Software Requirements for XM-Pro PLC

LEVEL – 3

v1.0

Features:

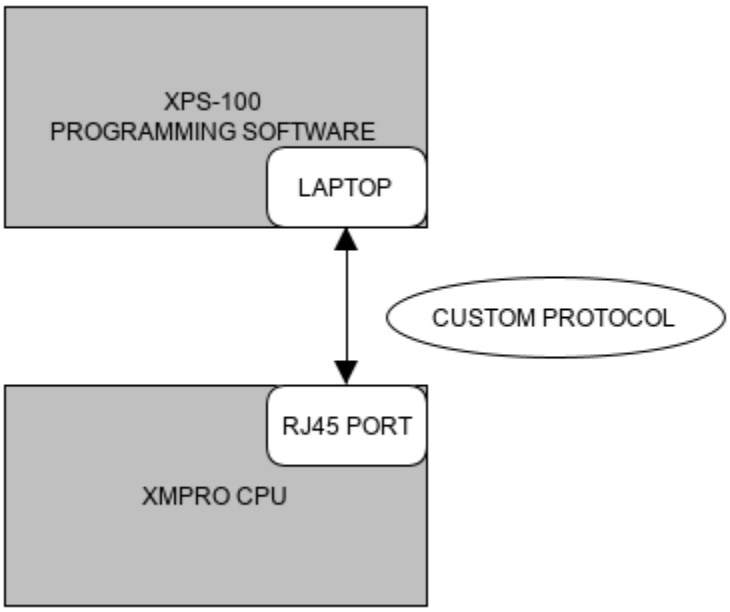
1. Online Monitering of CPU address status

Contents

Software Level 3 Requirement: (Online monitering of addresses value of user application program)

Objective is to online monitering the Application program address status without force write & & step debugging.

Scheme of Online Monitering BD



Proccess:

Online moniter the selected rung addresses status when Laptop & CPU is connected.

We will use the TCp/Ip port xxx & create our own protocol for online monitering. We will call that protocol M-OMP.

Utility will request the frames & CPU will response to that frame.

Check protocol details in Excel sheet…(M-OMP Protocol details)

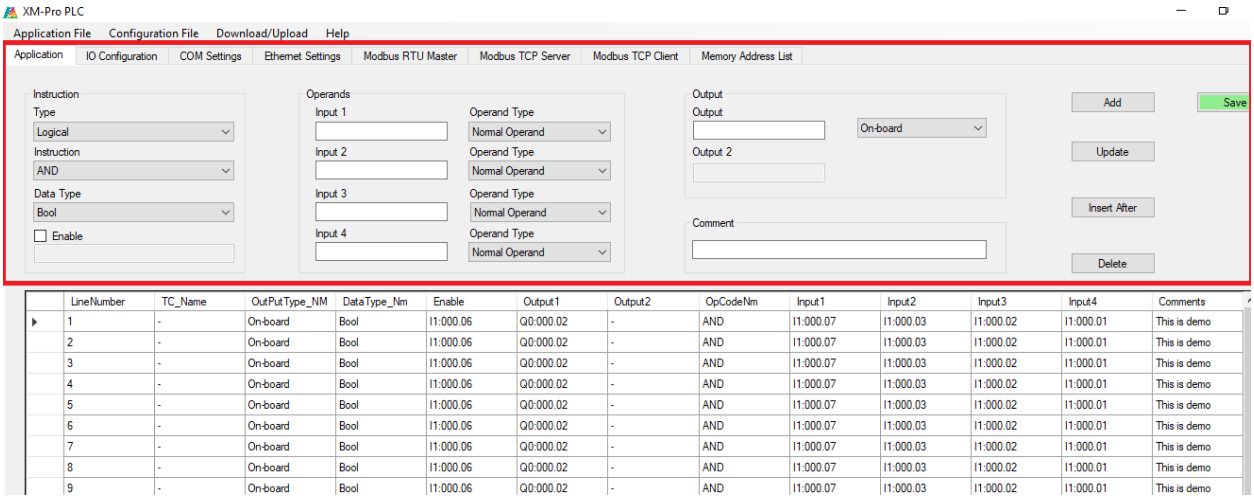
UI Requirement:

One tab of “PLC” should be added in Menubar. In PLC menu there are following sub menus.

1. PLC
    1.1. Online Moniter
    1.2. Offline Simulation

Backend logic requirement:

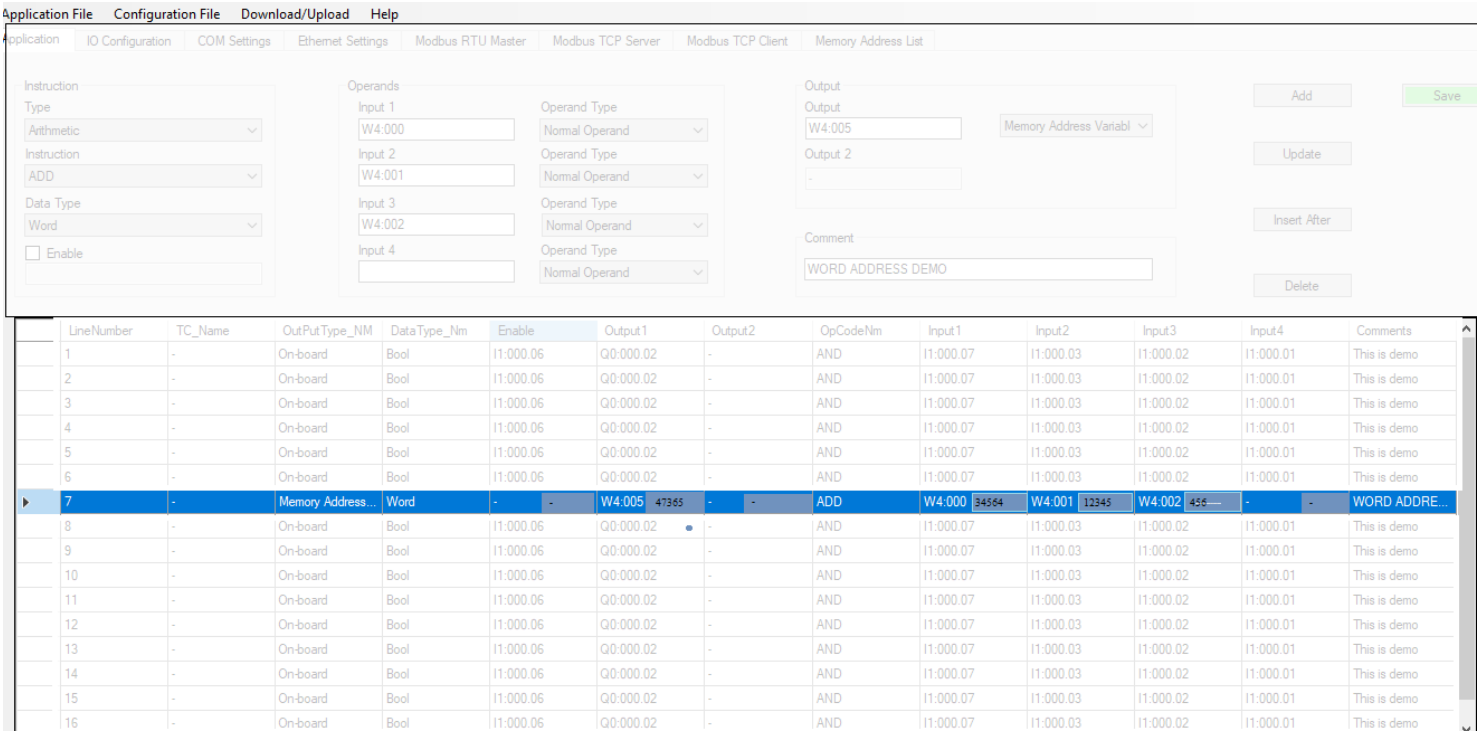
1. When user clicks on Online monitering whatever the latest application should be saved & downloaded to CPU
2. Connection of Laptop & CPU should be successfully establish and one pop up message should display “PLC CONNECTED”
3. After connection only “Application” tab will be visible with the all Rungs
4. User should not able to Add, Delet or Update any rungs or new rungs that upper window should be disable for editing. Check below image.



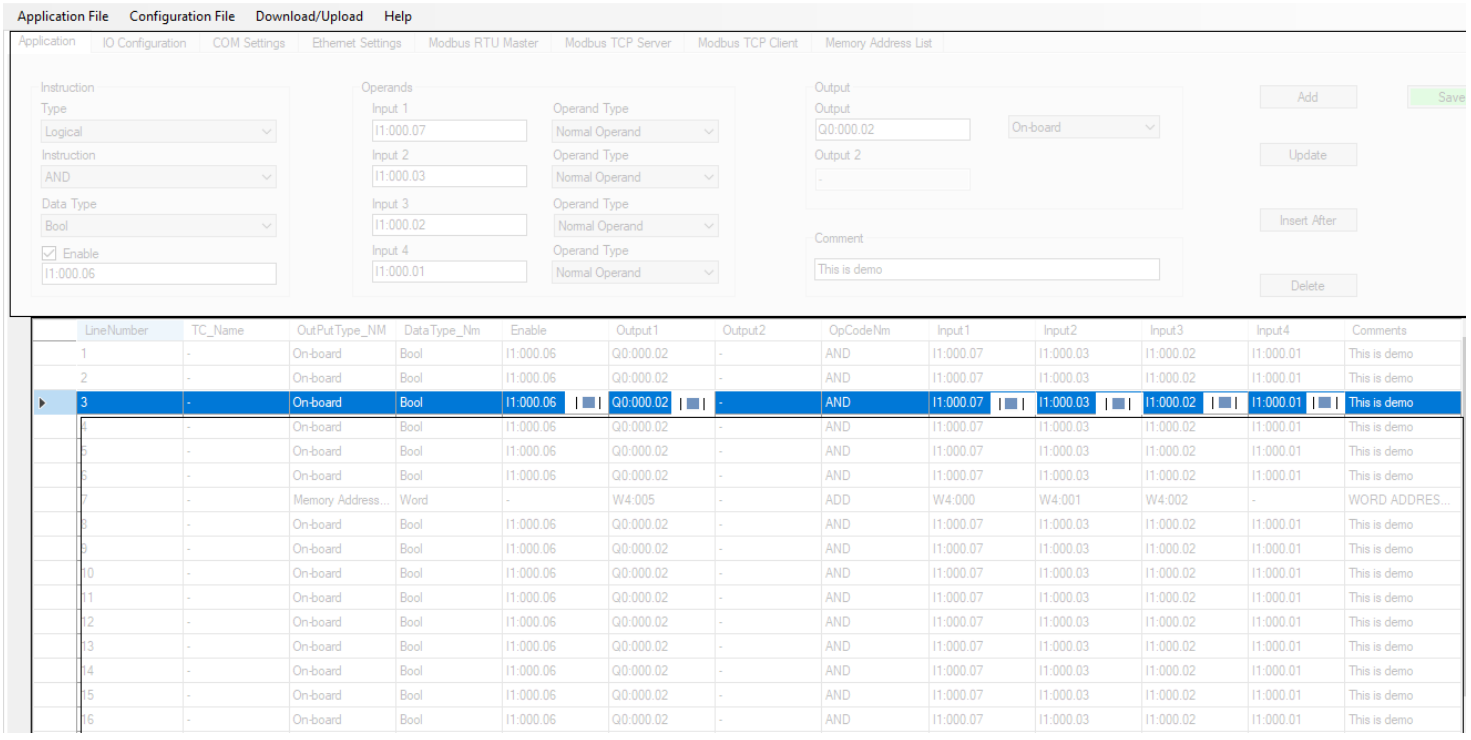
LineNumber	TC_Name	OutPutType_NM	DataType_Nm	Enable	Output1	Output2	OpCodeNm	Input1	Input2	Input3	Input4	Comments
1	-	On-board	Bool	I1:000.06	Q0:000.02	-	AND	I1:000.07	I1:000.03	I1:000.02	I1:000.01	This is demo
2	-	On-board	Bool	I1:000.06	Q0:000.02	-	AND	I1:000.07	I1:000.03	I1:000.02	I1:000.01	This is demo
3	-	On-board	Bool	I1:000.06	Q0:000.02	-	AND	I1:000.07	I1:000.03	I1:000.02	I1:000.01	This is demo
4	-	On-board	Bool	I1:000.06	Q0:000.02	-	AND	I1:000.07	I1:000.03	I1:000.02	I1:000.01	This is demo
5	-	On-board	Bool	I1:000.06	Q0:000.02	-	AND	I1:000.07	I1:000.03	I1:000.02	I1:000.01	This is demo
6	-	On-board	Bool	I1:000.06	Q0:000.02	-	AND	I1:000.07	I1:000.03	I1:000.02	I1:000.01	This is demo
7	-	On-board	Bool	I1:000.06	Q0:000.02	-	AND	I1:000.07	I1:000.03	I1:000.02	I1:000.01	This is demo
8	-	On-board	Bool	I1:000.06	Q0:000.02	-	AND	I1:000.07	I1:000.03	I1:000.02	I1:000.01	This is demo
9	-	On-board	Bool	I1:000.06	Q0:000.02	-	AND	I1:000.07	I1:000.03	I1:000.02	I1:000.01	This is demo

5. When UI enters in the Online moniter mode there should be Start & Stop Monitering option
6. When User clicks on start monitering the which ever rung is selected by user utility should send the protocol frame of selected rung to CPU as per the decided frame format.
7. For frame format check the Excel sheet…(M-OMP Protocol details)
8. If user not selected any rung & click on the Start monitering then by default first rung should be selected.
9. User can change the rung selection while monitering is started. According to that the requesting frames should be change. Check image …

Eg-1


Application File
Configuration File
Download/Upload
Help
Application
IO Configuration
COM Settings
Ethernet Settings
Modbus RTU Master
Modbus TCP Server
Modbus TCP Client
Memory Address List
Instruction
Type
Arithmetic
Instruction
ADD
Data Type
Word
Enable
Operands
Input 1
W4:000
Operand Type
Normal Operand
Input 2
W4:001
Input 3
W4:002
Input 4
Output
Output
W4:005
Output 2
Comment
WORD ADDRESS DEMO
Add
Save
Update
Insert After
Delete
LineNumber
TC_Name
OutPutType_NM
DataType_Nm
Enable
Output1
Output2
OpCodeNm
Input1
Input2
Input3
Input4
Comments
7 - Memory Address... Word - - W4:005 47365 - - ADD W4:000 34564 W4:001 12345 W4:002 456 - - WORD ADDRE...

Eg.-2


Application File
Configuration File
Download/Upload
Help
Application
IO Configuration
COM Settings
Ethernet Settings
Modbus RTU Master
Modbus TCP Server
Modbus TCP Client
Memory Address List
Instruction
Type
Logical
Instruction
AND
Data Type
Bool
Enable
I1:000.06
Operands
Input 1
I1:000.07
Input 2
I1:000.03
Input 3
I1:000.02
Input 4
I1:000.01
Operand Type
Normal Operand
Output
Output
Q0:000.02
On-board
Output 2
Comment
This is demo
Add
Save
Update
Insert After
Delete
LineNumber
TC_Name
OutPutType_NM
DataType_Nm
Enable
Output1
Output2
OpCodeNm
Input1
Input2
Input3
Input4
Comments
3 - On-board Bool I1:000.06 Q0:000.02 - AND I1:000.07 I1:000.03 I1:000.02 I1:000.01 This is demo

M-OMP Protocol Description:

Physical layer – Ethernet TCP//IP

Port- decide port

Protocol frame :

Request frame : Send by Utility (example)

SOF	***Total data length***	***LENGTH***	***CODE..1***	***LENGTH***	***CODE..2***	***LENGTH***	***CODE..n (45)***	***CRC***	***EOF***
0xFC	0X09	0x01	0x080B	0X02	0x000B	0X04	0x050B	0x0B to 0xFF	0XFE

SOF: Start of frame is fixed (0xFC) 1byte

Total data length: Total frame bytes (It will vary as per selected row) 1byte

Code: Code of perticuler adderess (See the Code list at the end) 2byte

CRC: CRC checking (1byte)

EOF: End of frame is fixed (0xFA) 1byte

Response frame send by CPU:

SOF	***Total data length***	***DATA..1 (1)***	***DATA..2(1)***	***DATA..2(2)***	***DATA..3(1)***	***DATA..3(2)***	***DATA..3 (3)***	***DATA..3(4)***	***DATA..n (n)***	***CRC***	***EOF***
0xFC	0x12	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x0B to 0xFF	0XFE

SOF: Start of frame is fixed (0xFC) 1byte

Total data length: Total frame bytes (It will vary as per selected row) 1byte

DATA 1 (1): 1st byte Data of requested first CODE

DATA 2 (1): 1st byte Data of requested second CODE

DATA 2 (2): 2nd byte Data of requested second CODE

DATA 3 (1): 1st byte Data of requested second CODE

DATA 3 (2): 2nd byte Data of requested second CODE

DATA 3 (3): 3rd byte Data of requested second CODE

DATA 3 (4): 4th byte Data of requested second CODE

CRC: CRC checking (1byte)

EOF: End of frame is fixed (0xFA) 1byte

Error frame :

CPU will send the error frame if request grame will not receive properly/fully. If timeout happened then also error frame will send by CPU.

SOF	***Total data length***	***ERR1***	***ERR2***	***CRC***	***EOF***
0xFC	0X02	0xEA	0XEF	0x0B to 0xFF	0XFD

SOF: Start of frame is fixed (0xFC) 1byte

Total data length: Total frame bytes is fixed (0x02)

ERR 1: ERR1 is fixed (0xEA) 1byte

ERR2: ERR2 is fixed (0xEF) 1byte

CRC: CRC checking (1byte)

EOF: End of frame is fixed (0xFA) 1byte

Note:

1. Detailed description of M-OMP protocol is given in the Excel sheet…(M-OMP Protocol details)
2. CPU will send the response frames bytewise.
3. Utility logic should be decide that where to put which data . (Bit ,Word, Real)
4. Bit requires 1 byte , Word requires 2bytes, Real requires 4bytes.
5. Error response should be display in screen