

Software Instructions CITECT SCADA 2018

Software v8.10

Version 1.1

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Software Instructions: CITECT SCADA 2018 v8.10

Acknowledgments:

We would like to acknowledge the following references used to compile these instructions for students:

- Installation Guide
- You can download CITECT SCADA 2018 -<u>https://sw.aveva.com/monitor-and-control/hmi-supervisory-and-control/citect-scada.</u>
- You can download OPC Factory Server v3.60 Demo
- <u>https://www.schneider-electric.com/en/product-range-download/547-</u> opc-factory-server/
- You can download UNITY PRO XL V13 (Trial 30 days)

https://schneiderelectric.app.box.com/s/6fbwwl6u99mo196mr6didek2p13rr8x7

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Preliminary instructions to set up the software:

Step 1: System requirements:

This information can be found in Chapter 4: System Requirements p.43-50 of <u>Installation</u> <u>Guide</u>

Step 2: Obtain the software:

- 1. Register and download CITECT SCADA 2018.
 - You can download CITECT SCADA 2018 (free software, big file ~2GB) from <u>https://sw.aveva.com/monitor-and-control/hmi-supervisory-and-control/citect-scada</u>
 - Click "Schedule A Demo"
 - Fill out the form
 - Go in your email box and copy your Aveva Software user ID
 - <u>https://softwaresupport.aveva.com/</u>
 - Click "Forgot password". Write your email and click "SEND"
 - Go in your email box and copy your temporary password
 - <u>https://softwaresupport.aveva.com/</u>
 - Click "Sign In" and write your account data
 - Click on Product Hub
 - In Filters section Products select Citect, in section Download Type select Full product Apply
 - Click on Citect SCADA 2018 and download
- 2. Download Unity Pro XL v13 (trial 30 days, big file ~2GB)

Step 3: Install the software:

- 1. Install CITECT SCADA 2018. This information can be found in Chapter 5: Installation p.57-74 of Installation Guide
- 2. Install OPC Factory Server v3.60 Demo (only v3.60 DEMO).

Install Unity Pro XL v13
 Part number: UNYSPUEFF1X

Serial: 12345678999

Instructions to utilise the software:

Step 1: Start Unity Pro XL v13:

- 1. Create a new project. Choose PLC M340 (for example, BMX P34 1000) and rack (BMX XBP 0800)
- 2. Save project "EIT_UNITY_1"
- In the Configuration folder, we can see our PLC bus. Double-click on an empty slot and add one discrete BMX DDI 1602 and one analogue BMX AMI 0800 module. Double-click on module you can configure it.
- 4. Create a new section in the following folder: Program Tasks MAST Sections right click Create new section. Name "test_logic", Language FBD OK.



5. Add TON block - Edit - Data Selection - write TON - choose TON block - OK

FBD	-Editor : F	FB Selection		×
TON				✓ Help On Type
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T Name = *				EFB 🗹 DFB
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6. Add variables in Variables & FB instances choose Elementary Variables.

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Test_time	TI	ME								

- 7. In the section "test_logic", add variables to the function block.
- 8. Add animation table "table_1". In the Animation Tables folder, right-click New Animation Table.
- 9. Add variables in the animation table.

 Start Simulation mode – click PLC – Simulation mode, then click Build - Rebuild all project, PLC – Connect, PLC - Transfer Project to PLC – check PLC Run after Transfer – click Transfer.

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😑 🛁 Variables & FB instances			
Elementary Variables			
Derived Variables			
Device DDT Variables			
IO Derived Variables			
Elementary FB Instances			
Derived FB Instances			
Motion			
Communication			
Program			
MAST			
Sections			
test_logic			
SK Sections			
Timer Events			
Animation Tables			

- 11. Check timer. In table_1 click on Modification button, in row Input on Value field right click Set Set to 1.
- 12. To connect with OFS choose Tools Project Settings. In General choose PLC embedded data and check Data dictionary OK.
- 13. Save project.

Step 2: Configure OFS:

- 1. Start OFS Configuration Tool.
- Choose Device overview, right click in empty field New Device Alias and rename it on M340. In device address wizard in TCP IP, in field TCP/IP write address 127.0.0.1 – OK
- 3. In Device Type choose Modicon M340
- 4. Check Using Data Dictionary
- 5. File Save Configuration.

Step 3: Start Citect Studio.

To start the program, click Windows Start menu - All Programs - Schneider Electric - Citect SCADA 2018 - Citect Studio.

Citect Studio window has the following form.

	∕sy	/stem	Menu		Acti	vity T	abs														
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Create a new project

- 1. In the activity bar called "Projects", select tab Home.
- 2. On the Command Bar select **Add New Project**.

The New Project dialog appears.

- 3. Complete the required fields (Name EIT_CIT_1, Starter project selection SA_Style_1_MultiRes).
- 4. Click OK.

The new project will appear in the Project activity.

Make project active

Click to select the project you want to make active. Click the **Make Active** button next to the project name. The Active Project indicator is displayed next to the project name and in the window title.

E	Projects	Compiled	Revision
E	Example		8.10.0000
	ExampleSA	Active Project	8.10.0000
0	Training	MAKE ACTIVE	1.0
		200	

+ Add 🔻	KRemove -
New Project	
Add Project L	ink
Link Project H	lierarchy

100 C

Devices configuration

In the **Topology** activity bar, select activity tab **Computers – By Cluster.** You can see that you have Server (**IOServer1**) and Cluster (**Cluster1**). Select **Edit**. On the menu below the Command Bar select **I/O Server**.

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Add new I/O device

In the Topology activity bar, select activity tab **I/O Devices**. In the Command Bar select **New Device**. In the window, choose your project – click Next – choose your I/O Server - click Next – Create a new I/O Device (**M340**) – Click Next – Select the type of I/O Device (**External I/O Device**) – click Next – Choose "**M340 - OFSOPC**" – Click Next – Address – **M340** – Next – check **Link I/O Device to an external tag database** – click Browse – in OPC Data Access Server Parameters click "+" and choose **M340** – OK – Next – Finish. Click on row with created device in External in Automatic Refresh choose FALSE.

In the System model activity bar, select activity tab Variables. You can see all exported variables.

Setup Wizard

In the Project activity bar, select activity tab Home, in Command Bar select Setup Wizard.

In the window, choose **Custom Setup** – click Next – **Local Engineering Environment** – click Next – **Configure local settings** – click Next – in Context choose **MyPlant**, in Startup Page choose **Master_PageMenu1_HD1080** – click Next – click Next – choose **Stand alone** – click Next – click Next – click Next – check **Enable events on this computer** – click Next – click Next – ... – click Next – Done.

Creating Graphics Page

When we start Citect Studio, Citect Graphics Builder window will open too.

Graphics Builder is the tool you use to create and configure graphics pages. You can add content to a page that makes it reflect the area or processes it will be used to monitor.

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From the File menu select New and choose Page. Use "pagecontent" tamplate.

To save the page: from the File menu select Save. In the Page field, write "MyPage". In Project, choose your project and click OK.

Go to **Citect Studio** in the **Visualization** activity bar, select activity tab **Menu Configuration**. In the last row, fill in the columns as shown below.

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e														

Drawing Graphics Objects

On the toolbar, click View, then Grid Setup. In the Grid Setup form, change the size of the grid from 8 x 8 pixels to 5 x 5 pixels. Check the Snap to Grid option, and then click OK to close the form.

Now we are ready to create and position our graphics objects.

Add Text

Click on the letter A on the Toolbox. Type "Start Timer". Place the cursor and click to position the text that you have typed. An appearance form will be displayed to allow further customisation of the text. Choose size 18.

Add Button

On the Toolbox, click on the Button icon. To draw the button, click and hold the left mouse button while moving the mouse then release the left mouse button (i.e. click and drag the mouse).

Once you release the mouse button, the Button Properties dialog popup will appear. Double-click on the word button in the Text edit box and write "Start".

Click on the Input tab at the top of the form to configure the action the button will perform. Select the **Up** action, then copy tag "M340_Input" from **System model** activity bar activity tab **Variables** and paste "Toggle(M340_Input)". When you are finished, click OK.

All objects you can copy (Ctrl+C), paste (Ctrl+V) and duplicate (Ctrl+D).

Add numbers and using keyboard data entry

On the Toolbox, click on the **Number** tool. In the **Numeric expression field** insert Tag "M340_set_point", choose format ####. In the horizontal tab "Input", choose vertical tab **Keyboard Commands.** In **Key sequence command** write "M340_set_point = arg1", in Key sequence choose ENTER and write ####ENTER. You want to create a second number with tag "M340_test_time".

Add animated symbols

On the Toolbox, click on the Symbol Set Tool.

Position the cursor next to the Manual button, then click to place the symbol on the page. In the ON symbol when edit box type "M340_Output". You can change the symbol type. Click Set.

Save your page.

Start Timer	Start
Timer Setpoint	####
Current Time	####
Output	•

Step 4: Compile and run project

10



Compile Project

In the activity bar, choose **Compile** the active project or Alt + F10. If compilation succeeded, you can run the project.

Run Project

In the activity bar, choose Run the active project or F5. Run in Demo mode? Click OK.

Save, Restore and Remove project

To save the project: in the Projects activity bar, select tab **Home**, and in the command bar choose command **Backup** (save in zip-file). To remove the project, choose command **Remove**. To restore the project, choose command **Restore**.

Check your program. Click Start. When the timer reaches the desired level, the LED should turn red.

Step 5: Add new FBD block in Unity Pro XL:

- 1. Create new section "LAG_logic".
- 2. Right click on the empty field FFB Input Assistant FFB type selection button choose LIBsetV13 folder CONT_CTL Conditioning LAG_FILTER block OK. Paste block.

AG_FILTER			× [Π	eip On Ty		
unction and Function Block types						
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Controller	🗈 💶 QDTIME		<efb></efb>			
Mathematics	🗈 💶 SCALING		<efb></efb>			
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- 3. Add tags for LAG_FILTER block
- 4. Simulate and check new block

IN	Valve
OUT	Temper
GAIN	1.2
TAG	t#20s

Step 6: Refresh tags in Citext Studio:

1. In the **System model** activity bar, select activity tab **I/O Devices and choose your device. Click** on Refresh Tags button, choose I/O device and click Refresh – Close.

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2. In Graphics Builder, create and save new page "LAG_test".

Step 7: Create Analogue Level Fill:

- 1. Add Rectangle from Toolbox.
- 2. Change the Filled Color to white.

3. Check the Gradient Fill option and select bright green as the Gradient Color.

	Свойства: Rectangle	×
Appearance Movement Scalin Line Width: Style: Solid Color: Fill Fill Color:	Goldent Gradient Gradient Fill Color: Direction:	General 3D Effects Visibility
	ОК Отмена Применить	Справка

- 4. From the pull-down options, change the Gradient Direction to vertical.
- 5. Click on the **Fill** tab and select **Level** from the vertical tabs on the right-hand side of the form.

Свойства: Rectangle	×
l ≪ Appearance ≪ Movement ≪ Scaling 🔽 Fill ≪ Input ≪ Slider ≪ Access ≪ Metadata	
Level expression	🖉 Color 🗸 Level
Specify range Minimum: 0.0 A Maximum 32000.0	
Level At minimum Imaximun Imaximun Imaximun Fill Fill Fill Fi	
Clear Property	
ОК Отмена Применить Спра	вка

6. Paste, in the Level expression field, "M340_Valve" tag and click OK.

Step 8: Create Slider to Control Analogue Values:

To create a slider you need to find out how far (in pixels) the slider needs to move.

Select the rectangle, and look at information provided in the status bar at the bottom right corner of the Graphics Builder.

- 1. On the Toolbox click on the Paste Symbol tool.
- 2. In the Library choose, xp_sliders library and then select the right_normal slider icon.

Paste Symbol						×
Symbol: right_	normal	< left_normal	Left_pressed	Library: valve_solonoid valves ventilation xp_buttons xp_grid xp_siders	^ [OK Cancel Edit
right_normal				xp_tabs ∢ I Linked	•	New
					1	Help

- 3. Position the pointer at the left bottom side of the gradient rectangle using Zoom and Nudge.
- 4. Double click on the Pointer Symbol to open the Symbol Properties form.
- 5. Click on the **Slider** tab, and then on the **Vertical** tab on the right-hand side.
- 6. Paste in the **Tag** field **M340_Valve** tag.

Свойства: Symbol							
✓ Appearance	Input 🖌 Slider 🖉 Access 🖉 Metadata						
Tag M340_Valve		- Horizontal Vertica					
Offset At maximun At minimum At minimum At Maximum At At At At At At At At At At		I × Rotational					
	Clear Property						
	ОК Отмена Применить Справ	ка					

7. If the Continuous update of tag option is checked, then the tag will be written to while it is being dragged. In the At Maximum edit box, type the height in pixels that you wrote down earlier.

- 8. Click OK.
- 9. Click the save icon to save your page. Compile and run the project to test these changes before continuing.

Add Text and Numbers (for tags "M340_Valve" and "M340_Temper").



Step 9: Add Trends

1. (Citect Studio) In the **System model** activity bar, select activity tab **Trends** and add new trend "**M340_Temp_trend**".



2. (Citect Graphics Builder) Click Objects - Trend and draw window.

	S	Alarms	Trends	Accumulators	SPC			
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3. In the Appearance tab in Cluster Name, choose your cluster. In the Pens field, in any row add your trend "**M340_Temp_trend**". You can change color of trend, number of samples, pixels per sample etc.

Свойства: Trend	×
Appearance Input Access Metadata Cluster Name: Cluster1 Pens L Barrier Edit Barri	General 🧹 Visibility
6 7 8 Samples Number of samples: 101	
Pixels per sample: 10 Display All Trend Types As Periodic	равка

Save your page.

Update two variables ("M340_Valve" and "M340_Temper") in Citect Studio,

Var	riables		-										
	Row	Tag Name		∇	CI 🏹	1/17	Data Type 🖓	Address 🛛	COV	Eng Zero Scale 🏹	Eng Full Scale 🏹	🕆 🖽 🖨 🍂 Seard	h Propertie
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8	84	M340_TOM	L1_Q			M340	DIGITAL	TON_1.Q				Equipment	
8	85	M340_TOM	L1_ET			M340	ULONG	TON_1.ET				Item Name	
	80	M340_Valv	ne.			M340	REAL	Valve.		0.0	100.0	J General	0
ø	87	M340_LAG	FILTER_0_IN			M340	REAL	LAG_FILTER_0.IN				Tag Name	M340_Va
8	88	M340_LAG	FILTER_0_GAIN			M340	REAL	LAG_FILTER_0,GAIN				Cluster Name	
S	89	M340_LAG	_FILTER_0_LAG			M340	ULONG	LAG_FILTER_0.LAG				I/O Device	M340
s	90.	M340_LAG	_FILTER_0_TR_I			M340	REAL	LAG_FILTER_0.TR_I				Data Type	REAL
ø	91	M340_LAG	,FILTER_0_TR_S			M340	DIGITAL	LAG_FILTER_0.TR_S				Address	Valua
ø	92	M340_LAG	FILTER_0_OUT			M340	REAL.	LAG_FILTER_0.0UT				Address	
o	93	M340_Ten	iper			M340	REAL	Temper		0.0	120.0	Comment	-
s	94	M340_LAG	X_0_X			M340	REAL	LAG_0.X				Deadband	
ø	95	M340_LA0	L0_YMAN			M340	REAL	LAG_0.YMAN				Eng Units	-
s	96	M340_LA0	i_0_Y			M340	REAL	LAG_0.Y				Format	
s	97	M340_LAG	_0_MODE_man			M340	DIGITAL	LAG_0.MODE.man				J Scale	
s	98	M340_LAG	_0_MODE_halt			M340	DIGITAL	LAG_0 MODE halt				Raw Zero Scale	
p,	99	M340 LAG	D PARA gain			M340	RFAI	LAG 0 PARA nain				* Raw Full Scale	

Step 10: Add Alarms

1. (Citect Studio) In the System model activity bar, select activity tab Alarms.

- 2. On the menu below the Command Bar, select Analog Alarms.
- 3. Click to modify the columns on display.

System Model	Equipment Va	riables Alar	ms Trends	Accumulato	rs SPC		
🕄 Save 🗙 Discard 🛛 🗖 C	opy 🖺 Paste 🚍	Delete Row(s)	Export All	- Import All			
Analog Alarms	-						
Row Alarm Tag	Alarm Name 🏹	Category 🏹	Setpoint 🖓	Deviation 🏹	Deadband 7	Comment 🍸	Variable Tag 🏹
Reset to Default Columns Size Columns to Content	Temperature Alarm						M340_Temper
Row							
Equipment							
 Alarm Tag Alarm Name Cluster Name Category Setpoint Deviation Deviation Delay Rate Deadband Format Help Comment 							
🗹 Variable Tag							
 High High High High Delay High Delay High Delay Low Delay Low Low Low Low Low Low Delay 							

4. Add analog alarm.

Analog Tag	M340_Temp_Alarm
Alarm Name	Temperature Alarm
Variable Tag	M340_Temper
High High	115
High	110
Low	10
Low Low	5

- 5. On the menu below the Command Bar, select **Digital Alarms.**
- 6. Add digital alarms.

Alarm Tag	M340_Start_Timer	M340_Stop_Timer
Alarm Desc	Start timer	Stop timer
Variable Tag A	M340_Input	M340_Output
Variable Tag B	M340_Output	

7. Click Save button.

Compile and Run your project.

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Valve Temperature	20.4 16.0			
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Проверка МуРаде	LAG_test	Оборудование не выбрано	Оборудование не	выбрано