PLC Programmer for Linux Controller

User Manual

2019/05 Ver : V00.00.006

Leading Numerical Controller



Contents

1. INT	PLC ROD					CONTROLLER	9
2.	INT	RODU	CTION OF THE	FUNCT		ES	10
	2.1.	Ladder	in LMLC Format Edit				10
3. OPI	PLC ERAT					CONTROLLER	12
	3.1.	Installat	tion				12
	3.2.	Run Ap	plication				12
	3.3.	Start La	ayout				13
	3.4.	Edit for	Ladder in LMLC Forma	at			14
		3.4.1.	Getting Started				14
		3.4.2.	Open Existing	File			14
		3.4.3.	New a file				16
	3.5.	Introduo	ction of Edit Mode for L	adder in LN	ALC Format		18
	3.6.	Edit Fu	nctionalities of Ladder i	n LMLC Fo	ormat		20
		3.6.1.	Mouse and Keyboard	۱			20
		3.6.2.					
		3.6.3.	New				22
		3.6.4.	: Application I	nformation			22
		3.6.5.					22
		3.6.6.	: Decrypt				23
		3.6.7.	Save				25
		3.6.8.	Close File				26
		3.6.9.	Save as				26
		3.6.10.	Print				26
		3.6.11.	E Pop Address	Symbol/Co	omment Editing	g Dialog	27

	3.6.12.	Pop Annotation Dialog	30
	3.6.13.	E From Edit Mode to Monitor Mode	30
	3.6.14.	Image: From Edit Mode to Simulation Mode	31
	3.6.15.	: Application Setting	32
	3.6.16.	Encrypt the Currently Opened File	34
	3.6.17.	: Copy Element or the Marked Area	36
	3.6.18.	Paste	36
	3.6.19.	Cut Element or the Marked Area	37
	3.6.20.	Element or the Marked Area	37
	3.6.21.	Example 2 Solution in the Left Side	37
	3.6.22.	Undo	38
	3.6.23.	Redo	38
	3.6.24.	: Insert a Line Row above Focus	38
	3.6.25.	Insert an Empty Row above Focus	38
	3.6.26.	: Insert a Comment Element above Focus	39
	3.6.27.	: Insert a Label Element Row above Focus	39
	3.6.28.	: Insert an RTS Element Row above Focus	40
3.7.	3.6.29. Elemen	t Toolbar	

	3.7.1. Contact Class :	41
	3.7.2. Coil Class :	44
	3.7.3. Simer Class :	
	3.7.4. Counter Class :	48
	3.7.5. Arithmetic Class :	51
	3.7.6. Tool Class :	56
	3.7.7. Sequence Class :	57
	3.7.8. Horizontal Connect :	
	3.7.9. Vertcal Connect :	59
3.8.	Set the Element	59
3.9.	Search and Replace	60
	3.9.1. Search Page	61
	3.9.2. Replace Page	62
3.10.	Edit Status Area	64
3.11.	Mouse Right Key Menu	64
PLC	LADDER ELEMENTS	66
4.1.	Normal Open Contact	66
4.2.		
4.3.	── ── ── Normal Open Coil	66
4.4.		67
4.5.		67
4.6.	──────Negative Edge Triggered Coil	67
4.7.	—⊂ ^𝔅 ⊃—Latch Coil	68
4.8.	——————————————————————————————————————	68
4.9.	Timer Relay	68
4.10.	RTimer Relay	69
4.11.	Up Counter	70
	Down Counter	
4.13.	Ring Up Counter	72

4.

4.14.	Ring Down Counter	73
4.15.	Reset Counter	73
4.16.	Add	73
4.17.	Subtract	74
4.18.	Multiply	74
4.19.	Division	75
4.20.	Modulo	75
4.21.	Logic AND	75
4.22.	Logic OR	76
4.23.	Logic XOR	76
4.24.	Logic Left Shift	77
4.25.	Logic Right Shift	78
4.26.	Compare : Larger Than	78
4.27.	Compare : Smaller Than	79
4.28.	Compare : Larger than or Equal to	79
4.29.	Compare : Smaller than or Equal to	79
4.30.	Compare : Equal to	80
4.31.	Compare : Not Equal to	80
4.32.	Move	80
4.33.	Register Move to Register pointer	81
4.34.	Register pointer Move to Register	81
4.35.	SCH	82
4.36.	ROT	82
4.37.	MULRINI	83
4.38.	MULRCPY	83
4.39.	I/RMAP	83
4.40.	O/RMAP	84
4.41.	I/RMAPN	84
4.42.	O/RMAPN	84
4.43.	JMP (Jump)	85
4.44.	JSR (Jump to Subroutine)	85
4.45.	RET	85
4.46.	RTS (Return Subroutine)	85
4.47.	Label	86
4.48.	END	86
4.49.	Example for SCH	86
4.50.	Example of ROT	87
4.51.	Example of JMP	87

	4.52. Exa	ample of JSR	88						
	4.53. RE	T Example	88						
5.	SIMUL	SIMULATION MODE							
	5.1. Sta	rt the Simulation Mode	90						
	5.2. The	e Introduction of the Simulation Mode Layout	90						
	5.3. Intr	oduction of Simulation Mode for Ladder in LMLC Format	91						
	5.3	.1. Mouse and Keyboard	91						
	5.3	.2. Toolbar	91						
	5.3	.3. Address Monitor/Setting Area	92						
6.	MONIT	OR MODE	96						
	6.1. Sta	rt the Monitor Mode	96						
	6.2. The	e Introduction of the Simulation Mode Layout	96						
	6.3. Intr	oduction of Monitor Mode for Ladder in LMLC Format	97						
	6.3	.1. Mouse and Keyboard	97						
	6.3	.2. Toolbar	97						
7.	SET TH	HE URL SHOWN ON START LAYOUT							
8.	TROUBLE SHOOTING								
	8.1. Cor	mpiling Errors and Warnings	104						
	8.1.1. Erro	Ors	104						
	8.1.1.1.	Branch before Any Contact Address is Loaded	104						
	8.1.1.2.	Duplicated Timer	104						
	8.1.1.3.	Duplicated Counter	104						
	8.1.1.4.	Connection Configuration between the Elements is inconsistent	104						
	8.1.1.5.	There is function element before any contact address is loaded	104						
	8.1.1.6.	Illegal Label Position	105						
	8.1.1.7.	Illegal Position for Return from Subroutine	105						
	8.1.1.8.	Jump is not paired with a Label	105						
	8.1.1.9.	Jump to Illegal Position	105						
	8.1.1.10.	Subroutine Label is at Illegal Position	105						
	8.1.1.11.	Jump to Subroutine is not paired with a Label	105						
	8.1.1.12.	Subroutine is not paired with Return	105						
	8.1.1.13.	Duplicated Label	106						
	8.1.1.14.	Open Circuit	106						
	8.1.1.15.	A Row is consist of only Horizontal Connect Elements	106						
	8.1.2. Wa	rnings	106						
	8.1.2.1.	Duplicated Coil	106						

8.1.2.2.	Short Circuit	106
8.1.2.3.	More Than One End for the Ladder	107
8.1.2.4.	Not Recommended Upward Branch	107
8.2. Use	er Register Area	107

Version	Date	Editor	Revision
00.00.001		Yu	Draft
00.00.002	2017/01	Yu	Added description for elements of RTimer and Larger than or Equal to/Less than or Equal to/Not Equal to.
			Fixed the incorrect description for Larger than/Less than elements.
00.00.003	2017/04	Yu	Added I/RmapN and O/RmapN.
00.00.004	2018/05	Yu	Change corporation name.
00.00.005	2019/04	Yu	Added MOD/RET.
00.00.006	2019/07	Yu	Corrected MOD example figure.

1. PLC Programmer for Linux Controller Introduction

This document is to instruct users to familiarize Windows-based LNC PLC Programmer for Linux Controller which can develop customized ladders used in all controller product lines.

PLC module provides several means to interact with other modules and environment within the controller and the outer environment like I/O, timer, counter, functional elements, etc. With those data types, the user can develop sequential control to meet the needs.

Data Type	Name	Size	Description
	I	4096	Digital Input10 ~ 14095
	0	4096	Digital Output00 ~ 04095
bool	А	4096	Internal AddressA0 ~ A4095
	S	4096	Internal Address (Status)S0 ~ S4095
	С	4096	Internal Address(Command)C0 ~C4095
	TIMER	256	TimerTM0 ~ TM255
	(TIM)	200	Types1ms,10ms,0.1s,1s
lana	Counter	050	CounterCT0 ~ CT255
long	(CNT)	256	Types: Up, Down, Ring Up, Ring Down, Reset
	Deviator	Refer to	Detain Turce Denges
	Register	product line	Retain Type Range: Refers to product line

The following table briefs the data types that PLC module can access:

Table 1 PLC Data Types

2. Introduction of the Functionalities

PLC Programmer may have different user interface by the evolving of versions but the following functionalities are supported at the least :

2.1. Ladder in LMLC Format Edit

• File Operation

- Open existing file : 3.4.2
- New file : 3.4.3
- Save(Check and Compiling would be carried out at the same time) :
 3.6.7
- Save as : 3.6.9
- Close : 3.6.8
- Encryption/Decryption : 3.6.16 · 3.6.6
- Print : 3.6.10
- Close Application : 3.3
- Edit
 - Elements insertion and set : 3.7
 - Copy : 3.6.17
 - Cut : 3.6.19
 - Paste : 3.6.18
 - Delete : 3.6.20
 - Delete Vertical Connection : 3.6.21
 - Undo : 3.6.22
 - Redo : 3.6.23
 - Search/Replace : 3.9
 - Insert One Line : 3.6.24
 - Insert One Space Line : 3.6.25
 - Insert Comment Element : 3.6.26
 - Insert Label Element : 3.6.27
 - Insert Return From Subroutine Element ÷ 3.6.28
 - Insert END Element : 3.6.29
 - Edit Symbol/Comment for addresses ÷ 3.6.11
 - Annotation : 3.6.12
- Others
 - Switch to Monitor Mode : 3.6.13
 - Switch to Simulation Mode ÷ 3.6.14

- Application Setting : 3.6.15
- Switch Application User Interface Language : 3.6.5
- Application Information ÷ 3.6.4

3. PLC Programmer for Linux Controller Operations

3.1. Installation

Execute

PLCProgrammerForLinuxController_00.03.xx.xx.Release_Setup.exe, then select the intended installation directory as Fig. 1. There will be a short cut on

desktop like 🥨 after installation -

Choose Install Location			Gui
Choose the folder in which to i	nstall PLCProgramme	r(Linux) 00.03.00.	01.09 Release. 🛛 😡
Setup will install PLCProgramm install in a different folder, did installation.			
Destination Folder			
	ProgrammerForLinu	Controller	Browse
C: (Program Files (x86) (PL)	ProgrammerForLinu	Controller	Browse
Space required: 39.9MB	ProgrammerForLinu	Controller	Browse
C: (Program Files (x86) (PL)	ProgrammerForLinu:	Controller	Browse
Space required: 39.9MB	ProgrammerForLinu	Controller	Browse

Fig. 1 Installation

3.2. Run Application

There are two ways to execute PLC Programmer for Linux Controller

Method I

Run QPLCProgrammer.exe from the installation directory, for example C:\Program Files (x86)\ (Installation folder).

Method II

Use short cut Or on desktop -

PLC Programmer for Linux Controller starts as Fig. 2, the application would

adjust the size according to the resolution of the screen. The maximum width of the application is 1366 pixel, and the height would expand to the task bar to provide the maximum working area.



Fig. 2 PLC Programmer Initialization

3.3. Start Layout



Fig. 3 Introduction of the Start Layout

The application only showed the functionalities that are suit for the current stage and will display corresponding functions after opening file. Move the cursor to the function icon would show tip string about its functionality.

① Functions needed for all occasions :





: Create a new file and start edit session.



i: Provide application information on versions.



Switch the application user interface language.



: Decrypt an encrypted file.

2 Applicatiion Operation



: Close the application.

- : Minimize the application.
- ③ Working Area: Show the set homepage at the starting.

Use open or new icons to start an edit session.

3.4. Edit for Ladder in LMLC Format

Programmer supports there mode on ladder in LMLC format, editing, monitoring and simulation. Edit Mode is the default mode to start and exit the application.

3.4.1.Getting Started

Use the following procedure to start the editing •

3.4.2. Open Existing File

Hot Key : Ctrl+Alt+O

- or use the hot key. Click
- Select the file format the file to open as Fig. 4.
- Select the language for address symbol/comment editing in the session as Fig. 5. There are already address symbol/comment string files for Traditional Chinese, Simplified Chinese and English.in this example.
- Opening finishes as Fig. 6.

	JX > 20150408	► working ►	pic	- +	授尋 plc		
組合管理 ▼ 新埠	i 資料夾				95	• 🖬	0
 ★ 我的最愛 ▶ 下載 ■ 桌面 > 最近的位置 ○ 保證櫃 ▲ Apps ③ Subversion ◎ 文件 ● 音樂 ○ 周片 	▲ 名稱 ■ cnc	s.Imlc			收日期 15/7/27 下午 0	<u></u> 重型 LMLC 協案	
			m				
	檔案名稱(<u>N</u>):			• •	mlc 開啟舊檔(<u>O</u>)	取消	+

Fig. 4 Open an Existing File



Fig. 5 Select the Language of Address Symbol/Comment



Fig. 6 Finish Opening



Hot Key : Ctrl+Alt+N

- Click or the hot key •
- Select the language for the address symbol/comment editing as Fig. 7.
- Click OK to new an LMLC file.
- Finish as Fig. 8, user can continue to develop above the END element.

🛷 String file language	,	8 ×
CHINESE_TRAN	CHINESE_SIMP	O ENGLISH
O JAPANESE	KOREAN	○ THAI
O INDONESIAN	VIETNAMESES	INDIAN
🔿 MALAYSIAN	O PHILIPPINE	O AUSTRALIA
🔘 TURKEY	💿 AFGHANISTAN	ARGENTINA
💿 PERU	O CHILE	MEXICO
💿 COSTA_RICA	💿 PANAMA	🔿 SPAIN
🔘 CANADA	🔘 GERMAN	O FRENCH
💿 BELGIUM	🔘 SWITZRLAND	💿 SWEDEN
💿 ITALY	🔘 RUSSIAN	HOLLAND
🔿 POLISH	🔿 FINLAND	🔿 POR TUGUESE
🔘 GREEK	🔘 ICELANDIC	HUNGARY
🔘 NOR WEGIAN	CZECH	🔿 UKRAINAN
💿 ROMANIAN	🔘 HEBREW	🔿 DENMARK
	OK	

Fig. 7 Select The Language of Address Symbol/Comment



Fig. 8 Finish creating a new LMLC file

🛍 🧚 🖓 🕅 🖄 👘 💾 📷 ng/pic/cnc imic (週一 七月 27 15:45:57 2015) 4 4 4 0 E A 🔏 💑 👩 🦘 🎓 🚍 🔤 🚟 🜆 🔤 ch Replace EDIT (1,45 開機常Or ──↓ ├─ 0(1,49) 40(1.62) 1 18 8 由電気 R1000

3.5. Introduction of Edit Mode for Ladder in LMLC Format

Fig. 9 Edit Mode for Ladder in LMLC Format

The layout of the edit mode is as Fig. 9 to achieve

- Instant access to full functionalities by toolbar icons.
- Larger application output area to let users easily notice the messages from application like compiling errors or warnings.
- Maximize working area.

Introduction to each area as following:

① Common tool bar, two additional toolbar icons in edit mode are as following:

Save file, checking and compiling would be carried out with saving. The

icon would change to after current file being modified.

Close file, application would return to the start layout. The user would be reminded by a dialog if the file has been modified.

- ② The area of displaying the annotation and directory of the opened file.
- ③ PLC Element Toolbar



: Contact class.



: Coil class



- 😢 : Delete the element on focus or marked area
- 😢 : Delete the vertical connection on the left
 - 🤊 : Undo, enable only it is doable
- Redo, enable only if it is doable
 - Insert one horizontal connection line above focus
- : Insert one empty line above focus
- : Insert comment element above focus
- : Insert label element above focus
- : Insert RTS element above focus

- Insert END element above focus
- (5) Search and replace
- (6) List of the occurrence in the file of the addresses used by the element with focus. Click one item to go the occurrence position.
- (7) Edit status area to show current mode, the comment of the element with focus, current row, column, etc.
- (8) Application output to feedback messages to the users like compiling result.
- (9) Working Area to display the opened ladder.

3.6. Edit Functionalities of Ladder in LMLC Format

3.6.1. Mouse and Keyboard



Mouse left key :

Mark area : Press mouse left key to mark area.

🖿 🦻 🕜 👰 🔁 💾 📷 ^{Bal} . Y 2.57 (D.4.14C/Error report/adder with problem/Line	2020151001/working/me: Linke (@T — 月 15 11:02:59 2016)
📑 😂 🖹 🕋 🕂 💋 🕕	Std Yer 2 58 modify at 2015/08/21
🗟 🗈 X 🍮 占 4 A 🖻 🔤 🚟 🖷	Always ON Always O
Search Replace	A0 Always ON A0
	Altery Oli NOV R20414 Λ0 ζ R27012
	Records R 2000.16
Shno	《 職械手I:
	Home MY II.(-) 16 R 2000 5 A 1006
	R 7995.0 R 20005 A 1000
	Home MY HL(4) 17 R20005 A 1007
	R 7995.0 R 20000 5 A 1250
	Home MZ HL(-)

Fig. 10 Marking Area



Mouse right key :

Right key menu : Click the right key to pop up right key menu.

<u>S</u> et	1
<u>F</u> ile	-
<u>E</u> dit	→ _
<u>P</u> LC	•

Fig. 11 Right key menu

Mouse wheel : Move focus up and down.

Moving the cursor to a toolbar icon can show the tip for the functionality of the icon.



Fig. 12 Tip for toolbar icon

F						
	۲	۲	۲	۲	۲	ł
	٠	٠	٠	٠	۰,	

Up, Down, Left, Right : Move focus up, down, left and right.

Page Up/Down : Move focus up or down one page.

Shift+Up, Down, Left, Right /Page Up/Down : Mark area. Return/Enter : Pop up mouse right key menu.

3.6.2. Open an Existing File

Refer to 3.4.2.

3.6.3.New

Refer to 3.4.3.



Show module version information of the application.



Fig. 13 Application Information



Select the language used by the application user interface.



Fig. 14 Select Language of Application User Interface

. This function is not to select the language used by ladder editing like address symbol/comment, string for label/comment elements, etc.

3.6.6.

Decrypt an encrypted file to the current working directory. Select File as Fig. 15, ask user to input password as Fig. 16 and finish decryption as Fig. 17.

👔 Open * Imicsz					8
🕞 🌖 - 📙 « Linux	c 🖡 20151001 🖡 worki	ng	▼ 49	授尋 working	Q
組合管理 ▼ 新増]	資料夾			93	• 🔟 📀
▲ Apps ● Subversion ● 文件 ● 音樂 ● 周片 ● 家用群組	▲ 名稱 □ cnc.Imlcsz		修改 E 2016,	日期 /1/15 下午 0	項型 LMLCSZ 檔案
ACER (C:) DATA (D:) Transcend (F:) CD Y THE (U)	← 《 a案名稱(N):		Ⅲ ▼ [*.lmk	csz 飲舊燭(<u>O</u>)	〕、

Fig. 15 Select the Encrypted File

🕼 Dialog			3	X
Password must b	e 1~8 chai	ractors		
Input Password	1			
OK				
Cancel				

Fig. 16 Ask User to Input Password

(B)	QPLCPro
it is	Unlock success.
	OK

Fig. 17 Finish Decryption

. The file with the same name of the one in the encrypted file in the working folder will be overwritten.



Hot Key : Ctrl+Alt+S

Save the currently opened file and do check and compiling. The result message would be showed on application output area as Fig. 18. Click an message item would lead to the position which is related to the message.

🖿 🥊 🕜 👰 🕣 💾 📷 Std_V2.57 [D /LMC/Error report/ledder with problems/L	mux20151001/vorkington: Inde (理五一月 15 11:02:59 2016)] 01/vorkington: Inde (理五一月 15 11:02:59 2016)]
📑 🚭 🖹 💌 🕂 🥒 🕕	3til Ver 2.58 modify at 20150821
Search Replace A0(1,2) A0(1,2) A0(1,2) A0(1,2) A0(1,3)	Always ON Initial
A v Addr: 0 Bit 0 A0(1.4) A0(1.25) A0(1.24)	A 0 A begg 0N MOV R20414
A0(1,247) A0(1,1002)	λ 0
A0(1,1005) A0(1,1126) A0(1,1149)	R 8005.0 R 20001.6
EDIT 1000 000 1 Col: 1 ROW: 4 A0(1,1158) A0(1,1158) A0(1,1158) A0(1,1158)	
A0(1,1166)	1 《 機械手!:
Compile failed.	Home M7 HL(-)
File:cnc Error:(9,1679) Open circuit.	16 R 2000.5 A 1006
	R 9950 R 2000.5 Å 1000
	Home MY HL(+) 17 R 20005 A 1007
	R 995.0 R 2000.5 A 1350

Fig. 18 The result message after saving

The following files would be generated after a successful compiling. cnc.lmlc : Ladder file.

cnc.lcod : Binary executable file.

cnc.lpar : Parameter file come with the binary executable file.

cnc_plc_xxxx.str and cnc_plc_xxxx_utf8.str : Address symbol/comment string file, xxxx are four digits and represent the language index used by the string file.

0000=Traditional	0011=Australia	0022=German	0033=Greek
Chinese	0012=Turkey	0023=French	0034=Icelandic
0001=Simplified	0013=Afghanistan	0024=Belgium	0035=Hungary
Chinese	0014=Argentina	0025=Switzerland	0036=Norwegian
0002=English	0015=Peru	0026=Sweden	0037=Czech
0003=Japanese	0016=Chile	0027=Italian	0038=Ukrainian
0004=Korean	0017=Mexico	0028=Russian	0039=Romanian
0005=Thai	0018=Costa Rica	0029=Holland	0040=Hebrew
0006=Indonesian	0019=Panama	0030=Polish	0041=Denmark
0007=Vietnamese	0020=Spain	0031=Finland	

0008=Indian	0021=Canada	0032=Portuguese	
0009=Malaysian			
0010=Philippine			

Table 2 Language Index



Hot Key : Ctrl+Alt+C

Close the currently opened file and remind the user if the file has been modified.

🖿 🥊 🕡 🦗 🔂 💾 📷 Stl_V2.57 (D'/L/NC/Enror report/Jedder with problems/Linu	w20151001/working/trac link: (理五一月 15 11:02:59 2016)] (21101/working/trac link: (理五一月 15 11:02:59 2016)]
	Stil Ver 2.58 modify at 2015/08/21
Search Replace	Always ON Always ON A d Always ON A d A d A d A d A d A d A d A d
Siatus Compile failed. File:one Error:(9,1679) Open circuit.	Home MY HL(s) 16 R 20005 A 1005 16 R 20005 A 1007 17 R 20005 A 1007 17 R 20005 A 1007 17 R 20005 A 1007 18 R 20005 A 1007 19 R 20005 A 1007 10 R 20005 A 1007 11 R 20005 A 1007 12 R 20005 A 1007 13 R 20005 A 1007 14 Home M2 HL(s)

Fig. 19 Reminding of the Modified File



Hot Key : Ctrl+Alt+A

Save the currently opened file to another file and open the newly saved file.

. The address symbol/comment string files would not be automatically saved to the new file's name.



Multi-select the print options (address symbol/comment and ladder.)

🕼 Print	8 ×
Print Symbol	
ок	Cancel

Fig. 20 Select Print Option

3.6.11. Pop Address Symbol/Comment Editing Dialog

Click to pop up address symbol/comment editing dialog as Fig. 21. The address that has been used in the ladder would be marked with \bigcirc . The user can write symbol and comment on I, O, C, S, A, Timer, Counter, Register, Register Bit to note the purpose of the usage. The symbol would be shown on the top of the ladder element when the element is able to do so. The comment which set by the element with focus would be shown to the edit status area as Fig. 22.

I Bit	0 Bit	C Bit	S Bit	A Bit	Timer	Counter	Register		
	Address		Used		Symbol			Comment	-
0			0	Main-h	or.				
1			0	Main-ve	er.				
2			0	Sub- <mark>h</mark> o	r.				
3			0	Sub-ver	\$.				
4			0	Sub-for	ward				
5			0	Sub-do	wn				
6			X						
7			x						
8			x						
9			x						
10			0	Gripper	1				
11			o	Gripper	2				
12			0	Gripper	3				
13			0	Gripper	4				
14			0	Vaccum	1				
15			0	Vaccum	2				
16			0	Vaccum	3				•

Fig. 21 Address Symbol/Comment Editing Dialog

🖿 🔮 🕜 🔯 🙃 💾 📷 Std_V2.57 [D/L.NC/Euror report/odder with problematu	immer20151001/vordang/cac lash: (卷丘—月 15 11 02 59 2016)
📑 🔿 🖻 🚍 👫 💋 🕦	Stil Ver 2.58 modify at 2015/08/21
🗟 🗋 🕹 👼 🐟 🦘 🚍 🚟 🚟 🚟	Abreys ON Abreys ON
Search Regisce RBIT8005.0(1.5) Reg Bit	Adversion Adversion Abversion Move Abversion Move Abversion Move
Prestage (orbot weiting above mod/) [D. Not allowed EDIT	λo ζ R27012 Preduce R 60050 R 2000016
Shite Compile failed	《 · · · · · · · · · · · · · · · ·
File:cnc Error:(9,1679) Open circuit.	Home MY IIL(>) 16 R 2000 5 A 1006
	R 1995.0 R 2000.5 A 1000 Home MY HL(+)
	1/1/2 R 2000 5 A 1007 17 R 2000 5 A 1007 zegetive Hone MThombog
	R 79950 R 20005 A 1350 Brow MZ 21(-)

Fig. 22 The Area of Displaying Comment

. The modified string would be written to the string file only OK button is clicked.

L : PLC Alarm/Warning String Editing

The user can assign PLC alarm string by writing comment for register bit ranging from R29000 to R29049 and PLC warning string by writing comment for register bit ranging from R29050 to R29099. The controller would show the corresponding PLC alarm/warning string after the string files being uploaded. Firstly select the register editing page then expand the edit field for register bit symbol/comment editing as Fig. 23. The register bit edit mode is as Fig. 24.

I Bit O Bit	CBit SBit	A Bit	Timer	Counter	Register		
+ Address	Used	S	ymbol			Comment	-
9000	x						
9001	X						
9002	х						
9003	0						
9004	x						
9005	x						
9006	×						
9007	×						
9008	x						
9009	x						
9010	x						
9011	x						
9012	x						
9013	×						
9014	X						
9015	x						
9016	×						



IBit OBit C	Bit S Bit	A Bit Timer	Counter Register
- Address	Used	Symbol	Comment
29000	X		
29000.0	0	M-V alarm	M-Arm C- Wait Time Overrun
29000.1	0	M-H alarm	M-Arm C+ Wait Time Overrun
29000.2	0	Z Unsafe	MZ-axis or SZ-axis position is not in safe area to imple
29000.3	×		
29000.4	0	IO Error	IO communication error
29000.5	0	Wrist err.	
29000.6	0	Wrist err.	
29000.7	0	Sub unsafe	SZ-axis position is not in safe area. Please go to manu
29000.8	0		Main arm wrist vertical signal needs to be ON before r
29000.9	0		Main arm wrist horizontal signal needs to be ON befo
29000.10	0	V/H all of	Both main arm wrist vertical signal and main arm wrist
29000.11	0	V/H all on	Both main arm wrist vertical signal and main arm wrist
29000.12	0	V/H all on	Both sub-arm wrist vertical signal and sub-arm wrist h
29000.13	0	C/O all on	Both 'mold fully open' and 'mold fully closed' signals f
29000.14	0		
29000.15	0		

Fig. 24 Register Bit Symbol/Comment Editing

3.6.12. 🗮 : Pop Annotation Dialog

Annotation dialog is as Fig. 25. The maximum allowed string is to 80 bytes.





🖿 🎐 🕖 👰 📵 💾 📷 Std_V2.57 D /L NC/Error report/sider with problemelling	v20151001/working/enc lmic (週五一月 15 11 02:59 2016)]	ũ ũ ũ ũ ũ ũ ũ ũ ĩ ŭ
	Still Ver 2.58 modify e	12015/08/21
		Always ON
Search Replace Restroods o.(1.5) Reg Bit ▲ Addr: 8005 \$161 Restroods o.02, 1163) Restroods o.02, 1163) Restroods o.02, 1163) Restroods o.02, 1163) Restroods o.02, 1163) Restroods o.02, 1163)		
	Always ON A 0 Prestate	ΜΟΫ R20414 ζ R27012
Prestage (color vesting above molt) (D. Not allowed	R ROCE D K insput.	R 200016
Slatus	《	
Compile failed. Fileranc Error:(9,1679) Open circuit.		Home MY HL(·) R 20000.5 & 1006
		R 7995.0 R 2000.5 A 1000
		Home MY HL(+) R 20000.5 & 1007
		R 7595.0 R 20000.5 A 1350
	// ca ca	

Fig. 26 Annotation Displaying

3.6.13. 🖭 : From Edit Mode to Monitor Mode

Click to pop up the connection dialog, use Detect to list the controllers on which connection is possible as Fig. 27. Select the controller in the list and click connect to build the connection. If the connection can be built then the application would change to monitor mode as Fig. 28, otherwise the application remains in edit mode. The functionalities of the monitor mode refer to chapter 6 錯誤! 找不到參照來源•.



Fig. 27 Connection Dialog

👔 🕅 Stl_V2.57 (D/LNC/Error report/ledder with problems/Linux/20151001/workington: lmlc (🕮 — — — — — — — — — — — — — — — — — —	5 11.02.59 2016)]	×
	Stil Yer 2.58 modify at 2015/08/21	-
Search A - Addr. 0 - Bit 0 - C	Always ON A 0 Always ON A 0	-
FLC Lude 16800 192 168 25 52	Δ0 Δhegy: ON Δ hegy:	
MON 0000 1 000 2 ROW 2	Pretage R 6005.0 R 2000.16	-
Address Monitoring Value		-
		-
	Home MY HL(-) 16 R 20005 A 1005 negative Rome MYHoneDog	
	R 79950 R 200005 A 1000 Borne MY HL(4)	
Shitu D	R 1995.0 R 2000.5 A 1350	-
	Home MZ HL(-)	-

Fig. 28 Monitor Mode

: The opened file must be the same version with the one running in the controller to reflect correct monitor result.

3.6.14. **From Edit Mode to Simulation Mode**

Before entering simulation mode, the application does saving, checking and

compiling. The application would enter simulation mode as Fig. 29 if the compiling is successful or remain in edit mode. The functionalities of the simulation mode refer to chapter 5.



Fig. 29 Simulation Mode



Application setting dialog is as Fig. 30. The user can use it to customize the application environment.



Fig. 30 Application Setting Dialog

Color Setting is to set:

- Ladder background color, the background color for the element with focus is the inverted color.
- Element color without focus, the element color with focus is the inverted color.
- Element color when is active in monitor/simulation mode. The inactive color is the inverted color.
- Element color for being marked in edit mode.

Example: The following figures show the effect of setting ladder color black, element color without focus white, the element active color green and the marked color red.

🖿 🔮 🕡 🎉 🔒 💾 📷 Std_V2.57 (D). I.M.C./Earce report/ledder with problematic	anner20151001/voodingstrae. lmle (@17 — 月 15 16 41:32 2016))
💾 🕒 🛃 🕋 🕂 🖉 🚯	Sti Ver 2.58 molify er 201508/21
🗟 🗈 🐱 🔁 🗢 🔶 📄 🚟 🚟	開建版設
Search Replace	
	Μοψ R20414 Δ 0
	F18-148 R 200016 R 200016 R 200016
Status	
	iae Elfrat Morrae Fra R 1995.0 R 2000.5 A 1000
	99594308t MY49154687 17 R.20005 A.1007
	高舟回野143 時野1431384 WYIF695784 R 7995.0 R 2000.5 A 1350

Fig. 31 Edit Mode

1 Std_V2.57 [D:/LNC/Error report/ledder with p	problems/Linux/20151001/working/enc.lmlc (週五一月	月 15 1641-32 2016)]	
		Stil Yer 2.58 mobility at 2015/08/21	
Search	HE O	開き線設 //- の 取得機構設	間機開發 人 0 開機初始化
FLC Info: T6600 192.168 25.52		間機觸發 MOV	開港初始佔 人 A 3 R20414 R27012
	🗧 COL: 8 ROW: 6	下降待機 R 6005.0	R 20000.16
Address	Monitoring Value		
		《 機械手:	
		99781188 1 16 8 2005 8 2005	
		第一日日本 第一日日本 1995日 - R20005	
			MY硬正極限
Status		17 ⁻¹ R. 2000.5 第46回転後の時時141版1	A 1007 MY正向原點
		R19950 R20005 	A 1350 MZ硬貨極限

Fig. 32 Monitor Mode

3.6.16. 3.6.16 Encrypt the Currently Opened File

This function is to encrypt the currently opened LMLC file. The password input dialog is as Fig. 33. The password must be 1 to 8 characters long and the characters must be in the set of a to z, A to Z and 0 to 9. Choosing the directory into which the encrypted files would be put as Fig. 34. The application would do save, check and compiling after the user confirm the directory. The encryption would take place if the compiling is successful and

the encrypted files, which are *.Imlcsz and *.lcodsz, would be put into the chosen directory as Fig. 35.

🕼 Dialog	? ×
Password must be 1~8 charactors	
Input Password Verify Password	
OK	
Cancel	

Fig. 33 Password Input

QPLCProgramme	r and a second	X
Select folder fo overwirtten.	r locked files, the files with	same names in the folder would be
		OK

Fig. 34 Selecting Directory



Fig. 35 Encrypted Successfully

					▼ 4 提尋 working		
合管理 ▼ 加入至媒體櫃 ▼ 共用器	討象▼ 燒蒜 新增資料夾					III • 🗍	10 (
12 最近的位置	名稱	修改日期	類型	大小			
in land	cnc.c	2016/1/15 下午 04:41	C Source	192 KB			
保證權	cnc.lcod	2016/1/15 下午 04:41	LCOD 福宾	100 KB			
🍰 Apps	cnc.lcodsz	2016/1/15 下午 04:41	LCODSZ 檔案	104 KB			
Subversion	a cnc.lmlc	2016/1/15 下午 04:41	LMLC 福宾	132 KB			
文件	cnc.lmlcsz	2016/1/15 下午 04:41	LMLCSZ 檔案	132 KB			
♪ 音瑛	🖲 cnc.lpar	2016/1/15 下午 04:41	LPAR 借索	4 KB			
🦷 視訊	cnc_plc_0000.str	2015/10/1 上午 11:25	STR 檔案	21 KB			
111 111 111 1111 1111 1111 1111 1111 1111	cnc_plc_0000_utf8.str	2016/1/15 上午 11:02	STR 借案	25 KB			
	inc_plc_0001.str	2015/5/26 上午 10:32	STR 榴寫	20 KB			
家用群组	cnc_plc_0002.str	2015/5/26 上午 10:47	STR 檔案	23 KB			
	cnc_plc_0002_utf8.str	2016/1/15 下午 04:41	STR 檔案	22 KB			
電階 =							
ACER (C:)							
DATA (D:)							
SRECYCLE.BIN							
LNC							
LNC software							
LINC 我的最愛							
ReconTool v4 10							
shared							
sikuliX							
System Volume Information							
🎍 tmp							
🔒 VM playground							
Transcend (F:)							
11 個項目							

Fig. 36 The Encrypted Files

L : Address symbol/comment string files would not be encrypted.

This functionality needs to work with the controller. Check if the controller side supports the functionality before using.

3.6.17. Sopy Element or the Marked Area

Hot Key : Ctrl+C

Copy the element with focus or the marked area to system clipper board.



Hot Key : Ctrl+V

Paste the copied elements in system clipper board to the current focus position.

The action would not be taken if the current focus position does not allow.
For example, try to paste across a comment element.

If the copied area is in complete rows, pasting is to insert those rows above the focus.
3.6.19. . Cut Element or the Marked Area

Hot Key : Ctrl+X

Cut the element with focus or the marked area to system clipper board.

3.6.20. 😎 : Delete Element or the Marked Area

Hot Key : Del

Delete the element with focus or the marked area to system clipper board.

L: The action would not be taken if the current focus position does not allow.

For example, try to delete the line elements on the row which contains END element.

3.6.21. 🕴 : Delete the Vertical Connection on the Left Side

Hot Key : Shift+Del

Delete the vertical connection on the left side of the current focus position as Fig. 37.

🖿 🕑 🕜 👰 🕣 💾 🏣 Dr.U.NC.Enor reportbalder with problematikanos20100118/vordingkne. hule (@= +月 21 06.47.58 2076)				
📑 🚭 🖹 💌 🕂 💋 🔂	TYM-6800 20151105	_		
🗟 🗋 X 👼 🖢 4 A 🗗 🔁 🚟 🚟 🚟	PowerON Rest key TIM TM10 MOV R40003 DIV #1000 StartSigna PowerON			
Search Replace	λ10 1200 100ms #10 ζ R200 / R200 Λ1 λ10 λ10 RoverON			
String Search String: TVM-6600.20151105	A 10 VER VER2 R 93301 PowerON MOV #600012 MOV #20151105			
	Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ10 Δ	-		
	RIO1 Emo Rest key Communica S 3002 200 R 2000	_		
	Communia:			
	¥90)-0 ↓/↓ ↓/↓			
Status	A19 ¥[@dby@d: TIM TM11			
	100ms #2 R 29050 25	,		
	¥90,-0 1 38 A 567 A 587	-		
	烧艽罐笔店港	-		
	PoveroN MotorON Mold Adj.Led Semiento key Mold Adj.key Mammal Led A 10 040 0204 1202 1203 1204 704 70421 0201	1		
		1.		

Fig. 37 Delete the Vertical Connection



Hot Key : Ctrl+Z

Cancel the last edit action.

L : There is undo number limit.

3.6.23. 📌 : Redo

Hot Key : Ctrl+Y

Redo the last canceled edit action.

🙏 : There is redo number limit.

3.6.24. 📑 : Insert a Line Row above Focus

Insert a line row above focus as Fig. 38.

🖿 🦻 🕜 🧸 🕣 💾 🚬 Sti_V2.57 [D /LNC/Error report/adder with problems/Linv	w20151001/vorking/tmc linke (昭五一月 15 16 41 32 2016)] 🙀 🖏 🖏 🖏 🖏 🖏 🖏 🖏 🖏 🖏
	Stil Ver 2.58 modify at 201508/21
Seach Regiace	A0 A0 Abwyr ON Initial A0 A3 A0 A3 A0 C R 8005.0 R 200016 (*) R 200016
Shite	《 · 通快手! · · · · · · · · · · · · · · · · · · ·
	Bons MY HL() 16 R 2000 5 A 1006 regibive Hone MYHNADQ R 2995 0 R 2000 5 A 1000
	R 2000.5 Å 1000 Home MY HL(+) 17 R 2000.5 Å 1007 CH CH C

Fig. 38 Insert a Line Row



Insert an empty row above focus as Fig. 39.

🖿 🔮 🕜 🦓 🕣 💾 🚬 Stl., V2.57 (D. f. NC/Eiroz seport/isdáer with problematium	uux20151001/vordaagtaa: kale (@ET – A] 15 16 41 52 2016]
💾 😂 🖹 🔳 🖓 👫 💋 🚹	Stit Ver 2.58 mobility at 2015/08/21
🗟 🗋 🕹 👼 🔶 🦘 🎓 🚍 🚟 🌆 🚟	Always ON Always ON
Seurch Replace	
	Always ON R20414
	Prestage R 8005.0 R 200016 ((input
Shite	
	Home MY HL(-) 16 R 2000 5 A 1006 negetive Home MY HomeDog
	R 79950 R 20005 A 1007
	CH CH : MYHomeDog



3.6.26. **3**: Insert a Comment Element above Focus

Insert a comment element above focus as Fig. 40.

🖿 🦵 🕜 👰 🔂 💾 📷 Std_V2.57 (D/LHC/Enror report/ladder with problems/Linu	#20151001/working/roz.lmle (趙五一月 15 16/41 32 2016)] 1 (11 16/41 32 2016)] 1 (11 16/41 32 2016)]
📑 🔿 🖻 🗏 💽 🐈 🖉 🕒	Siti Ver 2.58 modity at 2015/08/21
	Always ON Always ON Always O
Search Replace	Always ON
Sting Steerch Sting	Always ON MOV R20414
	λο <u>ζ R27012</u> Prestage
Input string: Common test.	R 2000016
OK Canel	
	Home MY HL(-)
	16 R 2000.5 A 1006
	Home MY HL(+) 77 R 2000.5 A 1007
	CH CH ; negative Home MYHomeDog

Fig. 40 Insert a comment element



Insert a label element row above focus as Fig. 41.

🖿 🤔 🕜 👰 📵 💾 📷 Std_V2.57 (D:4.14C/firmor report/ladder with problema/Linux	m220151001/workingtrac line (理五一月 15 16:41:32 2016)) 1 1 1 1 1 1 2 2016))
📑 🔿 🗾 🗃 💽 👯 💋 🕦	3tt Ver 2.58 modify at 201508/21
18 🗋 🕹 💀 k 🦘 🏕 🖻 🍜 🚟 🚟	Always ON Always ON
Search Replace	A 0 A 0 A Neeye ON
String 🔽 Search String	
🕼 Replaced by Sequence	ΔλνογεΟΝ MOV R20414 Δ C R27012
Exputching: ted	Prostage
input sang, west	R 2000016
OK Cancel	
	《 機械手I:
	« » ·
	Home MY HL(-) 16 R20005 A1006
	Y6 R 20000.5 Å 1066 negstive Home MYHomeDog
	R 7995.0 R 20000.5 A 1000
	Home MY HL(s) 17 R 2000.5 A 1007
	CH CH ; Home MYHomeDog

Fig. 41 Insert a Label Row

3.6.28. 📅 : Insert an RTS Element Row above Focus

Insert an RTS element row above focus as Fig. 42.

🖿 🦻 🕜 👰 🔂 💾 📷 Stl_V2.57 [D /LNC/Error report/ladder with problems/Linu	20151001/vorking/ne.lml: (過五一月 15 16 41:32 2016)] ① ① ③ ③ ③ ⑤ ◎ ⑤ ◎ ◎ ◎ ◎ ◎ ◎ ◎ ◎ ◎ ◎ ◎ ◎ ◎ ◎
📑 🕒 📰 💽 🐈 🖉 🕦	
🗟 🗇 🐰 💀 🐟 🔶 🚍 🚟 🚟	■ 278
Search Replace	
String 💽 Search String: test	Always OR MOΥ R21001 Δ ζ R100
U A U	<u>ΜΟΥ</u> <u>R21000</u> <u>ζ</u> <u>R101</u>
	SYS Alarm MOV #1 S 2000
EDIT 8070 1 30 COL: 1 ROW: 1662	S 3000 S 1405
	s'3001 <u>C</u> R103
Status	
	-] END [
	CH CH T

Fig. 42 Insert an RTS Element

RTS element must pair with label element which is used as subroutine.

3.6.29. 🔁 : Insert an END Element Row above Focus

Insert an END element row above focus as Fig. 43.

📑 🚭 🖹 💽 🐈 🖉 🔂		-
18 🗅 🕹 🖥 🖕 🔶 🗁 🔤 🚟 🚟 🚟	A 27b	
	TO TRACT MOUNTERSCO.	
Search Replace	Always ON	MOV R21001
String Search String test	AO	ζ R100
		MOV R21000
		C R101
	SYS Alarm	MOV #1
	S 3000	ζ R103
	SYS Wam	MOV #2
	S 3001	C R103
	5 3001	<u> </u>
Status		
	-] END [-	
	END END	
	1.4	
	K test:	
	RETURN	
	W con con	-
	III СН СН 📮	

Fig. 43 Insert END Element Row

. Only one END element is needed within one ladder.

3.7. Element Toolbar



Hot Key : Ctrl+F2

Click function icon and then click mouse left button on the desired position then the contact dialog would pop up as Fig. 44.

🕼 Replaced by Contact	? ×
Contact Type H POpen	
Address Type I	-
Induites Type 1	
Addr: 0	
OK Cancel	

Fig. 44 Contact Dialog

Contact type selection is as Fig. 45 :

- Open : Normal Open Contact
- Close : Normal Close Contact

Address selection is as Fig. 46:

- I : Outer environment input signal to PLC module, usually mapped to hardware digital input.
- O : PLC module output to outer environment, usually mapped to hardware digital output.
- C \ S : Used by NC kernel and PLC module to interact.
- A : PLC auxiliary address.
- Timer : Active status is corresponding to the assigned timer timeout status.
- Counter : Active status is corresponding to the assigned counter reaching status.
- Register Bit : Active status is corresponding to the assigned register bit.

Contact Type	Open	<u> </u>	
	+ } Open <mark>∤∕} Clo≋</mark>		
Address Type 🛛	I	_	
Addr: 0		🔿 Bit: 0 😜	
OK	Cancel		

Fig. 45 Contact Type Selection

Contact Type	Open	<u> </u>
Address Type	I	<u> </u>
	0	
Addr: 0	S A Timer	3
	Timer Counter Reg Bit	
OK	Cancel	

Fig. 46 Address Selection

Name	Description
Normal Open	Active when assigned address is True
Normal Close	Active when assigned address is False

Timer Normal Open	Active when assigned timer timeout
Timer Normal Close	Active when assigned timer has not timeout
Counter Normal Open	Active when assigned counter reaches the count.
Counter Normal Close	Active when assigned counter has not reached
	the count

Table 3 PLC Contact Functionality



Hot Key : Ctrl+F3

Click function icon and then click mouse left button on the desired position then the coil dialog would pop up as Fig. $\,$ 47 $_{^\circ}$

🕼 Replaced by Coil	? <u>×</u>
Coil Type <mark>K≻Open</mark>	
Address Type O	<u> </u>
Addr. 0	🔿 Bit: 0 🐳
OK Cancel	

Fig. 47 Coil dialog

Coil type selection is as Fig. 48 :

- Open : Normal Open Coil.
- Close : Normal Close Coil.
- Rising Edge : Rising Edge Triggered Coil.
- Falling Edge : Falling Edge Triggered Coil.
- Set : Latch Coil.
- Reset : Reset Latch Coil.

Address selection is as Fig. 49:

• O: PLC module outputs signal to outer environment, usually mapped to

hardware digital output.

- C S : Used by NC kernel and PLC module to interact.
- A : PLC auxiliary address.
- Register Bit : Active status is corresponding to the assigned register bit.

Rising Edge/Falling Edge triggered coil doesn't support register bit address type.

Coil Type	<≻ Open	<u> </u>
	🗘 Open	
	<∕≻ Close	
ddress Tv	(f) Rising Edge	-
	 (4) Falling Edge (5) Set 	-
	<pre>{P> Sei {P> Reset </pre>	
Addr: 0		∳ Bit: 0 ∲
OK	Cancel	

Fig. 48 Coil Type Selection

Replaced by Coil	ि २
Coil Type 🔀 Open	<u> </u>
Address Type 0	
O C A Reg Bit	T BIL U
OK Cancel	

Fig.	49 Address Selection
------	----------------------

Name	Description		
Normal Open	Output when the assigned address is		
Normal Open	True		
Normal Close	Output when the assigned address is		
inormai Ciose	False		
Pising Edgo Triggorod	Output when the assigned address is		
Rising Edge Triggered	changed from False to True		
Falling Edge Triggered	Output when the assigned address is		
Falling Edge Triggered	changed from True to False		
Set	Output continuously when the assigned		
	address even turns from False to True		
Reset	Reset the latch coil when enabled		

Table 4 PLC Coil Functionality



Hot Key : Ctrl+F4

Click function icon and then click mouse left button on the desired position then the timer dialog would pop up as Fig. $\,$ 50 $_{\circ}$

🕼 Replaced by Timer	? <mark>- x -</mark>
Timer Type	
Timer address: 0	
Preset Type Value	_
Preset: 0	
OK Cancel	

Fig. 50 Timer Dialog

Timer type selection is as Fig. 51:

• 1ms : Timer step is in 1ms.

. The interrupt time of the controller must be set to 1ms to make this type accurate.

- 10ms : Timer step is in 10ms.
- 100ms : Timer step is in 100ms.
- 1s : Timer step is in 1s.
- RTimer 1ms : Timer step is in 1ms.

The interrupt time of the controller must be set to 1ms to make this type

accurate.

- RTimer 10ms : Timer step is in 10ms.
- RTimer 100ms : Timer step is in 100ms.
- RTimer 1s : Timer step is in 1s.

One shot time period can be set by two ways as Fig. 52:

- Value : Directly input time period in 0 ~ 2147483647.
- Register : Use the value within the register as the time period.

🅼 Replac	ed by Timer	-	 ि <mark>२ २ २</mark>
Timer Type	9. 1ms	1	
Timer addre: Preset Tyme	00 10ms 20 100ms 0 1s	0	
Preset Type	Value	<u> </u>	
Preset: 0			
OK	Cancel		

Fig. 51 Timer Type

🅼 Replac	ed by Timer	-	-	? x
Timer Type	👰 1ms	<u> </u>		
Timer addre:	s: 0			
Preset Type	Value Value Reg	Ŧ		
Preset: 0	(100g)	×.		
OK	Cancel			

Fig. 52 Set Time Period

Name	Description
1ms Timer	Time step is 1ms
10ms Timer	Time step is 10ms
100ms Timer	Time step is 100ms
RTimer 1ms Timer	Time step is 1ms
RTimer 10ms Timer	Time step is 10ms
RTimer 100ms Timer	Time step is 100ms
RTimer 1s Timer	Time step is 1s

Table 5 PLC Timer Functionality



Hot Key : Ctrl+F5

Click function icon and then click mouse left button on the desired position then the counter dialog would pop up as Fig. $\,$ 53 $_{\circ}$

🏘 Replaced by Couner		 8 ×
Counter Type 📑 Up	×	
Counter address: 0		
Preset Type Value	<u> </u>	
Preset: O		
OK Cancel		

Fig. 53 Counter Dialog

Counter type selection is as Fig. 54:

- UP : Count from 0 to the set value increasingly.
- Down : Count from the set value to 0 decreasingly.
- Ring UP : Count from 0 to the set value and start over from 0 again till disabled.
- Ring Down: Count from the set value to 0 and start over from the set value again till disabled.
- Reset : Reset the counter to 0 for up counter and the set value for down counter.

The set value for the counter can be set as Fig. 55:

- Value : Directly input value in 0 ~ 2147483647.
- Register : Use the value in the register as the set value.

The user does not need to set value for reset type counter.

	d by Couner		-	
ounter Type	∱ Up ⊉ Up	<u> </u>		
ounter addre:	→ Up → Down ☆ Ring Up ☆ Ring Down ← Ring Down Fee Reset Yalue	1		
eset Type 🛐	alue	1		
reset: O				
OK	Cancel			
	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -			

Fig. 54 Counter Type Selection

🕼 Replac	ed by Couner	-	 8 ×
Counter Typ	e 🖵 Up	_	
Counter add	ress: 0	A. Y	
Preset Type	Value Value	I	
Preset: 0	Reg		
OK	Cancel		

Fig. 55 Counter Setting

Name	Description
Up Counter	Count from 0 to the set value

Down Counter	Count from the set value to 0
Ring Up Counter	Count from the 0 to the set value and start over again
Ring Down Counter	Counter from the set value to 0 and start over again
Reset Counter	Reset counter

Table 6 PLC Counter Functionality

3.7.5. Arithmetic Class :

Hot Key : Ctrl+F6

Click function icon and then click mouse left button on the desired position then the arithmetic function element dialog would pop up as Fig. $56 \circ$

🅼 Replaced I	oy Arithmatics	<u>२</u> ×
Arithmatic Type	+ Add 💽	
Input Type	Value	<u> </u>
Input value:	0	A Contraction of the second se
Output Type	Reg	<u> </u>
Output value:	0	A.
OK	Cancel	

Fig. 56 Arithmetic Function Element Dialog

Type selection is as Fig. 57:

- +Add : Do addition for two operands.
- -Sub : Do subtraction for two operands.
- ×Mul : Do multiplication for two operands.
- ÷Div : Do division for two operands.
- %Mod : Do modulo for two operands.
- >More than : Is one operand greater than the other one..

- <Less than : Is one operand lesser than the other one.
- =Equal to : Is one operand equal to the other one.
- &And : Do bit and operation between two operands.
- |Or : Do bit or operation between two operands.
- Xor : Do bit xor operation between two operands.
- Mulrini : Set value to more than one registers.
- Mulrcpy : Copy a continuous range of registers to a non-overlapped area.
- I/Rmap : Map 32 continuous I addresses to one register.
- O/Rmap : Map 32 continuous O addresses to one register.
- Shll : Do logic left shift operation.
- Shrl: Do logic right shift operation.
- >=More than or Equal to : Is one operand greater than or equal to the other one
- <=Less than or Equal to : Is one operand lesser than or equal to the other one.
- \neq Not equal to : Is one operand not equal to the other one.
- I/RmapN : Map N continuous I addresses to one register.
- O/RmapN : Map N continuous O addresses to one register.

Input operand type is as Fig. 58:

- Value : Directly input value in ± 2147483647 .
- Register : Use register's value.

Note : Move element has operand type of register pointer.

Note : I/Rmap and O/Rmap has I, O address as input.

Output operand type is as Fig. 59:

Register : Use register as operand.

Note : Move element has operand type of register pointer.

Mulrini, Mulrcpy, I/RmapN and O/RmapN have three operands as Fig. 60 and Fig. 61.

Mulrini : The first operand is the start address of the registers. The second is the number of registers to set. The third is the value to set into the registers.

Mulrcpy : The first operand is the start address of the source register area. The second is the start address of the target area. The third is the number to copy. The source and target area cannot overlap.

The third operand of I/RmapN and O/RmapN is the number of I or O to be mapped.

The element would continuously do the operation till it's disable by the the

ladder logic.

rithmatic Type	+ Add	•		
nput Type	+ Add — Sub	-	_	
Input value:	× Mul		*	
Output Type	÷ Div ∩ Move		_	
Output value:	 More than Less than Equal to And Or 			
OK	Cancel			

Fig. 57 Arithmetic Function Element Type

nput Type 🛛 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸	
nput value: Reg	
Dutput Type Reg 💽	
Dutput value: 0	

Fig. 58 Input Operand Type

. nepilice i	by Arithmatics	
Arithmatic Type	+ Add 💌	
nput Type	Value	-
nput value:	0	
Dutput Type	Reg	
Output value:	Reg U	
OK	Cancel	

Fig. 59 Output Operand Type

Arithmatic Type	Ref Mulani	
input Type	Reg	
Registart:	0	A
Output Type	Value	-
nit num:	1	★
Aux Type	Value	<u> </u>
lnit value:	0	.

Fig. 60 Mulrini Setting

Arithmatic Type	😹 Muliopy 💌	
input Type	Reg	<u> </u>
Src reg start:	0	
Output Type	Reg	<u> </u>
Dest reg start:	1	
Аих Туре	Value	<u> </u>
Copy num:	1	

Fig. 61 Mulrcpy Setting

Name	Description
Add	Add value or value of register to one
Add	register
Subtract	Subtract value or value of register from
	one register
Multiply	Multiply one register by value or value of
	register
Divide	Divide one register by value or value of
	register
Modulo	Divide one register by value or value of
Modulo	register then put the remainder to output
Move	Move value between two operands
Compare Large	Is one operand larger than another
Compare Less	Is one operand lesser than another
Compare Equal	Is one operand equal to another
AND	Bit and operation
OR	Bit or operation
Exclusive OR	Bit xor operation
Mulrini	Set value to more than one register
Mulrcpy	Copy register area to another area

I/Rmap	Map continuous 32 I address to one
илтар	register
0/Pman	Map continuous 32 O address to one
O/Rmap	register
Shll	Logic left shift
Compare Large than	Is one operand larger than or equal to
or Equal to	another
Compare Less than	Is one operand lesser than or equal to
or Equal to	another
Compare Not Equal	Is one operand not equal to another
to	is one operand not equal to another
I/PmanNI	Map continuous N I address to one
I/RmapN	register
	Map continuous N O address to one
O/RmapN	register

Table 7 PLC Arithmetic Function Element Functionality



Hot Key : Ctrl+F7

Click function icon and then click mouse left button on the desired position then the tool function element dialog would pop up as Fig. $\,$ 62 $_{\circ}$



Fig. 62 Tool Dialog

Tool function element selection is as Fig. 63:

• Search : Search element.

• Rotate : Rotation step calculation.

Input operand :

Register : Use register from 0 to 9999.

Output operand :

Register : Use register from 0~9999.

. The register addresses of input operand+1 and output operand+1 would also be used.

The element would continuously do the operation till it's disable by the the ladder logic.

Керіа	iced by Tool		8
ol Type	lool Search		
urce Reg	Search C Rotation		
estination	A STATE OF		
b		where exercise arrest of 0,000	
'he sour	rce/desination register nu	umber cannot exceed 9,999.	
'he sour	rce/desination register nu	umber cannot exceed 9,999.	

Fig. 63 Tool Element Type

Name	Description
Search	Search the tool number within the magazine
Rotate	Calculate the rotation step to a target position in a circle

Table 8 PLC Tool Functionality



Hot Key : Ctrl+F8

Click function icon and then click mouse left button on the desired position then the sequence function element dialog would pop up as Fig. $64 \circ$

🕼 Replaced by Sequence	2 ×
Tool Type 🏾 👻 Jump	
İnput string:	
OK Cancel	



Sequence function element selection is as Fig. 65.

- Jump : Jump to the paired label element and continue the PLC logic from there.
- Jump Sub Routine : Jump to the paired label element and continue the PLC logic from there. After meeting the RTS element, the PLC logic would return to the next element of Jump Sub Routine Element to go on.
- RET : Return to the caller. Finish ladder logic for this run if RET is within top layer(the logics before END), or return to the top layer if it is in subroutine.

. Jump and Jump Sub Routine must pair with label elements in appropriate position.

a nepia	ced by Sequence	
fool Type	» Jump 🗾	
	💓 Jump	
	📲 🛙 Jump Subroutine	
nput string		
OK	Cancel	

Name	Description	
JUMP	Jump to the paired label	
Call Subroutine	Jump to the paired label and	
	return after subroutine	

	ending
RET	Return to the caller

Table 9 PLC Sequence Element Functionality



Hot Key : Ctrl+F9

Click mouse left button on the desired position then a horizontal connection is inserted.

3.7.9. Vertcal Connect :

Hot Key : Ctrl+F10

Click mouse left button on the desired position then a vertical connection is inserted.



Fig. 66 Connection

Name	Description
Horizontal Line	Connect elements in horizontal direction
Vertical Line	Make a branch

Table 10 PLC Connection

3.8. Set the Element

Double click on the element, or hit Return/Enter to pop up right key menu and use Set as Fig. 67. The element setting dialog would pop up as Fig. 68.

<u>S</u> et	
<u>F</u> ile	•
<u>E</u> dit	- F
<u>P</u> LC	+

Fig. 67 Element Set

🕼 Replaced by Contact	? ×
Contact Type +/+ Close	
Address Type 🔼	
Addr: 0 🗣 Bit. 0 🗲	
Symbol Always ON	
Cmt	
OK Cancel	

Fig. 68 Element Set Dialog

3.9. Search and Replace

The search and replace area is as Fig. 69, use page tab to select between search page and replace page.

Search Replace		
Reg Bit	🔽 Addr: 8005	🖨 Bit: 0 🚔

Fig. 69 Search and Replace Area

3.9.1.Search Page

Search data type is as Fig. 70 and listed below:

- I : Search I address.
- O : Search O address.
- C : Search C address.
- S : Search S address.
- A : Search A address.
- Timer : Search Timer address.
- Counter : Search Counter address.
- Register : Search Register address.
- Register Bit : Search Register Bit address.
- String : Search the matching string in comment/label/Jump/Jump Sub Routine.
- Value : Search the value used in the elements.

The elements with register bit of the same register address are also considered match at searching for register.

: String search would not search in address symbol/comment strings.



Fig. 70 Search Type

The searching data type and the address would be automatically updated to the set address of one element when the element gets the focus as Fig. $71 \circ$

🖿 🔮 🕡 🎑 🔒 📑 🎫 Std_V2.57 (Drl. NC/Enor report/ledder with problems/Linx	تمرین 151001/vorbingknc_tink (ش الله الله 15 16:41:32 2016) 👔 🖏 🖏 🏹 🏹 🗳
	Stil Ver 2.58 molidy at 2015/08/21
🗟 🗈 🌫 🔂 🧄 🔶 🔿 🖉	Always ON Always ON
Search Replace REIT8005.0(1,4) REIT8005.0(8,1160) REIT8005.0(8,1162)	Always ON Initial
Reg Bit Addr: 8005 😨 Bit: 0 😨 RSIT8005.0(8,1166) RSIT8005.0(8,1166) RSIT8005.0(8,1168)	
	R 60050 bott -
Prestage (robot waiting above mold) [D: Not allowed	- </th
	《 機械手I:
	Home MY HL(-)
- Skibs Found.	Y6' R.2000.5 À 1006 negative Home MYHomeDog
	R 79950 R 200005 & 1000 Home MY HL(+)
	17 R 2000.5 & 107
	R 7995.0 R 20000.5 Å 1350
	Home MZ HL(-) 18 R 2000 5 A 1008
	ii ⊂H CH C

Fig. 71 Searching Type and Address Update for Element with Focus

Searching Direction is as below :

: Search from the beginning of the file.

Search down from the next element of the current element.

Hot Key : F3

: Search up from the previous element of the current element.

Hot Key : Alt+F3

3.9.2.Replace Page

Replace page is as Fig. 72 and there is additional area to set the replace address.

Search Replace		
Original: Reg Bit 💌 Addr: 800	5 🚔 Bit:	0
Replaced by: Addr: 0	Bit:	0
2	ALL	📃 Keep Symbol

Fig. 72 Replace Page

L : Replacing does not support String and Value data type.

Searching functionality refer to 錯誤! 找不到參照來源。, the buttons for replacing is as following:



: Replace the current searched element only.

Replace all the elements which match the searching condition in the file.

. The positions of the replaced elements would be listed in application output area for replacing all.

Replacing may not be possible in some cases like using I address to replace an O address in coil element.

Keep Symbol : Keep symbol/comment of the replaced address to the replacing address.

Example: If the symbol of the replaced address is "Home", and the replacing address does not have symbol set. If the keep symbol option is activated, then the symbol of the replacing address would become "Home" after replacing.

3.10. Edit Status Area

Restage (robot waiti	ng above mold) [D: Not allowed		
ÉDIT	100%	60TO	1	(6) COL: 1 ROW: 5

Fig. 73 Edit Status Area

The information displayed is as Fig. 73.

- ① Comment of the element with focus.
- ② Current mode.
- ③ Progress bar for time-consuming task.
- (4) Jump to row which is set by (5).
- 5 Set the row number to jump.
- 6 Show row and column of the current focus.

3.11. Mouse Right Key Menu

• File sub menu is as Fig. 74.

<u>S</u> et			
<u>F</u> ile	•	9 <u>N</u> ew	Ctrl+Alt+N
<u>E</u> dit	•	Den <u>O</u> pen	Ctrl+Alt+O
<u>P</u> LC	•	💾 Save	Ctrl+Alt+S
		📑 Save <u>a</u> s	Ctrl+Alt+A
		📙 <u>C</u> lose	Ctrl+Alt+C

Fig. 74 File Sub Menu

• Edit sub menu is as Fig. 75.

<u>S</u> et <u>F</u> ile	•	
<u>E</u> dit	🔸 <u>U</u> ndo	Ctrl+Z
<u>P</u> LC	🕨 🎓 <u>R</u> edo	Ctrl+Y
	📸 Сору	Ctrl+C
	👼 <u>D</u> el	Del
	🔏 Cu <u>t</u>	Ctrl+X
	Paste	Ctrl+V
	🐧 Ver <u>t</u> ical connection	Ctrl+F10
	👩 Del <u>V</u> ertical Line	Shift+Del

- Fig. 75 Edit Sub Menu
- PLC sub menu is as Fig. 76.

<u>F</u> ile <u>E</u> dit	+	Ì.		
PLC	•	6	Contacts	Ctrl+F2
			Coils	Ctrl+F3
			Timers	Ctrl+F4
		a	Counters	Ctrl+F5
			Arithmatic	Ctrl+F6
		8	Tools	Ctrl+F7
		9	Sequences	Ctrl+F8
		۵,	Horizontal Line	Ctrl+F9
		-	Add <u>L</u> ine	
		2	Add <u>E</u> mpty Line	
			Add C <u>m</u> t	
			Add <u>L</u> abel	
			Add <u>R</u> ts	
		- 100	Add E <u>n</u> d	
		Ð	Edit Symbol/Comment	
			<u>Annotation</u>	



4. PLC Ladder Elements

4.1. — Imal Open Contact

The timing diagram for normal open contact is as Fig. 77. The output status is doing AND operation between input and the value of the assigned address.



Fig. 77 Normal Open Contact

4.2. — // — Normal Close Contact

The timing diagram for normal close contact is as Fig. 78.



Fig. 78 Normal Close Contact

4.3. — Normal Open Coil

When input is ON, the element writes ON to address O0, otherwise writes OFF as Fig. $\,$ 79 $_{\circ}$

		A —<	
Input signal	Α _		
Coil status	00		



4.4. — C/>— Normal Closed Coil

When input is ON, the element writes OFF to address O0, otherwise writes ON as Fig. 80.



Fig. 80 Normal Close Coil

4.5. — CAD— Positive Edge Triggered Coil

When input changes from OFF to ON, the element writes ON to address O0 for one PLC scanning period.



Fig. 81 Positive Edge Triggered Coil

4.6. — C V — Negative Edge Triggered Coil

When input changes from ON to OFF, the element writes ON to address O0 for one PLC scanning period.

Note : The total number of edge triggered coils in a ladder cannot exceed 4096.



Fig. 82 Negative Edge Triggered Coil

4.7. — CS — Latch Coil

When input is ON, the element writes ON to address O0 continuously even the input turns OFF.



Fig. 83 Latch Coil

4.8. — CR >— Unlatch Coil

When the input is ON, the element writes OFF to address O0.



Fig. 84 Unlatch Coil

4.9. Timer Relay

• When I0 changes from OFF to ON and keeps ON, the timer #1 would start to time in time period of 100 ms.

- The timer#1 would enable O0 coil after reaching the set time (1s).
- There are total 256 timers and each timer has the corresponding contact signal. The corresponding contact signal would turn ON when the set time is reached and can be used as normal open or normal close contact.
- The timer would stop if the input becomes OFF during timing.
- The timing period can be set to 1ms, 10ms, 100ms and 1s.
- The timeout value can be set by register.

The interrupt period must be set to 1ms to make the timer with 1ms period accurate.

		TIM 100ms	TM1 #10	—< <u>_</u>
				—<_1>
<	1 Sec			
Contact status I0				
Contact status TM1				
Coil status OO				

Fig. 85 Timer

4.10. RTimer Relay

- User can adopt RTimer PLC elements by assigning a range of register for the RTimer inner timing so that the number of timers within a ladder can be increased.
- The five register from the assigned address R would be used for inner timing so that the registers cannot be within system write protecting range.
- The 0 bit of the assigned register address R would be the corresponding timer contact for the RTimer. R.0 would be OFF when timing is started and turned ON after timeout.
- The address R+1 is used for recording set time and address R+2 records the current counting.
- After I0 is turned ON and keeps ON, RTimer R0 would start to do timing based on 100 ms resolution. R0.0 is turned OFF, R1 records 10 and R2 records current time counting.
- When the timer reach timeou (1 sec), O0 coil would be turned ON and R0.0 is turned ON.
- If I0 is turned OFF during timing, the timer stops.

- The timing period can be set to 1ms, 10ms, 100ms and 1s.
- The timeout value can be set by register.
- The assigned R address of the RTimer would response to search of register and timer address which are equal to R but can only be replaced by register address.
- Do not use the same register range for more than one RTimer within a ladder.

• The symbol and comment of RTimer are assigned to R.0.

The interrupt period must be set to 1ms to make the timer with 1ms period accurate.





4.11. Up Counter

- When I0 changes from OFF to ON and keeps ON, the counter#1 which is set to up counter increases its count continuously till reaching 10.
- The counter#1enables coil O0 after reaching the set value.
- There are total 256 counters and each counter has the corresponding contact signal. The corresponding contact signal would turn ON when the set count is reached and can be used as normal open or normal close contact.
- The set value for counter can be from register.





4.12. Down Counter

- When I0 changes from OFF to ON and keeps ON, the counter#1 which is set to down counter decreases its count continuously till reaching 0.
- The counter#1enables coil O0 after reaching 0.
- There are total 256 counters and each counter has the corresponding contact signal. The corresponding contact signal would turn ON when the set count is reached and can be used as normal open or normal close contact.
- The set value for counter can be from register.



Fig. 88 Down Counter

4.13. Ring Up Counter

- When I0 turns ON from OFF and keeps ON, timer#1 which is set to ring up counter increases its count continuously. The counter would count from 0 again after it reaching the set value cyclically.
- The counter enables coil O0 on each time when it reaches the set value.



Fig. 89 Ring Up Counter
4.14. Ring Down Counter

- When I0 turns ON from OFF and keeps ON, timer#1 which is set to ring down counter decreases its count continuously from the set value. The counter would count from the set value again after it reaching 0 cyclically.
- The counter enables coil O0 on each time when it reaches 0.



Fig. 90 Ring Down Counter

4.15. Reset Counter

- When I0 turns ON, reset the count of the counter#1.
- If the counter is up type counter, reset to 0.
- If the counter is down type counter, reset to the set value.
- The corresponding contact signal turns OFF at reset.



Fig. 91 Reset Counter

4.16. Add

- When I0 turns ON from OFF, the element keeps adding the value of R001 to R002. The register size is 4 byte long.
- Data range : -2147483648<=X<=+2147483647
- Operation : R002<-R002+R001 •

- The addend can be set to value instead of register.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.





4.17. Subtract

- When I0 turns ON from OFF, the element keeps subtracting the value of R001 from R002.
- Operation : R002<-R002-R001
- Subtrahend can be set to value instead of register.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.





4.18. Multiply

- When I0 turns ON from OFF, the element keeps multiplying the value of R001 to R002.
- Operation : R002<-R002×R001
- Multiplier can be set to value instead of register.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.



4.19. Division

- When I0 turns ON from OFF, the element keeps dividing the value of R002 by R001.
- Operation : R002<-R002/R001
- Divisor can be set to value instead of register.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.



Fig. 95 Division

4.20. Modulo

- When I0 turns ON from OFF, execute R002 modulo R001. Remainder would be put into R002..
- Operation : R002<-R002 % R001
- Divisor can be set to value instead of register.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.





4.21. Logic AND

- When I0 turns ON from OFF, the element keeps doing logic AND between R001 and R002. The result would be put into R002.
- Operation : R002<-R002&R001, & means AND operation.
- The input operand can be set to value instead of register.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the

input.

• AND truth table is as Fig. 97.







Fig. 98 Logic AND

4.22. Logic OR

- When I0 turns ON from OFF, the element keeps doing logic OR between R001 and R002. The result would be put into R002.
- Operation : R002<-R002|R001. | means OR operation.
- The input operand can be set to value instead of register.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.
- OR truth table is as Fig. 99.

Х	Y	Z
1	1	1
1	0	1
0	1	1
0	0	0







4.23. Logic XOR

• When I0 turns ON from OFF, the element keeps doing logic XOR between R001 and R002. The result would be put into R002.

- Operation : R002<-R002^R001. ^ means logic XOR.
- The input operand can be set to value instead of register.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.
- XOR truth table is as Fig. 101.









Fig. 102 Logic XOR

4.24. Logic Left Shift

- When I0 turns ON from OFF, the element keeps doing logic left shift on R002 by R001. The least significant bit would be supplemented by 0 for each left shift.
- Operation : R002<-R002<<R001
- The shift number can be set to value and 0<=X<=32.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.



Fig. 103 Logic Left Shift

4.25. Logic Right Shift

- When I0 turns ON from OFF, the element keeps doing logic right shift on R002 by R001. The most significant bit would be supplemented by 0 for each right shift.
- Operation : R002<-R002>>R001
- The shift number can be set to value and $0 \le X \le 32$.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.



Fig. 104 Logic Right Shift

4.26. Compare : Larger Than

- When I0 turns ON from OFF, the element keeps doing comparison between R001 and R002. If R001 is larger than R002, then the element output TRUE, otherwise outputs FALSE.
- The value to be compared can be set as value instead of register.
- The element would enable coil O0 if the comparing result is TRUE and disable coil O0 if the comparing result is FALSE when it is enabled.
- The element would be executed for each PLC scan if it is enabled by the input.



Fig. 105 CMP Larger Than

4.27. Compare : Smaller Than

- When I0 turns ON from OFF, the element keeps doing comparison between R001 and R002. If R001 is smaller than R002, then the element output TRUE, otherwise outputs FALSE.
- The value to be compared can be set as value instead of register.
- The element would enable coil O0 if the comparing result is TRUE and disable coil O0 if the comparing result is FALSE when it is enabled.
- The element would be executed for each PLC scan if it is enabled by the input.



Fig. 106 CMP Smaller Than

4.28. Compare : Larger than or Equal to

- When I0 turns ON from OFF, the element keeps doing comparison between R001 and R002. If R001 is larger than or equal to R002, then the element output TRUE, otherwise outputs FALSE.
- The value to be compared can be set as value instead of register.
- The element would enable coil O0 if the comparing result is TRUE and disable coil O0 if the comparing result is FALSE when it is enabled.
- The element would be executed for each PLC scan if it is enabled by the input.

	CMP	R1	
10	>=	R2	00

Fig. 107 CMP Larger than or Equal to

4.29. Compare : Smaller than or Equal to

- When I0 turns ON from OFF, the element keeps doing comparison between R001 and R002. If R001 is smaller than or equal to R002, then the element output TRUE, otherwise outputs FALSE.
- The value to be compared can be set as value instead of register.
- The element would enable coil O0 if the comparing result is TRUE and disable coil O0 if the comparing result is FALSE when it is enabled.

• The element would be executed for each PLC scan if it is enabled by the input.



Fig. 108 CMP Smaller than or Equal to

4.30. Compare : Equal to

- When I0 turns ON from OFF, the element keeps doing comparison between R001 and R002. If R002 is equal to R001, then the element output TRUE, otherwise outputs FALSE.
- The value to be compared can be set as value instead of register.
- The element would enable coil O0 if the comparing result is TRUE and disable coil O0 if the comparing result is FALSE when it is enabled.
- The element would be executed for each PLC scan if it is enabled by the input



Fig. 109 CMP Equal To

4.31. Compare : Not Equal to

- When I0 turns ON from OFF, the element keeps doing comparison between R001 and R002. If R002 is not equal to R001, then the element output TRUE, otherwise outputs FALSE.
- The value to be compared can be set as value instead of register.
- The element would enable coil O0 if the comparing result is TRUE and disable coil O0 if the comparing result is FALSE when it is enabled.
- The element would be executed for each PLC scan if it is enabled by the input



Fig. 110 CMP Not Equal To

4.32. Move

- When I0 turns ON, the element moves the value within R001 to R002.
- Operation : R002=R001
- The moved value can be set as value instead of register.

- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.





4.33. Register Move to Register pointer

- When I0 turns ON, the element move the value of R001 to the register whose address is the value of R002. If the value of R002 is equal to 3. The value of R001 would be moved to R003.
- Operation : *R002=R001
- The moved value can be set to value instead of register.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.
- If the register address stored in the target register exceeds the allowed range, the element would not do the moving and outputs OFF.



Fig. 112 MOVE from register to register pointer

4.34. Register pointer Move to Register

- When I0 turns ON, the element move the value of register whose address is the value of R001 to R002. If the value of R001 is equal to 4. The value of R004 would be moved to R002.
- Operation : R002=*R001
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.
- If the register address stored in the source register exceeds the allowed range, the element would not do the moving and outputs OFF.

	MOV	*R1	
IO	5	R2	

Fig. 113 MOVE Register Pointer to Register

4.35. SCH

- The element searches tool number for its position on the magazine.
- Operation : Tool number is in R0. The magazine table size is in R1. The starting address of the magazine table is in R3. The searching result is in R2.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.

Position index is from 0 to (magazine table size-1).





4.36. ROT

- The element calculates the shorted path to take on a circular magazine.
- Operation : Current position on circular magazine is in R0 [,] The target position is in R1. The magazine size is in R3. The calculated result is in R2.
- Turn in reverse direction if the result is negative.
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.

• : The position index is from 0 to(magazine table size-1).

: The element is for circular magazine.



Fig. 115 ROT

4.37. MULRINI

- When I0 turns ON, the element sets value of the ten register from R000 to R009 to 1.
- Operation : [R000..R009]=1
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.

	MULRINI	RO	
ΠO	S:#1	N:#10	

Fig. 116 MULRINI

4.38. MULRCPY

- When I0 turns ON, the element copies the register area from R000 to R009 to the area from R020 to R029 continuously.
- Operation : [R000..R009]=[R020..R029]
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.

	MULF	RCPY	RO	
10	N.#	111 1	R20	00

Fig. 117 MULRCPY

4.39. I/RMAP

- When I0 turns ON, the elements maps the value of I001 to I0032 to R001. The I001 is mapped to the least significant bit of R001 and I032 is mapped to the most significant bit.
- Operation : R001=I032<<(31) OR (I031)<<(30) OR ...OR (I001)
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.

	IRMAP	I1	
	N:32	R1	

Fig. 118 I/RMAP

4.40. O/RMAP

- When I0 turns ON, the element maps the value of O000 to O0031 to R001. The O000 is mapped to the least significant bit of R001 and O031 is mapped to the most significant bit.
- Operation : R001=O031<<(31) OR (O030)<<(30) OR ...OR (O000)
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.



Fig. 119 O/RMAP

4.41. I/RMAPN

- When I0 turns ON, the element maps the value of 10 logic input addresses from I001 to I0010 to R001. The I001 is mapped to the least significant bit of R001 and I010 is mapped to the most significant bit.
- Operation : R001=I010<<(9) OR (I009)<<(8) OR ...OR (I001) OR 0x00000000
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.
- The element would be executed for each PLC scan if it is enabled by the input.
- . The value of the designated register is cleared to 0 before mapping.

	IRMAPN	I1
10	N:10	R1

Fig. 120 I/RMAPN

4.42. O/RMAPN

- When I0 turns ON, the element maps the value of 10 logic output addresses from O001 to O0010 to R001. The O001 is mapped to the least significant bit of R001 and O010 is mapped to the most significant bit.
- Operation : R001=O010<<(9) OR (O009)<<(8) OR ...OR (O001) OR 0x00000000
- The element would enable coil O0 if it is enabled and disable coil O0 if it is disabled.

- The element would be executed for each PLC scan if it is enabled by the input.
- . The value of the designated register is cleared to 0 before mapping.

I	ORMAPN	01
10	N:10	R1



4.43. JMP (Jump)

- The element can jump to position before END element.
- After I0 turns ON, the PLC logic would jump to label with string of "stop".

```
Fig. 122 JMP
```

 \rightarrow

stop

 \vdash

4.44. JSR (Jump to Subroutine)

The subroutine area must be after END element. After I0 turns ON, the PLC logic would jump to subroutine ToSub1.

1 | 10

Fig. 123 JSR

4.45. RET

When this element is executed, the execution would return to the caller. If RET is in the top logics (before END), then the ladder logics of this run is finished. If RET is in the subroutine, the execution would return to the top logics, starting from next row where the subroutine is called.

Fig. 124 RET

4.46. RTS (Return Subroutine)

The element is paired with the subroutine label element. The PLC logic would return from subroutine if the element is met.

(RETURN

4.47. Label

The element is paired with JMP or JSR as target position. The label string is 6 byte long.

Fig. 126 Label

4.48. END

The element marks the end of a ladder. The area after this element is for subroutines.

Fig. 127 END

4.49. Example for SCH

- The magazine table is from R100 to R103. The size is 4. The position index is 0 to 3.
- R2 : Magazine table size.
- R4 : The start address of magazine table.
- R1 : Tool index for searching.
- After I0 turns ON , the value of R3 is equal to 3, which means tool #248 is at position index 3.





4.50. Example of ROT

- R1 : Current position on circular magazine.
- R2 : Target position.
- R4 : Magazine size.
- After I0 turns ON , R3 value is equal to -1 which means the shortest path to the target position is to reverse one step.





4.51. Example of JMP

- After I0 turns ON, the accumulation on R0 would be skip.
- The paired label element must be before END element.





4.52. Example of JSR

- After I0 turns ON, accumulation on R1 is started.
- The logic would continue from next element of JSR element after finishing Sub1 so that accumulation on R0 is always executed.
- The label used as subroutine must be after END element.

	≫[÷	Sub1]—
	ADD +	#1 R0
] END [
-{{ Sub1:		
	ADD +	#1 R1
-{ RETURN }		



4.53. RET Example

- When I0, I10 are both OFF, R0 and R1 keep being updated.
- When I10 is ON but I0 is OFF , R1 stops being updated but R0 keeps being updated.
- When I0 is ON, the ladder logics would return immediately and R0 and R1 stop being updated.



Fig. 132 RET Example

5. Simulation Mode

5.1. Start the Simulation Mode

The simulation mode can simulate the PLC logic on host computer without interacting with other modules in the controller. The user can verify the correctness of the pure PLC logic. How to start refer to 3.6.14.

5.2. The Introduction of the Simulation Mode Layout

The simulation layout is as Fig. 133, only the areas that differ from edit mode are explained as following.

1) IV Stl_Y2.57 [D./L.NC/Error report/ladder with problems/Linux/20151001/working/mc.lml: (過五一月	15 16 41 32 2016)]	×
Simu INT time Inc -	Still Yer 2.58 modely at 2015/08/21.	<u> </u>
Starch Seech String: M Yer 2.50 modely et 20150821 Pluc Indo: Image: Seech String: M Yer 2.50 modely et 20150821 Pluc Indo: Image: Seech String: M Yer 2.50 modely et 20150821 Pluc Indo: Image: Seech String: M Yer 2.50 modely et 20150821 Pluc Indo: Image: Seech String: M Yer 2.50 modely et 20150821 Pluc Indo: Image: Seech String: M Yer 2.50 modely et 20150821 Pluc Indo: Image: Seech String: M Yer 2.50 modely et 20150821 Address Monitoring Value	Always ON Always ON Always ON Int Always ON MOV Always ON MOV Always ON S2001 R 8005.0 R 200 (Input:	ial }
(5)	Boxe MY H R 20005 A 10 R 20005 A 10	206 meDog 200 100 100 100 100 100 1007 meDog 350

Fig. 133 Simulation Mode

- ① Simulation Mode toolbar.
- ② Search area. Only search is allowed in simulation mode.
- ③ Simulation time duration and operation light (Green for operating, Red for stop) are added to status area.
- ④ The working mode is shown as simulation mode.
- 5 Address monitor/setting area.

The ladder would show the element activation status by the color set by the user if the element has active/inactive state.

5.3. Introduction of Simulation Mode for Ladder in LMLC Format

5.3.1. Mouse and Keyboard



Mouse left button :

Double click on contact and coil elements to toggle the active status.

Leave the active status of the contact and coil element may not be changed because of the PLC logic under simulation operating condition.



Mouse right button :

None.

Wheel : Move focus up and down.

Move the cursor to the icon on the toolbar would display the tip for the icon.



Up, Down, Right, Left Key : Move focus up, down, left and right. Page Up/Down Key : Move focus up or down by one page.

5.3.2.Toolbar



Switch back to the edit mode.

5.3.2.2. Start the Simulation

Start the simulated interrupt to run the PLC logic. The operation light turns green.

5.3.2.3. Stop the Simulation

Stop the simulated interrupt. The operation light turns red.

5.3.2.4. Single Run

Only run simulated interrupt once and stop.

L : Not possible during simulation operating

5.3.2.5. C Reload

Reset simulation environment like to initialize PLC address area, etc.

Not possible during simulation operating.

5.3.2.6. Simu INT time 1ms Set the Simulated Interrupt Period

The simulated interrupt period would effect the timer elements.

5.3.3.Address Monitor/Setting Area

The user can add or remove the addresses for monitor/setting.



Click to pop the dialog as Fig. 134. Choose the address as Fig. 135. The user can choose the way to display the register type as Fig. 136. The address would be added to the list as Fig. 137.

🕼 Add Watch	8 ×
Address Type 📘	.
Addr: O	×.
OK	Cancel

Fig. 134 Add Address

Address Type	I	ਹ
Addr: O	I O C S A Timer Counter Reg Reg Bit	
OK	Cance	el

Fig. 135 Select Address Type

Address Typ	e Reg	•	
Addr: O		\$	
Show Type	Decimal	-	
	Decimal Hex	3	
OK	Ca	ncel	

Fig. 136 The Way of Displaying Register

E				
	Address		oring Value	Set Value
1	Reg 1000	(Hex):0000000		0
-				F
		Fig	137 Added Addre	

Fig. 137 Added Address

Remove Address 5.3.3.2.

Click this icon to remove the address with focus on the list.

Operation of the Address

The Monitor Value column shows the current value of the address. The user can set the value on Set Value column.

Solution is the monitored value may not reflect the set value while simulation is operating. The value may be overwritten by running PLC logic.



6. Monitor Mode

6.1. Start the Monitor Mode

The user can monitor the PLC logic on the remote controller with the monitor mode. How to start refer to 3.6.13.

. The monitor mode is not in real time. The monitored status may be asynchronous with the remote side.

: The ladder files must be synchronized to get correct monitor result.

Sutomatically return back to the edit mode if the connection is broken.

6.2. The Introduction of the Simulation Mode Layout

The layout for monitor mode is as Fig. 138. The areas which differ with edit and simulation mode is explained as follows.



Fig. 138 監看模式

- ① Toolbar.
- ② Connected control IP and PLC operation status light on remote controller are added to the status area. The PLC operation light is green if the PLC logic is running, red if the PLC logic is stop and yellow during reloading.
- ③ The working mode is shown as monitor mode

The ladder would show the element activation status by the color set by the user if the element has active/inactive state.

6.3. Introduction of Monitor Mode for Ladder in LMLC Format

6.3.1. Mouse and Keyboard



Mouse left key :

None.



Mouse right key :

None.

Wheel : Move focus up and down.

Move the cursor to the icon on the toolbar would display the tip for the icon.



Up, Down, Left, Right Key : Move focus up, down, left and right. Page Up/Down Key : Move focus one page up and down.

6.3.2.Toolbar

6.3.2.1. End Monitor Mode

Return to the edit mode.

6.3.2.2. Download the Files on Remote Side and Open

Click and the user can select the directory to contain the downloaded files as Fig. 139. The application shows overwriting warning as Fig. 140. The user can select files for downloading as Fig. 141. The application automatically opens the downloaded LMLC file when the downloading successfully finishes.

🕼 Open Directory	-					x
🔘 🖯 📕 « Linux	▶ 20151001 ▶ we	orking	+ 4	• 搜尋 worki	ng	٩
組合管理 ▼ 新増資	料夾					0
 ■ 視訊 ■ 圖片 	▲ 名稱		g有符合搜尋的]	修改日期 頁目 •	類型	
😽 家用群組						
▲ 電腦 ▲ ACER (C:) DATA (D:) □ Transcend (F:) ▲ CD 光碟機 (H:) ♀ root (\\QUSER-E	, III.					
9 網路			ш			F.
資料	料夾:			選擇資料夾	取消	

Fig. 139 Select Local Directory

QPLCProgram	mer 📃 🔀
Download fi	les
would be ov	the same name in the directory erwritten. Download to:C: nistrator\Desktop\test\20160120
	OK Cancel

Fig. 140 Overwriting Warning

	1	2	-	
1 🔽		cnc.lcod		
2 🔽		cnc.lmlc		
3 🔽		cnc.lpar	1	
4 🔽		cnc_aic_0000.str		
5 🔽		cnc_aic_0001.str		
6 🔽		cnc_plc_0000.str		
7 🔽		cnc_plc_0000_utf8.str		
•			Ť	

Fig. 141 Select Remote Files

6.3.2.3. Upload Local Files to Remote Controller

Click and the warning message is shown as Fig. 142. The user can select the files to upload as Fig. 143. The selected files will be uploaded after the user confirming.



Fig. 142 Upload Warning

1	2	-
1 💟	cnc.lcod	
2 🔽	cnc.lmlc	
3 🔽	cnc.lpar	
4 🔽	cnc_aic_0000.str	
5 🔽	cnc_aic_0001.str	
6 🔽	cnc_plc_0000.str	
7 🔽	cnc_plc_0000_utf8.str	
• 📼	and all 0001 at	

Fig. 143 Local File List

. The user must signal the remote controller to reload PLC for the uploaded binary executable file taking effect.

6.3.2.4. Start PLC on the Remote Controller

Inform the remote controller to start the PLC logic. The remote PLC operation light should turn to green. If the light is not green, check the remote controller.

6.3.2.5. Stop PLC on the Remote Controller

Inform the remote controller to stop the PLC logic. The remote PLC operation light should turn to red. If the light is not red, check the remote controller.

6.3.2.6. Single Run PLC on the Remote Controller

Inform the remote controller to run the PLC logic only for one interrupt.

6.3.2.7. Reload PLC on the Remote Controller

Inform the remote controller to reload PLC. The remote PLC operation light should turn to green eventually after a short period time.

Monitored Address Area

Refer to 5.3.3 but setting value under monitor mdoe is not possible.

7. Set the URL Shown on Start Layout

It is possible to customize the URL to which the application would try to connect at starting. The steps are as follows :

- Get copy of progsettings.ini from the installation folder of a copy of PLC Programmer.
- Modify the value of the two keys manually.

main_url, this is the URL to which the application would try to connect at starting.

Example : main_url=http://www.google.com.tw/

backup_url, this is a local html file when connection to Internet is not possible. Example : backup_url=test.html

- 😋 🔵 🖉 📕 « DATA (D:) 🔸 LNC 🔸 Qt_Mingw_prjs 🔸 tmpreleasebackup 🔸 change_html_example 🔸 ▼ 4 / 授尋 change_html_example Q 組合管理 ▼ 加入至媒體種 ▼ 共用對象 ▼ 燒錄 新増資料夾) 🗄 👻 🛄 🔞 修改日期 ▲ 名稱 補型 大小 🥽 煤體櫃 🔋 test.files 2016/1/20下午 0... 檔案資料夾 🚓 Apps 12,472 KB 🗑 PLCProgrammerForLinuxController_00.... 2016/1/5 上午 09... 應用程式 Subversion 2016/1/20 下午 0... Configuration Se... progsettings.ini 2 KB 1 文件 2015/7/28下午 0... Chrome HTML D... C test html 4 KR ⇒ 音樂 📕 視訊 ■ 圖片 🜏 家用群組 ▲ 雷階 🚢 ACER (C:) DATA (D:) \$RECYCLE.BIN 📗 LNC LNC software 📗 LNC 我的最愛 4個項目 СН 🌍 🔅
- Put the following files within the same folder as Fig. 144.

Fig. 144 Customize the Start URL

• If the local html file needs additional files, those files can be put within a folder named as <html file name>.files. This folder is named as test.files in the example since the local html file is test.html.

• The starting layout would be as Fig. 145 after installation.



Fig. 145 Customized Starting URL

8. Trouble Shooting

8.1. Compiling Errors and Warnings

Compiling errors would stop generating the executable binary file. On the contrary, compiling warnings would not stop the generation of the executable binary file since it may be the user special usage or not severe issue.

8.1.1.Errors

8.1.1.1. Branch before Any Contact Address is Loaded

Pattern is as Fig. 145. There is no contact element before branch.





8.1.1.2. Duplicated Timer

Using the same timer address more than once within a ladder inclines to unexpected result.

8.1.1.3. Duplicated Counter

Using the same counter address more than once within a ladder inclines to unexpected result.

8.1.1.4.Connection Configuration between the Elements is inconsistent

The record for a vertical connection between elements is not consistent. Delete or redo the vertical connection on the reported position.

8.1.1.5. There is function element before any contact address is loaded

Pattern

as

ADD	#1	
+	RO	

Fig. 147. There is no contact element before function elements.





8.1.1.6. Illegal Label Position

The label paired with JMP element is after END element.

8.1.1.7. Illegal Position for Return from Subroutine

RTS element is before END element.

8.1.1.8. Jump is not paired with a Label

There is no label before END element to pair with a JMP element.

8.1.1.9. Jump to Illegal Position

The label element which has the same string with JMP element is after END element.

8.1.1.10. Subroutine Label is at Illegal Position

The label element which has the same string with JSR element is before END element.

8.1.1.11. Jump to Subroutine is not paired with a Label

There is no label element after END element to pair with JSR element.

8.1.1.12. Subroutine is not paired with Return

The label element used as subroutine does not pair with RTS element.

8.1.1.13. Duplicated Label

There is more than one label with the same string.

8.1.1.14. Open Circuit

There is broken connection in ladder as Fig. 148.





8.1.1.15. A Row is consist of only Horizontal Connect Elements

There is row only consist of horizontal connection element as Fig. 149.



8.1.2.Warnings

8.1.2.1. Duplicated Coil

There is more than one coil with the same address. The user should use with caution if the pattern is used.

8.1.2.2. Short Circuit

There are only horizontal connection elements between branches. It may be redundant connection or invalidate other OR branches as Fig. 150.

Some short circuit pattern may cause compiling failure.





8.1.2.3. More Than One End for the Ladder

There is more than one END element in a ladder.

8.1.2.4. Not Recommended Upward Branch

There is upward branch as Fig. 151. This is stronly not recommended.



Fig. 151 Pattern

8.2. User Register Area

A ladder with element which contains user register area (address above 1,000,000) is not supported by the PLC programmer 02.XX.XX.XX version. A warning would be shown if such ladder is opened by PLC programmer 02.XX.XX.XX version as Fig. 152. Compiling and editing are also not possible to prevent generation the executable binary which can cause issue.

PLC Programmer 02 version does not support user register area.

* The functionality must work with the controller which also supports it. The PLC logic would be skipped on the controllers which does not support the functionality.

👫 C:\Users\Administrator\Desktop\test\tmp\cnc.lmlc(Tue Jan 26 14:09:41 2016)-	
Project(P) Edit(E) Search(S) Setting(D) Transfer(D) Help(H)	
🛷 💱 🐻 💸 🖺 🔏 🛍 🖄 😂 🚳 🖉 📨 🗳 🎸 🛋 🛛 🖓 🕼 🎲 🖓 🖓 🗖 🕞	
Image: Documentary of the second se	
- J END E	<u>e</u> () () () ()
Row: 1 Col: 1	89

Fig. 152 User Register Area Warning