Bài 31.

Các bước lập trình PLC – S7-300

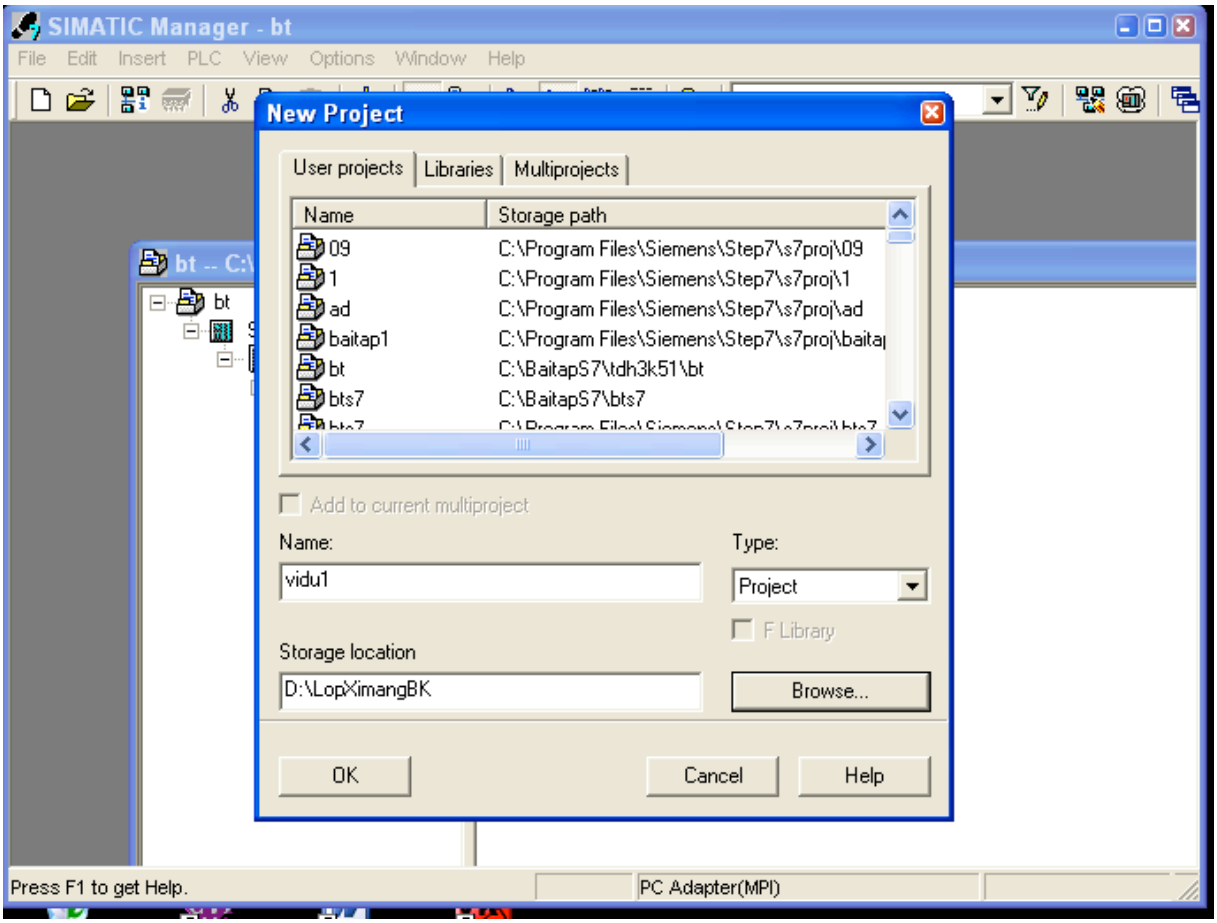
Lập trình cho S7-300 bao gồm các bước :

- Xác lập cấu hình phần cứng cho trạm
- Cài đặt tham số làm việc cho trạm
- Lập trình ứng dung
- Mô phỏng
- Ghép nối

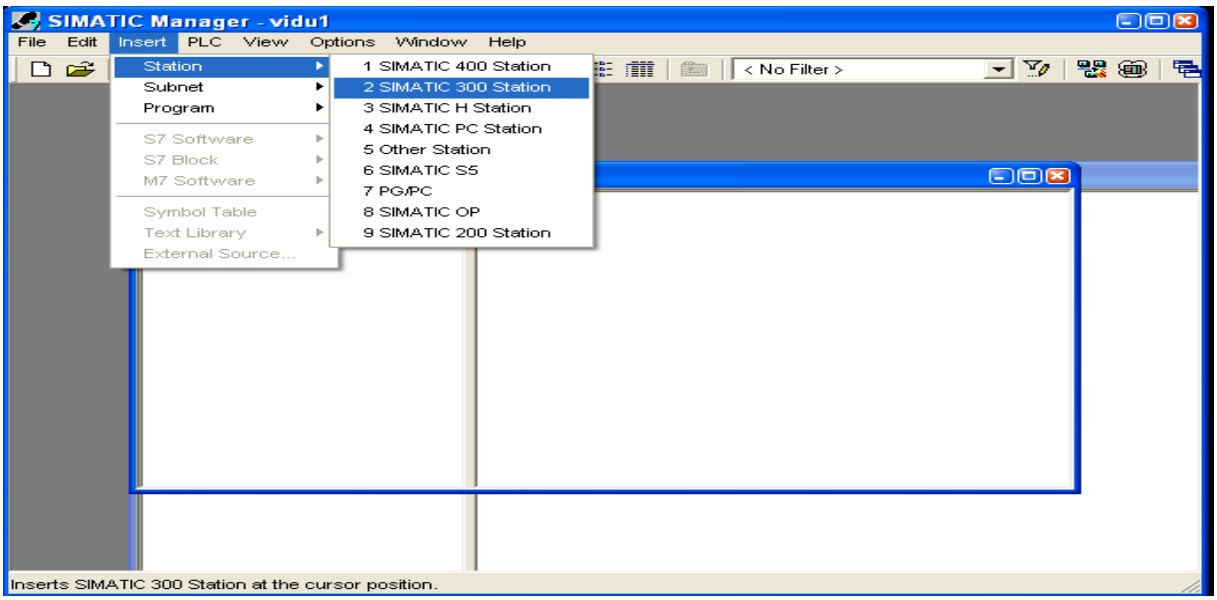
Các bước :

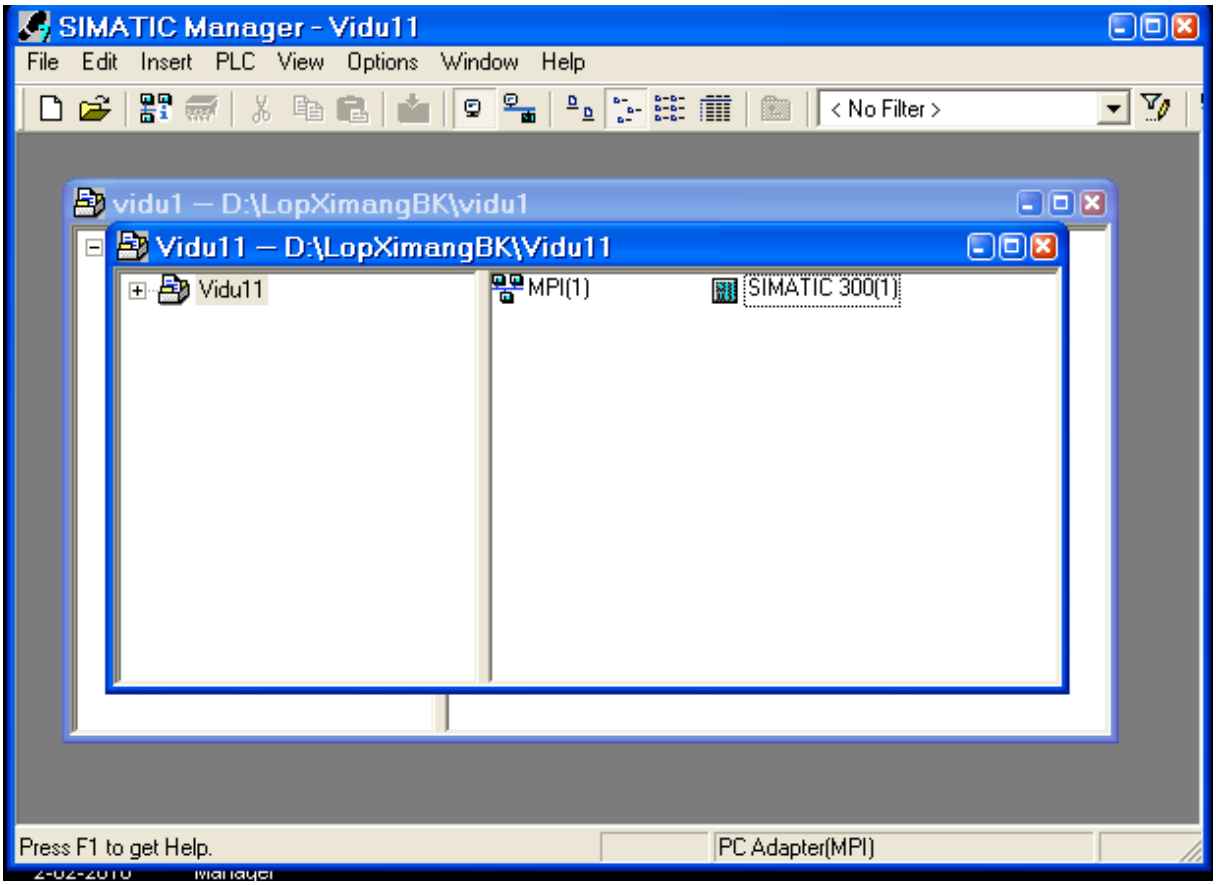
1.Khởi động và tạo dư an mới

- Khởi động Simatic Manager
- Nhắp Simatic Manager
- Nhăp Chọn New Project, Chon Name [vidu1], Location[ ]. -> OK



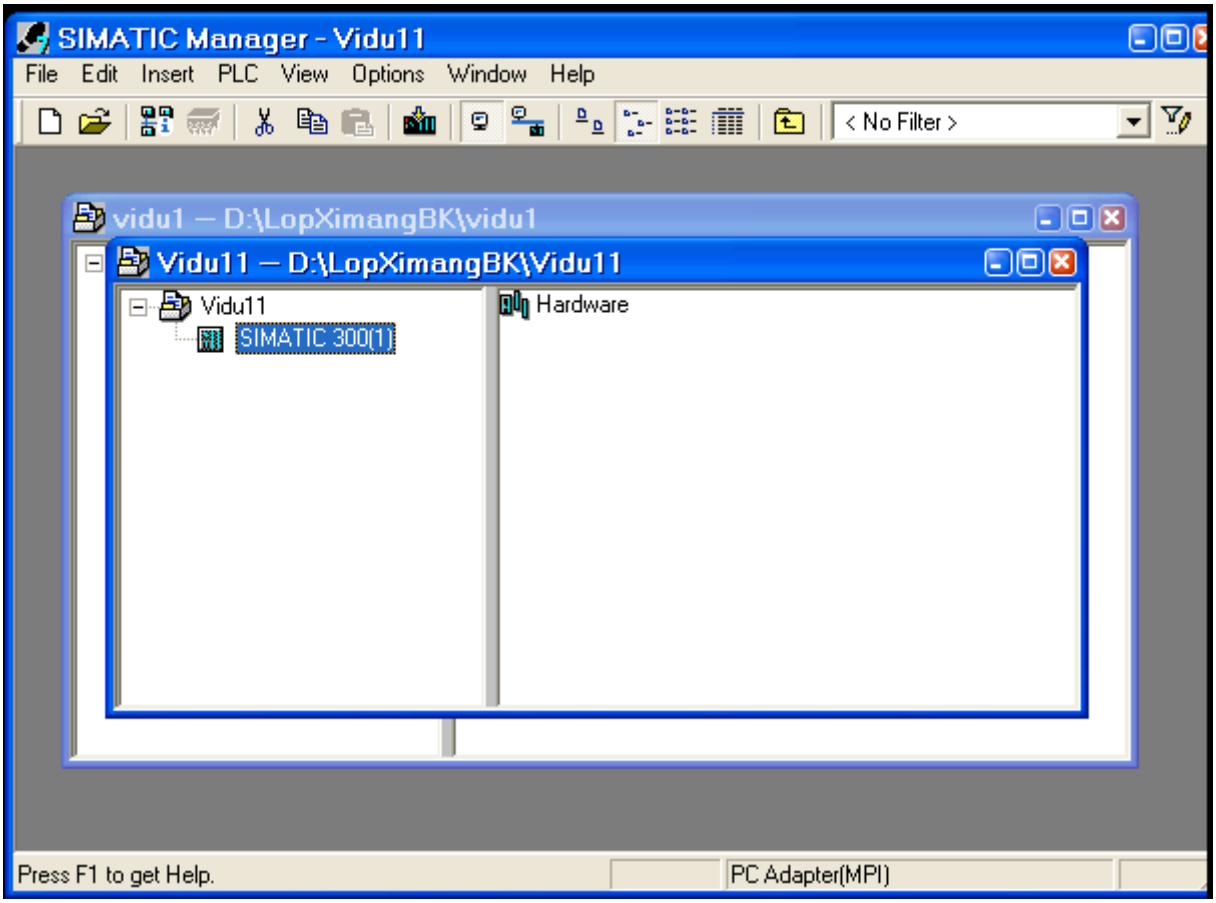
2. Khai bao trạm lam việc PLC

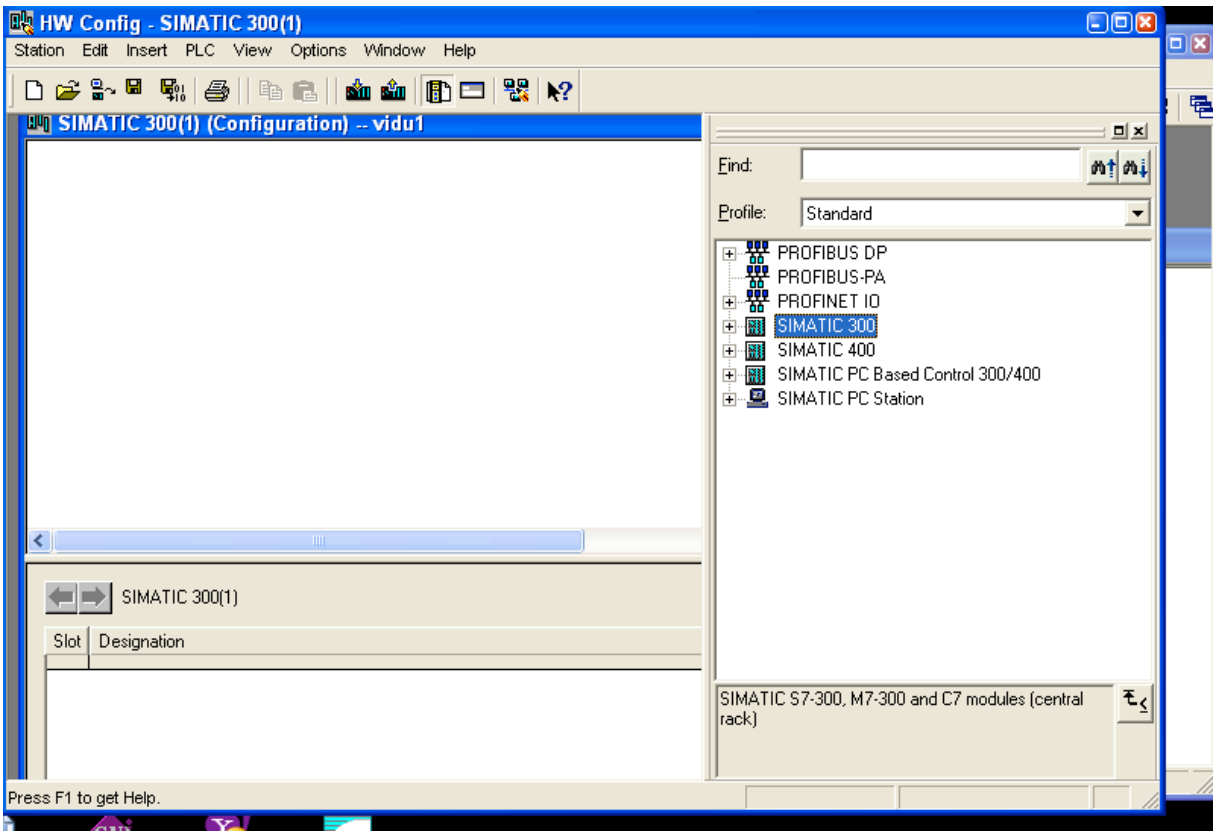


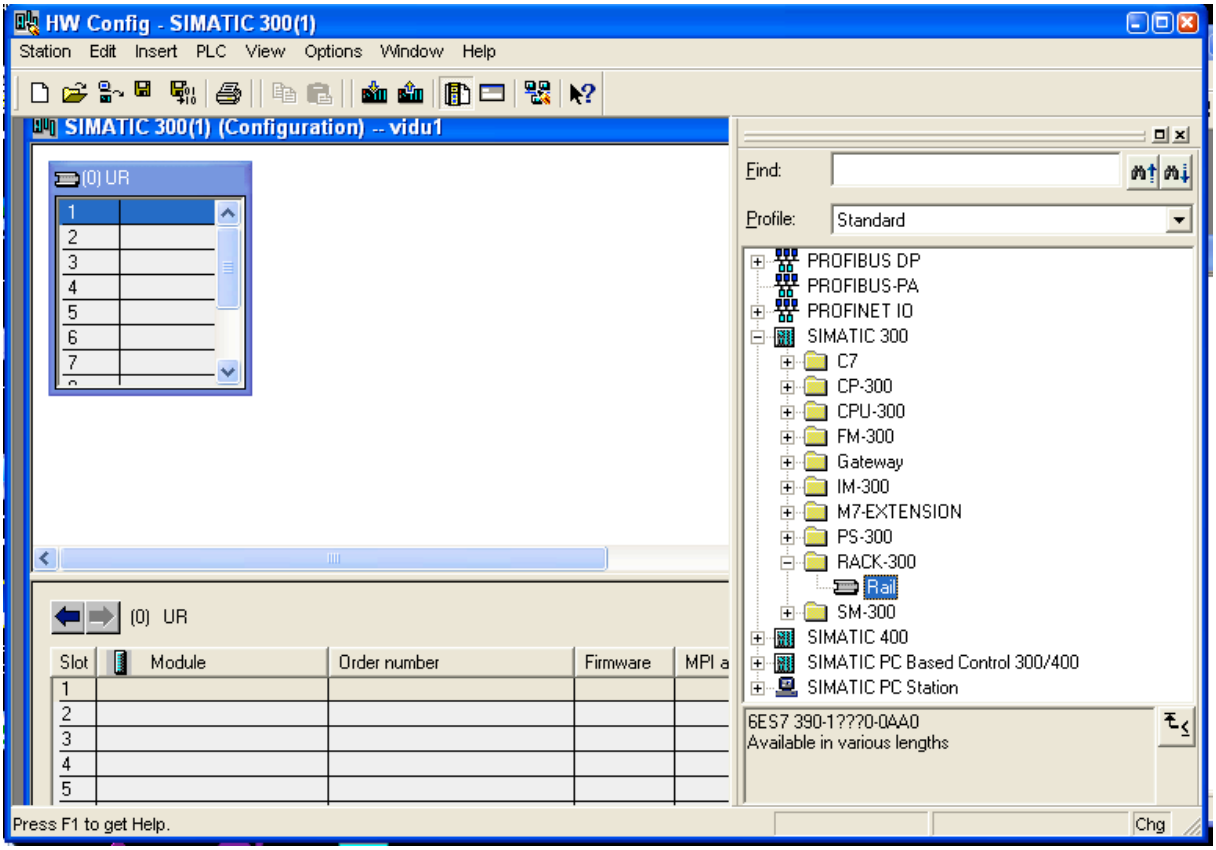


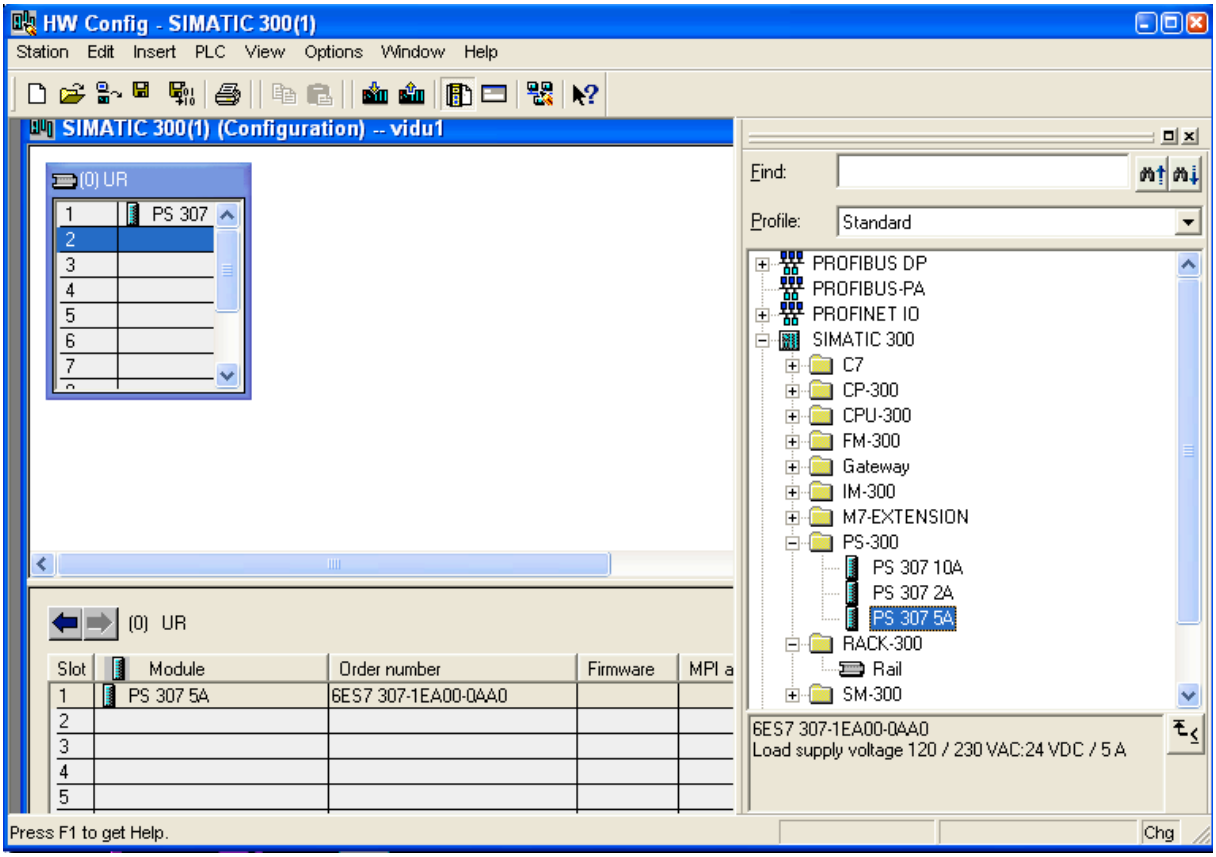
3. Đặt cấu hình cứng cho trạm

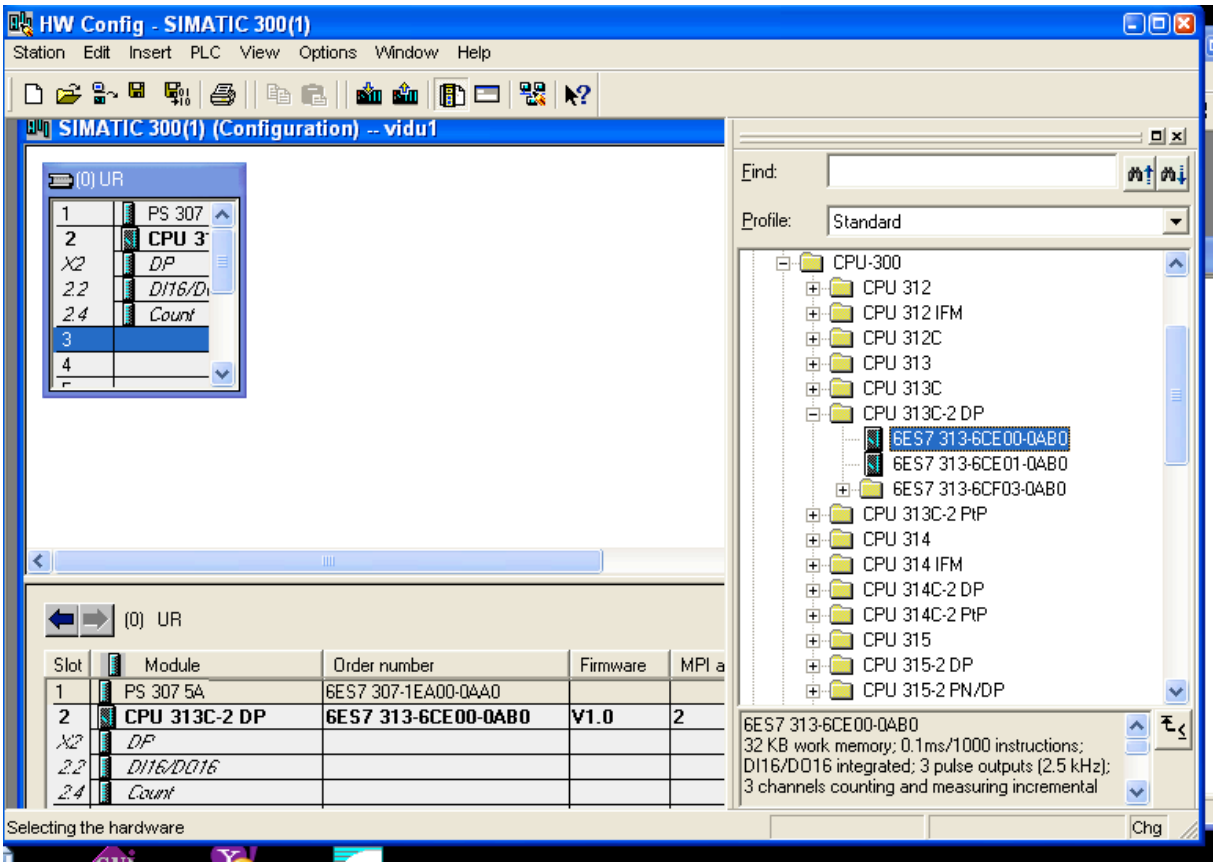
Nhăp Hardware mở ra màn hình đặt cấu hình cứng cho trạm

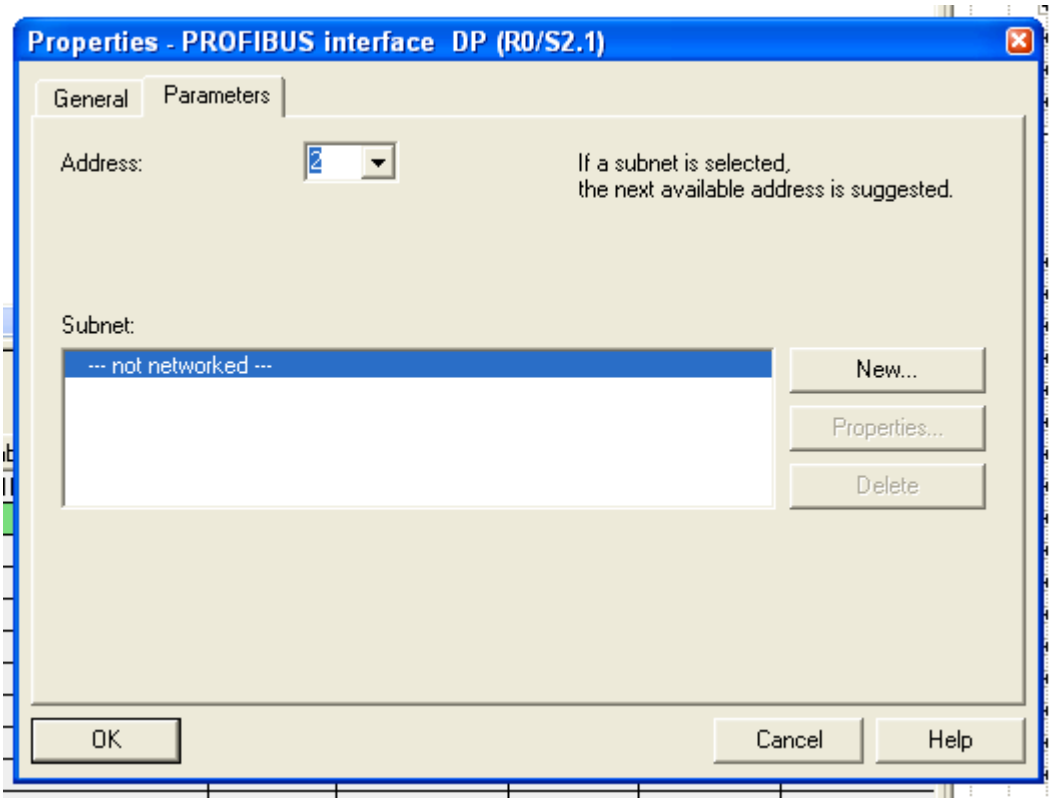



HW Config - SIMATIC 300(1)
Station Edit Insert PLC View Options Window Help
SIMATIC 300(1) (Configuration) -- vidu1
Find:
Profile: Standard
PROFIBUS DP
PROFIBUS-PA
PROFINET IO
SIMATIC 300
SIMATIC 400
SIMATIC PC Based Control 300/400
SIMATIC PC Station
SIMATIC 300(1)
Slot Designation
SIMATIC S7-300, M7-300 and C7 modules (central rack)
Press F1 to get Help.


HW Config - SIMATIC 300(1)
Station Edit Insert PLC View Options Window Help
SIMATIC 300(1) (Configuration) -- vidu1
(0) UR
Find:
Profile: Standard
PROFIBUS DP
PROFIBUS-PA
PROFINET IO
SIMATIC 300
C7
CP-300
CPU-300
FM-300
Gateway
IM-300
M7-EXTENSION
PS-300
RACK-300
Rail
SM-300
SIMATIC 400
SIMATIC PC Based Control 300/400
SIMATIC PC Station
(0) UR
Slot Module Order number Firmware MPI a
6ES7 390-1???0-0AA0
Available in various lengths
Press F1 to get Help.
Chg


HW Config - SIMATIC 300(1)
Station Edit Insert PLC View Options Window Help
SIMATIC 300(1) (Configuration) -- vidu1
(0) UR
1 PS 307
2
3
4
5
6
7
Find:
Profile: Standard
PROFIBUS DP
PROFIBUS-PA
PROFINET IO
SIMATIC 300
C7
CP-300
CPU-300
FM-300
Gateway
IM-300
M7-EXTENSION
PS-300
PS 307 10A
PS 307 2A
PS 307 5A
RACK-300
Rail
SM-300
(0) UR
Slot Module Order number Firmware MPI a
1 PS 307 5A 6ES7 307-1EA00-0AA0
2
3
4
5
6ES7 307-1EA00-0AA0
Load supply voltage 120 / 230 VAC:24 VDC / 5 A
Press F1 to get Help.
Chg


HW Config - SIMATIC 300(1)
Station Edit Insert PLC View Options Window Help
SIMATIC 300(1) (Configuration) -- vidu1
(0) UR
1 PS 307
2 CPU 3
X2 DP
2.2 DI16/D
2.4 Count
3
4
Find:
Profile: Standard
CPU-300
CPU 312
CPU 312 IFM
CPU 312C
CPU 313
CPU 313C
CPU 313C-2 DP
6ES7 313-6CE00-0AB0
6ES7 313-6CE01-0AB0
6ES7 313-6CF03-0AB0
CPU 313C-2 PtP
CPU 314
CPU 314 IFM
CPU 314C-2 DP
CPU 314C-2 PtP
CPU 315
CPU 315-2 DP
CPU 315-2 PN/DP
(0) UR
Slot Module Order number Firmware MPI a
1 PS 307 5A 6ES7 307-1EA00-0AA0
2 CPU 313C-2 DP 6ES7 313-6CE00-0AB0 V1.0 2
X2 DP
2.2 DI16/DO16
2.4 Count
6ES7 313-6CE00-0AB0
32 KB work memory; 0.1ms/1000 instructions;
DI16/DO16 integrated; 3 pulse outputs (2.5 kHz);
3 channels counting and measuring incremental
Selecting the hardware
Chg

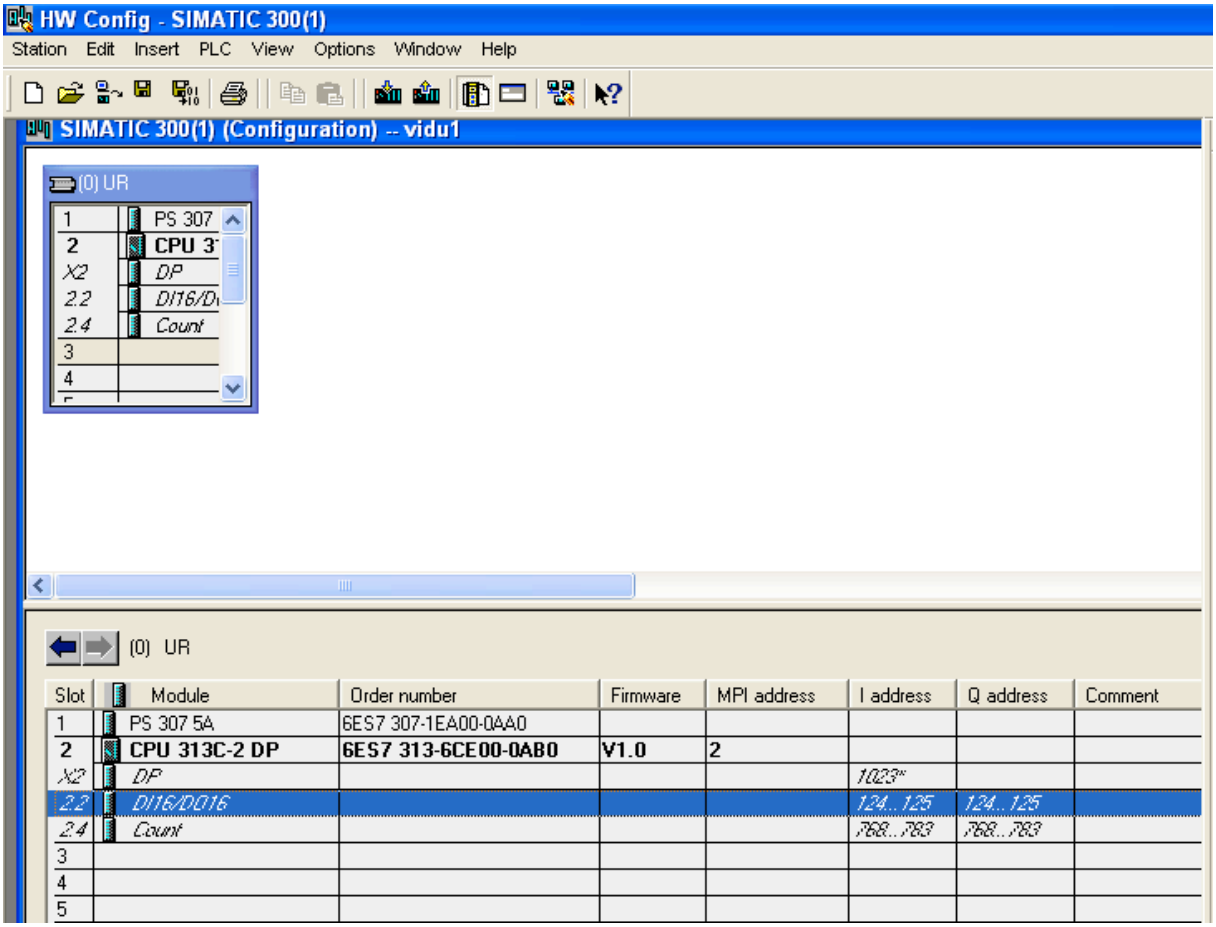


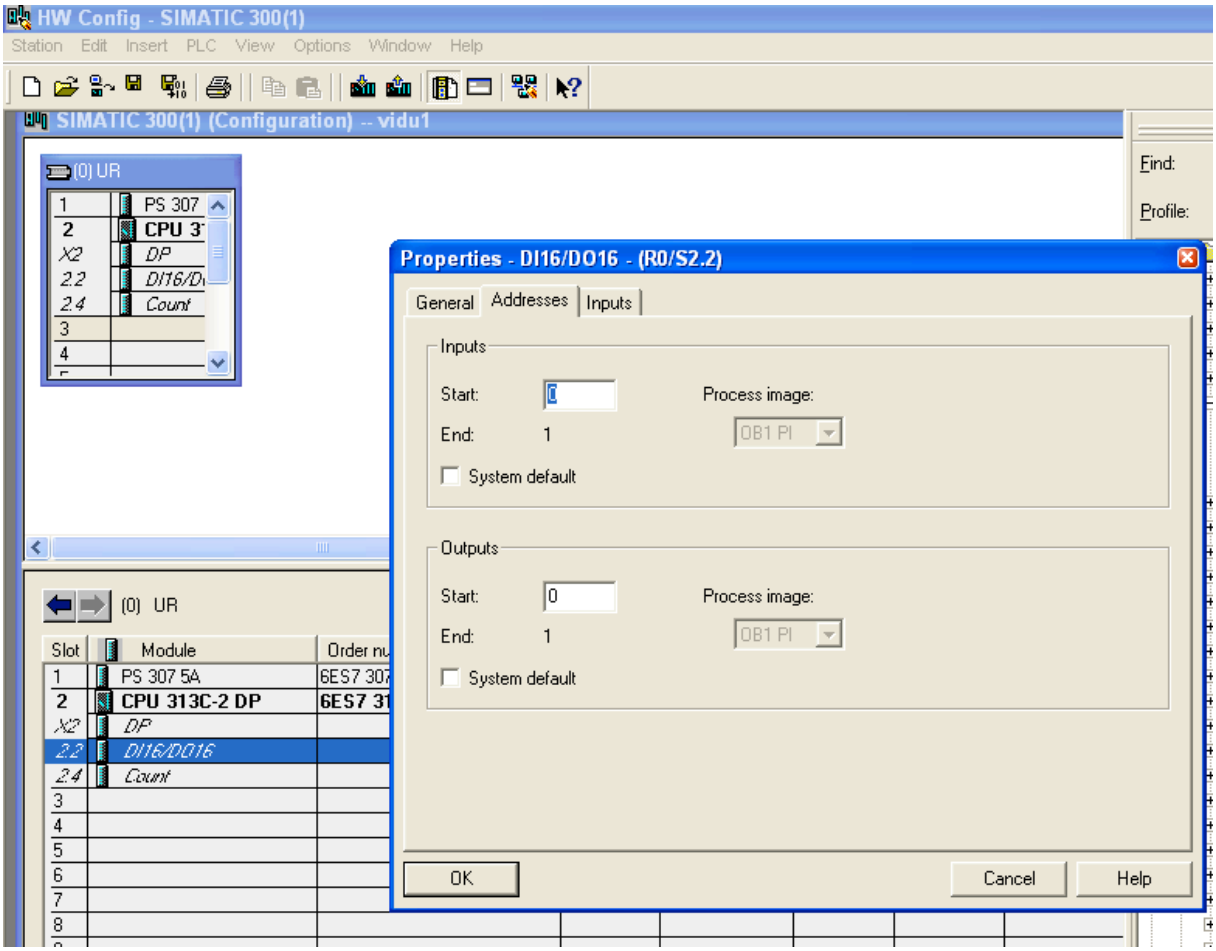
Khai báo tham số cho trạm

Chọn đầu vào, ra logic, khai báo

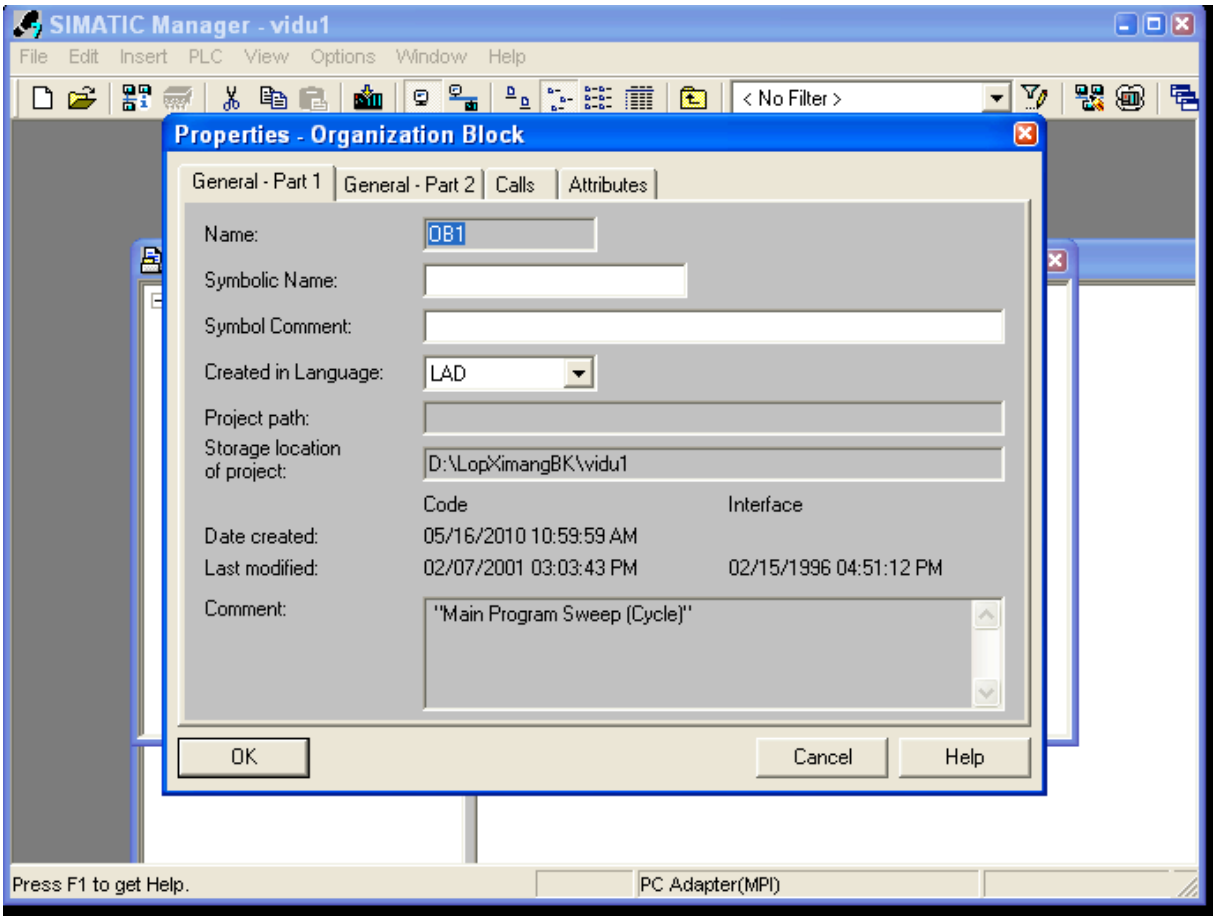
Chọn AI/AO, khai báo

Chọn Count,...


HW Config - SIMATIC 300(1)
Station Edit Insert PLC View Options Window Help
SIMATIC 300(1) (Configuration) -- vidu1
(0) UR
1 PS 307
2 CPU 3
X2 DP
2.2 DI16/D
2.4 Count
3
4
(0) UR
Slot Module Order number Firmware MPI address I address Q address Comment
1 PS 307 5A 6ES7 307-1EA00-0AA0
2 CPU 313C-2 DP 6ES7 313-6CE00-0AB0 V1.0 2
X2 DP 1023*
2.2 DI16/DO16 124...125 124...125
2.4 Count 768...783 768...783
3
4
5

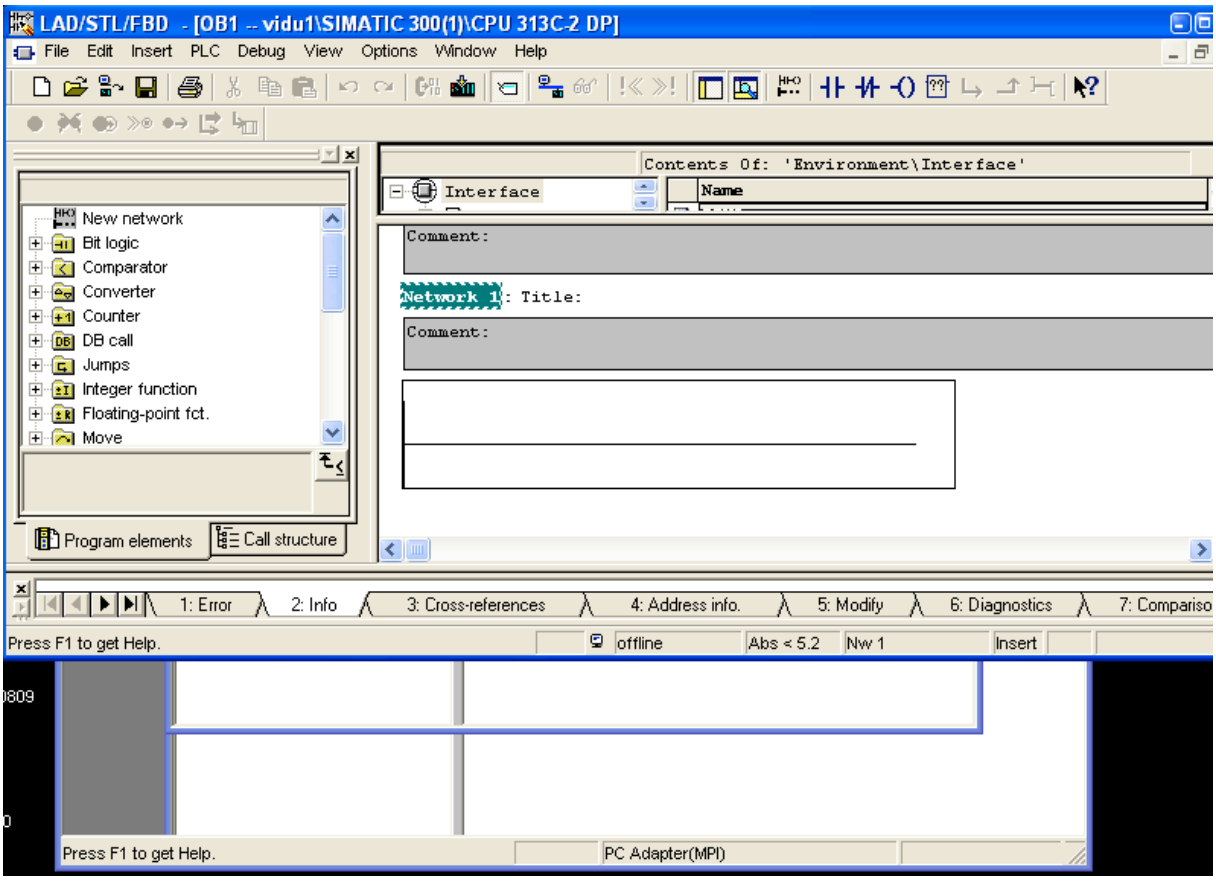

HW Config - SIMATIC 300(1)
Station Edit Insert PLC View Options Window Help
SIMATIC 300(1) (Configuration) -- vidu1
(0) UR
1 PS 307
2 CPU 3
X2 DP
2.2 DI16/D
2.4 Count
3
4
Find:
Profile:
Properties - DI16/DO16 - (R0/S2.2)
General Addresses Inputs
Inputs
Start: 0
End: 1
Process image: OB1 PI
System default
Outputs
Start: 0
End: 1
Process image: OB1 PI
System default
OK
Cancel
Help
(0) UR
Slot Module Order nu
1 PS 307 5A 6ES7 307
2 CPU 313C-2 DP 6ES7 31
X2 DP
2.2 DI16/DO16
2.4 Count
3
4
5
6
7
8

4. Lập trình PLC – OB1

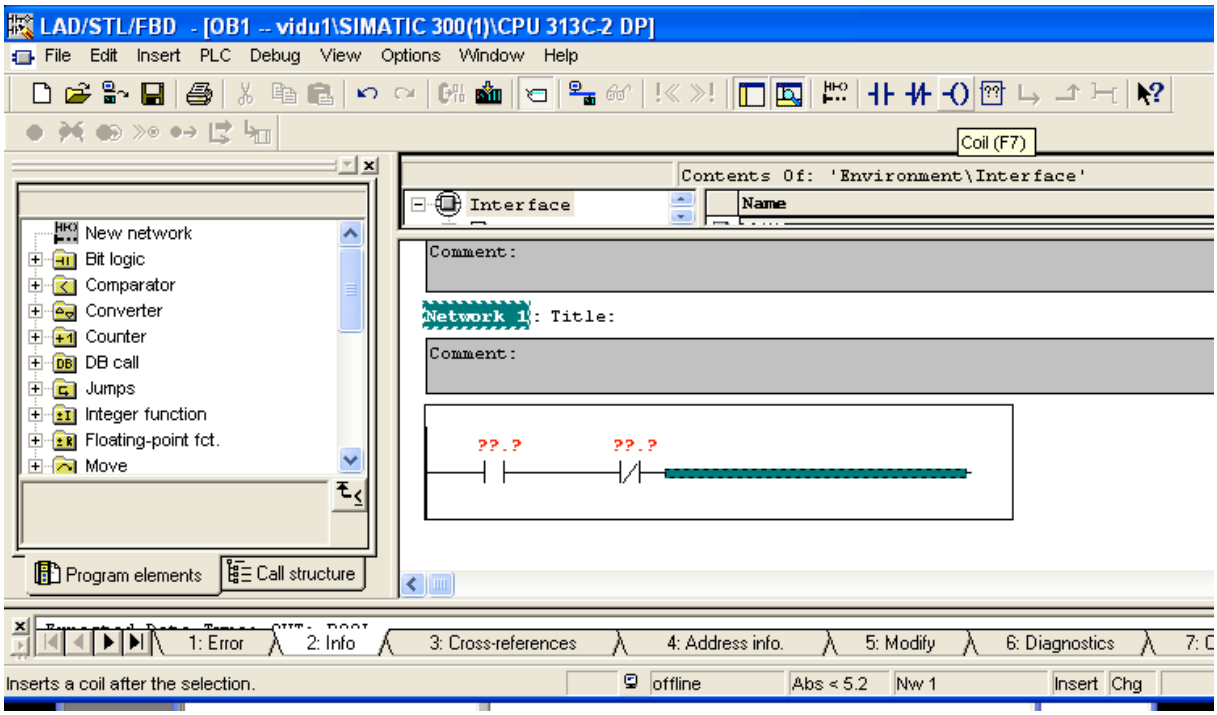


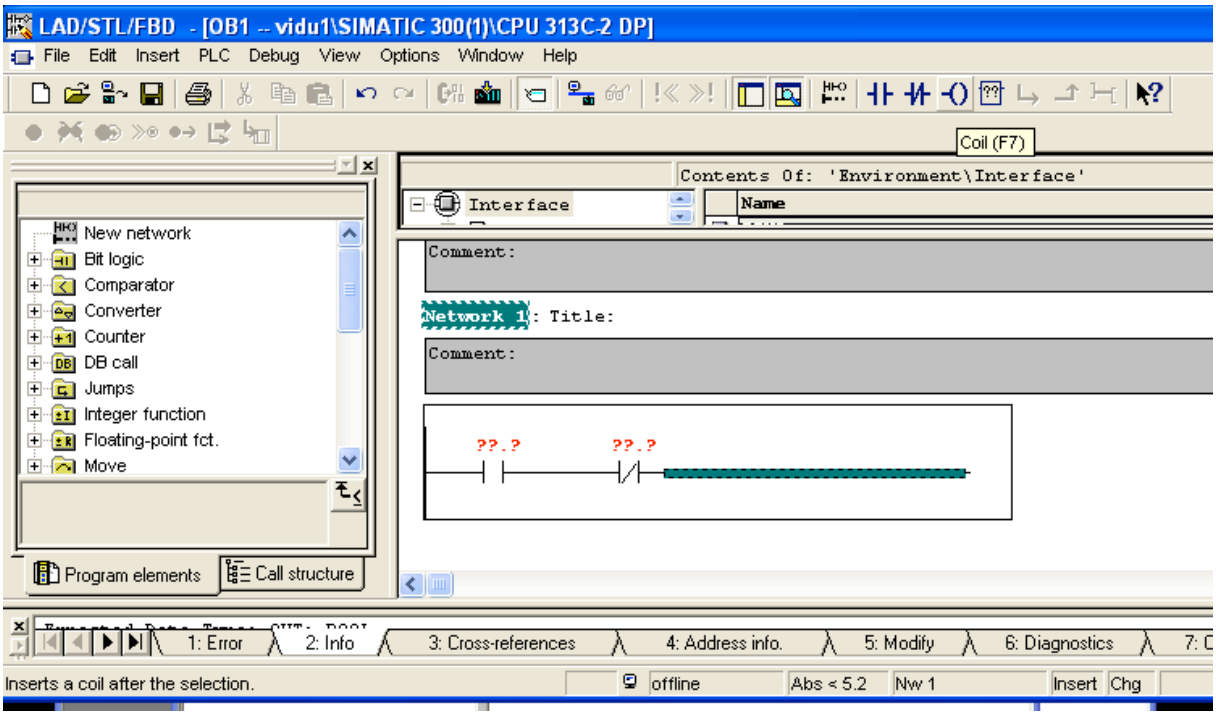
- Chọn Name OB1
- Language LAD

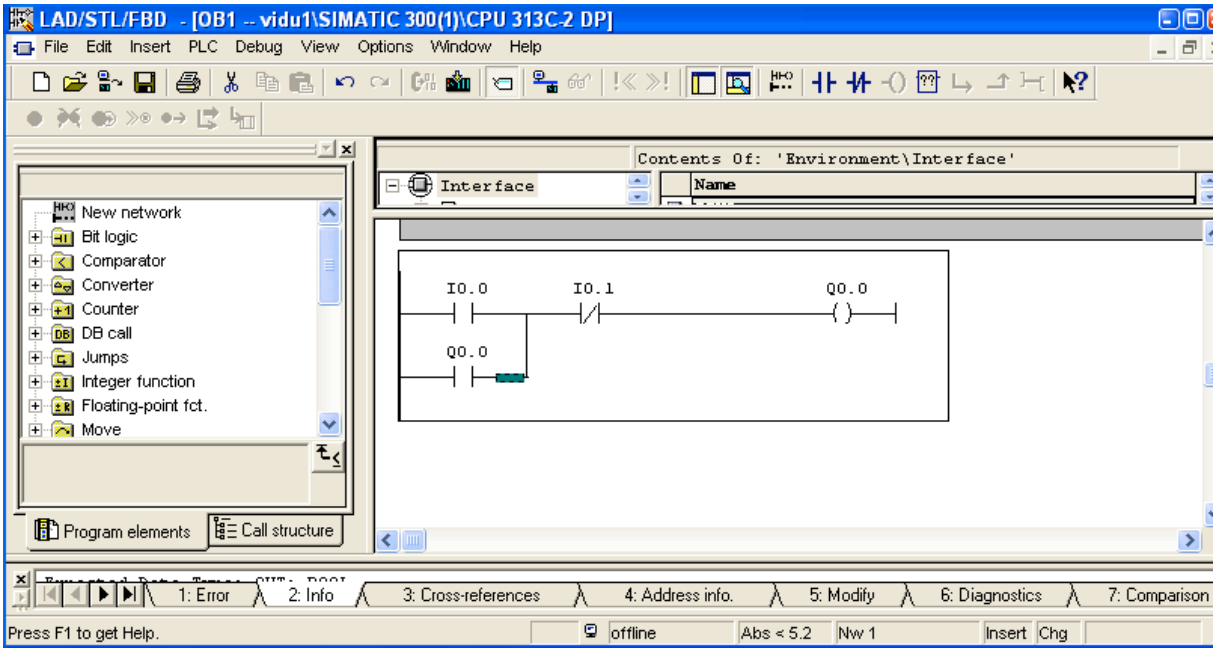
Màn hình lập trình



Lập trình bằng cách nhăp biểu tượng ⊣⊢ ⊣/⊢ —( ) sau đó nhấp ra màn hình, và khai báo

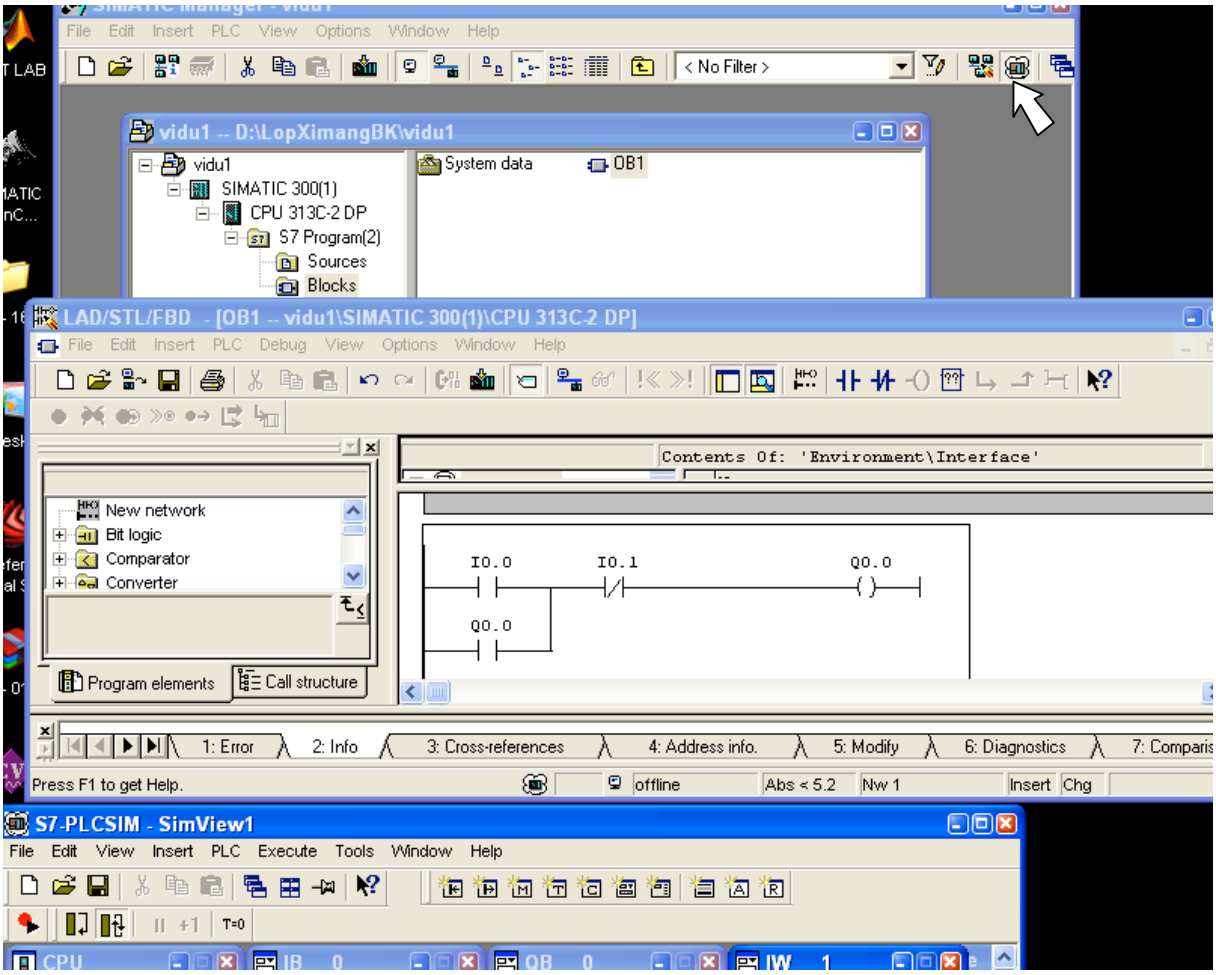



LAD/STL/FBD - [OB1 -- vidu1\SIMATIC 300(1)\CPU 313C-2 DP]
File Edit Insert PLC Debug View Options Window Help
Coil (F7)
Contents Of: 'Environment\Interface'
Interface
Name
New network
Bit logic
Comparator
Converter
Counter
DB call
Jumps
Integer function
Floating-point fct.
Move
Comment:
Network 1: Title:
Comment:
??.?
??.?
Program elements
Call structure
1: Error
2: Info
3: Cross-references
4: Address info.
5: Modify
6: Diagnostics
Inserts a coil after the selection.
offline
Abs < 5.2
Nw 1
Insert
Chg


LAD/STL/FBD - [OB1 -- vidu1\SIMATIC 300(1)\CPU 313C-2 DP]
File Edit Insert PLC Debug View Options Window Help
Contents Of: 'Environment\Interface'
Interface
Name
New network
Bit logic
Comparator
Converter
Counter
DB call
Jumps
Integer function
Floating-point fct.
Move
I0.0
I0.1
Q0.0
Q0.0
Program elements
Call structure
1: Error
2: Info
3: Cross-references
4: Address info.
5: Modify
6: Diagnostics
7: Comparison
Press F1 to get Help.
offline
Abs < 5.2
Nw 1
Insert
Chg

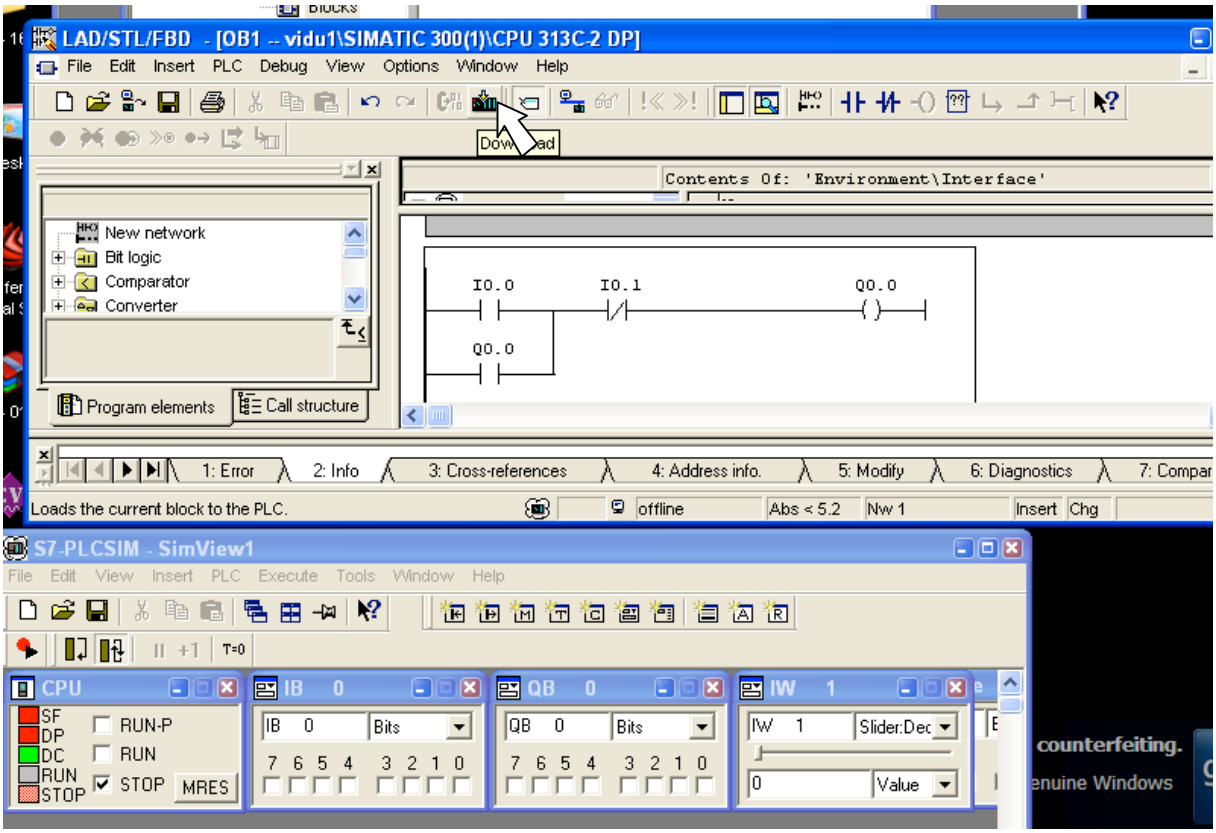
6. Chạy chương trinh mô phỏng : PLC-SIM

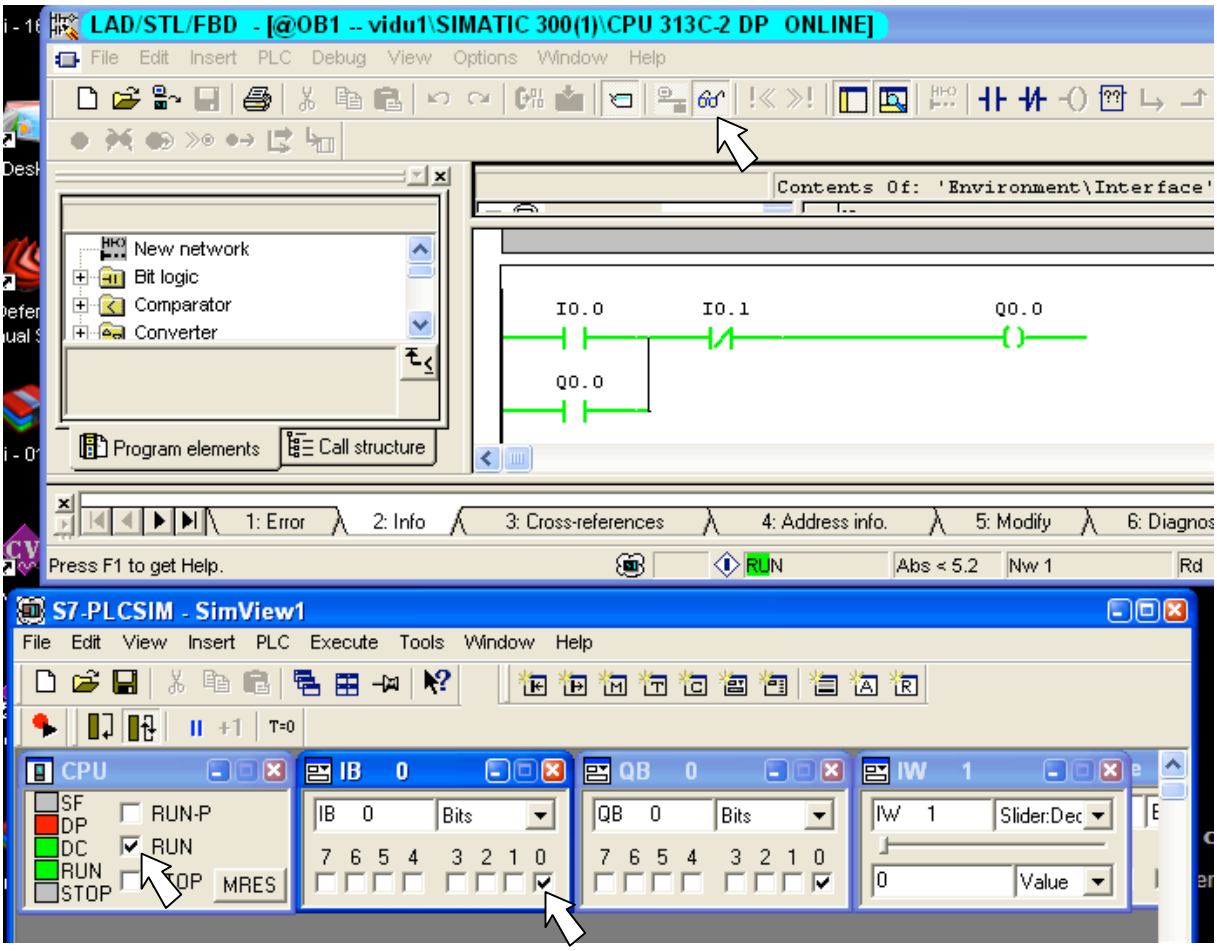
Nhấp biểu tượng PLC SIM trên thanh công cụ để mở ra cửa sổ S7 PLC SIM- SimView



7. Đồ chương trình xuống PLC SIM

Nhấp biểu tượng Dowload đổ chương trình xuống PLC SIM



8. Chạy mô phỏng xem kết quả

- Chuyển PLC SIM lên chế độ RUN
- Nhấp biểu tượng Monitoring
- Đưa tín hiệu vào PLC SIM (IB 0.0, IB 0.1,...)
- Xem kết quả Trên đầu ra PLC SIM (QB0.0, QB0.1,...) và xem trên chương trình OB1.