Freeway Exercise

Solutions for OEMs, FreeStudio Thermostat exercise





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Function Description

Goal: Describe thermostat flow chart









Programming

Goal:

- Familiarizing with programming environment
- Creating Thermostat Function Block



Creating New project





Creating New project



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Creating New project

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Al M. Operator and standard blocks / Terrativersibles \ Terrative	
Rady FDIT MODE	NOT CONNECTED



Programming environment





Programming Languages



The FREE STUDIO platform is compatible with all 5 standard programming languages (IEC 61131-3).



5 programming languages, 2 text-based and 3 graphics-based:

- ST, Structured Text, language text
- FBD, Functional Block Diagram language graphical
- LD, Ladder language graphical
- IL, Instruction List language text
- SFC, Sequential Function Chart language graphical



Associating a program to a task



- For a program to run, it must be associated to a task.
- There are various types of tasks:
- BOOT Task runs once only at system start-up.
- Init. Task runs each time the application is downloaded and after **BOOT**.
- Timed. Task runs at regular intervals which can be set by the developer.

The default setting is 100ms.



- •Background. Task runs with low priority after the Timed tasks (between the end of one Timed task and the start of the next), it can be interrupted in case of long execution or executed more than 1 time in case short execution.
- Note Each new project has the main program associated to the background task (the main program can still be eliminated and/or associated to other tasks).
- To activate a task, go to the task you want, right-click and select Add program

Tasks



- BOOT Task runs once only at system start-up.
- Init. Task runs each time the application is downloaded and after BOOT.
- **Timed.** Task runs at regular intervals which can be set by the developer. The default setting is 100ms.
- •Background. Task runs with low priority after the Timed tasks (between the end of one Timed task and the start of the next).



Assigning program to the task





View FBD toolbar





New function block creation





- 1. Right Click
- 2. New function block
- **3. Select the language**
- 4. Assign a name
- 5. Double click on the Hysteresis to open the editor related to the selected language.

Note: Try to create function if the block does not require static RAM, it will optimize the RAM usage

New function blo	ck			×
Canguage	© FBD	© LD	● ST	© SFC
Name Hysteres	is			
	Ok		Cancel	

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Insert record

Window Tools Developer Help

1

2



x

Inside Hystersis FBD



Local variables									
	Class	Pin	Name	Туре	Array	Init value	Attribute	Description	
1	VAR_INPUT	0	Temperature	INT	No			Analogue Input 1	
2	VAR_INPUT	1	Setpoint	INT	No			Set point	
3	VAR_INPUT	2	Differentiation	INT	No			Δ	
4	VAR_OUTPUT	0	Alarm	BOOL	No			Probe Alarm	
5	VAR_OUTPUT	1	Output	BOOL	No			Actuator	

0001 0002 0003 0004	<pre>(* Hystersis FBD *) if Temperature >= Setpoint + Differ Output := TRUE;</pre>	rentiation then	Compile resu as FBD used	ılt i in	s va the	lid as soo program
0005	end_if;					
0006	if Temperature < Setpoint then	Output				
0008	Output := FALSE;	Free code space:	2F1E0h	(188	KByte)
0010 0011 0012	(* Probe disconnection detector)	Data space: Free data space:	8C0h 8ABh	((2 2	KByte) KByte)
0013	if Temperature = -32768 then					
0014 0015 0016	Alarm := TRUE; else Alarm := FALSE; end_if;	O warnings, O ern	rors.			
0017 0018		▲ ► Build Find in pro	ject) Debug) Resource	es /		_

FBD in Background





Set password for written FB



Ap PLC - Eliwell Free Studio Application - C:\Electrical\Solution Archite	Ap M171 exercise - Eliwell Free Studio Applicatio	n - C:\Electrica
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	- i 💁 🔁 🕞 トロス 🏝 🛍 🖓 🖓	🖨 🖪 🗖
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PLC Project Local variables	B-@ M171 exercise Project	Local variables
Programs Name Name	🕀 🦲 Programs	Eocur vonuores
Hysteresis 1 Input_Temp	Function blocks	1 Hysters
Functions Global variab Global shared Tasks Duplicate function block properties Duplicate function block Delete function block Delete function block to library Copy (name) Crypt Decrypt Decrypt Build Find	Edit source View Function block proper Edit Function block proper Edit Function block propert Duplicate function block Delete function block Export function block to lib Copy (name) Crypt Decrypt	rties ties rary Ctrl+C
Get password Password: Confirm password: OK Cancel Unical Training April 2014 Ai	Get password Password: Confirm password: Confirm password: Cancel	You o to yo inside

You can prevent access to your written codes inside of FBD by cript.

FBD toolbar...





- **1.** Connection
- 2. Watch
- 3. New block
- 4. Variable
- 5. Constant
- 6. Return
- 7. Jump
- 8. Comment
- 9. Increase number of pins
- **10. Decrease number of pins**
- 11. Display enable I/O pins
- **12. FBD properties**
- 13. View source

11. The output will not update if En=False





Cross Reference





Compile/Build

Compile

Output	ዋ ×
	A
Preparing for PLC application download done. Downloading file C:\Users\SESA94552\Thermostat New\Thermo Booting PLC application done.	stat New.cod completed.
O warnings, O errors.	
	E
< III	- F
LIN Build & Find in project & Debug & Resources /	
lutput	т ×
Generating program THERMOSTAT	*
Generating program DISPLAYALARMLED	
Generating program APPLICATIONMENU	
Generating unresolved	
ADDILEG. THEDMOSTAT(19EB·HVSTEDSIS 00) - error 20008· ST =\ Invel	id access to variable
<u>metalosini (1915.misteksis_00)</u> elitel 60000. SI -> 11041	in access to variable
0 warnings, 1 errors, Double click	on the error to
refer to the er	ror source
I. Build (Findiansia) Debug Descures (

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Chapter 3

Resources

Goal:

Defining the resources:

- Assigning physical Input/output
- EEPROM parameters
- Status variables
- Menu definition and navigation



Physical I/O Mapping (Base Unit)...



						Local I/O Mapping
esources $+ \wedge$	#	Name	Variable	Туре		Description
	1	AIL1	Ambient_temperature	INT	AIL1 analogue input	
Madhua abiasta	2	AILZ		INT	AILZ analogue input	
	3	AIL3		INT	AIL3 analogue input	
	4	AIL4	141	INT	AIL4 analogue input	
Status variables	5	AIL5	•	INT	AIL5 analogue input	
	6	DIL1		BOOL	DIL1 digital input	
Menu Pra	7	DIL2		BOOL	DIL2 digital input	
Menu set	8	DIL3		BOOL	DIL3 digital input	2 I/O Manning definition:
E I/O Mapping 2	9	DIL4		BOOL	DIL4 digital input	2. Vo mapping demittion.
	10	DIL5		BOOL	DIL5 digital input	
Extended	11	DIL6		BOOL	DIL6 digital input	Local: Base I/O
Remote 13	12	DOL1	Otput_Heating	BOOL	DOL1 digital output	Extend: Expansion
Alarms	13	DOL2	Alarm	BOOL	DOL2 digital output	
Help	14	DOL3		BOOL	DOL3 digital output	Remote: Keyboard
	15	DOL4		BOOL	DOL4 digital output	
	16	DOL5		BOOL	DOL5 digital output	
Project 🗠 Defini 🖽 Resou	17	DOL6		BOOL	DOL6 digital output	
	18	AOL1		INT	AOL1 analogue output	
	19	AOL2		INT	AOL2 analogue output	
•	20	AOL3		INT	AOL3 analogue output	
	21	AOL4		INT	AOL4 analogue output	
Resources	22	AOL5		INT	AOL5 analogue output	
	23	TCL1		INT	TCL1 analogue output	

- 3. Local
- 4. Name variables

...Physical I/O Mapping (Base Unit)...



Ap Thermostat Exercise rev.1 - Eliwell Free Studio Application - C:\Electrical\Solution Architect\Eliwell\Exercise\Thermostat Exercise\Restore\Thermostat Exercise										
🔚 File Edit View Project On-line Debu	ug V	Vindow Tools	Developer Help							
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Project 7 × Resources 7 Thermostat 💫 Global variables										
🖃 🗃 Thermostat Exercise rev.1 Project 🦵	Thermostat Exercise rev.1 Project									
🖶 💼 Programs						FreeSmart Local I/O Mapping				
🖶 🚞 Function blocks						- · · ·				
Eunctions	#	Name	Variable	Туре		Description				
🗄 🛄 Global variables 🛛 📩 📘	1	AIL1	Ambient_temperature	INT	AIL1 analogue input					
Global shared	2	AIL2		INT	AIL2 analogue input					
	3	AIL3		INT	AIL3 analogue input					
Appings	4	AIL4		INT	AIL4 analogue input					
	5	AIL5		INT	AIL5 analogue input	After saving the project, all				
	6	DIL1		BOOL	DIL1 digital input	the defined recourses will				
	7	DIL2		BOOL	DIL2 digital input	the defined resources will				
	8	DIL3		BOOL	DIL3 digital input	be available under Global				
	9	DIL4		BOOL	DIL4 digital input	shared folder:				
	10	DIL5		BOOL	DIL5 digital input					
	11	DIL6		BOOL	DIL6 digital input	Mappings in case of I/O				
	12	DOL1	Otput_Cooling	BOOL	DOL1 digital output					
	13	DOL2	Alarm	BOOL	DOL2 digital output					
	14	DOL3		BOOL	DOL3 digital output					
	15	DOL4		BOOL	DOL4 digital output					
	16	DOL5		BOOL	DOL5 digital output					
	17	DOL6		BOOL	DOL6 digital output					
l l	18	AOL1		INT	AOL1 analogue output	t				
l l	19	AOL2		INT	AOL2 analogue output	t				
	20	AOL3		INT	AOL3 analogue output	t				
F	21	AOL4		INT	AOL4 analogue output	t				
F	22	AOL5		INT	AOL5 analogue output	- t				
	23	TCL1		INT	TCL1 analogue output	t				

...Physical I/O Mapping (Expansion)



How to configure I/O types, range?



Image: Continue to the contin the continue to the continue to the continue to the continue to	Image: Second continuation Image: Second continuation Build Configuration Image: Second continuation Image: Second continuation Export application to cate Image: Second continuation Image: Second continuation Export application to cate Image: Second continuation Image: Second continuation Export application to cate Image: Second continuation Image: Second continuation Export application to cate Image: Second continuation Image: Second continuation Export application to cate Image: Second continuation Image: Second continuation Export application to cate Image: Second continuation Image: Second continuation Export application to cate Image: Second continuation Image: Second continuation Export application Image: Second continuation Image: Second continuation Export application	alog (小) 田樹(逾勤(小)) = hysteresis	한한하노 않성영역 (명명): 1866년년년(1991): 1966년년년(1991):	2月11日日本 (1991日) (199100) (1991	
FreeSmart FreeSmart Status variables Status variables Status variables Status variables Status variables Status variables BIOS Parameters BIOS Parameters Menu Prg Setting Menu Setting Menu Setting Menu Setting Menu Setting Menu Setting Menu Setting Menu Help Help	Display Fundamental state display: Redisent Temperator F1 F5 I F5 I F3 eliL/eli	F2 F2 Esc I Prg I Set F4	FreeSmart Configuratio	Drowse Export	

1. Menu Developer ► Open with free studio device

Note: BIOS parameters are also available on the installation manual

Check FS Device parameters description...



Project	1	7 ×						
🗊 Thermosta exercise rev.2								
E-FreeSmart		_						
BIOS parameters							Local	
in Marameters	Address	Name	Value	Um	Default	Min	Max	Description
	53304	CL00	2=NTC	num	2=NTC	0	8	AIL1 analogue input type
	53305	CL01	2=NTC	num	2=NTC	0	8	AIL2 analogue input type
Pamoto	53306	CL02	2=NTC	num	2=NTC	0	7	AIL3 analogue input type
	53307	CL03	2=NTC	num	2=NTC	0	7	AIL4 analogue input type
	53308	CL04	2=NTC	num	2=NTC	0	8	AIL5 analogue input type
	15649	CL10	500	°C/Bar	500	-9999	9999	AIL3 analogue input full scale value
Extended	15655	CL11	0	°C/Bar	0	-9999	9999	AIL3 analogue input start of scale value
Remote	15650	CL12	500	°C/Bar	500	-9999	9999	AIL4 analogue input full scale value
Protection Password	15656	CL13	0	°C/Bar	0	-9999	9999	AIL4 analogue input start of scale value
Application	53334	CL20	0	°C	0	-120	120	AIL1 analogue input differential
Empes	53335	CL21	0	°C	0	-120	120	AIL2 analogue input differential
	53336	CL22	0	°C/Bar	0	-120	120	AIL3 analogue input differential
	53337	CL23	0	°C/Bar	0	-120	120	AIL4 analogue input differential
	53338	CL24	0	°C	0	-120	120	AIL5 analogue input differential
	53344	CL60	0=0-20mA	num	0=0-20mA	0	2	AOL5 analogue output type
	53346	CL70	0=Disable	num	0=Disable	0	2	Enable TCL1 analogue output
	53347	CL71	0=Disable	num	0=Disable	0	2	Enable AOL1 analogue output
	53348	CL72	1=Enable	num	1=Enable	0	2	Enable AOL2 analogue output
	53349	CL73	27	Deg	27	0	90	Phase shift TCL1 analogue output
	53350	CL74	27	Deg	27	0	90	Phase shift AOL1 analogue output
	53351	CL75	27	Deg	27	0	90	Phase shift AOL2 analogue output
	53352	CL76	10	69 µsec	10	5	40	TCL1 analogue output pulse length
	53353	CL77	10	69 µsec	10	5	40	AOL1 analogue output pulse length
	53354	CL78	10	69 µsec	10	5	40	AOL2 analogue output pulse length

...and define the Application BIOS Default



EEPROM parameters





	Add 📃	Remove	Recalc										5		
#	Address	Name	Display label	Device type	Application type	Default value	Min	Max	Scale	Offset	Unit	Format	AccessLevel	Description	Note
1	16384	Setpoint	SetP	Signed 16-bit	INT	180	150	300	1	0	°C	XXX.Y	Always visible		
2	16385	Differentiation	Diff	Signed 16-bit	INT	20	5	50	1	0	°C	XXX.Y	Always visible		

EEPROM Properties

							FreeSmart EEPROM Parameters								
-	Add 🚦	Remove	Recalc								2		4		
#	Address	Tvame	Display label	Device type	Application type	Default value	Min	Max	Scale	Offset	Unit	Format	AccessLevel	Description	
1	16384	Setpoint	SetP	Signed 16-bit	INT	180	150	300	1	0	°C	XXX.Y	Always visible		
2	16385	Differentiation	Diff	Signed 16-bit	INT	20	5	50	1	0	C	XXX.Y	Always visible		
 Mesrage from webpage Image: State of the sta															

Ар

Status Variables



34



Alarms





Fundamental state display configuration




Menu Program – Add Folder



- 1. Menu Prg.
- 2. Add Menu
- 3. New Menu, name it (Cfg)
- 4. 7 segment preview

Menu Set – Add Folder





- 1. Menu Set, Right Click Add Menu
- 2. New Menu, name it (Setting Menu)
- 3. 7 segments preview

Add/Remove elements to folder





Add/Remove elements by drag & drop



Resources	ч ×	F	eeSmart 'Cfg' Menu
Configuration		er e e e e e e e e e e e e e e e e e e	
🚊 🚛 FreeSmart			
🗄 📲 Modbus objects		# Name Description	
EEPROM Parameters		1 Setpoint	
Status variables		2 Differentiation	
- 🕅 Enums			
BIOS Parameters	Drog		
- Menu Prg	Drag	J & Drop	
Cfg			
Menu set			
R Setting Menu		FreeSmart	'Setting Menu' Menu
		La	
Alarms		Display label: Add Add Remove Down	
A Help		# Name Description	
- Tich		1 Setpoint	
		2 Differentiation	
		3 Ambient_Temperator	

						FreeSmar	t EEPROM Param	ieters				
	Add 🔚 Remove 📓 Recalc											
#	Address	Name	Display label	Device type	Application type	Default value	Min	Max	Scale	Offset	Format	AccessLevel
1	16384	Setpoint	SetP	Signed 16-bit	INT	180	150	300	1	0	XXX.Y	Always visible
2	16385	Differentiation	Diff	Signed 16-bit	INT	20	5	50	1	0	XXX.Y	Always visible

Menu Program – How to Access





Menu Set – How to Access





Menu architecture









Using physical I/O





System LED setting

2



LED reference for the developer

 x Resources 🗃 Configuration EreeSmart Modbus objects EEPROM Parameters Status variables 🔊 Enums BIOS Parameters 🖮 🖳 Menu Prg -- 🗈 Cfg - Menu set Setting Menu I/O Mapping 🗄 Local Extended 📑 Remote Alarms 🥭 Help



The IEC developer can turn on (either steady or blinking) and off the whole range of local display LEDs, by properly setting the array SYSLED.

LED number	Symbol or icon	Description	Off	On (steady)	On (blinking)
0	:	Colon	SYSLED[0]=0	SYSLED[0]=1	SYSLED[0]=2
1	%R.H.	%RH	SYSLED[1]=0	SYSLED[1]=1	SYSLED[1]=2
2	*	Defrost	SYSLED[2]=0	SYSLED[2]=1	SYSLED[2]=2
3	Bar	Bar	SYSLED[3]=0	SYSLED[3]=1	SYSLED[3]=2
4	Ċ	Stand-by	SYSLED[4]=0	SYSLED[4]=1	SYSLED[4]=2
5	°C	°C	SYSLED[5]=0	SYSLED[5]=1	SYSLED[5]=2
6	桊	Cooling	SYSLED[6]=0	SYSLED[6]=1	SYSLED[6]=2
7	\odot	Clock (RTC)	SYSLED[7]=0	SYSLED[7]=1	SYSLED[7]=2
8	業	Heating	SYSLED[8]=0	SYSLED[8]=1	SYSLED[8]=2
9	-	User-defined 1	SYSLED[9]=0	SYSLED[9]=1	SYSLED[9]=2
10	-	User-defined 2	SYSLED[10]=0	SYSLED[10]=1	SYSLED[10]=2
11	•	User-defined 3	SYSLED[11]=0	SYSLED[11]=1	SYSLED[11]=2
12	•	User-defined 4	SYSLED[12]=0	SYSLED[12]=1	SYSLED[12]=2
13	•	User-defined 5	SYSLED[13]=0	SYSLED[13]=1	SYSLED[13]=2
14	-	User-defined 6	SYSLED[14]=0	SYSLED[14]=1	SYSLED[14]=2
15	-	User-defined 7	SYSLED[15]=0	SYSLED[15]=1	SYSLED[15]=2
16	\wedge	Alarm	SYSLED[16]=0	SYSLED[16]=1	SYSLED[16]=2
17	ABC	Menu	SYSLED[17]=0	SYSLED[17]=1	SYSLED[17]=2
18	Ô	Economy	SYSLED[18]=0	SYSLED[18]=1	SYSLED[18]=2

Some of the LEDs - for example, LED number 0, 1, 3, 5, and 7 (in green) - cannot be used by the IEC developer when BIOS menu is active.

System local LED assigning









Connecting dedicated LED's to the FBD





Valorize Fundamental State Display

Compile/Build

	•] = 🎧 🖓 🖋 🖋 🎼 🌆 🛍 🔂 🔜
Compile	
Output	д х
Preparing for PLC appli Downloading file C:\Use Booting PLC application O warnings, O errors.	cation download done. ers\SESA94552\Thermostat New\Thermostat New.cod completed. done.
	nong <u>Antesources</u>
Generating program THE Generating program DIS Generating program APP Generating unresolved aborted. THERMOSTAT(1\$FB:HYSTER	AMOSTAT PLAYALARMLED LICATIONMENU SIS_00) - error G0008: ST => Invalid access to variable
O warnings, 1 errors.	Double click on

Debug

Image: Image

Resources

-

the error to refer to

the error source

Chapter 4

Simulation/Debugging – Part 1

Goal:

Debugging created FB by different off-line simulation tools such as Watch or Oscilloscope

Off line simulation mode

The state of communication is shown in a small box next to the right border of the **Status bar.**

If you have not yet attempted to connect to the target, the state of communication is set to **Not connected.**

NOT CONNECTED

- When you try to connect to the target device, the state of communication becomes one of the following:
- -Error: the communication cannot be established. You should check both the physical link and the communication settings.

ERROR

-Connected: the communication has been established

- Next to the communication status there is another small box which gives information about the status of the application currently executing on the target device.
- When the connection status is Connected, the application status takes on one of the following values.
- -No code: no application is executing on the target device.

NO CODE

--Diff. code: the application currently executing on the target device is not the same as the one currently open in the IDE; moreover, no debug information consistent with the running application is available: thus, the values shown in the watch window or in the oscilloscope are not reliable and the debug mode cannot be activated.

--Diff. code, Symbols OK: the application currently executing on the target device is not the same as the one currently open in the IDE; however, some debug information consistent with the running application is available (for example, because that application has been previously downloaded to the target device from the same PC): the values shown in the watch window or in the oscilloscope are reliable, but the debug mode still cannot be activated.

DIFF. CODE (SYM)

-Source OK: the application currently executing on the target device is the same as the one currently open in the IDE: the debug mode can be activated.

SOURCE OK

Assigning local variable to the FBD

Debug mode/Changing values

Watch configuration

ſ	Name Hysteresis 00	Type Hysteresis	Address Auto	Array	Init value	Attribute				independant
2	Input_Temp	INT	Auto	No			11			ive debug in
								Drag & Dr	on	
Vat P	ch 🍽 🕨 🖥 🚮	۶							op	
Sym	nbol	Valu	іе Ту	pe	Location					
B	HYSTERESIS_00	-	H.		@BACKGRO	UND				
-	- TEMPERATURE	250	IN	Т	@BACKGRO	UND				
-	- SETPOINT	180	IN	Т	@BACKGRO	UND				
-	- DIFFERENTIATIO	ON 20	IN	Т	@BACKGRO	UND				
-	ALARM	FALS	SE BO	DOL	@BACKGRO	UND				
		TRU	E BO	OOL	@BACKGRO	UND				

Watch/ drag & drop

	Watch							
~	Symbol	Value	Туре	Location				
4	- INPUT_TEMP	0	INT	@BACKGROUND:THERMOSTAT				

Watch Configuration/ST language

0001 (* Hystersis FBD * 0002 if Temperature >= 0003 if Temperature >= 0004 Output := TRUH 0005 end_if; 0006 Output := FALS 0008 Output := FALS 0009 end_if;	*) Setpoint + I; Setpoint the SE;	Differenti en	 ation then 2 1. Select the variale 2. Double click 3. Drag & drop it directly to the watch properties
0010 (* Probe disconned 0012 if Temperature = - 0013 if Temperature = - 0014 Alarm := TRUE 0015 else Alarm := 0016 end_if; 0017 0018	tion detec 32768 then FALSE;	0001 0002 0003 0004 0005 0006 0007 0006 0007 0008 0009 0010 0011 0012 0013 0014 0015 0014	<pre>(* Hystersis FBD *) if Temperature >= Setpoint + Differentiation then Output := TRUE; end_if; if Temperature < Setpoint then Output := FALSE; end_if; if Temperature = -32768 then Alarm := TRUE; else Alarm := FALSE; end_if;</pre>
Watch			
🖉 🚳 🕨 🖪 🖬 😫 🗡			
Symbol	Value	Туре	Location
— HYSTERESIS_00.TEMPERATURE	0	INT	@BACKGROUND:THERMOSTAT

Oscilloscope

View ► Tool windows ► Async graphic windows ► 👼

	5	1 🗊 📰
--	---	---------

Assigning variable to the oscilloscope

Assigning variable to the oscilloscope

When you add a variable to the Oscilloscope, data acquisition begins immediately.

However, you can suspend the acquisition by clicking on **Pause acquisition.** The curve freezes (while the process of data acquisition is still running in background), until you click on **Restart acquisition.**

In order to stop the acquisition you may click on Stop acquisition.

In this case, when you click on **Restart acquisition, the evolution of the** value of the variable is plotted from scratch.

Oscilloscope tools/ Vertical split

- 1.Selected track's vertical show all
- 2. Horizental show all
- 3. Show all values
- 4. When you are watching the evolution of two or more variables, you may want to split the respective tracks.
- 5. The tool highlights the single values detected during data acquisition.
- You can click on the same item again, in order to go back to the default view mode.
- 6. The Oscilloscope includes two measure bars, which can be exploited to take some measures on the chart.

When you open the Oscilloscope, Application applies a default scale to the axes. However, if you want to set a different scale, you may follow this procedure:

1) Open the graph properties 2) Set the scale of the horizontal axis & sampling polling rate 3) Specify a distinct scale for the vertical axis.

4) Confirm your settings.

cilloscope settings			? >	
Show grid 🛛 🕅	Sample polling	grate 20	ms	Real rate
Show time bar 🛛 📝	Horizontal sca	le 5000	ms/di∨	20.00
Show tracks list 🛛 📝	Buffer size	40000	samples	
		Fracks list		3
Name	Unit	Value/div	Offset	Hide
@BACKGROUND:TH	ERMC	1	0	
@BACKGROUND:TH	ERMC	1	U	
@BACKGROUND:TH	ERMC	1	0	
@BACKGROUND:TH	ERMC	1	0	
@BACKGROUND:TH	ERMC	1	0	
				_ ا
	(Cancel	Apply	ОК

Oscilloscope/export

Oscilloscope **Ψ**× 🛅 🖻 | 🕀 | 🛠 🎗 🖃 | 🛠 🎗 🗊 | 🔳 🕨 💽 🖆 🎒 Ap Save As - 22 - G 🕸 📂 🗔 -Deskto Save in: 1. Save icon 23 2. Name & format defining Recent Places Libraries Aidin Network Desktop Aliyarzade. -OSC: simple plain-text file, containing Desktop time and value of each sample 1400 Launch free -OSCX: XML file, that includes more Libraries Studio complete information **Available formats** Computer 2 3. Open it via Excel (OSCX) (îi Network Oscilloscope XML files (*.OSCX) Themostat OSCX Save File name: Oscilloscope files (*.OSC) Save as type Osciloscope XML files (".OSCX) Cancel All files (*.*)

	А	В	C		D	E	F	G	Н		J
1	hscale 🛛 💌	triggerpos 🛛 🔽	name	💽 ur	m 💌	vscale 💿 💌	offset 🛛 🔽	color 💽	note 💌	sample 💌	time 🔽
2	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE			25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870186
3	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE			25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870205.9
4	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE			25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870226.2
5	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE			25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870246.1
6	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE			25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870266.2
7	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE			25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870286.2
8	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE	$\int^{}$	٦	25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870306.1
9	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE	$\mathbf{S}\mathbf{B}$		25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870326
10	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE			25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870346.1
11	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE			25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870366
12	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE			25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870386.2
13	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE			25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870406.1
14	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE			25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870426.2
15	55536.85563	1.79769313486232E+308	@BACKGROUND:THERMOSTAT.NTC_PROBE			25323.57143	111271.0714	65535	@BACKGROUND:THERMOSTAT	0	232870445.9

Chapter 5

Simulation and Debugging – Part 2

Goal:

On-Line simulation mode, testing of:

- Physical I/O
- 7 segment display

Off line simulation mode

Simulation tools

Active code execution
 Show I/O panels
 Show HMI window

Digital Inputs	
DIL3	
DIL4	
DIL5	
DIL6	

Π	Analogue Inputs		×
	I AIL1		0
	AIL2		0
	AIL3	— <u> </u>	0
	II AIL4		0
	AIL5		0

Digital Outputs	Analogue Outputs	8
🗉 DOL1 🖉		
🔲 DOL2 🥥	AOL2 0	
🗉 DOL3 🥥	AOL3 0	
🗉 DOL4 🥥	AOL4 0	
🗉 DOL5 🥥	AOL5 0	
🔳 DOL6 🥥		

Open Free Studio Device from Application

	18189 18189	Build Configuration Export application to catalog	리미터 (미호퍼)에 = 타타라 (에) (開始) (해) (해) (해) (해) (해) (해) (해) (해) (해) (해	「「舞藝後聞」回回「い姓」を有多単しののママ国の	
Resources # × Configuration FreeSmart Image: Status variables Image: Status variables Image: Status variables <	Display Fundamental state display: F1 F2 Data export Select XSLT export filter:		Hysteresis Fr F2 Data export Select XSLT export filter:	PeeSmart Configuration Execution time Set execution time: Execution time (ms): 100 Browse Export	
	I F5 F3	① ② ③ ④ ⑤ ⑥ ⑦ eli⊾~ell	1. Deve	eloper ► Open with Free Studio Device	

Free Studio Device (Simulation Target)

Thermostat Exercise rev.1.CFN - Eliwell Free Stu	dio Device			• ×
File Edit View Parameters Recipes Option	is Help			_
🗋 🥔 🗐 🕄 🖓 🛄 R W 🗗 Lj				
Project # 1		Catalog		a 3
Thermostat Exercise rev.1	FreeSmart 412 Configuration	Device name	Version Maxversi Descriptio	an
Internostat Exercise rev1 I	General Name: FreeSmart Me version: 412.15 Communication Settings Address: 127.0.0.1 Obsable communication Obsable communication Part: TCPSP-5000 Baud rate: Obsable communication F1 TCPSP-5000 Part: TCPSP-5000 Baud rate: Disable communication Status: NOT CONNECTED F1 Free F2 Esc I Prg I Status: NOT CONNECTED Free ware version:			•
nnect to the tar te: Free Studio	get ► Connected feedback Device does not download the code in Simulation or cotting EEPROM parameters and check Status	n, it		3

С

N
Read / Write Values



Address	Name	Value	Um	Default	Min	Max	Description
6384	Setpoint	180.0	°C	180.0	150.0	300.0	
6385	Differentiation	20.0	°C	20.0	5.0	50.0	

Menu Navigation







Menu Navigation







Setting the setpoint





Setting the differentiation













Out of range message Only can disply: - 99.9.....999.9 Free Studio Device does not write default values

Testing program/applying values



Setpoint=26.0, Differentiation=10.0 & Ambient_Tempereature =37.0
 ⇒ DOL1= ON & ☆ = ON

- Setpoint=26.0, Differentiation=10.0 & Ambient_Tempereature =25.0
 ⇒ DOL1= OFF & ☆ = OFF
- Setpoint=26.0, Differentiation=10.0 & 26.0<Ambient_Tempereature<36.0
 ⇒ DOL1= ON & ☆ = ON
- Ambient_Tempereature =-32768
 > DOL1= OFF , 🔅 = OFF & DOL2= ON (probe disconnection alarm= ON)



- Application is the programming starting point.
- Device is used to download the overall compiled project and it is the only tool able to write EEPROM parameters.
- From Application it will always be possible to open Device directly without having to launch the program using the FREE Studio icon.





Connection to Smart

Goal: DMI interface driver installation and connect to the target





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DMI interface setup WIN 7



• As soon as the DM interface is connected, the Windows 7 operating system recognizes the newly connected hardware. The steps to be followed are described below.

Note: Connection procedure:

Connection: first USB then TTL

Disconnection: first TTL then USB

1.Once the hardware is connected, the message shown in the figure will appear:



Click on the message to start the Guided installation procedure Or you can manualy find it at:

Control Panel > All Control Panel Items > System

Device manager ► other devices ►

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Update driver software



2. The screen shown below will appear: select the second option to identify the driver

+	Search automatically for updated driver software Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings.
•	Browse my computer for driver software Locate and install driver software manually.

3. In the next screen, select the installation path for the FREE Studio program. Unless changed during installation, the path will be as shown in the next figure.

Update driver software



4. Once you have selected the correct path, the screen shown below will appear: select **Install this driver software anyway**

	Windows Security
G I Update Driver Software - AVR USB CDC DEMO	Windows can't verify the publisher of this driver software
Browse for driver software on your computer Search for driver software in this location:	Don't install this driver software You should check your manufacturer's website for updated driver software for your device.
 Computer → Windows (C:) → Program Files (x86) → Eliwell → free Studio Browse Include subfolders 	 Install this driver software anyway Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information. See details
Let me pick from a list of device drivers on my computer This list will show installed driver software compatible with the device, and all driver software in the same category as the device.	
Next Cancel	

Update driver software



5. The screen shown below will appear, indicating that the action has been performed.



6. On completion of the process, the screen shown below will appear, then close.



DMI Test via FS Device



To check correct installation of the driver and the port to which the hardware has been allocated, check the Windows screens shown below:



Connection to Smart



To download the IEC applications of **Studio from the personal computer to the Smart target device**,



Note: in "Direct", Smart must not be connected to earth

- it can switch on Smart without external power supply

Connection to Smart

Smart

Preliminary operations

In order to download the application correctly:

- 1. connect the DMI hardware interface to the PC.
- 2. Make sure that the driver is installed

Press **Settings**

The COM port must previously have been read/set in "Peripherals Management" (see Reading the DMI interface COM port) to be recognized. If there are errors, refer to the paragraph "DMI interface connection error".

the COM settings must be set on all of the workspaces: Application, Device and User Interface



-General		
Name: Fro	eeSmart	
File version:	412.15	
- Communicat	ion	
Protocol:	EwDMI	Settings
Address:	1	
Port:	COM:5	
Baud rate:	38400	





Protocol Configuration



- For Smart select EWDMI or Modbus*. If the protocol is not activated press the Activate button
- The value selected for the COM port will be saved and will reappear each time the program is accessed, until it is changed.
- The properties are visible and can be edited from the panel Communication
 > Settings > Properties**

DMI Configuration v10.0.28.0	2
Protocol settings ——	
Port	COM13 💌
Baudrate	38400 💌
Frame settings	E,8,1
Protocol settings	
Address	1
Timeout	1000
ОК	Cancel

* in the case of Modbus for /S models only with maximum speed 19200 baud. TTL not for use. NOT POSSIBLE TO UPDate the BIOS.
** obviously, the protocol must be activated beforehand

Address:1, Baud rate: 9600 E,8,1 (CF30=1, CF31=3, CF32=1)



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Error opening serial port

If the "Error opening serial port" message appears, proceed as follows:

1.Check that the COM port setting in the program is the same as one read in the COM port reading by the DMI interface.

2. Check if Com Server is opened when you try to connect to Evolution. If not disconnect TTL cable, USB port and reconnect first USB and then TTL.



3. Repeat the DMI Detection function.



Parameters needed for correct connection between the **Smart target and Free Studio.**

parameter	description	values	default	visibility	notes			
CF30	Modbus protocol controller address	1255	1	3				
CF31**	Modbus protocol baud rate	0,1,2 = not used 3 = 9600 baud 4 = 19200 baud 5 = 38400 baud 6 = 57600 baud 7 = 115200 baud	3	3	Check that the set values correspond to those defined by the panel Communication >			
CF32	Modbus protocol controller parity	1= EVEN 2 = NONE 3 = ODD	1	3	Settings > Properties			
*COM1 = TTL /	*COM1 = TTL / RS485 (/S models only): cannot be used simultaneously							
**CF31			5=38400 baud 6=57600 baud 7=115200 bau	d (RS485: not support d (RS485: non suppor ud (RS485: non suppo	ed) ted) orted)			



Smart parameters in the CF folder manages the connection between the target and Studio If the target is "empty", i.e. there is no IEC application on the device, Smart will display the message FrEE, otherwise fundamental state is displayed (Press F5 to switch to FrEE menu)



To view the parameter menu, press the Esc and Set keys at the same time. This will open the PAr menu.



The parameters menu PAr contains all controller folders. Press the set key to view folders.



The first folder shown is the CF configuration folder. Press the set key to view the folder parameters.



The first parameter shown is CF30. To view the value of the parameter press the set key.



Use the UP and DOWN keys to change the value if necessary. To confirm the value press the set key. To exit press Esc



Use the UP and DOWN keys to scroll the other parameters and repeat the procedure to view the values and if necessary - edit them.

Customize Smart Baud Rate by FS Device





Only After Connection has been estabilished:

1. Project ► BIOS parameters ► All parameters ► Configuration 2. CF31 editing ► 38400 bits/Sec.

Protocol parameters are loaded at power up, remember to switch off controller after changing them.

	configuration							
Address	Name	Value	Um	Default	Min	Max	Description	
53265	CF01	1	num	1	0	1	Select COM1 protocol	
53272	CF20	0	num	0	0	14	Eliwell protocol controller address	
53273	CF21	0	num	0	0	14	Eliwell protocol controller family	
53274	CF30	1	num	1	1	255	Modbus protocol controller address	
53275	CF31	5=38400 💌	num	3=9600	0	7	Modbus baud rate protocol	
53276	CF32	1=2400 🔺	num	1=Even	1	3	Modbus parity protocol	
15639	CF60	2=4800	num	0	0	999	Customer code 1	
15640	CF61	4=19200 =	num	0	0	999	Customer code 2	
53456	CF50	5=38400	num	1=Present	0	1	RTC present	
15715	Ui26	6=57600	4ms	350	0	999	Key hold time to enable function	
15744	Ui27	7=115200 *	num	1	0	255	Installation engineer password	
15745	Ui28	2	num	2	0	255	Manufacturer password	
15636	Par_POLI	1026	num	0	0	65535	Polycarbonate code	

Configuration

Free Studio Device - Main icons



File Edit View Parameters Recipes Options			
Project R W 1 40 Project X X Thermostat Exercise rev.1 FreeSmatt FreeSmatt Configuration - Configuration - Configuration - Configuration - Configuration - Configuration - Configuration - Configuration	General General Name: FreeSmart File version: 412.15	FreeSma	 Continuous read/write by toggle auto refresh mode. As soon as value changes, it will automatically aligne with the target. Select all variables Read all device parameters
Contraction Contraction	Communication Protocol: EwDMI Address: 1 Port: COM:13 Baud rate: 9600	Settings	 4. Write all device parameter 5. Download all (PLC & parameter) 6. It is possible to check the firmware version via information.
Recipes	F1 $F5$ $F3$ $F1$ $F1$ $F1$ $F3$ $F3$ $F1$ $F3$ $F3$ $F3$	free F2	Information Status: CONNECTED 6

Free Studio Device - Colors





				Local			
Address	Name	Value	Um	Default	Min	Мах	
8336	AIL1	0.0		0.0			AIL1 analogue input
8337	AIL2	0.0		0.0			AIL2 analogue input
8338	AIL3	0.0		0.0			AIL3 analogue input
8339	AIL4	0.0		0.0			AIL4 analogue input
8340	AIL5	0.0		0.0			AIL5 analogue input
8192	DIL1	False		False			DIL1 digital input
8193	DIL2	False		False			DIL2 digital input
8194	DIL3	False		False			DIL3 digital input
8195	DIL4	False		False			DIL4 digital input
8196	DIL5	False		False			DIL5 digital input
8197	DIL6	False		False			DIL6 digital input
8528	DOL1	False		False			DOL1 digital output
8529	DOL2	False		False			DOL2 digital output
8530	DOL3	False		False			DOL3 digital output
8531	DOL4	False		False			DOL4 digital output
8532	DOL5	False		False			DOL5 digital output
8533	DOL6	False		False			DOL6 digital output
8448	AOL1	0.0		0.0			AOL1 analogue output
8449	AOL2	0.0		0.0			AOL2 analogue output
8450	AOL3	0.0		0.0			AOL3 analogue output
8451	AOL4	0.0		0.0			AOL4 analogue output
8452	AOL5	0.0		0.0			AOL5 analogue output
8453	TCL1	0.0		0.0			TCL1 analogue output

soon as you change them. Color meanings: **Red**: not aligned with the target Grey: read only data **Blue:** value is different from default **Green**: data is not visible in the target **Black**: aligned with the target (if auto referesh is enabled)

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Connect to the target and Download All



Thermostat Exercise rev. Structure File Edit View Parameters uper Options	C Ⅲ R ₩ ()Ĵ 4() [].	7 9 8	EWDevice	
Project 7 × Thermostat Exercise rev.1 FreeSmart H BIOS parameters H BIOS parameters Configuration Local	General Name: FreeSmart	nfiguration	Are you sure you wa	nt to download ALL ?
Extended Remote I/O Values Local Extended Protection Password Application	File version: 412.15 Communication	EWDevice	2	K Cancel
Cfg Cfg Setting Menu Recipes	Baudrate: 38400	Stotusi Firmvare ver	Download parameters default valu	ies into 'FreeSmart' ?
 Download All Write the default parameter values 	$ \begin{array}{c} I \\ F_{5} \\ I \\ F_{7} $	43	0	Cancel
4. DMI Blink: Communicating	-Firmware management BIOS download Create firmware file		4	

Editing value





Oscilloscope





Oscilloscope





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Oscilloscope



Debug on-line/Watch





Otput_Heating Symbol Value Type Location Debug windows	ŤÂ
Debug windows Int global Watch Int global Oscilloscope Int global Image: Alarm of the second seco	_
Watch Oscilloscope OUTPUT_HEATING TRUE BOOL global - ALARM FALSE BOOL global - SETPOINT 18 INT @BACKGROUND:THERMOSTAT - DIFFERENTIATION 2 INT @BACKGROUND:THERMOSTAT	
Oscilloscope FALSE BOOL global - SETPOINT 18 INT @BACKGROUND:THERMOSTAT - DIFFERENTIATION 2 INT @BACKGROUND:THERMOSTAT	
- SETPOINT 18 INT @BACKGROUND:THERMOSTAT - DIFFERENTIATION 2 INT @BACKGROUND:THERMOSTAT	
- DIFFERENTIATION 2 INT @BACKGROUND:THERMOSTAT	

Chapter 7

Target conversion and code import

Goal: Reuse of existing code and libraries



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Convert project from Smart to Evolution



File Edit View Project Image: Configuration Image: Configuration Image: Configuration Image: FreeSmart Image: Configuration Image: FreeSmart Image: Configuration	On-line Debug Window Tools Developer w object Image: State object Image: State object Image: State object Image: State object Index object Image: State object Image: State object Image: State object Image: State object Index object Image: State object Image: State object Image: State object Image: State object Index object Image: State object Image: State object Image: State object Image: State object Index object Image: State object Image: State object Image: State object Image: State object Index object Image: State object Image: State object Image: State object Image: State object Index object Image: State object Image: State object Image: State object Image: State object Index object Image: State object Image: State object Image: State object Image: State object Index object Image: State object Image: State object Image: State object Image: State object Index object Image: State object Image: State object Image: State object Image: State object Index object Image: State object Image: State object Image: State object Image: State object Index object<	Help 副圖論用品語目目的 中 与話話常習言 [小(() (> (> (> (> (> (> (> (> (> (> (> (> (>	 1. Project ► Select target 2. Free evolution EVD* 3. Change 4. Save the project
EEPROM NO Obj Status va Enums Enums BIOS Par BIOS Par BIOS Par Menu Prg Cfg Menu set Setting N Et Local Et Local Et Extended BE Remote Alarms Alarms Ref Opt	ect Browser mple F7 comple all nerate redistributable source module port object from library tort object from library rary manager fresh all libraries cros ect target fresh current target bons (1 ② ③ ④	Sele F2 F2 F2 F F F F F F F F F F F F F	Available Targets FreeEvolution EVC 477.18 FreeEvolution EVC 423.18 FreeEvolution EVP 489.11 FreeSmart 412.15 FreeSmart Modbus Master 542.1 Cancel Change
By target co to reuse	F3 elicell Execution time Set execution time: Execution time (ms): 100 Execution time (ms): 100	F4	Eliwell Free Studio Application

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Converted project from Smart to Evolution



- 0 × 📅 Thermosta exercise rev.2 - Eliwell Free Studio Application - CAElectrical/Solution Architect/Eliwell/Exercise/Thermostat Exercise/rev.2/Thermosta exercise rev File Edit View Project On-line Debug Window Tools Developer Help - # 3 X 5 Resources * Watch Project ⇒ I Thermosta exercise rev 2 Proje 四形 ** 劉劉圖 * Programs FreeEvolution Configuration Symbol Value Type Location Thermostat Function blocks Hystoresis Eurotions 2 -11111 1111111 🖶 🧮 Global variables. Automatic variables 22222 Conversion between Evolution to Smart is Mapped variables Constants Retain variables not fully supported (all resources are Global shared d- Alarms deleted). TempProbeError - Meppings INTC_Probe M Output Heating br Alarm - Parameters ***** C Setpoint -111111 Differentiation - Veriables Ambient_Temperator Oscilloscope Tosks -Execution time 日回用[\$\$\$E]\$\$日|■■ ■ ■ @ @ @ - Timed Background Set execution time: -12 Execution time (ms): - Boot - O Init -Data export-Select XSLT export filter: Browse Export Library # X Track Lim. Min value Max value Curvelue w/div Red cursor Output MABS 7 NOT >> SHR Preprocessing module TARGET completed. 28hCOSH IN LN Preprocessing module MAIN completed. KIACOB €DV MaLOG. LOR: WISN. Preprocessing Global shared completed. + ADD = E0 < LT SPOW. MISINH Preprocessing Menu completed. 7 ADR e DP MMAX 10 R HI SIZEC Preprocessing basic completed, 8 AND FLOOR **MMN** CHART SORT ZIASIN & GE \$MOD WROL - SUB O warnings, O errors. **KIATAN** > GT ET MOVE MROR ZITAN be TANH KATAN2 HM JMP XMUL CPIS | PICEL € LE NMAX SEL SEL + TO B VICOS. RUMT # NE < SHL TO D Project /wo Definity... (Billesour... / +) Build (Find in project) Dabug) Resources + + Operator and standard blocks (Target variables | Target blocks) basic ; EDIT MODE NOT CONNECTED

Ready

Import Objects from library (or Project)



Roject		New object Copy Object Paste object Duplicate object	,]D4 @ 1월 1월 부 등 등 등 1월
Programs	er X	Delete object PLC Object properties Object Browser	At+Enter	FreeEvolution Configuration
Function bli Functions Global vari Global sha Global sh	19 19	Compile Recompile all Generate redistributable source module	F7	Image: Set execution time Image: Set execution time
	d grc : 10 ain 40	Import object from library Export object to library Library manager Refresh all libraries	,	Data export Select XSLT export filter:
		Select target Refresh current target Options		Both directions, upgrade & downgrade are possible, from: Smart ► Evolution

It allows also to import programs, FB, functions from other projects regardless the related target.

Import Objects from Project...



х

3

Name B Hys

< III.

Select all

mport objects

Cancel

Enable merge meth

Look in:	🐌 Thermostat	exercise rev.0	- 🕝 🌶 📂 🖽		 Objects filter 	
(Ca	Name	*	Date modified	Туре	<u>▼</u> Programs	Ope <u>r</u> ators
Percent Discor	Ap thermosta	t exercise rev.0.ppjs	09/05/2014 1:35 P	M PPJS File	Function Blocks	
Necent Places					✓ <u>F</u> unctions	Standard function
		12			✓ariables	Local variables
Desktop		•			<u> </u>	Basic types
Libraries					Check <u>a</u> ll	Check <u>n</u> one
					Other filters	
					Name *	
Computer						
					Location All	
Network	•	III		•	Library	
	File <u>n</u> ame:	thermostat exercise rev.0.p	pjs 🔻	Open	Varstyne All	
11	Files of type:	Single file PLC project files	(* poie) -	Cancel		

- 1. Select *.ppjs file type
- 2. Select desired project (Smart)
- 3. Select desired program & FBD
- 4. Import Objects

ь

Select none

...Assign to Task (in case of program)





Assigning imported program to the task



			Project ⊡	Ψ×
Objects filter		Name	Programs	_
✓ Programs	Ope <u>r</u> ators	°P main	Intermostat	_
Function <u>B</u> locks		🛯 🖻 Thermostat	Eurotion blocks	_
<u> </u>	Standard functions		Global variables	_
	Local variables			_
□ <u>U</u> ser types	Basic types		⊡∰ Tasks	_
			C Timed	
Check <u>a</u> ll	Check <u>n</u> one		Background	
			Thermostat	
ther filters			- to Boot	_
Name *	ОК		init	_
Location All	•		1. Select the desired	program
Location All Library All	•		1. Select the desired name ► OK	program
Location All Library All Vars type All	•		 Select the desired name ► OK The ? Disapeares in 	program n prgram
Location All Library All Vars type All	•		 Select the desired name ► OK The ? Disapeares in It will assign to to open 	program n prgram lesired
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Link libraries...



...Link Libraries



Pr	oject library list		X
	Name	Link	Add
	basic	c:\program files (x86)\eliwell\free studi	
	PIDregulators_v1	C:\Electrical\Solution Architect\HVAC	Remove
	-		Remove all
			UnLink
			ReLink
			Close



Save a project as:

File ► save a project as :

* Create a folder for the project before saving

Ap Save As					*	x
App Save As Save in: Recent Places Desktop Libraries Computer Network	Desktop Libraries	Aidin Aliyarzade	Computer	Retwork	Desktop	
	File name: Save as type:	Themostat Single-file P	Exercise LC project files (*.ppjs)	▼ ▼	Save Cancel









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Thanks

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