SRS

XMPS-1000

(GUI for programming software of PLC)

Version <3.0>

(Revised the specification with new approach)

1. **Graphical UI of programming software**
   Predefined FB

Contents

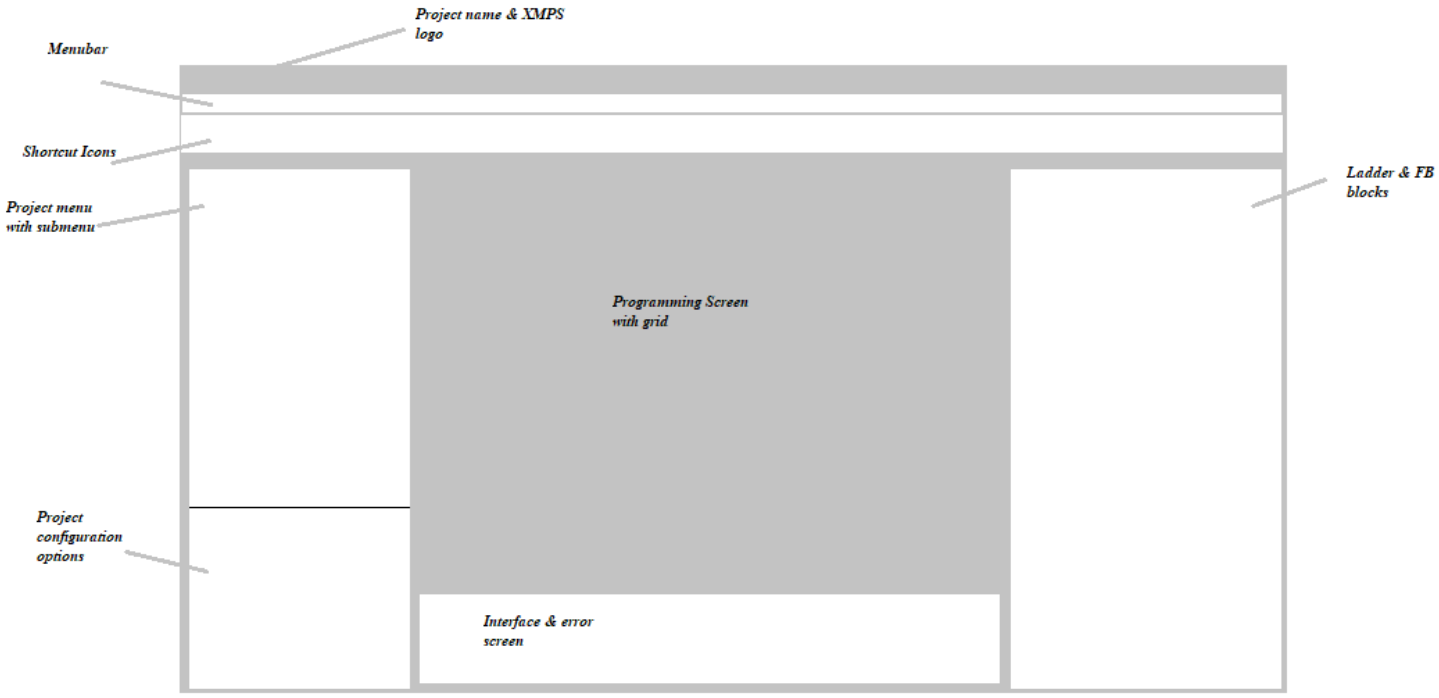
1. Introduction :

This is the Software Requirements Specification (SRS) document which provides an overview of the entire XMPS-1000 requirements.

2. Purpose:

In short, the purpose of this SRS document is to provide a detailed overview of our XMPS- 1000 software product, its parameters and goals. This document describes the project's user interface requirements. It will explain the purpose and features of the system, the interfaces of the system.

3. Provisional Proposed UI : (Development done)



4. Menu Bar : (Development done)

4.1. Project : In “Project” menu following options should be added.

4.1.1 New Project

Frontend-New Project

Backend – a. New path for project

b. Select CPU option

c. If existing path choosed popup of warning.

4.1.2 Open Project

Frontend- Open Project

Backend- a. Open project popup

b. If exixsting project not saved then popup for saving the project

4.1.3 - Save project

Frontend- Save project

Backend- a.Save project latest changes

4.1.4 Save As..

Frontend-Save As..

Backend- a.Ask for saving project path

4.1.5 Close Project

Frontend- Close Project

Backend- a. Save the latest changes and close the project

b. only project should close not programming software

4.1.6 Print

Frontend- Print

Backend- a. Same as what we have done in XMPS-100

Print the ladder main program & configuration settings.

4.1.7 Exit

Frontend-Exit

Backend- a.Save and close the software.

4.2 Edit : In “Edit” menu following options should be added.

4.2.1 Undo

Frontend-Undo

Backend- a. Undo the latest change (atleast last 15 changes)

4.2.2 Redo

Frontend- Redo

Bacckend- a. Redo the changes (atleast 15 changes)

4.2.3 Copy

Frontend-Copy

Backend- a. Copy the selescted rung/instruction

b. Copy the selected project folder

c. Copy the selected program logic file

4. 2.4 Paste

Frontend-Paste

Backend- a.Paste the copied /cutted rung, instruction

b. Paste the copied/cutted folder

c. Paste the copied program logic file

4. 2.5 Cut

Frontend-Cut

Backend- a.Cut the selected rung/ instruction

b. Cut the folder

c. Cut the Program logic file

4. 2.6 Delete

Frontend-Delete

Backend- a.Delete the selected rung/ instruction

b. Delete the slecetd folder

c. Delet the selected program logic file

4.2.7 Find & Replace

Frontend-Find & Replace

Backend- a. Find the text

b. Fing & replace the text

4.3 View : In “View” menu following options should be added.

4.3.1 Device info

Frontend-Device info

After Click- It will show the XMPRo CPU parameters

4.3.2 Zoom

Frontend-Zoom

Backend-Should able to zoom the programming grid window

4.3.3 Project Window

Frontend-Project Window

Backend-After click project window should Enable or Disable

4.3.4 Compiler error screen

Frontend-Compiler error screen

Backend-After click compiler screen should Enable or Disable

4.4 Mode : In “Mode” menu following options should be added.

4.4.1 Login

Frontend- Login

Backend-Sotware should connect with PLC via ethernet port & all editable functions should be disable, no program will edit in this mode only start & stop plc command should accept.

Online Monitering option should enable.

4.4.2 Logout

Frontend-Logout

Backend- Logout the Login mode and Normal mode activate.

4.4.3 Download Project

Frontend- Download Project

Backend-Save - Compile - Download the compiled file into the PLC via ethernet port

4.4.4 Upload Project

Frontend- Upload project

Backend- Upload the project from PLC & display the project

4.4.5 Offline Simulation

Frontend-Offline simulation

Backend- TBD

4.4.6 PLC Start

Frontend- PLC start

Backend-PLC start command shoud go to PLC & this mode should active only if the user is Login to PLC

4.4.7 PLC Stop

Frontend- PLC stop

Backend-PLC stop command shoud go to PLC & this mode should active only if the user is Login to PLC

4.4.8 Compile

Frontend- Compile

Backend- Generate code as per requirement.

4.5 Help : In “Help” menu following options should be added.

4.5.1 Index

Frontend Index

After click the Index of XMPS-1000 intruction help window should be open. And after clicking each of index point it will show the detail information of perticuler point.

4.5.2 Contents

Frontend-Contents

After click the Contents all help related to XMPS-1000 software should open.

4.5.3 Search

Frontend-Search

Should open the search bar for the user.

4.5.4 User amnual

User manual PDf open.

5. Shortcut Bar : (Development done)

In shortcut bar following symbols should be present:

5.1 New
5.2 Open
5.3 Save
5.4 Project close
5.5 Upload
5.6 Download
5.7 Zoom IN
5.8 Zoom out
5.9 Zoom % selection
5.10 Compile
5.11 Login
5.12 Logout
5.13 Run Online Monitering
5.14 Help
5.15 Cut
5.16 Copy
5.17 Paste
5.18 Select
5.19 Undo
5.20 Redo
5.21 Delete
5.22 Previous screen
5.23 Next screen
5.24 Find
5.25 Ladder components (Contact,Coil,Parallel contact,Parallel coil, Variable,New rung,New comment)

After click on perticuler shortcut related action should be taken.

6. Project Menu: (Development done)

In Left side of screen there should be the Project Menu with the Submenus as follows:

-All files

5.26 Project List

5.26.1 Project name XXXXXX

5.26.1.1 Powerup routine (Init)

5.26.1.1.1 Logic 1

5.26.1.1.2 Logic 2

5.26.1.1.3 xxxxxx

5.26.1.2 Main

5.26.1.2.1 Main program (should call the Logic blocks as per sequence)

5.26.1.3 Library

5.26.1.3.1 Logic blocks

5.26.1.3.1.1 Logic 1

5.26.1.3.1.2 Logic 2

5.26.1.3.1.3 Logic 3

5.26.1.3.1.4 Logic 4

5.26.1.3.1.5 xxxxxx

5.26.1.3.2 Hardware Interrupt

5.26.1.3.2.1 Logic 1

5.26.1.3.2.2 Logic 2

5.26.1.3.3 UDFB

5.26.1.3.3.1 FB 1 xxxxx

5.26.1.3.3.2 FB 2 xxxxx

5.26.1.3.3.3 FB 3 xxxxx

5.26.1.4 IO configuration

5.26.1.4.1 Base (XMPRO-10)

5.26.1.4.2 Local IO 1 (xxxx)

5.26.1.4.3 Local IO 2 (xxxx)

5.26.1.4.4 Local IO 3 (xxxx)

5.26.1.4.5 Local IO 4 (xxxx)

5.26.1.4.6 Local IO 5 (xxxx)

5.26.1.5 Tags

5.26.1.6 Error diagnostic tags

5.26.1.7 System Configuration

5.26.1.7.1 Ethernet

5.26.1.7.1.1 Modbus TCP Server

5.26.1.7.1.2 Modbus TCP Client

5.26.1.7.1.2.1 Slave 1
5.26.1.7.1.2.2 Slave 2
5.26.1.7.1.2.3 Slave 3
5.26.1.7.1.2.4 xxxxxx
5.26.1.7.2 RS485
5.26.1.7.2.1 Modbus RTU Master
5.26.1.7.2.1.1 Slave 1 (MOD-DI-8)
5.26.1.7.2.1.2 Slave 2 (xxxxx)
5.26.1.7.2.1.3 Slave 3 (xxxxx)
5.26.1.7.2.1.4 Xxxxx
5.26.1.7.3 CAN
5.26.1.7.3.1 CANOpen Master
5.26.1.7.3.1.1 CANOpen Slave 1 (CAN -DI16)
5.26.1.7.3.1.2 CANOpen Slave 2
5.26.1.7.3.1.3 CANOpen Slave 3
5.26.1.7.3.1.4 xxxxxxx
5.26.2 Project name XXXXXX

Same as project 1 …….

All tabs should include the dedicated screen as defined below.

Project name Screen- After click it should display the overall program information

(No.of Power up blocks, No of Logic blocks,Total IO used,Total tags defined etc)

Powerup routine (Init) Screen- Under this tab Logic blocks should be added as per requirement of user.

Main- Under this tab one “Main Program” block should add. Here user can call the Logic blocks as per their sequence. (It will be the programming grid screen)

Library- In this tab user should able to select the which following library he wants to use for his application.

Logic blocks-Under this tab user should add the Logic blocks as per their requiement and should rename that block as per their requirement.

Hardware interrupt- In this tab user should configure the Interrupt Input and Under that Input tab user should add the Logic blocks which should run when Interrupt is occure.

UDFB- User defined function block. Under this tab user can create his own programmed function block.

Function block has Inputs & outputs, so user will able to add the Inputs & can create his own logic as per received input and gives the Output.

IO configuration- Under this tab user should able to configure the Onboard and Local IO modules.

Tags- In this tab all pregenerated CPU & Local IO tags should be automatically assigned as per predefined address.

User can able to add the memory tags as per their requirement in Logic block screen only and same tag should add in Tags screen automatically.

User should able to rename the tag name only.

User should able to add the memory address tags as per their requirement.

All memory tags which will generate in all logic blocks during the program should add here automatically.

Error Diagnostic tags- In this tab all predefined error tags will be added as per added configuration.

System Configuration- Under this tab all settings and requests of Ethernet,Modbus TCP Server,Modbus TCP Client,RS485,Modbus RTU masterSlave 1,Slave 2,Slave xxx ,CAN, CANOpen master,CANOpen slave 1, CANOpen slave xx should be added.

7. FB Blocks screen:

a. Predefined Function blocks:

7.1 Logical

- 7.1.1 AND
- 7.1.2 OR
- 7.1.3 XOR
- 7.1.4 NOT

7.2 Arithmatic

- 7.2.1 ADD
- 7.2.2 SUB
- 7.2.3 MUL
- 7.2.4 DIV
- 7.2.5 MOD
- 7.2.6 MOV

7.3 Bitshift

- 7.3.1 SHL
- 7.3.2 SHR
- 7.3.3 ROR
- 7.3.4 ROL

7.4 Limit

7.5 Compare

- 7.5.1 GT
- 7.5.2 GE
- 7.5.3 LT
- 7.5.4 LE
- 7.5.5 EQ
- 7.5.6 NE

7.6 Edge detector

- 7.6.1 Rising edge
- 7.6.2 Falling edge

7.7 Counter

- 7.7.1 CTU
- 7.7.2 CTD

7.8 Timer

- 7.8.1 0.01S TON
- 7.8.2 0.1S TON
- 7.8.3 1S TON
- 7.8.4 0.01S TOFF
- 7.8.5 0.1S TOFF
- 7.8.6 1S TOFF

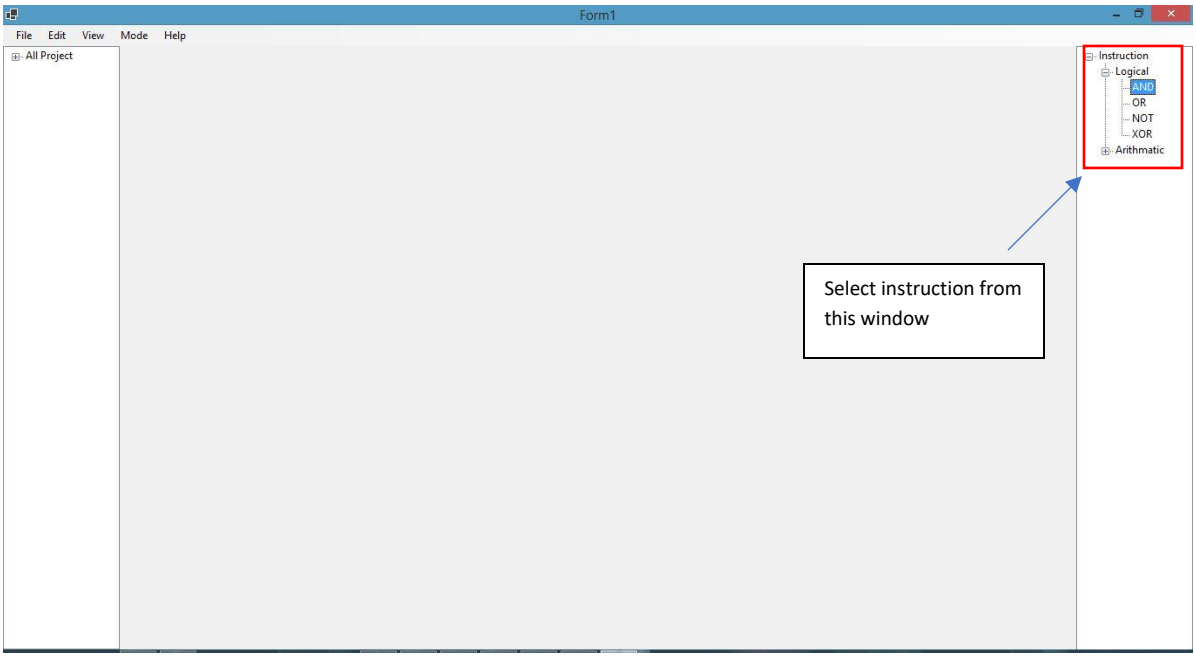
7.8.7 0.01S TP
7.8.8 0.1S TP
7.8.9 1S TP
7.9 Flipflop
7.9.1 RS
7.9.2 SR

8. Programming Screen :

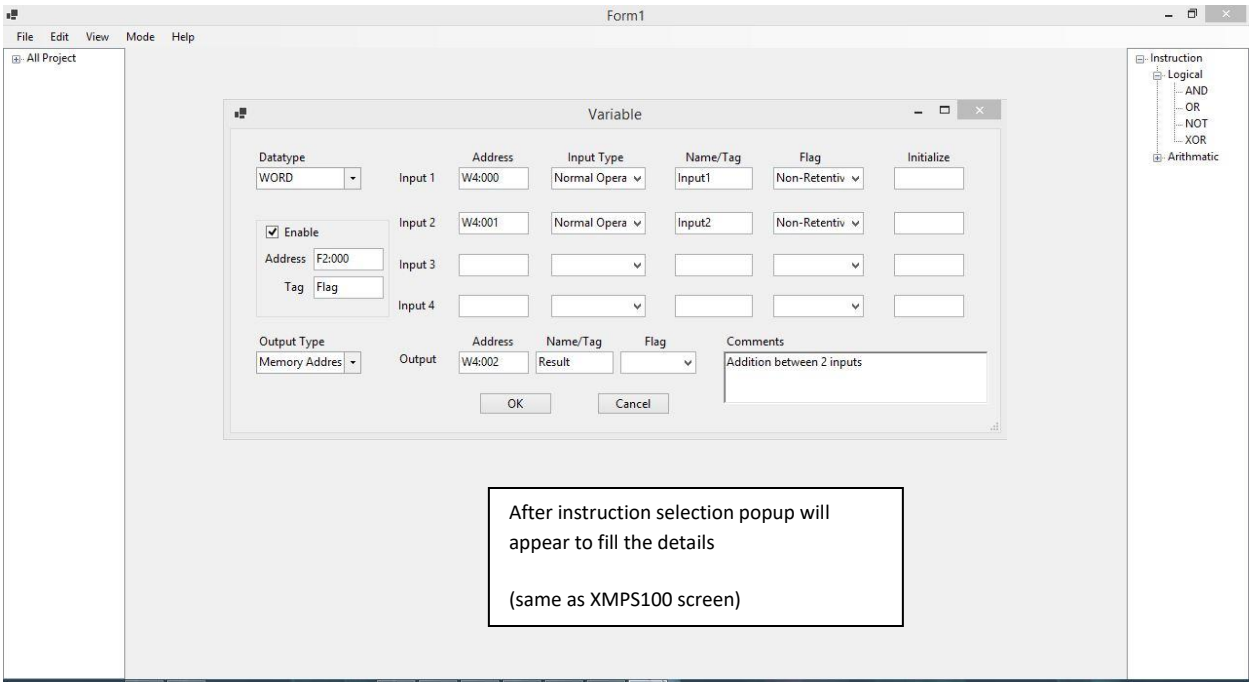
Proposed screen: Example

1. A

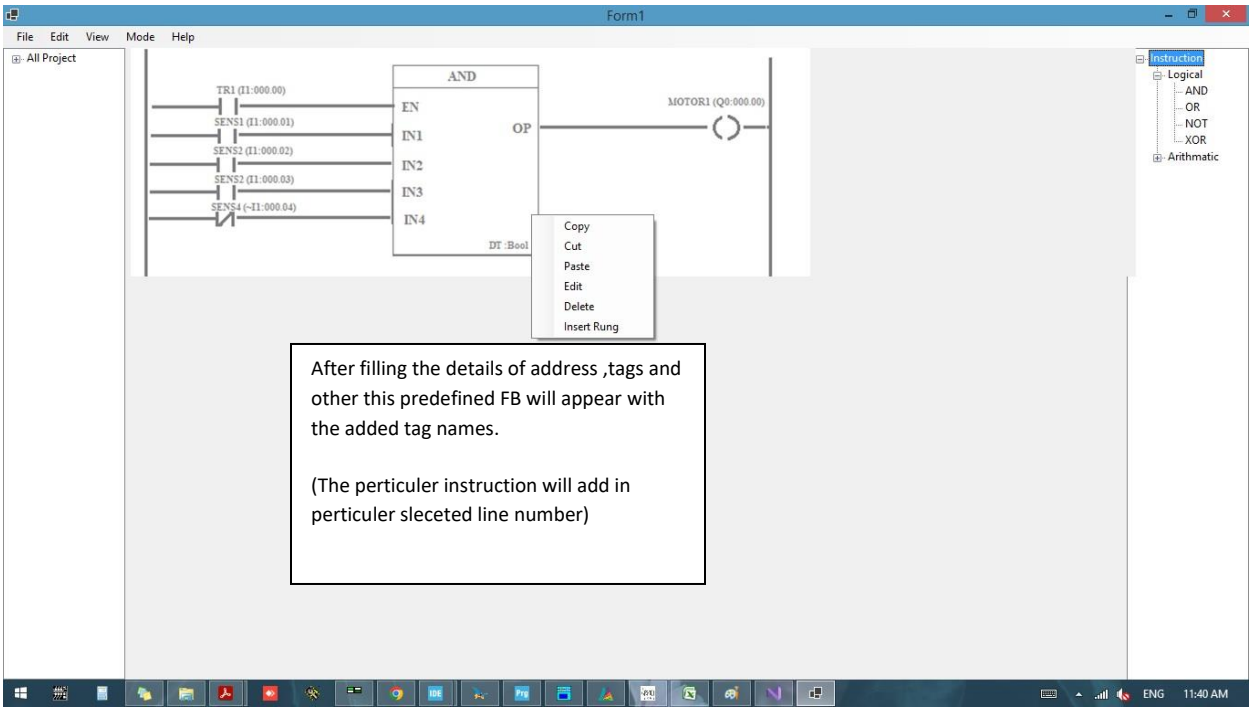
2. B


Form1
File Edit View Mode Help
All Project
Instruction
Logical
AND
OR
NOT
XOR
Arithmatic
Select instruction from this window

3. C


Form1
File Edit View Mode Help
All Project
Instruction
Logical
AND
OR
NOT
XOR
Arithmatic
Variable
Datatype
WORD
Enable
Address F2:000
Tag Flag
Address
Input Type
Name/Tag
Flag
Initialize
Input 1 W4:000 Normal Opera Input1 Non-Retentiv
Input 2 W4:001 Normal Opera Input2 Non-Retentiv
Input 3
Input 4
Output Type
Memory Addres
Output W4:002 Result
Comments
Addition between 2 inputs
OK
Cancel
After instruction selection popup will appear to fill the details
(same as XMPS100 screen)

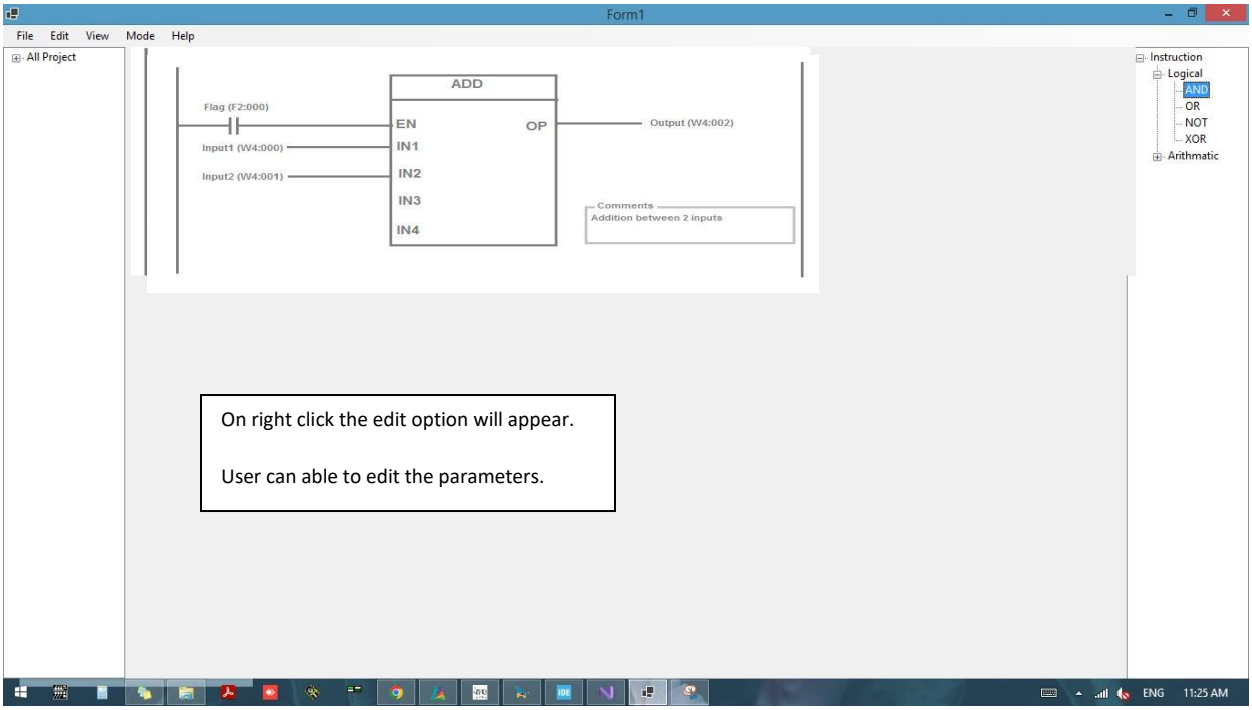
4. D



After filling the details of address ,tags and other this predefined FB will appear with the added tag names.

(The perticuler instruction will add in perticuler sleceted line number)

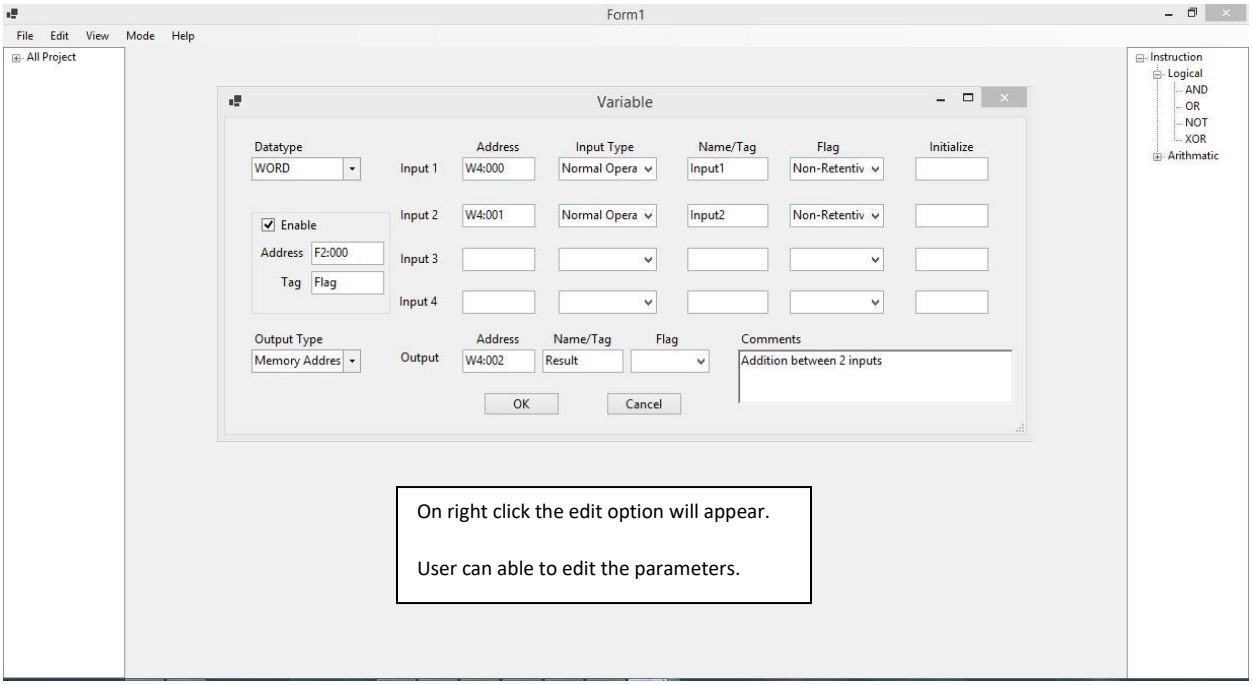
5. E



On right click the edit option will appear.

User can able to edit the parameters.

6. F



On right click the edit option will appear.

User can able to edit the parameters.

CPU addresses :

XM-Pro CPU Addressing Scheme				
Block No	**Type**	**Logical Address Range**	**Used as**	**Remark**
0	Output address	Q0:000 to Q0:255	Word and Bit	Physical Digital+Analog Outputs. (local+Expn+Remote)
1	Input adress	I1:000 to I1:255	Word and Bit	Physical Digital+Analog Inputs. (local+Expn+Remote)
2	Flags (Memory bits)	F2.000 to F2.255	Bit	Memory bits
3	Status	S3:000 to S3:255	Word	PLC Status & dignostics
4	Integer Word	W4:000 to W4:255	Word	Memory word address
5	Floating Point	P5:000 to P5:255	Real	Memory Real address
6	Timers	T6:000 to T6:255	Word	Timer word address
7	Counters	C7:000 to C7:255	Word	Counter word address
8	Reserved for future	X8.000 to X8.255	Word	Retentive
9	Reserved for future	Y9.000 to Y9.255	Word	Retentive
10	*Auto memory flag*	*D10:000 to D10:2048*	*Bit*	*(Reserved for future)*

9. Interpreter (Application & configuration) : (Development done)

Same as XMPS100---- App.csv & Config. Csv

Will download using same TFTP protocol.

Logic blocks which is called sequentially in “Main program” tab should create the “App.csv file” as per the given format.

Eg—

Main Program

Motor1
Motor2
Motor3

Library

Logic blocks

Motor1------50 rungs of logic

Motor2------20 rungs of logic

Motor3------30 rungs of logic

Motor4------60 rungs of logic

In above example under the "Main program" tab we have called the 3 logic blocks. "Motor1", "Motor2", "Motor3". So, 50 + 20 + 30 =100 rungs of App.csv file should be generated sequentially when user click on compile/generate code option.

All logic blocks should save in the laptop memory when user opens the existing project all blocks should open as it is.

10. All Features of XMPS100.

All features & protocols of XMPS100.