

RTDS Training course of IEPG

DAY [?]: Introduction to Component Builder

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April 14, 2018

1.0 Preamble

RSCAD's CBuilder software module enables RTDS users to develop their own custom component models. Both power system and control system type components can be developed using CBuilder. CBuilder includes an interface for drawing the component's icon, a structure to define the parameters which must be entered by the user for the new model and a mechanism to provide input and output signals to/from the component. The code written into the component is compiled into executable code by a compiler within RSCAD. The custom component similar to Fig 1 can be shared with other users.

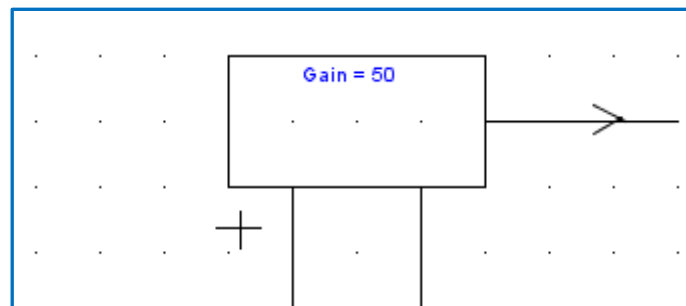


Figure 1: Sample component built with C Builder

2.0 Lab Objectives

The tutorial aims to equip students with the basic knowledge to enable them do the following:

- a. Create a simple custom library component In RSCAD

3.0 Prerequisites

Before attending this lab session, students should:

Have basic knowledge of C programming language (a good tutorial for beginners can be found in [1])

- Be able to do basic drafts and simulations in RSCAD (Module 1 and Module 2)

4.0 Attached document:

- C Builder Tutorial.pdf (Please read pages 6 to 17 before the lab session to get an overview of how to use the tool and familiarise yourself with the lab assignment)

5.0 Steps in building a component

To create a new component using CBuilder, first launch it by clicking on the button as shown in Fig 1 and then select the “New Component” radio button.

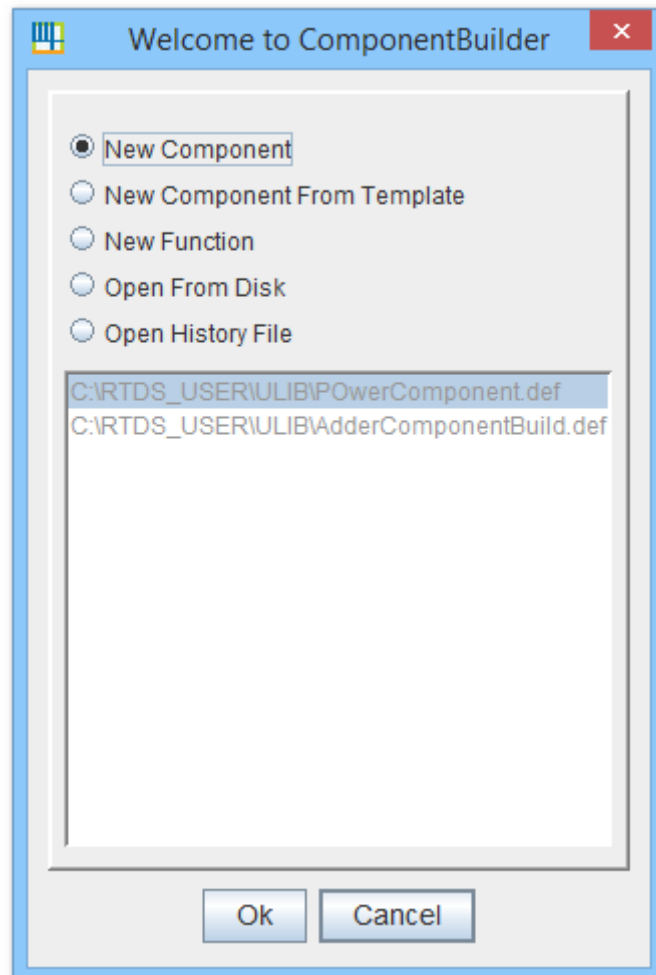
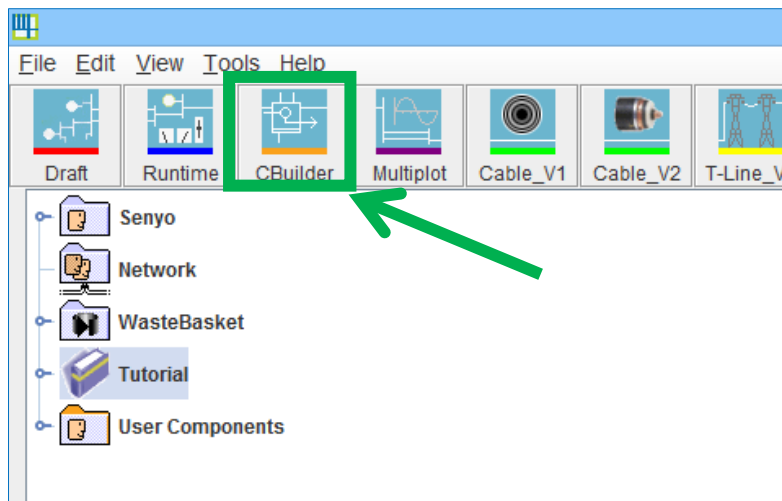


Figure 1: C builder selection menu

Choose the type of component you wish to build with a radio button as shown in fig 2.

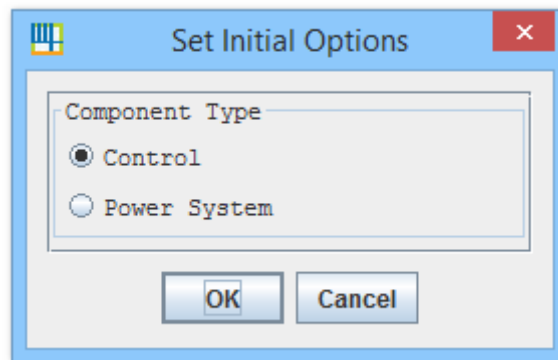


Figure 2: Buttons to select control or power system component

Note: Only power system components may directly connect to power system nodes. Control type components may obtain input from other control type components or by measuring power system signals such as node voltages or branch currents.

The basic steps required to generate a new component using CBuilder are outlined below:

1. Draw the component.
2. Assign input and output ports.
3. Define component parameters.
4. Write the C Code for the data preparation portion
5. Write the C Code for the algorithm that runs on the RTDS.
6. Compile the model from within C Builder
7. Load the new component model in RSCAD/Draft and test.

To gain a better understanding of how it works, it is best to try to build a simple component. The document labelled “C Builder Tutorial” details steps for creating simple components.

Assignment:

1. Complete the task set out in Chapter 1 of C Builder Tutorial.pdf (Title: “Using CBUILDER to create a multiple input adder”).

6.0 Additional Resources

[1] Perry, GM, & Miller, D. (2013). *C Programming Absolute Beginner's Guide*. Pearson Education.