DADA OSOUTIONS Developing and exploiting machine intelligence

CODESYS beginner Tutorial

Visualising with CODESYS

Version: 1.2 Last updated: 15/05/2017 Author: Noor Mufti



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Introduction

These tutorials are designed for aspiring programmers who wish to learn more about industrial and physical computing using the open source platform; CODESYS[®].

Each tutorial follows on from the last, with the list of planned and produced tutorials so far being:

- Beginner Tutorial: Getting started with CODESYS
- Beginner tutorial II: Visualising with CODESYS
- Beginner Tutorial III: Sequential actions and Timers ¹
- Beginner Tutorial IV: Resets and Interrupts²

More information about CODESYS can be gained from the Smart Software Solutions (3S) website <u>www.codesys.com</u>.

Objectives

In the course of this tutorial you will learn how to:

- Update and save new CODESYS projects
- Visualise inputs and outputs in a virtual environment
- Run virtual simulations to test your programme
- Have the confidence to further explore the programming environment

Prerequisites

There is no need for previously proven software development skills in order to successfully complete this tutorial. All that is required is a licenced (including a Demo licence) copy of CODESYS version 3.5 or higher, and basic computer literacy.

In addition, as this tutorial follows on from the previous *Getting Started with CODESYS* tutorial

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¹ Planned for release in October 2017

² Planned for release in November 2017



How to visualise with XSoft – CODESYS 3

Step 1: Open the program from the first tutorial

Rather than create a new program from scratch, we will design a visualisation screen for the project that was created in tutorial 1.

A)Open the program

Open your project from the tutorial 1. If you have not done it yet, please first complete tutorial 1.

Step 2: Add a visualisation screen into your project:

Open a visualisation screen for the program Right click on "Application" \rightarrow Add Object \rightarrow Visualisation



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Creates a visualization of	oject	
Name:		
Visualization		
Symbol libraries	Active	
📲 VisuSymbols (System)		

It will also add a visualisation screen, your project should look like this



If you don't see the "Visualization" object, then you can redo the step 1

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B) Open the visualisation editor

Now double click on the "Visualization" object, it will open the visualisation editor as shown below:

Fest.project* - XSOFT-CODESYS-3 - PLC program	ming system		
Edit View Project Visualization Build Q	line Debug Tools Window Help Eaton Automation		
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Test		^ ▼	
Device (XC152)			Basic Common controls
PLC Logic			Alarm manager
Library Manager			Measurement controls
PLC_PRG (PRG)			Lamps/Switches/Bitmaps
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Messages - Total 0 error(s), 0 warning(s), 14 mess	age(s)		
	La	st build: 🙆 0 🕐 0 Precompile: 🖌	SIMULATION Current user: (nobody)

Step 3: Add a title to the visualisation screen

A) Select 'ToolBox' from the bottom right of the screen

You can see the Toolbox in the above picture, which has got different set of controls that can be used in the Visualisation editor, select 'Common Controls'.



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C) Add a title to the visualisation screen

"Label" control can be used to show any text message on the screen. If you click on the text "Label", you will be able to change the text



You can change the Font size by following steps:

- 1) Click on Label
- 2) Click "Properties" at bottom of "ToolBox"
- 3) Select "Font" in the "Text Properties"



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Step 3: Add visualisation elements

A) Open the ToolBox

Click on "ToolBox", select "Lamps/Switches/Bitmaps" and drag "Power switch" onto visualisation editor as shown below



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Now click on the "power switch" and open properties.

1) Select "Variable" from properties and click on button with ".."

2) From the variable tree, select App	blication \rightarrow PLC_PRG \rightarrow	Button_1
---------------------------------------	---	----------

3) Click Ok

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2	Application	Application			E	Type of element	Power switch
2 >		ROOKAM				Position	
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		3					▼ ‡
				OK Cancel	SIMU	LATION Current us	er: (nobody)

Variable value will be filled as shown below:

/0
70
PLC_PRG.Button

Now drag a "Lamp" from Toolbox and drop on visualisation editor



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Open properties for Lamp:

- 1) Click on ".." button next to Variable.
- 2) From the variable tree, select Application \rightarrow PLC_PRG \rightarrow Bulb_1
- 3) Click O

es	Name	Type	Address	Origin	•	Properties	▼ 4
		Analication				Y Filter • Sort by • 💈	Sort order 🝷 🗹 Expert
2	E PLC PRG	PROGRAM			•	Property	Value
4	Ø Bulb 1	BOOL			5	Elementname	GenElemInst_5
	Button 1	BOOL			7 -	Type of element	Lamp
	+ BPLog	Library		Breakpoint Logging F	P.	Position	
	🗉 🎑 IoConfig Globals	VAR GLOBAL				X	332
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	• {} VisuElem3DPath	Library		VisuElem3DPath, 3,5,	=	Width	70
	+ {} VisuElemCamDisplayer	Library		VisuElemCamDisplave		Height	70
	{} VisuElemsDateTime	Library		VisuElemsDateTime, 3		Variable	(
	{} VisuElemsWinControls	Library		VisuElemsWinControls		Image settings	<u> </u>
	{} VisuElemTextEditor	Library		VisuElemTextEditor, 3		Transparent	
	VisuElemTrace	Library		VisuElemTrace, 3.5.8		Transparent color	Black
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ed view			Filter: None	•		Tooltip	
		_	_			State variables	
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ion:						Background	
3001.				^		Image	Yellow
					R +	Variable that will be displayed b	y the element
		3		*	,		≁ # X

The "Variable" property will look like this

=	Width	70	
	Height	70	
	Variable	PLC_PRG.Bulb_1	
	Image settings		

The application is complete now. We can now run the application to test it.

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Step 4: Testing

A) Log in

From the menu in the "Online" make sure that "Simulation" is ON. Then click on "Login"



B) Click "OK" on next screen

Options Login with online change. Login with download. Login without any change. 	Options Login with online change. Login with download. Login without any change. Update boot project 	?	Application changed since last download. What do you want to do?
 Login with online change. Login with download. Login without any change. 	 Login with online change. Login with download. Login without any change. Update boot project 		Options
 Login with download. Login without any change. 	 Login with download. Login without any change. Update boot project 		Cogin with online change.
Cogin without any change.	 Login without any change. Update boot project 		Ogin with download.
	✓ Update boot project		Cogin without any change.
Update boot project			Update boot project

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C) Now click "Debug \rightarrow Start" to start the application



D) You will see the visualisation in Run mode on the screen



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- F) Separate the visualization screen by dragging and dropping it's tab off the menu bar, so that you can see the visualisation and the line diagram at the same time.
- G) If you check your program you will see that turning ON the "Button" on visualisation is actually turn ON the "Button_1" variable in your program that will turn ON the "Bulb_1" in the program. Because we have linked the controls on the visualisation with the variables so we can see the effect in the visualisation.

Device.Application.PLC_PRG						
xpression	Туре	Value	Prepared value	Address	Comment	
Ø Button_1	BOOL	??				
Ø Bulb_1	BOOL	??				
RET Vi	sualization		× •			Bulb_1
	Visualisa	ation Exa	ample		=	
			\bigcirc			

H) This tutorial is complete now

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