XMPS- 2000 Feb 2023

Tasks SRS_V2

Contents

Task 1: New instruction FB addition (12 types)

1. Limit Alarm:

1.1 FB name – **LIMIT ALARM - O**

UI:

- Input 1 – Text (Max Value)
- Input 2 – Text (Actual Value)
- Input 3 – Text (Min Value)
- Input 4 – Disable
- Output 1 – Text (Over Limit)
- Output 2- Text (In Limit)

CSV:

- Opcode: 00Ex … (x is datatype)
- Validation:
  - Input 1: Bool, Byte, Word, Dword, Int, Real
  - Input 2: Bool, Byte, Word, Dword, Int, Real
  - Input 3: Bool, Byte, Word, Dword, Int, Real
  - Input 4: Disable
  - Output 1: Bool (Except I1:xxx. xx)
  - Output 2: Bool (Except I1:xxx. xx)

1.1 FB name – **LIMIT ALARM - U**

UI:

- Input 1 – Text (Max Value)
- Input 2 – Text (Actual Value)
- Input 3 – Text (Min Value)
- Input 4 – Disable
- Output 1 – Text (Under Limit)
- Output 2- Text (In Limit)

CSV:

- Opcode: 00Fx … (x is datatype)
- Validation:
  - Input 1: Bool, Byte, Word, Dword, Int, Real

- Input 2: Bool, Byte, Word, Dword, Int, Real
- Input 3: Bool, Byte, Word, Dword, Int, Real
- Input 4: Disable
- Output 1: Bool (Except I1:xxx. xx)
- Output 2: Bool (Except I1:xxx. xx)

2. SWAP:

2.1 FB name – **SWAP CDAB**

UI:

- Input 1 – Text (Input)
- Input 2 – Disable
- Input 3 – Disable
- Input 4 – Disable
- Output 1 – Text (Output)
- Output 2- Disable

CSV:

- Opcode: 026x … (x is datatype)
- Validation:
  - Input 1: Dword, Real
  - Input 2: Disable
  - Input 3: Disable
  - Input 4: Disable
  - Output 1: As per input 1
  - Output 2: Disable

2.2 FB name – **SWAP BADC**

UI:

- Input 1 – Text (Input)
- Input 2 – Disable
- Input 3 – Disable
- Input 4 – Disable
- Output 1 – Text (Output)
- Output 2- Disable

CSV:

- Opcode: 027x … (x is datatype)
- Validation:
    - Input 1: Dword, Real
    - Input 2: Disable
    - Input 3: Disable
    - Input 4: Disable
    - Output 1: As per input 1
    - Output 2: Disable

2.3 FB name – **SWAP DCBA**

UI:

- Input 1 – Text (Input)
- Input 2 – Disable
- Input 3 – Disable
- Input 4 – Disable
- Output 1 – Text (Output)
- Output 2- Disable

CSV:

- Opcode: 028x … (x is datatype)
- Validation:
    - Input 1: Dword, Real
    - Input 2: Disable
    - Input 3: Disable
    - Input 4: Disable
    - Output 1: As per input 1
    - Output 2: Disable

3. Data Conversion:

3.1 FB name: **Bool to BOOL….REAL**

UI:

- Input 1 – Text (Input)
- Input 2 – Disable
- Input 3 – Disable
- Input 4 – Disable

- Output 1 – Text (Output)
- Output 2- Disable

CSV:

- Opcode: 02A0 … input1 datatype is BOOL, Output Bool
- Opcode: 02A1 … input1 datatype is BOOL, Output Byte
- Opcode: 02A2 … input1 datatype is BOOL, Output WORD
- Opcode: 02A3 … input1 datatype is BOOL, Output DWORD
- Opcode: 02A4 … input1 datatype is BOOL, Output INT
- Opcode: 02A5 … input1 datatype is BOOL, Output Real

- Validation:
  - Input 1: Bool
  - Input 2: Disable
  - Input 3: Disable
  - Input 4: Disable
  - Output 1: Bool, Byte, Word, Dword, Int, Real
  - Output 2: Disable

3.2 FB name: **BYTE to BOOL….REAL**

UI:

- Input 1 – Text (Input)
- Input 2 – Disable
- Input 3 – Disable
- Input 4 – Disable
- Output 1 – Text (Output)
- Output 2- Disable

CSV:

- Opcode: 02B0 … input1 datatype is BYTE, Output Bool
- Opcode: 02B1 … input1 datatype is BYTE, Output Byte
- Opcode: 02B2 … input1 datatype is BYTE, Output WORD
- Opcode: 02B3 … input1 datatype is BYTE, Output DWORD
- Opcode: 02B4 … input1 datatype is BYTE, Output INT
- Opcode: 02B5 … input1 datatype is BYTE, Output Real

- Validation:
  - Input 1: BYTE
  - Input 2: Disable
  - Input 3: Disable
  - Input 4: Disable
  - Output 1: Bool, Byte, Word, DWORD, INT, Real
  - Output 2: Disable

3.3 FB name: **WORD to BOOL….REAL**

UI:

- Input 1 – Text (Input)
- Input 2 – Disable
- Input 3 – Disable
- Input 4 – Disable
- Output 1 – Text (Output)
- Output 2- Disable

CSV:

- Opcode: 02C0 … input1 datatype is WORD, Output Bool
- Opcode: 02C1 … input1 datatype is WORD, Output Byte
- Opcode: 02C2 … input1 datatype is WORD, Output WORD
- Opcode: 02C3 … input1 datatype is WORD, Output DWORD
- Opcode: 02C4 … input1 datatype is WORD, Output INT
- Opcode: 02C5 … input1 datatype is WORD, Output Real

- Validation:
  - Input 1: WORD
  - Input 2: Disable
  - Input 3: Disable
  - Input 4: Disable
  - Output 1: Bool, Byte, Word, DWORD, INT, Real
  - Output 2: Disable
  -

3.4 3 FB name: **DWORD to BOOL….REAL**

UI:

- Input 1 – Text (Input)
- Input 2 – Disable
- Input 3 – Disable
- Input 4 – Disable
- Output 1 – Text (Output)
- Output 2- Disable

CSV:

- Opcode: 02D0 … input1 datatype is DWORD, Output Bool
- Opcode: 02D1 … input1 datatype is DWORD, Output Byte
- Opcode: 02D2 … input1 datatype is DWORD, Output WORD
- Opcode: 02D3 … input1 datatype is DWORD, Output DWORD
- Opcode: 02D4 … input1 datatype is DWORD, Output INT
- Opcode: 02D5 … input1 datatype is DWORD, Output Real

- Validation:
  - Input 1: DWORD
  - Input 2: Disable
  - Input 3: Disable
  - Input 4: Disable
  - Output 1: Bool, Byte, Word, DWORD, INT, Real
  - Output 2: Disable

3.5 FB name: **INT to BOOL….REAL**

UI:

- Input 1 – Text (Input)
- Input 2 – Disable
- Input 3 – Disable
- Input 4 – Disable
- Output 1 – Text (Output)
- Output 2- Disable

CSV:

- Opcode: 02E0 … input1 datatype is INT, Output Bool
- Opcode: 02E1 … input1 datatype is INT, Output Byte
- Opcode: 02E2 … input1 datatype is INT, Output WORD
- Opcode: 02E3 … input1 datatype is INT, Output DWORD
- Opcode: 02E4 … input1 datatype is INT, Output INT
- Opcode: 02E5 … input1 datatype is INT, Output Real

- Validation:
  - Input 1: INT
  - Input 2: Disable
  - Input 3: Disable
  - Input 4: Disable
  - Output 1: Bool, Byte, Word, DWORD, INT, Real
  - Output 2: Disable

3.6 FB name: **REAL to BOOL….REAL**

UI:

- Input 1 – Text (Input)
- Input 2 – Disable
- Input 3 – Disable
- Input 4 – Disable
- Output 1 – Text (Output)
- Output 2- Disable

CSV:

- Opcode: 02F0 … input1 datatype is REAL, Output Bool
- Opcode: 02F1 … input1 datatype is REAL, Output Byte
- Opcode: 02F2 … input1 datatype is REAL, Output WORD
- Opcode: 02F3 … input1 datatype is REAL, Output DWORD
- Opcode: 02F4 … input1 datatype is REAL, Output INT
- Opcode: 02F5 … input1 datatype is REAL, Output Real

- Validation:
  - Input 1: REAL
  - Input 2: Disable

- Input 3: Disable
- Input 4: Disable
- Output 1: Bool, Byte, Word, DWORD, INT, Real
- Output 2: Disable

4. SCALE:

4.1 FB name: **SCALE**

UI:

- Input 1 – Text (IN)
- Input 2 – Text (IN Min)
- Input 3 – Text (IN Max)
- Input 4 – Text (OUT Min)
- Input 5 – Text (OUT Max)

- Output 1 – Text (IN Min Error)
- Output 2- Text (Output)
- Output 3- Text (OUT Max Error)

CSV:

CSV will always generate in 2 lines:

SCALE Block csv generation

LineNumber	T/CName	OutputType	DataType	Enable	Output1	Output2	OpCode	Input1	Input2	Input3	Input4	Comments	Window Name
			0005		-	IN Min Error	0295	IN	IN Min	IN Max	-		
			0005		OUTPUT	OUT Max Error	0295	OUT Min	OUT Max	-	-		

- Opcode: 0295 … datatype is always REAL
- Validation:
  - Input 1: Real
  - Input 2: Real
  - Input 3: Real
  - Input 4: Real
  - Input 5: Real

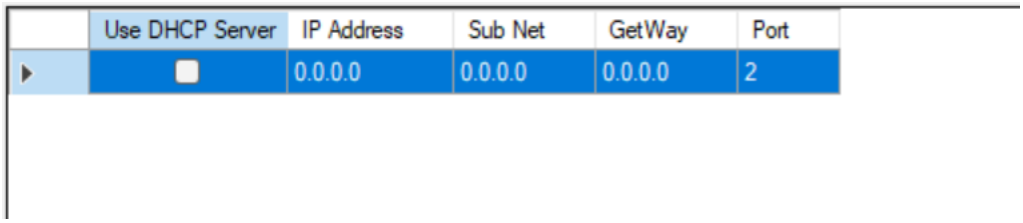
  - Output 1: BOOL (Except I1:xxx. xx)
  - Output 2: Real

- Output 3: BOOL (Except I1:xxx. xx)

Task 2: IP address UI & CSV update:

Current:

UI:

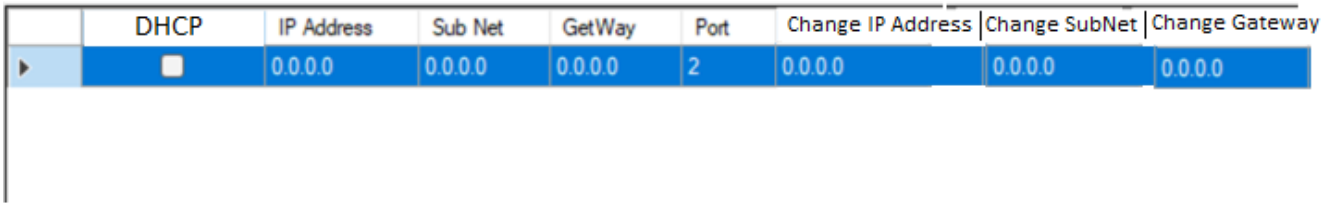


CSV:

ConfigType	Use DHCP	IP Address	Subnet	Gateway	Port Number
Ethernet Settings	0	192.168.15.60	255.255.255.0	192.168.015.253	2

Update:

UI:



CSV:

ConfigType	Use DHCP	IP Address	Subnet	Gateway	Port Number
Ethernet Settings	0	192.168.015.060	255.255.255.0	192.168.015.253	2
NEthernet Settings	-	172.168.123.060	255.255.255.0	172.168.123.253	-

New Line add in Config.csv.

After first time download in PLC following steps should happen:

UI:

Change IP address, Change Subnet, Change Gateway parameters should copy to current IP.

And Change IP, Subnet, Gateway should fill with 0.0.0.0.

Note :1. If Change IP parameters are 0.0.0. then don't copy to current IP column.

2. IP address parameters are always be in 3-digit Eg- 192.168.015.060

CSV:

As per UI.

Validation:

IP Range : xxx.xxx.xxx

Task 3: Add new expansion module in Expansion module List.

Module Name: **XM-UI4-UO2**

CSV – Config.csv data:

Logical address: Auto assign. (Word address)- For UI –I1:xxx For UO: Q0:xxx

IO List	Model	Type	Mode	Label	Logical Address	Tag
ExpansionIO	0x0011	UniversalInput	00	UI0	I1:001	UniversalInput_UI0
			01	UI1	I1:002	UniversalInput_UI1
			00	UI2	I1:003	UniversalInput_UI3
			02	UI3	I1:004	UniversalInput_UI4
		UniversalOutput	00	UO0	Q0:001	UniversalOutput_UO0
			02	UO1	Q0:002	UniversalOutput_UO1

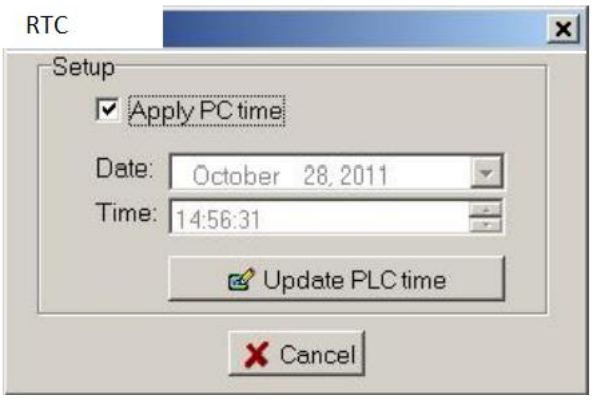
Mode list: UI & CSV

UI - MODE		UO - MODE	
CSV Code	GUI Text	CSV Code	GUI Text

-	-	-	-
00	Digital	00	Digital
01	0-10V	01	0-10V
02	0-5V	02	0-20mA
03	0-20mA	03	4-20mA
04	4-20mA		
05	Resistance		
06	PT100		
07	PT1000		
08	10K -NTC		
09	20K -NTC		

Task 4: RTC Date & Time update from Software

1. Under **MODE** tab add **RTC Setting** Tab
2. After click on RTC Setting open below tab



3. User should manually add Date & Time if Apply PC time is not selected
4. If Apply PC time selected that area should feel with Laptop/PC date & time.
5. When user click on Update PLC time following frame should send on same tcp/ip port (Similar like Run/Stop frame)

Utility request											
SOF	Total data length	CMD TYPE	Day	Month	Year	HH	MM	SS	AM/PM	CRC	EOF
0xF9	0x08	0xEC	17	'01	23	14	18	35	0/1	Orange xor 0x97	0xF8

6. PLC will response:

SOF	Total data length	CMD TYPE	Status	CRC	EOF
0xF9	0x02	0xEC	0xAA (if OK)	Orange xor 0x97	0xF8
			0XBB (if error)		

7. If OK the show popup **RTC configured successfully**. If Error then shows popup **Error while configuring RTC.**

Add following status address in default Tag list :

a. S3:026 - WRITE HOURS
b. S3:027 - WRITE_MINS
c. S3:028 – WRITE_SECS
d. S3:029 – WRITE_DATE
e. S3:030 – WRITE_MONTH
f. S3:031 – WRITE_YEAR

Task 5: Full window Online Monitoring

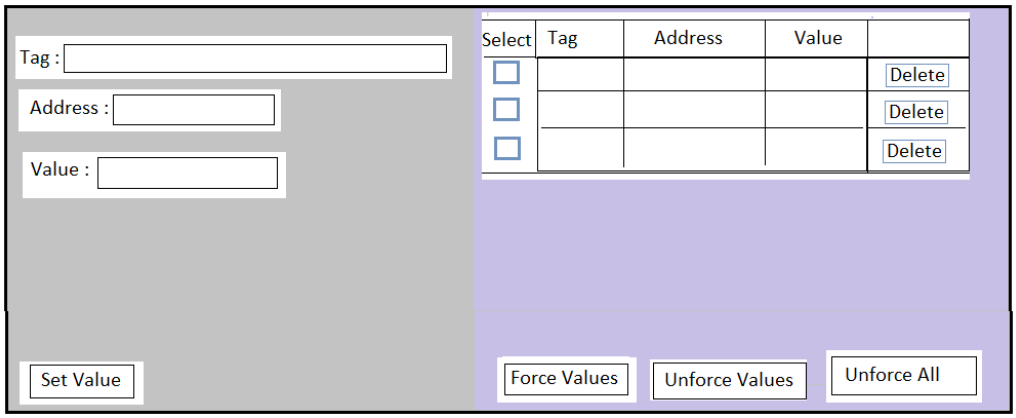
1. Current we are showing 1 line /rung real time data on Online monitoring window
2. We have to increase the number of rungs which will show real time data when PLC is in online monitoring mode
3. New proposed architecture is as follows:
    a. Identify the number of rungs is display on laptop
    b. Send the single frame by creating and identifying the addresses. (Frame should be generate similar like current version)
    c. Eg - If 5 rungs are showing on screen (from rung no. 10 to Rung no. 15) then create the single frame of all present addresses and send the frame to PLC.
    d. PLC will response like 1 rung version
    e. Display the received data at appropriate address.

Task 6: Force functionality when PLC is in Online Monitoring Mode

This functionality is useful to simulate the inputs and check the written logic without connection of any physical inputs to the PLC.

Requirement:

1. When PLC is in Online monitoring mode
2. When user click on any contact or coil or FB then popup should appear which is showing the Tag name & Address of that contact, coil or FB
3. Like Below:



4. Left part is for current selected contact, coil and FB (in case of FB tags and addresses will increase up to 4 Qty. Not shown in the image)
5. Right part is for showing how many addresses you want to write in single Force Value click.
6. We will give maximum limitation up to 10 address to write in single click.
7. When user wants to write more than 10mvalues then he should write in the step of 10 - 10 addresses.
8. When user selects the check box and clicks on Force Values & Unforce Values following frame should be created and sent on similer tcp/ip port of online monitoring.
9. Frame Format for Force values & Unforce values & Unforce All values:

Force Frame																						
Frame from XMPS2000	*SOF*	*CMD*	*Total data length*	*LENGTH*	*CODE..1 (byte1)*	*CODE..1 (byte2)*	*DATA..1*	*LENGTH*	*CODE..2 (byte1)*	*CODE..2 (byte2)*	*DATA..1 (2)*	*DATA..2 (2)*	*LENGTH*	*CODE..n (byte1)*	*CODE..n (byte2)*	*DATA..1 (n)*	*DATA..2 (n)*	*DATA..3 (n)*	*DATA..4 (n)*	*CRC*	*EOF*
	0xF7	0xCA (Force)	0x10	0x01	0x0B	0x0B	0x01	0X02	0x00	0x0B	0xEB	0X34	0X04	0x05	0x0B	0xEB	0X34	0xEB	0X34	0x0B to 0xFF	0XF6

UnForce Frame											
Frame from XMPS2000	*SOF*	*CMD*	*Total data length*	*CODE..1 (byte1)*	*CODE..1 (byte2)*	*CODE..2 (byte1)*	*CODE..2 (byte2)*	*CODE..n (byte1)*	*CODE..n (byte2)*	*CRC*	*EOF*
	0xF7	0xCB (UnForce)	0x06	0x0B	0x0B	0x00	0x0B	0x05	0x0B	0x0B to 0xFF	0XF6

Unforce All Frame	*SOF*	*CMD*	*Status*	*CRC*	*EOF*
Frame from XMPS2000	0xF7	0xCC (UnForce)	0xBB (if OK)	0x0B to 0xFF	0XF6

Response from PLC	*SOF*	*CMD*	*Received data length*	*Status*	*CRC*	*EOF*
	0xF7	0xCA (Force) or 0xCB /0xCC (if Unforce)	0x10 & if unforce by default 0xFF	0xBB (if OK)	0x0B to 0xFF	0XF6
				0xAA (if Error)		

10. Address codes are already defined in Online Monitoring protocol
11. When user Logout from online monitoring mode by default send Unforce All values command to PLC.

Task 7 : Insert After Rung

Requirement:

Insert the blank rung after any rung.

Validation: 1. Update Rung number automatically.

2. If rung is blank don't compile the program.

Task 8: Set Coil & Reset Coil

Requirement:

UI**:**

1. The S & R coil should be valid with the ladder logic output without function Block.
2. No parallel Coil allowed when user select S/R coil at output
3. Only bit address (except I1:xxx.xx) should allowed to S/R coil

CSV:

1. Opcode – For S coil 0x0310 & For R coil 0x0320
2. Enable (-)
3. Input 1 (Address of Input Q0,F2,D10..any as per decoding)
4. Input 2 (-)
5. Input 3 (-)
6. Input 4 (-)
7. Output 1 (Address of S/R coil)