1. OVERVIEW

LogicLab is an IEC61131-3 Integrated Development Environment supporting the whole range of languages defined in the standard.

In order to support the user in all the activities involved in the development of an application, LogicLab includes:

- textual source code editors for the Instruction List (briefly, IL) and Structured Text (briefly, ST) programming languages (see Chapter 6.);
- graphical source code editors for the Ladder Diagram (briefly, LD), Function Block Diagram (briefly, FBD), and Sequential Function Chart (briefly, SFC) programming languages (see Chapter 6.);
- a compiler, which translates applications written according to the IEC standard directly into machine code, avoiding the need for a run-time interpreter, thus making the program execution as fast as possible (see Chapter 7.);
- a communication system which allows the download of the application to the target environment (see Chapter 8.);
- a rich set of debugging tools, ranging from an easy-to-use watch window to more powerful tools, which allows the sampling of fast changing data directly on the target environment, ensuring the information is accurate and reliable (see Chapter 9.).

1.1 THE WORKSPACE

The figure below shows a view of LogicLab's workspace, including many of its more commonly used components.





The following paragraphs give an overview of these elements.

1.1.1 THE OUTPUT WINDOW

The *Output* window is the place where LogicLab prints its output messages. This window contains four tabs: *Build*, *Find in project*, *Debug*, and *Resources*.

Output	×
Preprocessing Global shared completed. Preprocessing Menu completed. Preprocessing basic completed. Preprocessing thermmodel completed. Reading symbol file L:\Applicazioni\IEC\IEC.sym.xml completed. Reading target symbol file L:\Applicazioni\IEC\IEC.syt.xml completed. 0 warnings, 0 errors.	
	~
↓ Build / Find in project) Debug) Resources /	

Build

The *Build* panel displays the output of the following activities:

- opening a project;
- compiling a project;
- downloading code to a target.

Find in project

This panel shows the result of the *Find in project* activity.

Debug

The *Debug* panel displays information about advanced debugging activities (for example, breakpoints).

Resources

The *Resources* panel displays messages related to the specific target device LogicLab is interfacing with.

1.1.2 THE STATUS BAR

The *Status* bar displays the state of the application at its left border, and an animated control reporting the state of communication at its right border.



1.1.3 THE DOCUMENT BAR

The *Document* bar lists all the documents currently open for editing in LogicLab.

🏲 Fast 🗾 Main 🏠 Global variables



1.1.4 THE WATCH WINDOW

The *Watch* window is one of the many debugging tools supplied by LogicLab. Among the other debugging tools, it is worth mentioning the Oscilloscope (see Paragraph 9.2), triggers, and the live debug mode (see Paragraph 9.4).

CNT_1.ENABLE	TRUE	BOOL	@PL
🖃 🃲 PROVASTRU			- WFL
	-	STRUTTURA	@PL
- 🕶 REALE	0.584264	REAL	@PL
🛨 🚺 INTERO	-	INT[]	@PL
🖃 🚺 CNT_0	-	CONTATORE[]	@PL
🔁 📴 [0]	-	CONTATORE	@PL
ENABLE	FALSE	BOOL	@PL
- RESET	FALSE	BOOL	@PL
COUNTER	0	UINT	@PL
🕒 📴 [1]	-	CONTATORE	@PL
🕂 📴 [2]	-	CONTATORE	@PL
🕂 🖪 [3]	-	CONTATORE	@PL
🕂 📴 [3]	-	CONTATORE	0

1.1.5 THE LIBRARY WINDOW

The *Library* window contains a set of different panels, which fall into the categories explained in the following paragraphs.

You can choose the display mode by clicking the right button of your mouse. In the *View list* mode, each element is represented by its name and icon. Instead, a table appears in the *View details* mode, each row of which is associated with one of the embedded elements. The latter mode also displays the *Type* (Operator/Function) and the description of each element.

If you right-click one of the elements of this panel, and you click *Object properties* from the dialog box, then a window appears with further details on the element you selected (input and output supported types, name of input and output pins, etc.).

1.1.5.1 OPERATORS AND STANDARD BLOCKS

This panel lists basic language elements, such as operators and functions defined by the IEC 61131-3 standard.

×	Name	Туре	Description
	IXI ABS	Function	Absolute value
	ACOS	Function	Arccosine
	+ ADD	Operator	Arithmetic addiction
	& AND	Operator	Logical/bitwise AND
	ASIN	Function	Arcsine
	ATAN	Function	Arctangent
	Operator and standard b	locks (Target	variables) basic) thermmodel /





1.1.5.2 TARGET VARIABLES

This panel lists all the system variables, also called target variables, which are the interface between firmware and PLC application code.

×	Name	Туре	Address	Group	Description
	i Ad_InPo	INT	%MW0.1	DEB - ANALOG-DIGITAL EN	incremental position
	i Ad_NuCi	INT	%MW0.12	DEB - ANALOG-DIGITAL EN	DSP cycles without position increment
	di Ad_PeSp	DINT	%MW0.10	DEB - ANALOG-DIGITAL EN	calculated speed
	i Ad_SeOf	INT	%MW0.9	DEB - ANALOG-DIGITAL EN	sine channel offset
	di Ad_ViPo	DINT	%MW0.2	DEB - ANALOG-DIGITAL EN	virtual position
	di Ad ViPoIni	DINT	<u>%</u> MW0.218	DEB - ANALOG-DIGITAL EN	
	▲ ▶ \ Operator and st	andard block	s) Target variable	es (basic) thermmodel /	

1.1.5.3 TARGET BLOCKS

This panel lists all the system functions and function blocks available on the specific target device.

Name	Туре	Description	^
sysMsgInterpMono	Function	Checks messages from single axis int	
sysQuiesInterpMonoPlc	Function	Verifies the end of an interpolated sin	
sysResetInterpMonoPlc	Function	Resets an interpolated single axis mo	
sysSleep	Function	Puts the current task in the sleeping s	
sysStartInterpMono	Function	Starts an interpolated single axis mov	
sysStartInterpMonoPlc	Function	Starts an interpolated single axis mov	
sysTargetInterpMonoPlc	Function	Verifies if the target of an interpolated	
sysWaitInterpMono	Function	Waits until the end of an interpolated	~

1.1.5.4 INCLUDED LIBRARY PANELS

The panels described in the preceding paragraphs are usually always available in the *Li*-*brary* window. However, other panels may be added to this window, one for each library included in the current LogicLab project. For example, the picture above was taken from a LogicLab project having two included libraries, *basic.pll* and *thermmodel.pll* (see also Paragraph 4.7).

×	Name	Туре	Description
	BitToByte Function		Compose a byte from 8 bits
	🖅 BitToWord	Function	Compose a word from 16 bits
	🖪 ByteToBit	Function block	Split a byte into bits
	🖅 ByteToWord	Function	Compose a word from 2 bytes
	F_TRIG	Function block	Falling edge detector
	FF_D	Function block	D-type flip-flop
	I ► Operator and	standard blocks) Target variables) basic (thermmodel /



1.1.6 THE WORKSPACE WINDOW

The *Workspace* window consists of three distinct panels, as shown in the following picture.



1.1.6.1 **PROJECT**

The *Project* panel contains a set of folders:

- *Program, Function blocks, Functions*: each folder contains Program Organization Units (briefly, POUs see Paragraph 5.1) of the type specified by the folder name.
- *Global variables*: it is further divided in *Variables*, *I/O Variables*, *Constants* and *Retain variables*. Each folder contains global variables of the type specified by the folder name (see Paragraph 5.2).
- *Tasks*: this item lists the system tasks and the programs assigned to each task (see Paragraph 5.3).

1.1.6.2 DEFINITIONS

The *Definitions* panel contains the definitions of all user-defined data types, such as structures or enumerated types.

1.1.6.3 RESOURCES

The contents of the *Resources* panel depends on the target device LogicLab is interfacing with: it may include configuration elements, schemas, wizards, and so on.





1.1.7 THE SOURCE CODE EDITORS

The LogicLab programming environment includes a set of editors to manage, edit, and print source files written in any of the 5 programming languages defined by the IEC 61131-3 standard (see Chapter 6.).



The definition of both global and local variables is supported by specific spreadsheet-like editors.

	Name	Туре	Address	Group	Array	Init value	Attribute	Description
1	freeRunCounter	DINT	Auto		No	0		
2	incr	INT	Auto	Analog out 3	No	0		
3	period	REAL	%MD1.11	Onda quadra	No	0		
4	valueFilt	REAL	%MVV1.8	Onda quadra	No	0		
5	tau	REAL	%MD1.9	Onda quadra	No	0		
6	valueRef	REAL	%MD1.10	Onda quadra	No	0		
7	kiniiner	INT	Auto	Analog out 3	No	50	CONSTANT	



2. QUICK START

This chapter is a step-by-step tutorial that introduces you to the use of the LogicLab development environment.

You will be guided through all the tasks you need to accomplish in order to run and monitor a simple PLC application.

The examples in this chapter refer to a virtual target, *VPLC1*, which is installed along with LogicLab during the setup procedure.

2.1 SETUP PROCEDURE

In order to install LogicLab, follow this simple procedure:

- 1) Close all the applications running on the system.
- 2) Run LogicLab's setup executable file and follow the instructions shown in the setup wizard.



The setup procedure adds the following *Start* menu.



The LogicLab's folder in the file system has the following structure.







2.2 USING THE IDE

The following steps show you how to create, run and debug a simple LogicLab PLC program. The program will be written in the ST language and will be executed directly on your machine. A virtual target, *VPLC1*, has been installed by the setup procedure. *VPLC1* emulates a simple programmable controller provided with digital and analog I/O.

1) Launch LogicLab from the *Start* menu.



2) When LogicLab is started for the first time, not all windows and toolbars are shown. You can customize LogicLab's workspace through the *View* menu.



3) In order to create a new project, select the item *New project* from the menu *File*.





4) Insert the new project name (for example, *P1cExamp1e*) and choose the destination folder, then press *OK*. *VPLC1* virtual target has been selected for this project. LogicLab's workspace looks now like in the picture shown at step 2 (that is, all operators and target variables are shown, preprocessing status log has been printed in the output window).

New project		
Project – Name	PlcExample	
Directory	L:\PrjTraining\	
Target se Select the	election e target for a new project VPLC1 1.0	
Options Case	sensitive	
	OK	

5) To add a new empty program to the project, select *New program* from the menu *Project* > *New object*.



Choose the ST language, insert the new program name (for example, *Main*), and press *OK*.

It is also possible to assign here the program to one of the available tasks.

New program	n			
Language	, 🔿 FBD	© LD	0.57	0.050
© IL	I FBD	0 LD	ST	SFC
Name				
Main				
Task Assign to				•
	<u>_</u> k		<u>C</u> ancel	





LogicLab shows now the editor window of the *Main program* object. On the top of the window there is the local variables editor. The variables editor allows to add, remove, copy and paste variable definitions.

Na	ame .	Type Addi	ress Array	Init value	Attribute	Description
:]						
001						

The textual source code editor is placed in the bottom part of the window.

6) Insert a new local variable by pressing the *Insert record* button in the *Project* toolbar. Alternatively, you can use the *Insert* option of the *Variables* menu.



7) Edit the name (for example, *Counter*) and the type of the variable. A double-click in the type field opens the type selection dialog.

Choose the INT data type.

8) Implement a simple counter in ST language, as shown below.

	Name	Туре	Address	Array	Init value	Attribute	Descriptio	n
co	ounter	INT	Auto	No	0			
								3
01								1
02 03	(* Å counte	simple cour er := counte	nter *) er + 1:					
			,					
								2

9) In order to be executed, the program *Main* has to be assigned to a task. In the *Workspace* window, right-click on the *Slow* task and select the *Add* program option. The *Object browser* window pops up.







10) Select the *Main* program and click *OK*. The picture below shows the *Workspace* window after the successful completion of the operation.

Object browser		×
Objects filter		_
Programs Operators Function Blocks	Name °P Main	Type Programs
Functions Standard functions		
Variables Local variables		
User types Basic types		
Check all Check none		
Other filters		
Name *		
Location All		
Library All 🗸		
Vars type All	<	•
Cancel <u>Q</u> K		

11) Select *Simulation mode* from *Debug* menu.

<u>ا</u> ه	ŵ	Simulation mode	
1	3	Debug mode	
	3,	Live debug mode	
•		Add symbol to watch	
0	▶*	Inserts new item into watch	Shift+F8
		Add symbol to a debug window	F10
k		Inserts new item into a debug window	Shift+F10
_	Þ		
_ <	-	Add/remove breakpoint	F12
8	80	Remove all breakpoints	
	Ð	Breakpoint list	
	•	Add/remove text trigger	F9
	Ø	Add/remove graphic trigger	Shift+F9
	×	Remove all triggers	Ctrl+Shift+F9
		Trigger list	Ctrl+l



Choose works	bace	X
Create new	w workspace	
Name:	PLCExampleWsp	
Directory:	L:\PrjTraining\PlcExa	mple\
Open exist	ing workspace	Choose other Delete
Ок		Cancel





12) *VPLC1* is a software which emulates a simple programmer controller provided with digital and analog I/O. It is possible to interact with simulator as explained in Simu-Lab manual or briefly in *Resources* tab.

File Edit View	Project Debug Communication	Variable	Window Tools	telo								- 8 ×
	X											
	위위 법업 분 분 ()			-								
	and the second s											
101 00 11 1/1 101												
N E E (3 5)	08 D(00			🔍 🗸 🕰	AI							
25 + 4 *	00 D101		AXEL		E 0 1 🔒		- A Cinud	ab - PL.	x	D		
	0 DI03											
Project	(iii) D104	i H	O RUN			December 1) 🗆 🗄	00			×
Project> Defin		ame	STOP	E 🔲 E 🔶		Description		0 0		à 🗟		
PicExample Pro Programs	III DI06	- 12	FAULT							Value	Type Location	
😐 🔝 Main	(1) D107 (1) D109		PAOL				_	_	_	-		
- Eunction ble - Eunctions	<u>III</u> D109	-		E 🔲 E 🔶				A				
🕢 🧰 Global varia	DI010	(* cou			IR 1							
Tasks Fox	B DI011											
B-O Slow	DI012			R 🔲 R 👄								
- 📲 Ma	00 D1013 00 D1014											
	(iii) Di015		VPLC1									
	1											
		1										
	Digital outputs		Analog I/O		88							
	<u>m</u> D000		<u>10</u> AI00									
	(III) DO01 (III) (IIII) (IIII) (III)		0 AI01 10 AI02									
	III D002		III AIC2	[0								
	BI D004		B A000	0								
	🔟 D005 🥥		0 A001	0								
	<u>m</u> DOOG		B A002	0								
	(1) D007 (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)		0 A003	0								
	<u> </u>							-				
Output	💷 D010 🌑	-				× Library						×
Preprocessing	00 D011	-				Name		Address	Sige		B	
Preprocessing	<u>m</u> D012					Nome sysAnaloginputs	Type	Address 3/JW1.0	500	Group Analog Inputs	Description System analog inputs	
Preprocessing	01 D013 O					1 sysAnalogOutputs	INT	30/w1.0	4	Analog Outputs	System analog outputs	
0 warnings, 0	00 0015					K/r sysDigitalInputs	BOOL	2000.0	16	Digital Inputs	System digital inputs	
Target extensi						Mr sysDigitalDutputs ud sysTimer	BOOL	200×0.0 2MD60000.0	16 1	Digital Dutputs System Timers	System digital outputs System timer (ma)	
Preprocessing						b sysUserDataBlock	BYTE	3MB1.0	10000	Internal variables	Data block available for user data ma	
0 varnings, 0	errors.											
+ + Build / Find in	project), Debug), Resources /					+ + Coperator and stand	rd blocks), Tar	get variables / Sta	ndard), F	5d /		
Ready										EDI	T MODE	RROR

The status of the *VPLC1* I/O is available in LogicLab as the *Target variables* listed in the *Library* window.

13) With LogicLab connect to *VPLC1* through the apposite button on the toolbar.



- 14) Press *F7* (or select the menu option *Project Compile*) to compile the application. Verify that the compilation ends with *0 warning 0 errors*, otherwise correct the errors and compile again.
- 15) Download the code by means of the appropriate toolbar command.



PLC is now running on *VPLC1*. You can see the LogicLab bottom bar indicating *Source ok* - *Connected*.



16) Open the *Watch* window through the *View* menu, then select the variable in the text editor with a double-click and drag and drop it into the *Watch* window.

The *Watch* window should display the value of the *Counter* variable which should increment continuously.





B M	ain							
	Name	Туре	Address	Array	Init value	Attribu		
1	counter	INT	Auto	No	0			
<						>		
000	1		,			~		
000	2 (* A	simple cou r := count	nter *)					
		. Count		Watch				E
					▶ · · · · · · · · · · · · · · · · · · ·			6
				Symbol		Value	Туре	Locat
				- COL	JNTER	724	INT	@SLO
				10000				
				1				
				<				>
								>

You are at the end of this very simple but complete (edit-compile-download-debug) working session with LogicLab.

Further steps you should take in order to acquire a deeper knowledge of the tool include the use of the other languages, function & function blocks, global variables, libraries, real time debugging and so on. Refer to the following sections of this manual to obtain the necessary information.

2.3 A MORE COMPLEX EXAMPLE

In the *SampleProjects\Sample* subdirectory of your LogicLab installation you can find a more complex *VPLC1* example, which offers an overview of IEC 61131-3 languages.

To open the project use the *File* - *Open project* menu option and open *VPLC1Sample*. *ppjs* or select it from *Example projects* list in the welcome page.









3. USING THE ENVIRONMENT

This chapter shows you how to deal with the many UI elements LogicLab is composed of, in order to let you set up the IDE in the way which best suits to your specific development process.

3.1 LAYOUT CUSTOMIZATION

The layout of LogicLab's workspace can be freely customized in order to suit your needs. LogicLab takes care to save the layout configuration on application exit, in order to persist your preferences between different working sessions.

3.2 TOOLBARS

3.2.1 SHOWING/HIDING TOOLBARS

In details, in order to show (or hide) a toolbar, open the *View>Toolbars* menu and select the desired toolbar (for example, the *Function Block Diagram* bar).



The toolbar is then shown (hidden).



3.2.2 MOVING TOOLBARS

You can move a toolbar by clicking on its left border and then dragging and dropping it to the destination.

T File	Edit	View Project	Debug Communicat	ation Scheme Variables Window Tools Help	
8	-		X 🖻 🖻 🗛 🖇	4 🙀 🖨 🛕 🖪 🗛 🐺 🐺 🖓 🖉 🖪	
•م چ]	٩		▶ (**) +1 -1 EN		
10 🛗	***	:: 9	1 🖀 🔩 🛣 😭 📃	5 🐨 🚡 🔜 🖉	

The toolbar shows up in the new position.





T File	Edit Viev	v Project	Debug C	ommunication	Scheme	Variables W	/indow Tool	ls Help		
🖪 🔁	4	na.	X 🖻 🖪	MA	H 6		- - 	fő 🔳		
14 🎬	***	BO 40	1 🐂 💈	k 😭 🔒	🖬 🕹 🛛	€ <u>,</u> , •	۰ 🔍 🔳	8 6 D	(* <u>*</u>) +: -:	1 En 🖌
Project			×			43				

You can change the shape of the toolbar, from horizontal to vertical, either by pressing the *Shift* key or by moving the toolbar next to the vertical border of any window.



You can also make the toolbar float, either by pressing the *CTRL* key or by moving the toolbar away from any window border.

Corr	munication Scheme	Variables Wind	ow Tools Hel	lp .			Com	munication Scheme	Variables Wind	low Tools He	p		
ß	M A 🦬 🎒 🗋	. 🖪 🔊 📮						M & 🐂 🎒	à 🖪 🗖 📮				
25	🖆 🗟 🖬 🍝 📢	۵ مړ 🕄	\ ≣ ⊡ 6)]) (<u>*</u> .*) +	1 -1 🔛 🕯		***	😭 🔜 🖼 🍝	•				
Pt# F	ast						T F	ast					
	Name	Туре	Address	Array	Init value	At		Name	Туре	Address	Array	Init value	A
1	fbPulse	Pulse	Auto	No	0		1	fbPulse	Pulse	Auto	No	0	
2	fbFlipFlop	FF_D	Auto	No	0	(a)	2	fbFlipFlop	FF_D	Auto	No	0	11
3	fbFilter	TusFilter	Auto	No	0		3	fbFilter	TusFilter	Auto	No	0	
4	fbSplit	ByteToBit	Auto	No	0	-	4	fbSplit	ByteToBit	Auto	No	0	10
5	fbSplit_0	ByteToBit	Auto	No	0		5	fbSplit_0	ByteToBit	Auto	No	0	
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000		Square wave or Receimed State			fbPulse		000	51 FBD ▶ - [*] २, ≇	Square wave o	· ·		fbPulse	
	inp7	<u> </u>	то_иит		enable period	ou		· 🖓 ·	eriod	то_иит	·	enable period	01

3.3 DOCKING WINDOWS

3.3.1 SHOWING/HIDING TOOL WINDOWS

The *View>Tool* windows menu allows you to show (or hide) a tool window (for example, the *Output* window).



The tool window is then shown (hidden).







3.3.2 MOVING TOOL WINDOWS

In order to move a tool window, click on its name (at the top of the window) and then drag and drop it to the destination.



You can make the tool window float, by double-clicking on its name, or by pressing the *CTRL* key, or by moving the tool window away from the main window borders.



A tool window can be resized by clicking-and-dragging on its border until the desired size is reached.







3.4 WORKING WITH WINDOWS

LogicLab allows to open many source code editors so that the workspace could get rather messy.

You can easily navigate between these windows through the *Document* bar and the *Win-dow* menu.

Cascade Tile	(a.a) +: 	-1 🇞 🖌 📬							
Arrange Icons Close All) "t " F	ast 🔓 St	ati	K Exec	🚡 Globa	al variables	"먺: Running		
		Class	P	Name	Туре	Array	/ Init value	Attribute	
1 Fast	1	VAR		NotEnabled	BOOL	No	FALSE		Transition result
2 Stati	2	VAR		NotRunning	BOOL	No	FALSE		Transition result
3 Exec	3	VAR		NotStopped	BOOL	No	FALSE		Transition result
4 Global variables	4	VAR		n	DINT	No	0		
5 Running	5	VAR		Running	BOOL	No	FALSE		Transition result
	6	VAR_INPUT	0	enab	BOOL	No	FALSE		
	7	VAR_INPUT	1	run	BOOL	No	FALSE		
	<	UAD INDUT	0		BOOL	N1-	541 OF		>
		Init N							
		enab				0.00			10101000

3.4.1 THE DOCUMENT BAR

The *Document* bar allows to switch between all the currently open editors, simply by clicking on the corresponding name.

τ Fa	30		🔓 Sta	a			K E	Xec			B	Globa	al vari	ables	1.1	RI	Innin	g				
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1	VAR				1	VotE	nable	ed		BC	OL		N	0		FA	LSE					
	VAR				1	NotR	unni	ng		BC	OL		N	0		FA	LSE					
3	VAR				١	VntS	tonni	hs		RC	001		N	n		FA	I SF					
	ing a			1.0			0.1				0.1				11			1		į.		1
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·											10 A		•									
G Fa	st		La Stal	j :i	_	·	in e	xec			2	Globa	l vari	ables		RL		9				
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_		•	Stal	;i		•	E	xec			B	Globa	l vari	ables	-75 -	Ru	Innin	9				
. G Far 0001		•	Sta	;i	•	•	TR E	xec		•	ð	Globa	l vari	ables	170	RI	Innin	g		•		×
_		· · ·	Stat	;i	•	•	E	xec		•	3	Globa	l vari	ables	1	L.R.	innin	9		•		*
_		• •		:i un	•	•	•	xec			B	Globa	l vari	ables	1	Ru	innin	9		•		•
_		· · ·		•	•		•	•				Globa	l varia	ables	1	R	innin	9		•		
_		· · ·		•		•	•	•				Globa	l varia	ables		, RL	innin	9		•		
_		· · · · · · · · · · · · · · · · · · ·		•	•		•	•				Globa	l vari	ables	110	Ru		9		•		
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_				•	•	•	•	•	•	•		Globa	varii	ables			innin	9	•	•		
· j				•	· · · · · · · · · · · · · · · · · · ·		•	•				Globa	l vari.	ables				9	•			

You can show or hide the *Document* bar with the menu option of the same name in the menu *View>Toolbars*.





3.4.2 THE WINDOW MENU

The *Window* menu is an alternative to the *Document* bar: it lists all the currently open editors and allows to switch between them.



Moreover, this menu supplies a few commands to automate some basic tasks, such as closing all windows.

3.5 FULL SCREEN MODE

In order to ease the coding of your application, you may want to switch on the full screen mode. In full screen mode, the source code editor extends to the whole working area, making easier the job of editing the code, notably when graphical programming languages (that is, LD. FBD, and SFC) are involved.

Fast 🄓	Stati	Exec	"t; R	unning							
Name	Type	Address	Array	Init value	Attribute		Description	 		 	
fbPulse	Pulse	Auto	No	0							
fbFlipFlop	FF_D	Auto	No	0							
fbFilter	TusFilter	Auto	No	0							
fbSplit	ByteToBit	Auto	No	0							
fbSplit_0	ByteToBit	Auto	No	0							
uare wave on output 7 riod = 10 ms* val11					fbFlipFlop					 5 5 6 6 5 5 5 5	
10 ms - val11		toPub	2 2 2 2	5 2 2							
		Pulse		5.2							
				2 S 🖵	0 d	q	out7 · · ·				
TO UIN	-	- enable	out		cik						
->		penod	1 A A								
ve filtering 10											
18			1bFilb	2 - 1 - 1 - 1 H							
	SEL		Tus Filt								
0 - 0					valueFilt						
0.0 100		tau	Tay	20	eargerin						
alueRet In1			TS	1.1							
ounter on outputs 8 to											
	rb Se	int_0									
TO USINT		ToElt									
IO_OSMI	byte	60	outs								
	cyre	81	0010								
		82	out10								
		63	out11								
		84	out12								
		65	out13								
		58	out14								
		67	out15								

You can switch on and off the full screen mode with the *Full screen* option of the menu *View* or with the corresponding command of the *Main* toolbar.





3.6 ENVIRONMENT OPTIONS

If you click *Options*... in the *File* menu, a multi-tab dialog box appears and lets you customize some options of LogicLab.

General

Autosave: if the *Enable Autosave* box is checked, LogicLab periodically saves the whole project. You can specify the period of execution of this task by entering the number of minutes between two automatic savings in the *Autosave interval* text box.

Graphic Editor

This panel lets you edit the properties of the LD, FBD, and SFC source code editors.



Text Editors

Language

You can change the language of the environment by selecting a new one from the list shown in this panel.

After selecting the new language, press the *Select* button and confirm by clicking *OK*. This change will be effective only the next time you start LogicLab.



Tools

You can add up to 16 commands to the *Tools* menu. These commands can be associated with any program that will run on your operating system. You can also specify arguments for any command that you add to the *Tools* menu. The following procedure shows you how to add a tool to the *Tools* menu.





1) Type the full path of the executable file of the tool in the *Command* text box. Otherwise, you can specify the filename by selecting it from Windows Explorer, which you open by clicking the *Browse* button.

Command	
Arguments Menu string Add Delete	Modify

- 2) In the *Arguments* text box, type the arguments if any to be passed to the executable command mentioned at step 1. They must be separated by a space.
- 3) Enter in *Menu string* the name you want to give to the tool you are adding. This is the string that will be displayed in the *Tools* menu.
- 4) Press *Add* to effectively insert the new command into the suitable menu.
- 5) Press *OK* to confirm, or *Cance1* to quit.

For example, let us assume that you want to add *Windows* calculator to the *Tools* menu:

- Fill the fields of the dialog box as displayed.

Command	C:\WINDOWS\syste	m32\calc.ex	e	
Arguments				
Menu string	Cald			
	Add	Delete	e <u>M</u> a	odify

- Press *Add*. The name you gave to the new tool is now displayed in the list box at the top of the panel.

Command	C:\WINDOWS\system32\calc.exe	
Arguments		
Menu string	Calc	
	Add Delete Modify	20

And in the Tools menu as well.



