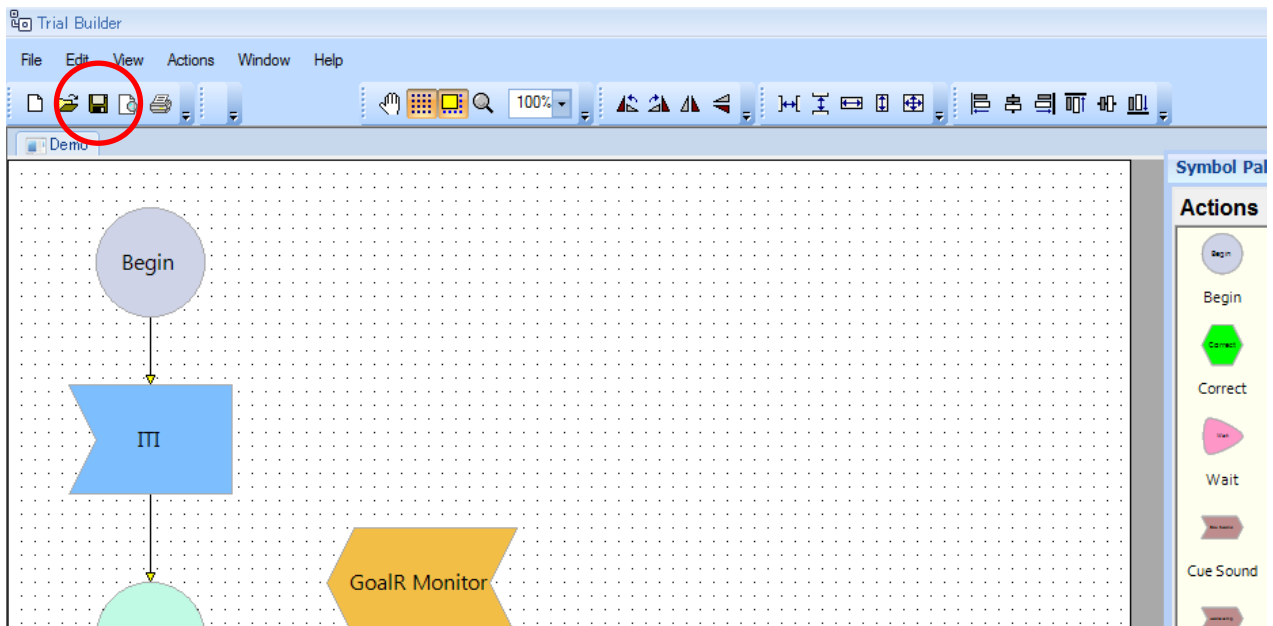


When it is connected, the tip of the arrow is displayed red.



In this way, compose tasks by connecting icons and arrows.

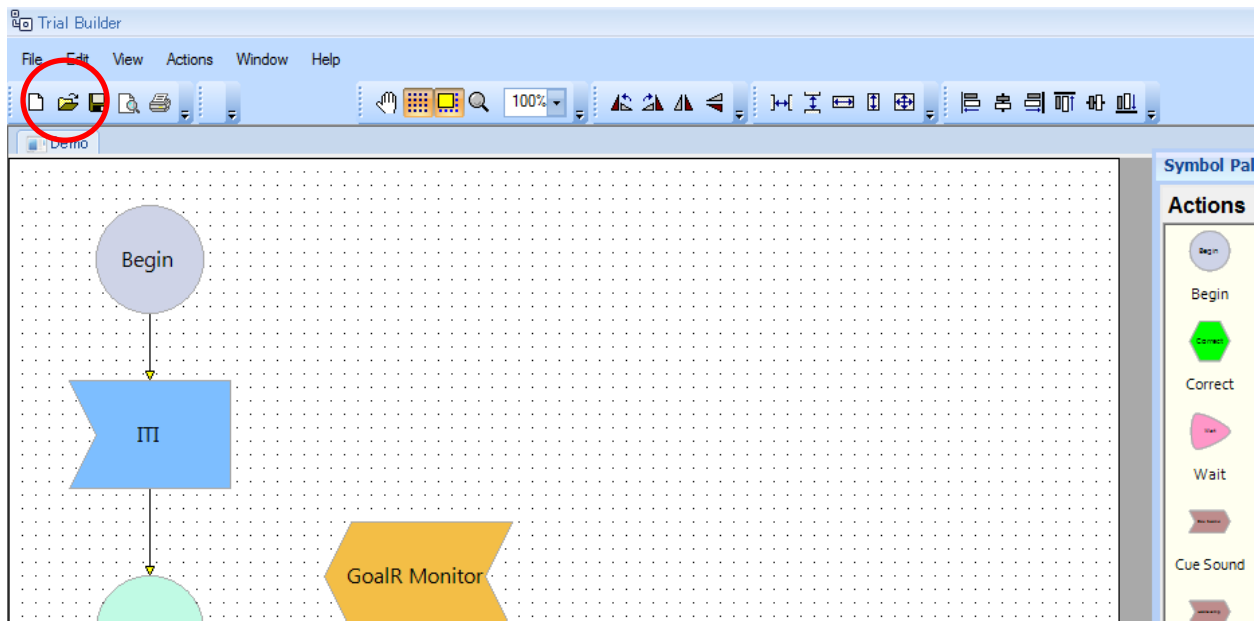
When you finish creating the Diagram, save the Diagram with name.



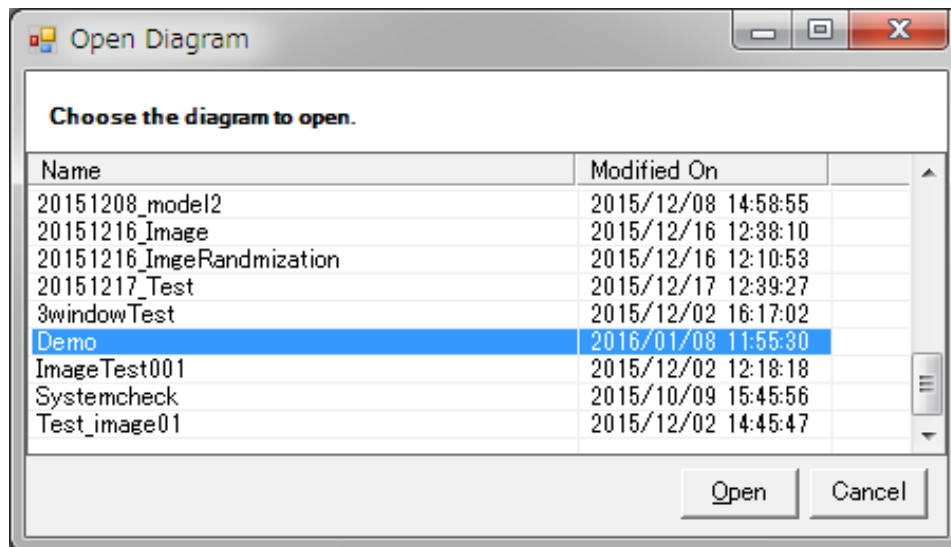
The screenshot shows a 'Save Diagram' dialog box. The title bar reads 'Save Diagram'. Below the title bar is a section titled 'Enter diagram details' which contains a text input field labeled 'Name'. This input field is highlighted with a red rectangular box. Below the input field is a section titled 'Existing Diagrams' which contains a table with two columns: 'Name' and 'Modified On'. The table lists several existing diagrams with their names and modification dates. At the bottom of the dialog box are 'Save' and 'Cancel' buttons.

Name	Modified On
20150916_Test	2015/09/16 16:23:44
20151016_Demo	2015/10/18 2:42:00
20151111VisualTask	2015/11/11 22:41:55
20151112_choice	2015/11/13 20:18:56
20151112_Go	2015/11/12 21:15:02
20151112_Nogo	2015/11/12 20:59:03

When you edit an existing Diagram, click icon of folder at toolbar.

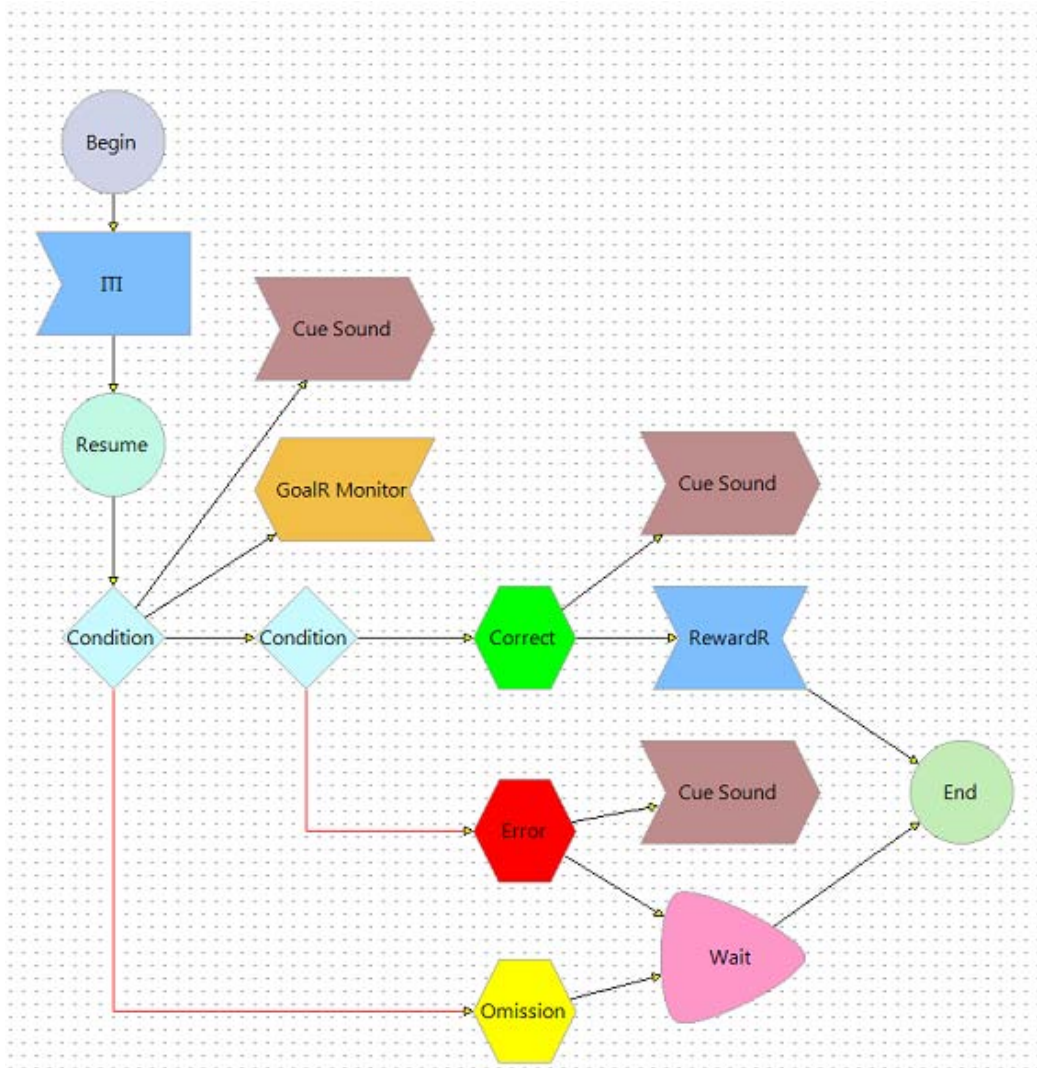


Select the objective Diagram, and click “Open”

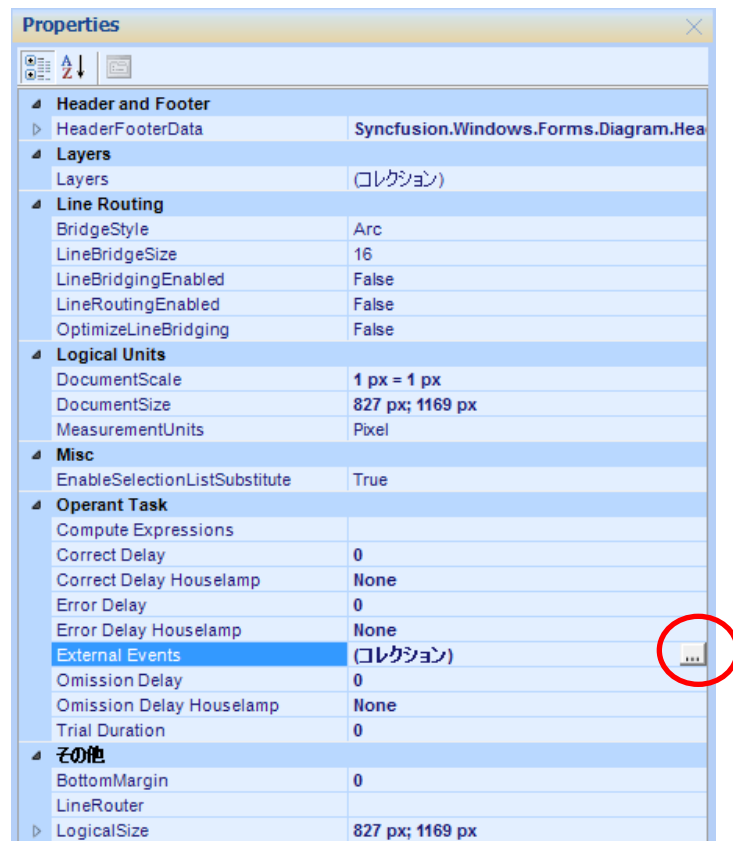


External Event

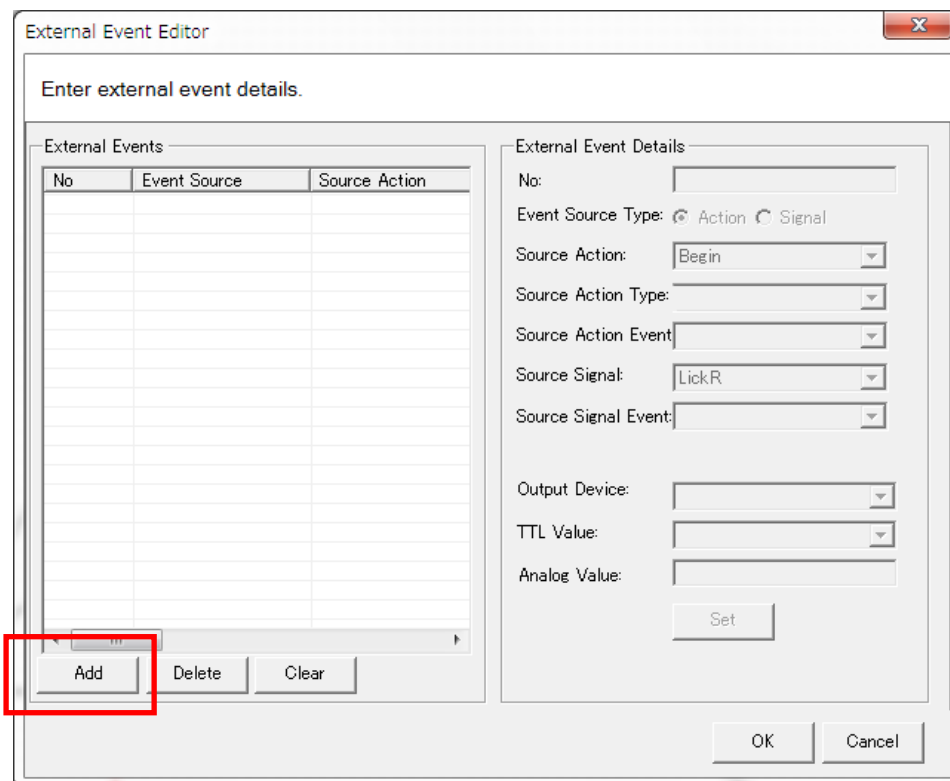
Output any Analog Voltages or 5V TTL to external device to specified Action.



Select a vacant part of the Diagram to set.



Extent Operant Task from Properties, click the right edge of “External Events”, and open External Event Editor.



Then click “Add”.

The image displays two instances of the 'External Event Details' configuration window. The left window is for event No. 1, where 'Action' is selected as the Event Source Type, 'Cue Sound' is the Source Action, 'DigitalOutput1' is the Output Device, and 'On' is the TTL Value. The right window is for event No. 2, where 'Signal' is selected as the Event Source Type, 'LeverGoalSignalR-On-V' is the Source Signal, 'AnalogEventOut' is the Output Device, and '-3' is the Analog Value. Both windows have a 'Set' button at the bottom.

Select the active icons of External Event Details and set them. Please choose one from each drop-down list. Register the setting by clicking “Set”.

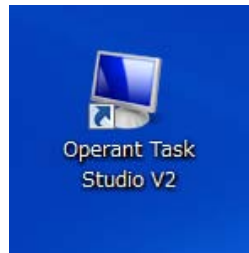
- No.: Registered number, automatically filled-in.
- Event Source Type: Select Action (mainly for output) or Signal (mainly for input).
- Source Action: Select Action will be performed.
- Source Action Type: Select one, if certain Type is set to specified Action. (For example, if selected action is outputting sound stimulus and multiple frequency of sound is set as type, use this source action type).
- Source Action Event: Select one, if certain Event is set to specified Action (Usually, it is set from 2 events: start & end).
- Source Signal: Select Signal will be performed.
- Source Signal Event: Select one, if certain Event is set to specified Signal (Usually, it is set from 2 events: start & end).
- Output Device: Select specified Device for out-put (Generally, select from DigitalOutput "Number" or AnalogEventOut).
- TTL Value: When you select DigitalOutput "Number" at Output Device and select "On" at this item, 5V will be output. If it is not output, select Off. *Duration of 5V output is 10 msec pulse.
- Analog Value: When you set AnalogEventOut at Set Output Device, you can set any voltage for output. You can set the voltage in the -5 V to +5 V range and you can set its increments arbitrarily. *Unless the next event starts, the same voltage continues to output.

Operant Task Executor

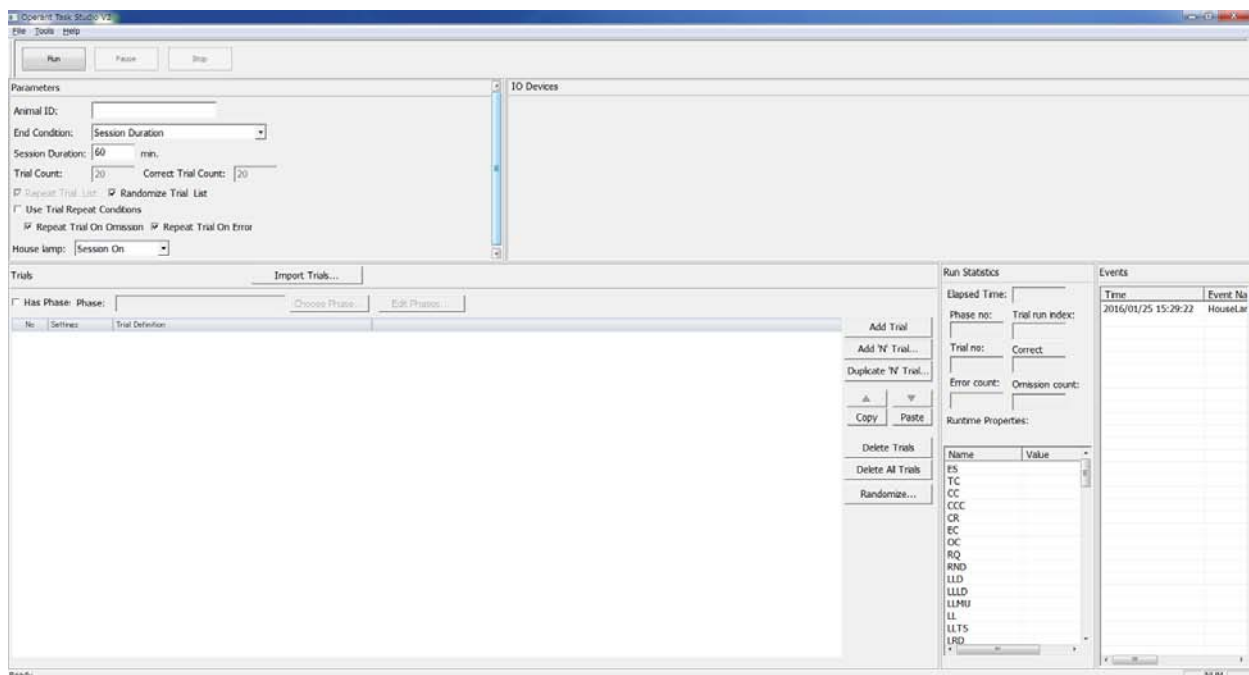
Outline

This software is for executing Trial, which you have design at trial Builder. The definition of Session is all the action executing. Phase Shift is also available in the case of meeting specified criteria. These relation is Session> Phase> Trial.

Start Operant Task StudioV2 by clicking its icon on the desktop.



The following main window appears after activating the software.



The window is consisted of generally 5 parts.

1. Parameters: set parameters of Task, such as duration and the way of end.
2. IO Devices: display available input systems in each hardware.
3. Trials: read Trial created by Trial Builder. A phase setting is also available.
4. Run Statistics: property of running Trial appears.
5. Event: Event (Action, Signal, et al.) type of current Trial is described.

1. Parameters

Parameters

Animal ID:

End Condition:

Session Duration: min.

Trial Count: Correct Trial Count:

Repeat Trial List Randomize Trial List

Use Trial Repeat Conditions

Repeat Trial On Omission Repeat Trial On Error

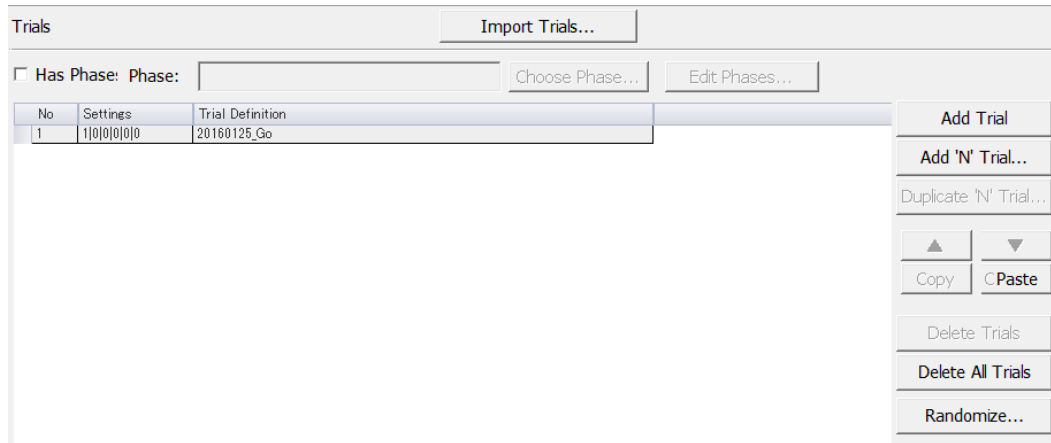
House lamp:

- Animal ID: fill in any letters. If it is blank, this software will not work.
- End Condition: set the condition to finish Session.
 - None: it will not end until it clicked the Stop button.
 - Session Duration: The session will end at the duration you set. The duration should be filled in minutes.
 - Trial Count: when it reaches the trial count you set, the session will be over. It should be filled in number.
 - Correct Trail Count: when it reaches the correct trial count you set, the session will be over. It should be filled in number.
 - Session Duration & Trial Count: when it reaches Session Duration or Trail Count, the session will end.
 - Session Duration & Correct Trial Count : when it reaches Session Duration or Correct Trail Count, session will be end.
- Repeat Trial List: Repeat Trial on Trials (Trial list).
- Randomize Trial List: when there are multiple trials, run them randomly.
- Use Trail Repeat Condition: when it is judged Error or Omission, run the same Trial once again. The conditions are selectable by checkboxes with Omission and Error.
- House lamp: select condition of House lamp during Session.
 - Off: the lamp always turns off.
 - Session On: the lamp always turns on during session
 - Trial Resume On: the lamp turns on after a Trial resumes. And the lamp turns off at interval between trial end and next Resume.
 - Trial Iti On: the lamp turns on at interval between trial end and next Resume.

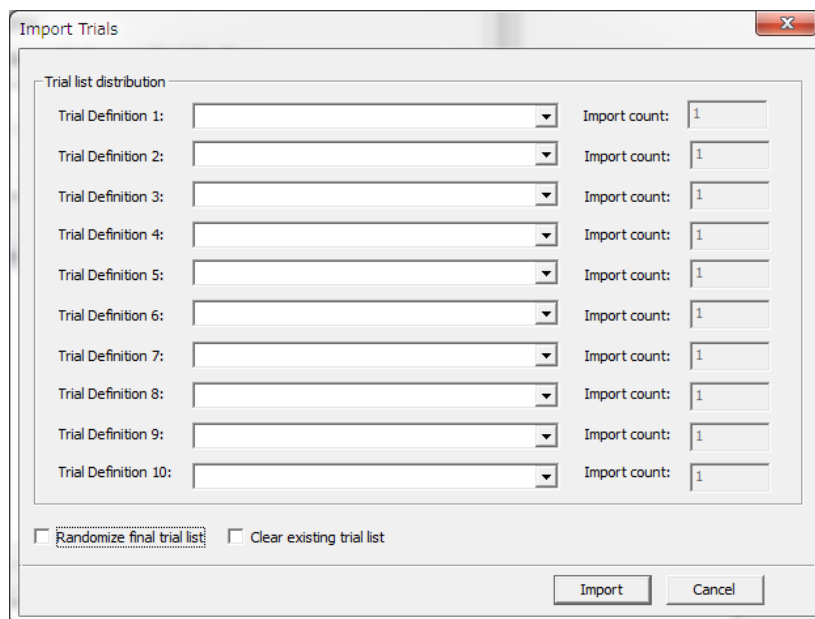
2. I/O Devices

When a signal is input from hardware, the ramp will turn on. The display will be different by hardware construction.

3. Trials



Import Trials: Read Trial which you have created by Trial Builder. When you click the button, the following window appears.

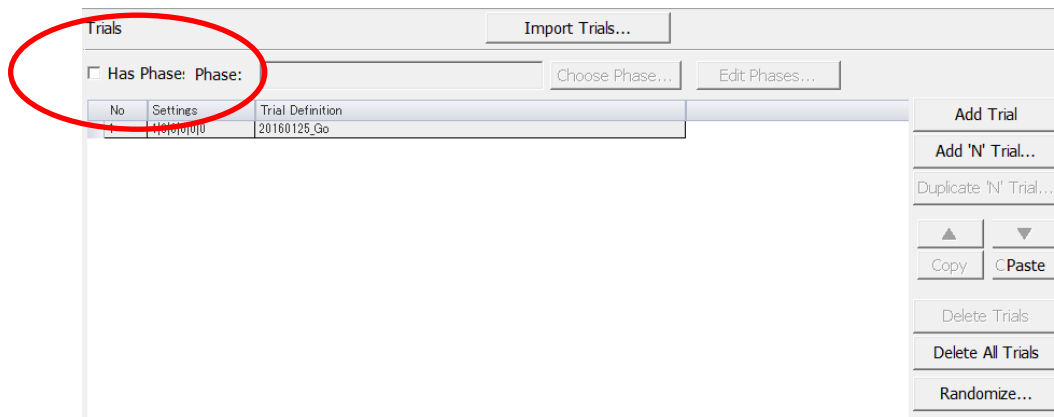


- Trial Definition: available to read saved Trial by selecting from the right ▼ mark of pull-down menu.
- Import Count: the number of import (read) trial can be set.
- Randomize final trial list: when it is checked after trial is read, trials are presented in random order.
- Clear Existing Trail list: when it is checked, import trial after existing trials are cleared.

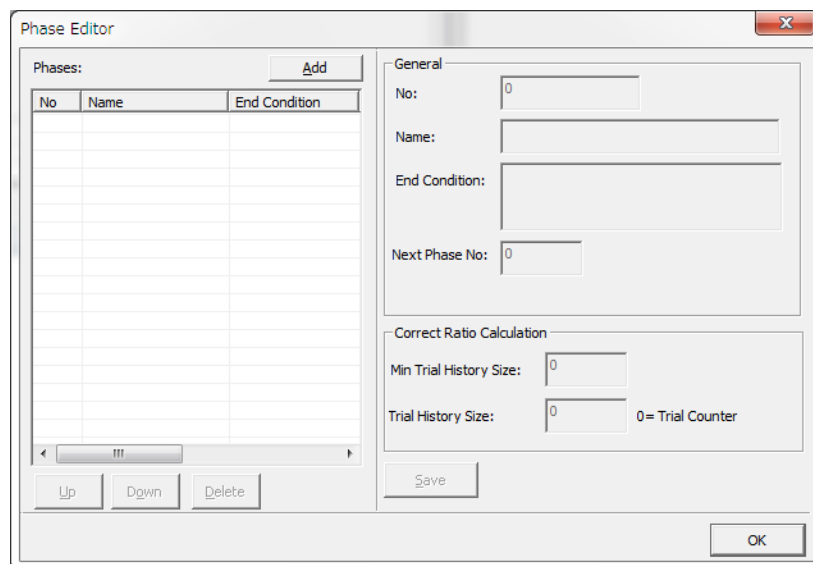
Reading trials are finished by clicking “Import”. When you quit, click “Cancel”.

In case using Phase

Check “Has Phase”.



Edit Phase: Construct Phase



You can add a new Phase by clicking Add. When you add Phase, the number is assigned sequentially.

- Name: fill in any letters.
- End Condition: enter condition for altering Phase. You can use ">", "<", "=" to create conditions.

TC: Trial Count

CC: Correct Count

CCC: Continues Correct Count

CR: Correct Ratio

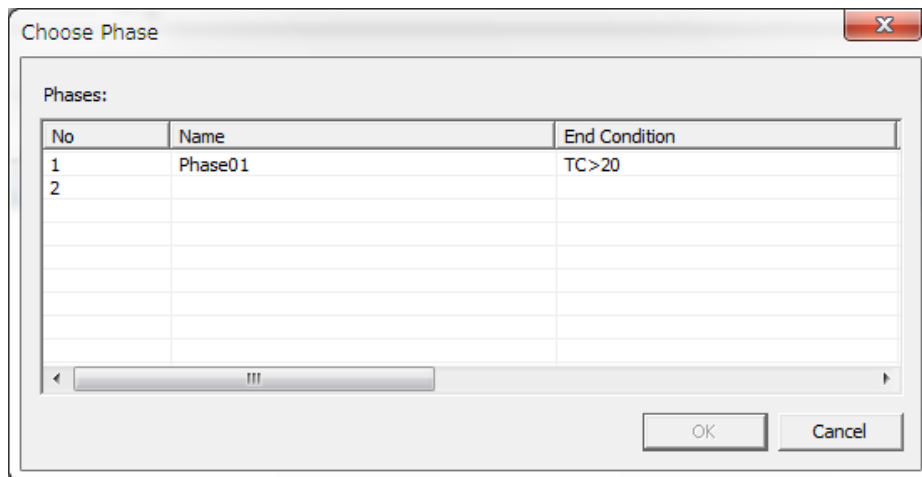
EC: Error Count

OC: Omission Count

Ex.) TC>20 (Trial Count is 20 or more)

- Next Phase No.: after the current phase is finished, jump to a specified Phase.

Choose Phase: You can choose Phase.



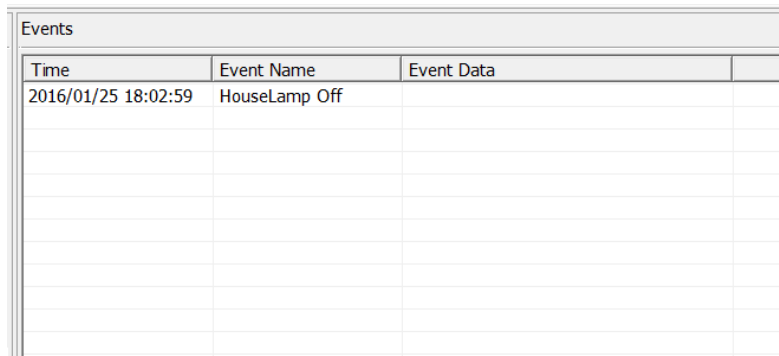
Assign specific trial to Phase created Edit Phase. Select objective Phase. The way of reading Trial is the same as Trial settings.

4. Run Statistics

Elapsed Time:	<input type="text"/>
Phase no:	<input type="text"/>
Trial run index:	<input type="text"/>
Trial no:	<input type="text"/>
Correct:	<input type="text"/>
Error count:	<input type="text"/>
Omission count:	<input type="text"/>

- Elapse Time: Elapsed Time duration
- Phase no: Current number of Phase, when Phase is set (if it is not set, displayed 0).
- Trial Run index: Assigned number for running Trial. You can confirm types of current Trials.
- Trial no: number of running Trial.
- Correct: number of Correct.
- Error count: number of Errors.
- Omission count: number of Omission.

5. Events



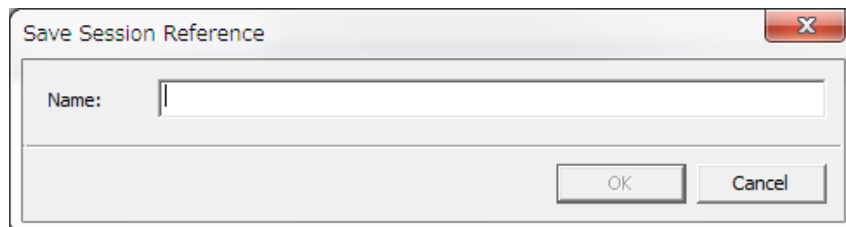
Time	Event Name	Event Data
2016/01/25 18:02:59	HouseLamp Off	

- Time: Running duration from Start is displayed (msec unit)
- Event Name: Running event name (action, signal, etc.) is displayed.
- Event Data: Condition of Action, Signal.

These Events are saved as text file format.

The above settings can be saved as a Session Reference.

When you select a file from Save Session Reference, the following window appears.



Save Session Reference

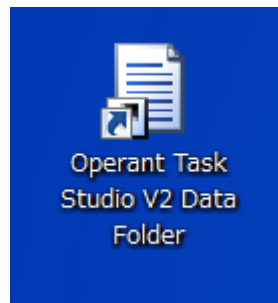
Name:

OK Cancel

Save it as any name.

When you would like to run the same Session, read a file of Load Session Reference and use it.

About Data Folder



A shortcut of Data Folder is on the desktop. The actual place of storage is on C:\ProgramData\Operant Task StudioV2.

- Diagram: The Trial file created at Trial Builder is saved. The extension of the file is “edd”.
- Log: save the log file of software automatically.
- Registry: store setting file in each hardware.

Action.xml: method of operation of output equipment.

Devices.xml: registered information of connected hardware.

ExternalEvents.xml: information for external output.

Signals.xml: method of operation of input equipment.

Stencils.xml: display setting at Trail Builder

Do not modify or move the Internal file. It may cause a whole system failure.

- Result: Result file of executed Session is saved.
The file name with “event” is a text file, which records all kinds of events. On the other hand, the file name with “trial” records the result of Judgment in each trial.
- Session References: Session Reference is saved. File extension is “csv”.
- Sound: .wav files are saved. .Wav files are used for outputting sound from software. When you add a .wav file, the sound type for output will increase.
- Visual: this folder is used for the Touch panel Operant task. In this folder, the Hotspot and image folder are stored. On the Hotspot folder, window size and number information are saved with the text file. On the Image folder, the stimulus image is saved. Available file format is .bmp, gif. Hence, when it put images into a folder under the Image folder, only these images can be displayed.

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