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**Release Information**

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| Version | Date | Changes |
| 1.0 | 21.11.2019 |  |
| 1.1 | 22.11.2019 | - Axes added to the main gui in order to display the Simulink model output during the simulation |

**Title**: **Interface between MATLAB App and Simulink**

# Introduction

This document explains the necessary steps required to interface the MATLAB app with Simulink model. The necessary steps for creating event listener for a Simulink model in order to display the signals in the App Designer are mentioned in the Procedure section.

# Procedure

In a similar way to GUIDE, it is possible to read real-time values from Simulink Model.

As an initial step, it is required to define the “Tag” property in App designer opening Function:

**Why we need to define Tag manually in App Designer?**

Read the MATLAB Answer on the following link: <https://de.mathworks.com/matlabcentral/answers/446241-editing-component-tag-in-app-designer>

% Defining Tags in App Designer

app.Out1.Tag = 'Out1';

app.Out2.Tag = 'Out2';

**Settings & properties to be defined for Simulink Model**

**1st Step:** File 🡪 Model Properties 🡪 Callbacks 🡪 StartFcn

% Set up the arguments that will go into the gain block event callback listener

blk1 = 'exampleModell/Out1';

blk2 = 'exampleModell/Out2';

event = 'PostOutputs';

listener = @updateApp;

% Create the listener

h1 = add\_exec\_event\_listener(blk1, event, listener);

h2 = add\_exec\_event\_listener(blk2, event, listener);

**2nd Step:** Create a MATLAB Function (updateApp.m)

function varargout = updateApp(varargin)

% create a run time object that can return the value of the gain block's

% output and then put the value in a string.

rto1 = get\_param('exampleModell/Out1','RuntimeObject');

str1 = num2str(rto1.InputPort(1).Data);

rto2 = get\_param('exampleModell/Out2','RuntimeObject');

str2 = num2str(rto2.InputPort(1).Data);

% get a handle to the GUI's 'current state' window

all\_tag\_objects = findall(0, '-property', 'tag');

all\_tags = get(all\_tag\_objects, 'tag');

[tf, idx] = ismember('Out1', all\_tags);

if tf

st1 = all\_tag\_objects(idx);

end

[tf, idx] = ismember('Out2', all\_tags);

if tf

st2 = all\_tag\_objects(idx);

end

[tf, idx] = ismember('UIAxes', all\_tags);

if tf

app\_plot = all\_tag\_objects(idx);

end

XData = get\_param('exampleModell','SimulationTime');

YData = rto1.InputPort(1).Data;

% update the gui

set(st1,'Value',str2double(str1));

set(st2,'Value',str2double(str2));

% plotting real time values from Simulink

plot(app\_plot,XData,YData,'.');

hold(app\_plot, 'on' );

drawnow;

# Known Issues

* Use of event listeners slows down the simulation

# 4. Recommended Reading

[1] <https://blogs.mathworks.com/simulink/2013/01/25/accessing-block-data-during-a-simulation/>