

ProfiNet

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- Overview

Overview

system requirements

CP1616

configuration as controller

configuration as device

configuration on robot side

Example of installation and configuration

For using the new fieldbus ProfiNet you need the following system components

- **KRC Edition 2005**
- **Systemsoftware V 5.4.x or V 5.5.x**

ProfiNet is a ethernet based fieldbus

Device types:

Controller: is a control, which superordinate controls all components of system.

Device: is field device, which is controlled by a controller. A device comprises of several modules and sub-modules. A devices can contain several Controllers (Masters)

A physical device, such as the Robot Control can be controller and/or device. The project planning of communication devices take place exclusively at the controller side.

A project planning can be created with the folling programs and loaded on the contructions groups:

- NCM(Siemens) till firmware 2.0
- Step 7 (siemens) starting from firmware 2.1

ProfiNet components in switch cabinet

- Siemens CP1616 in PC

The PCI-card CP 1616 has the following properties:

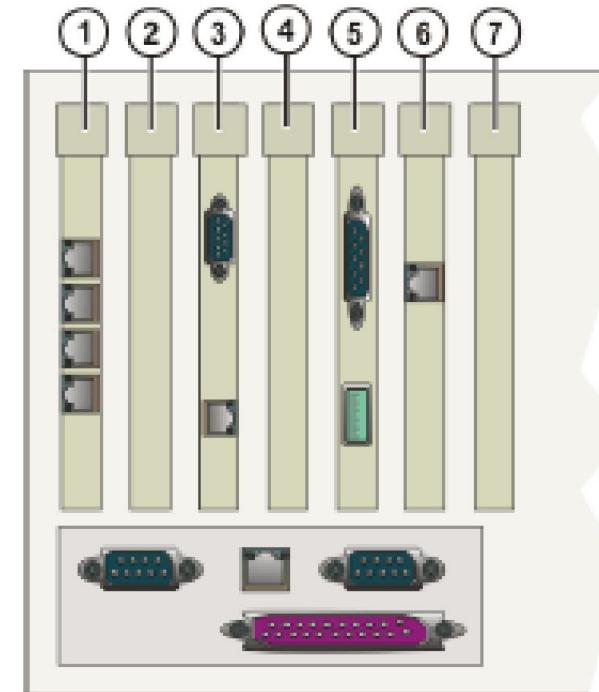
- can be configured and parameterized via the network
- up to 256 devices
- Connections are designed for 10BASE-T and 100BASE-TX
- Data transmission speeds of 10 and 100 Mbit/s in full/semi-duplex mode are supported
- Operation of the CP1616 as Controller and/or Device
- Project planning with NCM 5.4 or Step 7 Software
- Use of acyclic channels
- Use of Profinet IO Communication
- Support of shared devices
- 4 RJ45-connectors for connecting terminals or other network components.
- Integrated 4-Port-Real-Time-Switch.



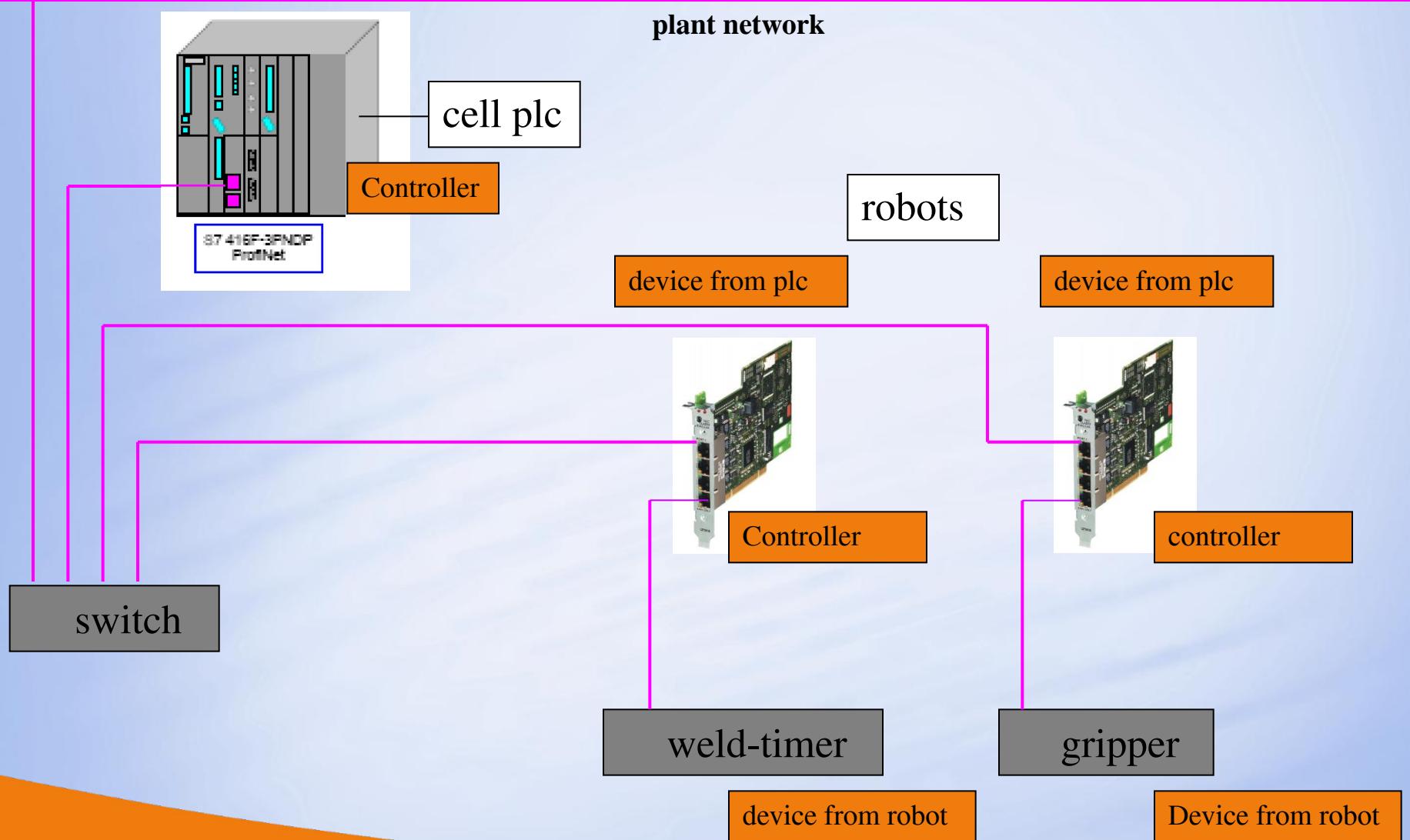
placement for CP1616 in PC



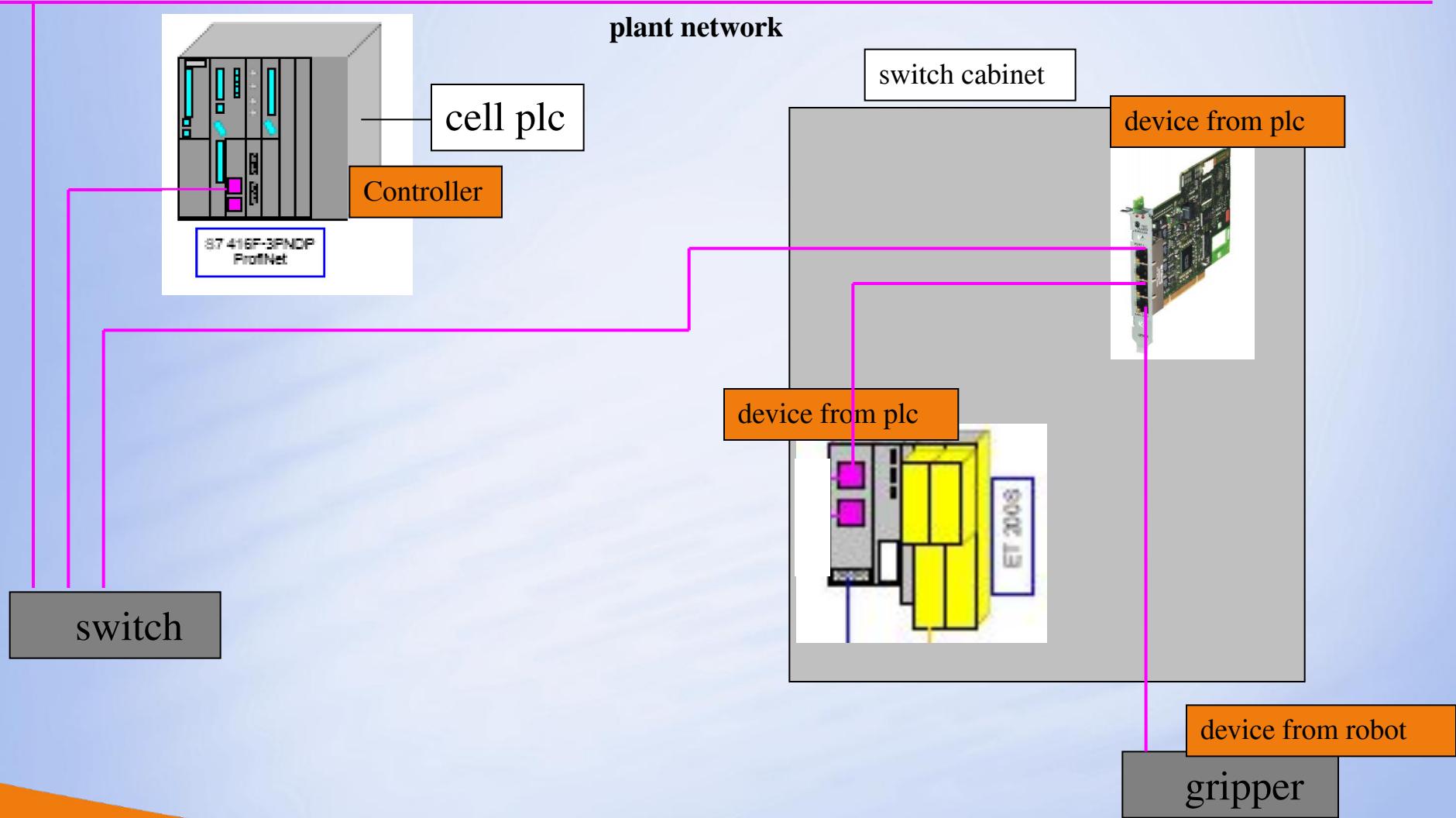
1	PCI CP1616-card ProiNet
2	free
3	KVGA-card
4	DSE-IBS-C33 Aux-card (option)
5	MFC3-card
6	Networkcard (3COM)
7	free



standard assembly in a roboter-cell



standard BMW-switch cabinet



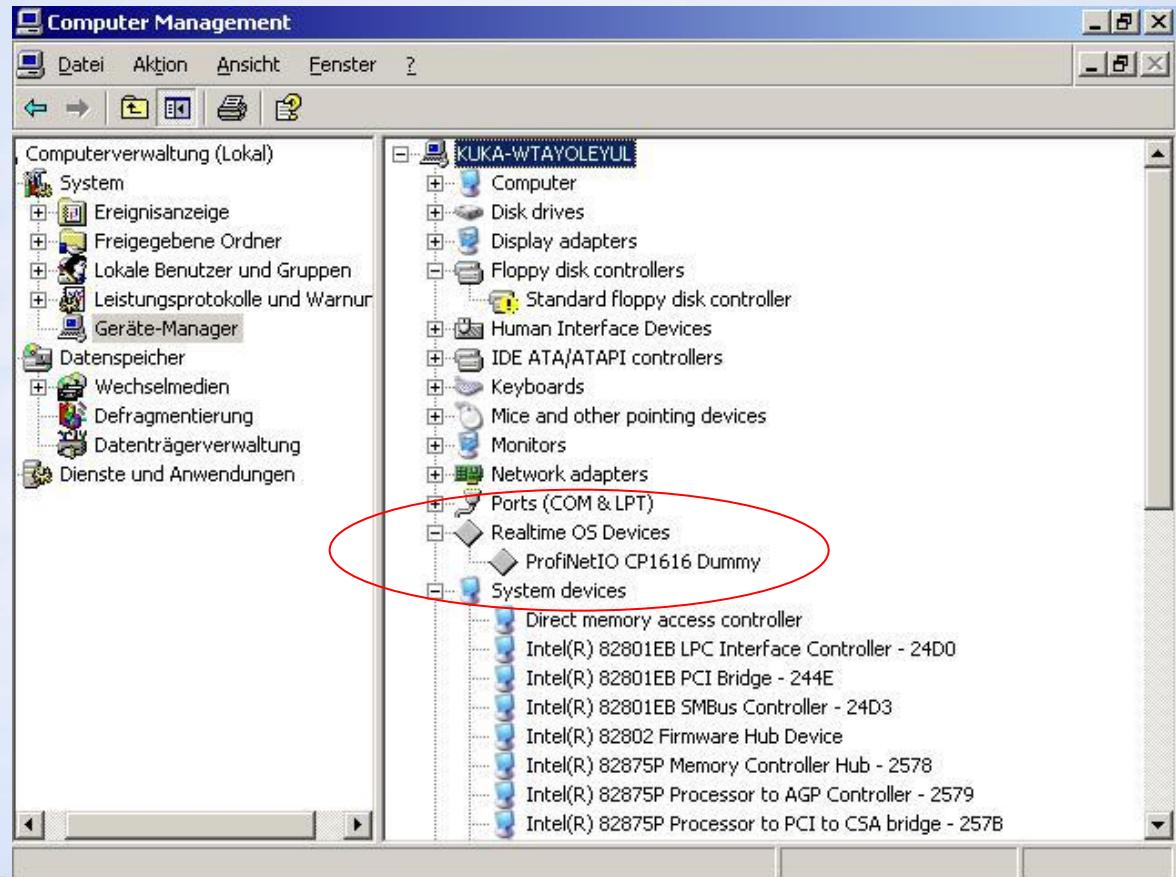
- shutdown Pc
- plug in CP1616
- start pc and stop startup in windows
- start setup.exe

The setup install all components. Drivers for windows and
for VxWorks.

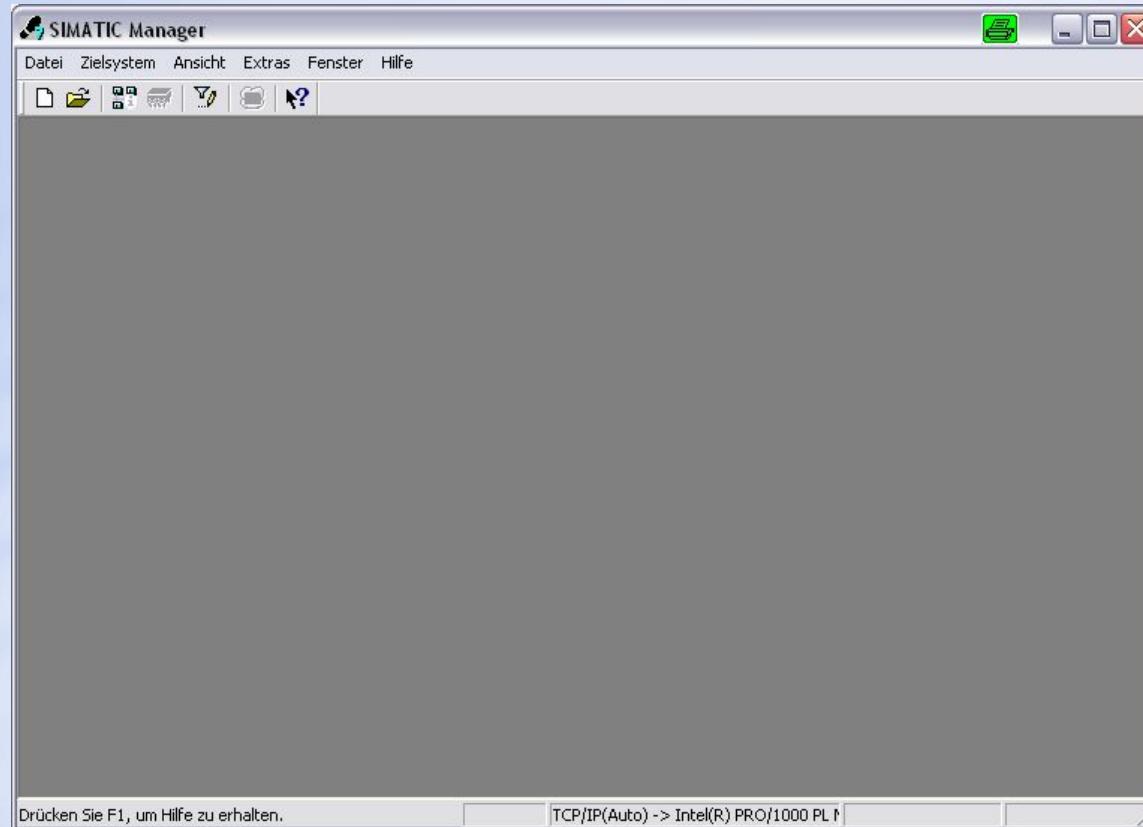
Installation from ProfiNet



The setup installed a dummy driver for windows. The driver make the CP1616 unvisible for windows.



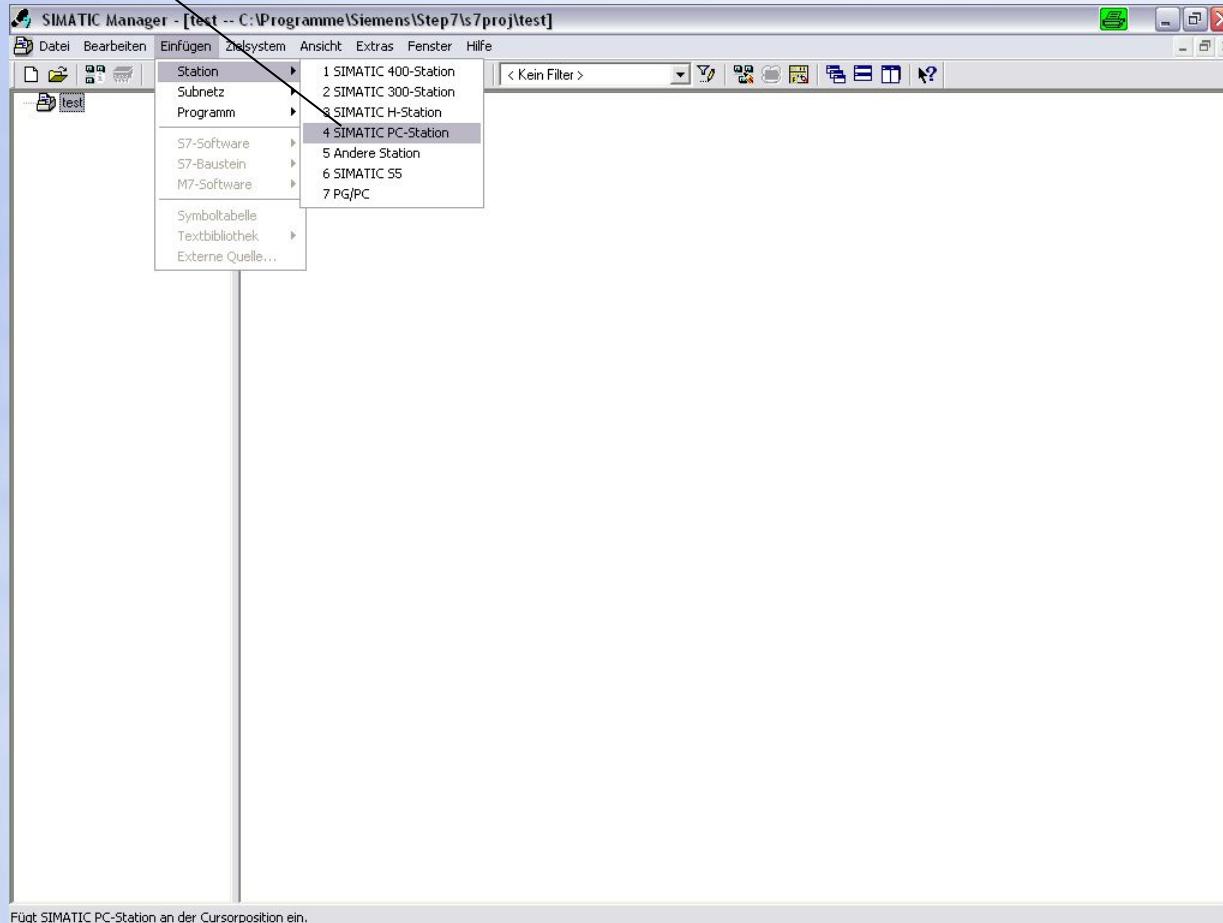
configuration roboter as controller in Step7/NCM-Manager



configuration roboter as controller in Step7/NCM-Manager



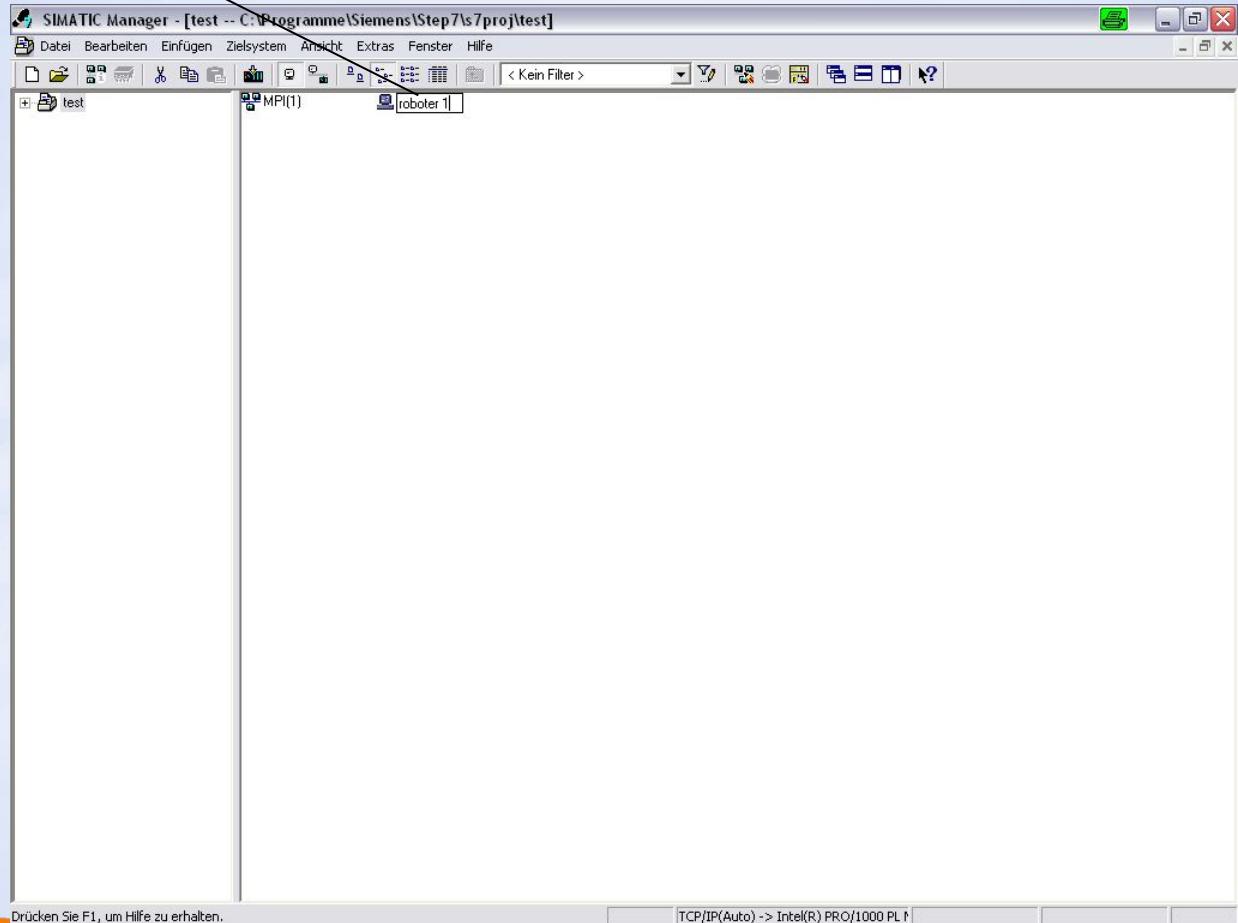
insert PC-station



configuration roboter as controller in Step7/NCM-Manager



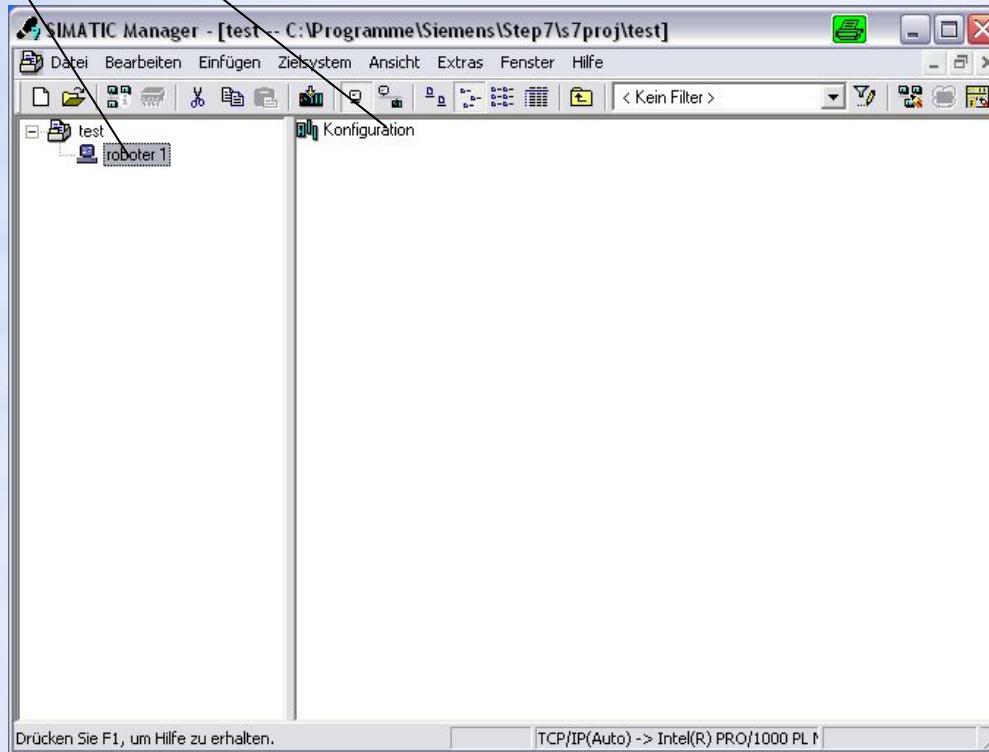
Rename station name



configuration roboter as controller in Step7/NCM-Manager



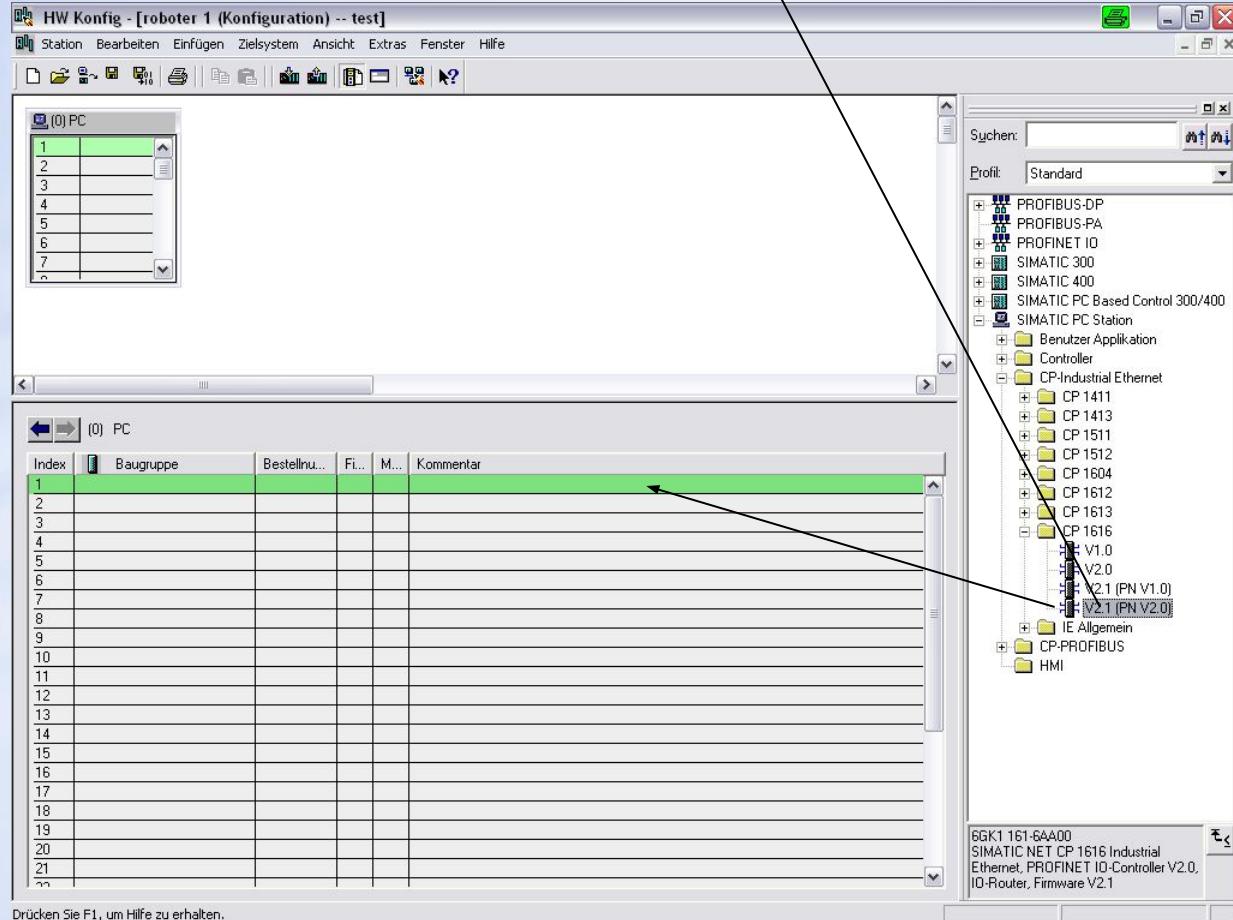
Open station on left side and make double-click on Configuration



configuration roboter as controller in Step7/NCM-Manager



Select CP1616-V2.1 and drop it into slot1 from pc-station

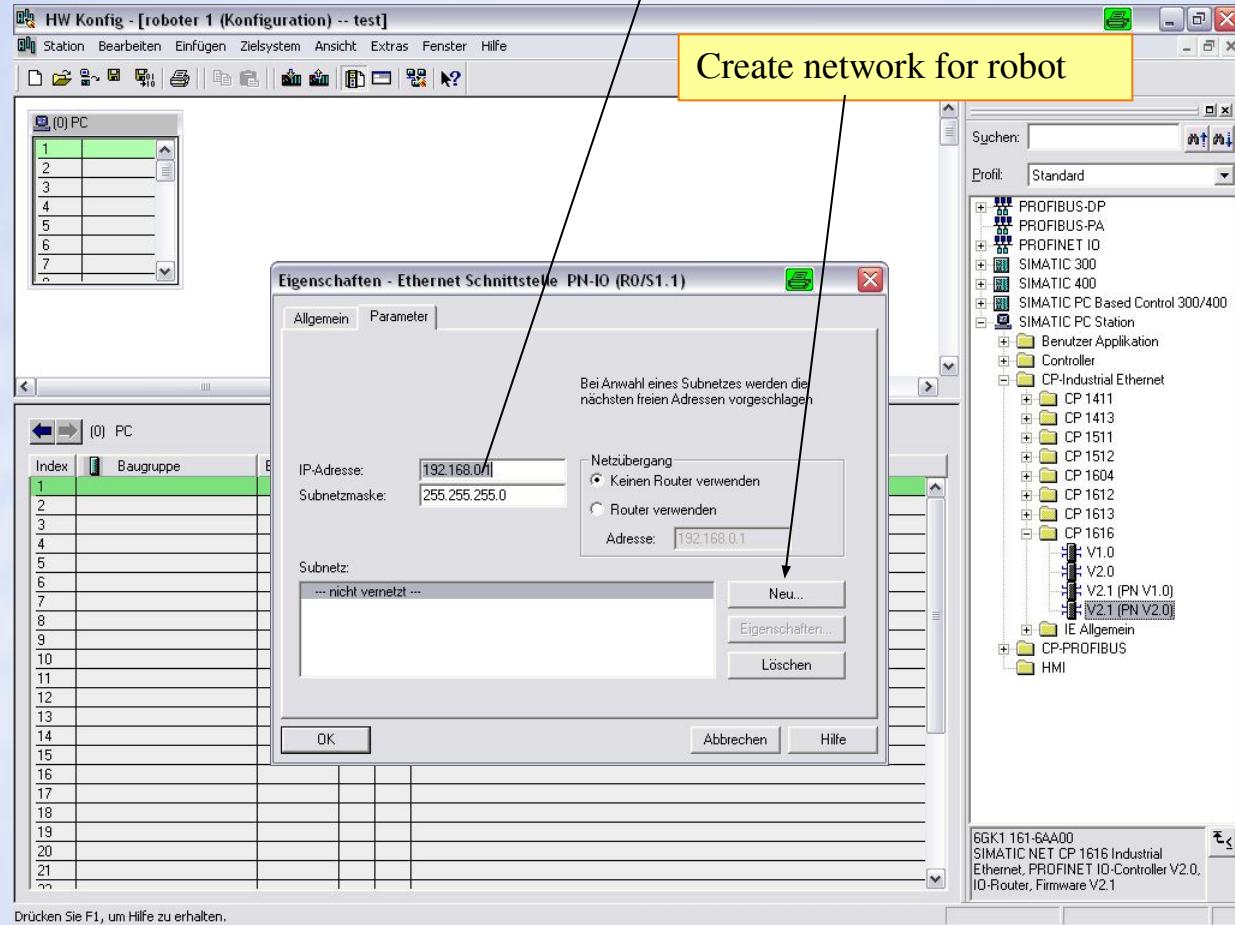


configuration roboter as controller in Step7/NCM-Manager



define ip adress for the cp1616

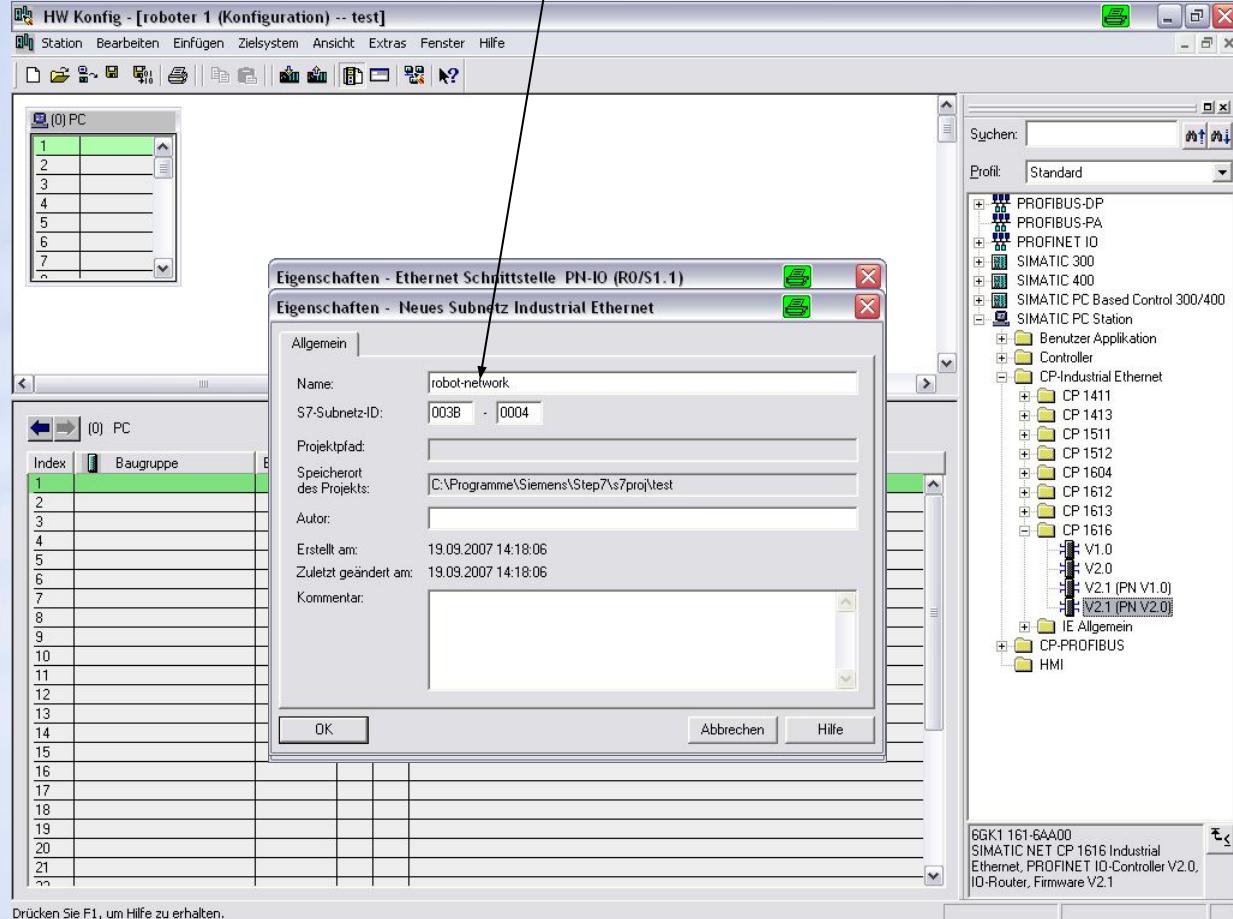
Create network for robot



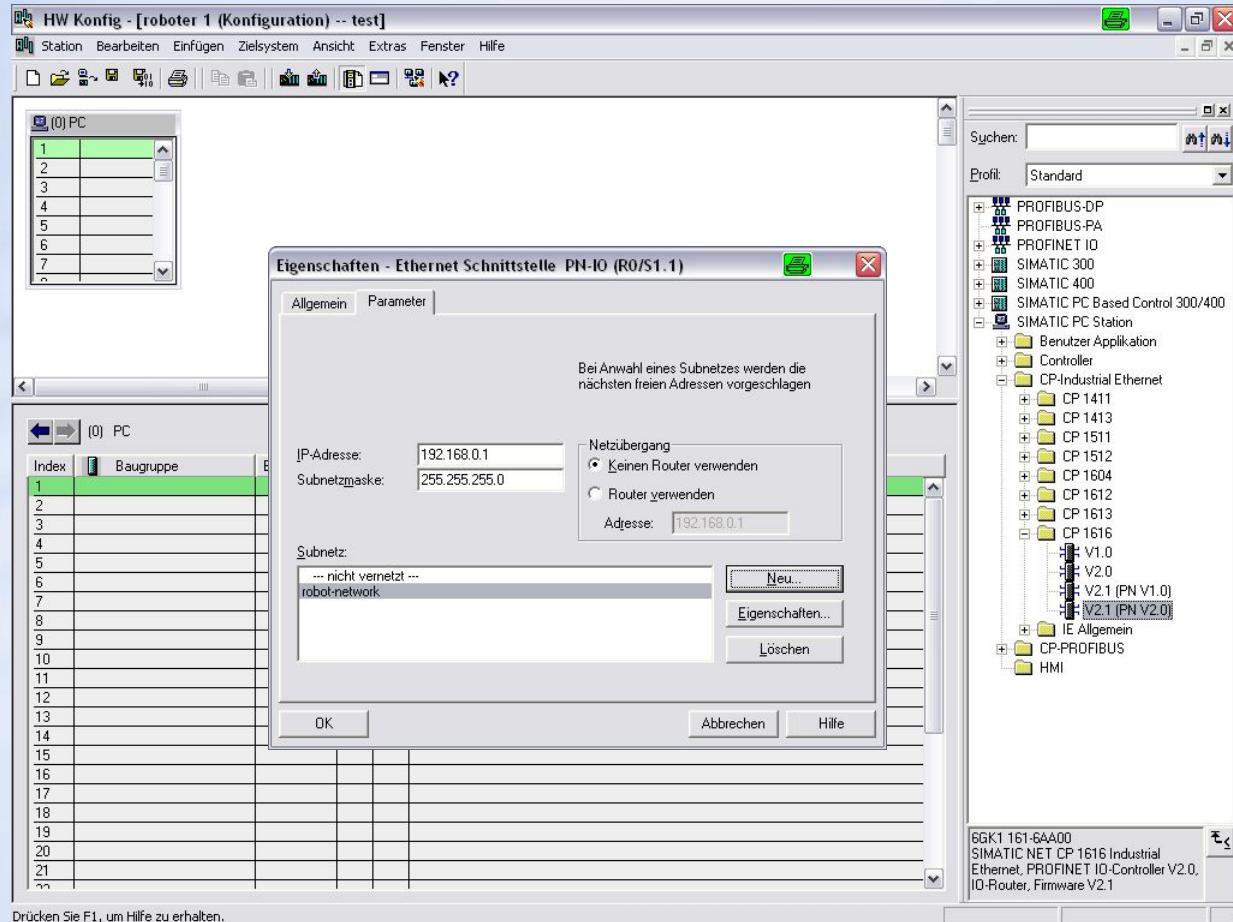
configuration roboter as controller in Step7/NCM-Manager



create name for profiNet network



configuration roboter as controller in Step7/NCM-Manager

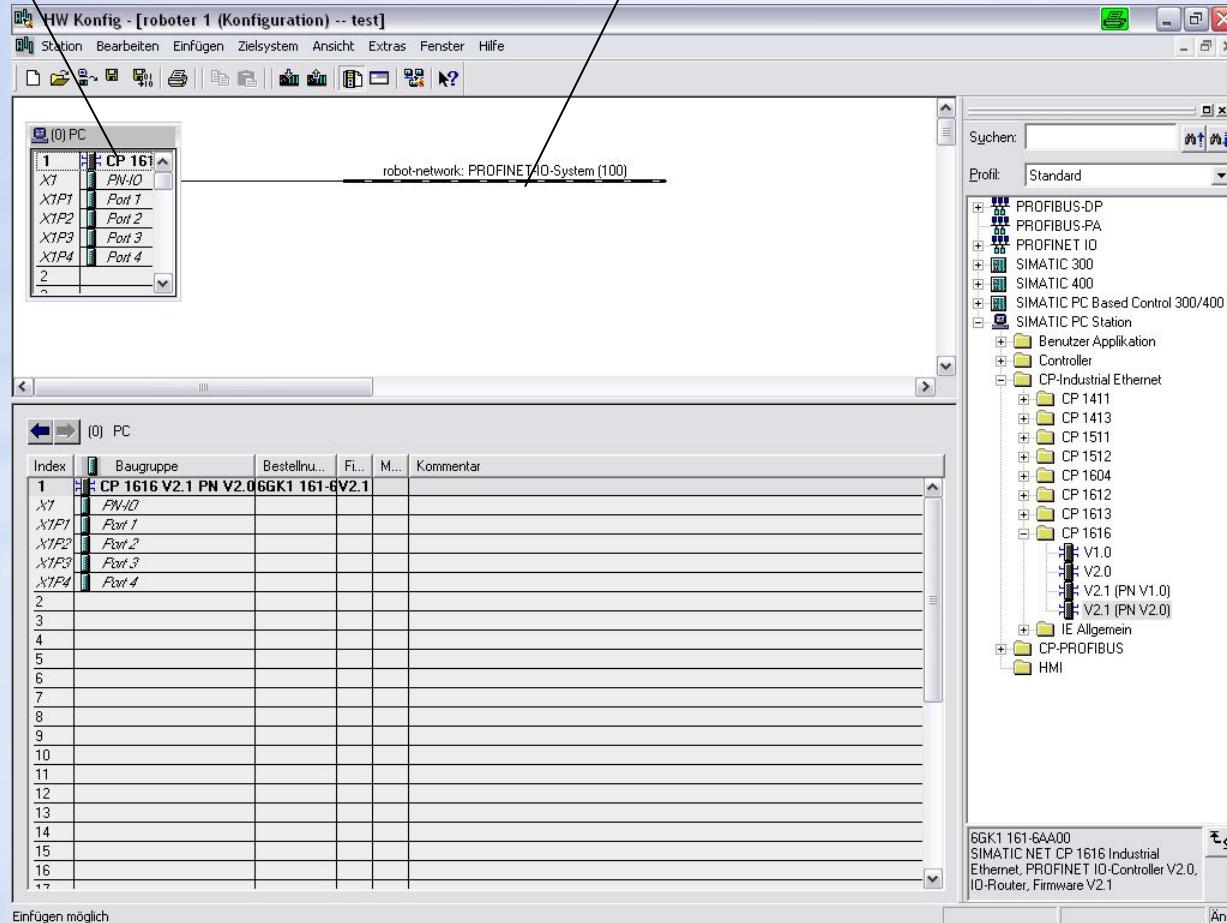


configuration roboter as controller in Step7/NCM-Manager



CP1616 with ports

Robot network

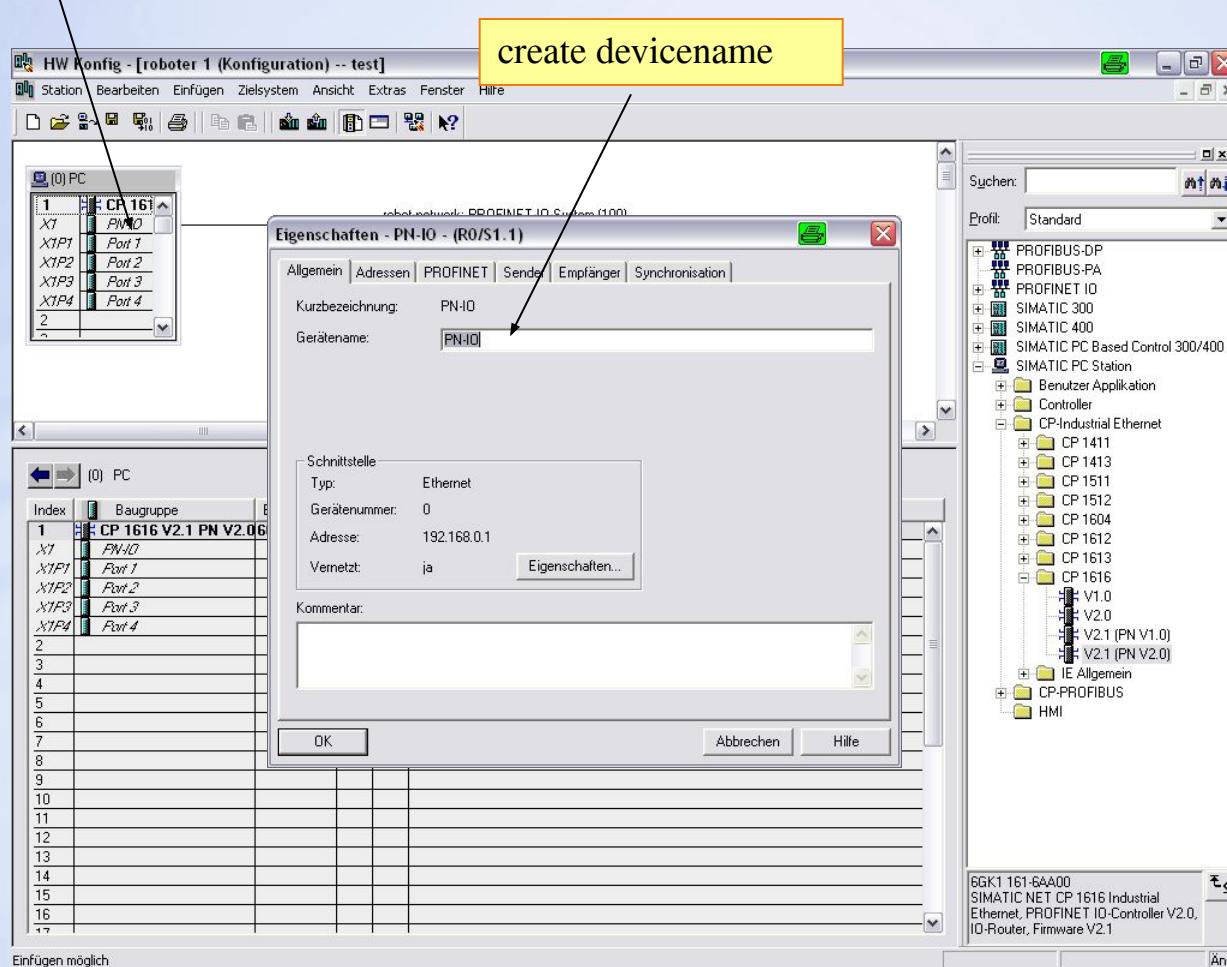


configuration roboter as controller in Step7/NCM-Manager



Make double-click on PN-IO

create devicename



very important

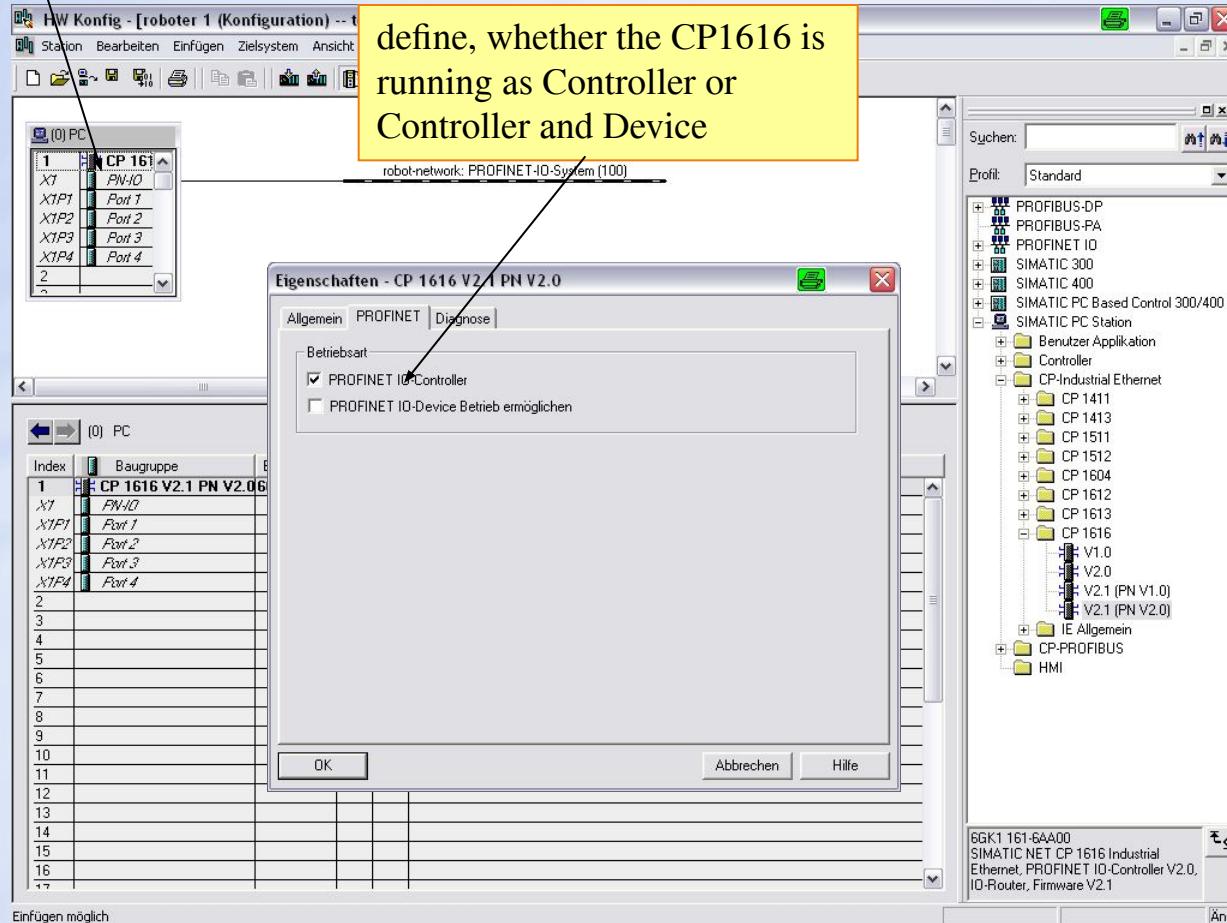
For all devices on bus you must define a devicename. The devicename must be unique. The devicename is to define in the configuration and online over the network, directly on the SM-card on the profiNet-device.

The devicename must be the same in the configuration and on the SM-card.

configuration roboter as controller in Step7/NCM-Manager



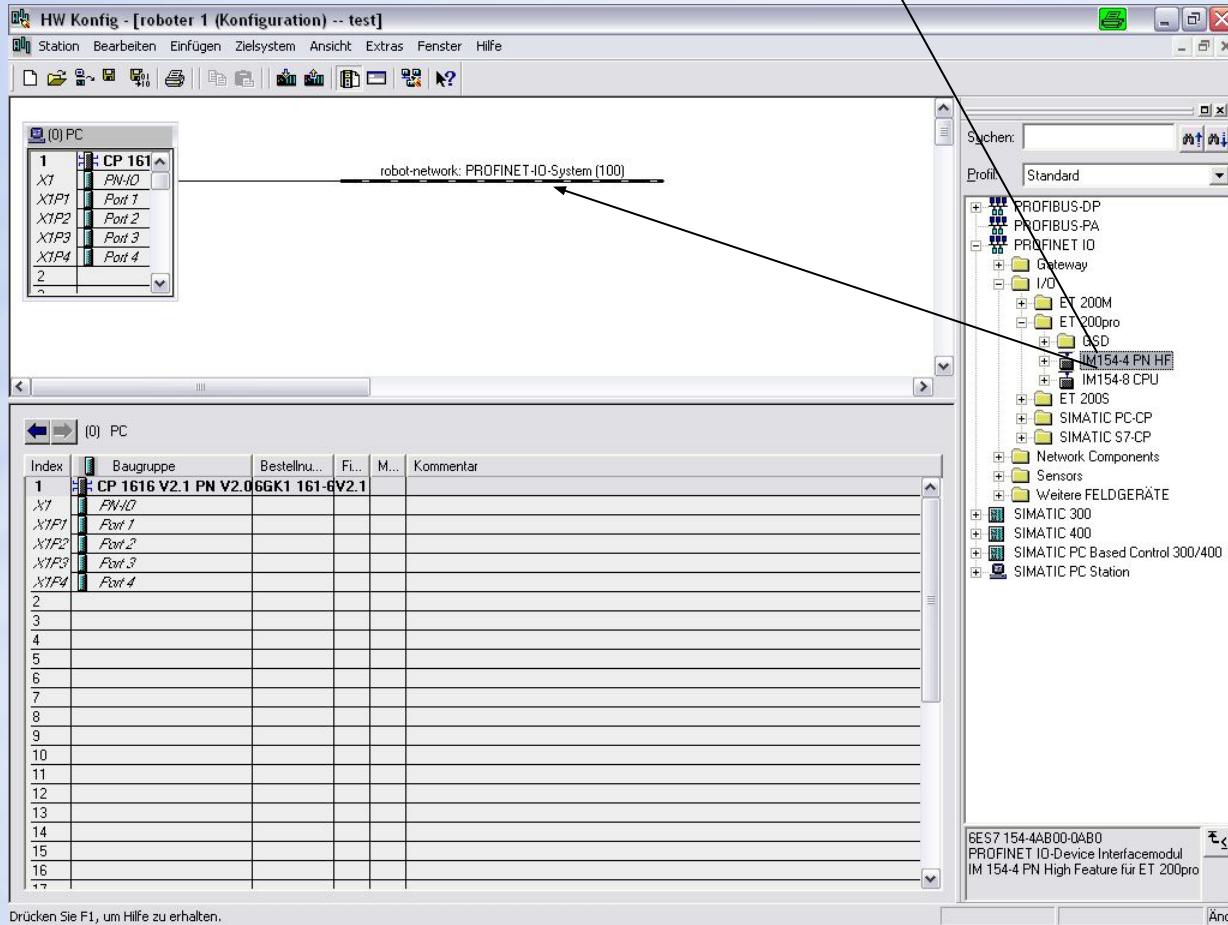
Make double-click on Slot 1



configuration roboter as controller in Step7/NCM-Manager



add IO-device to
robot-network

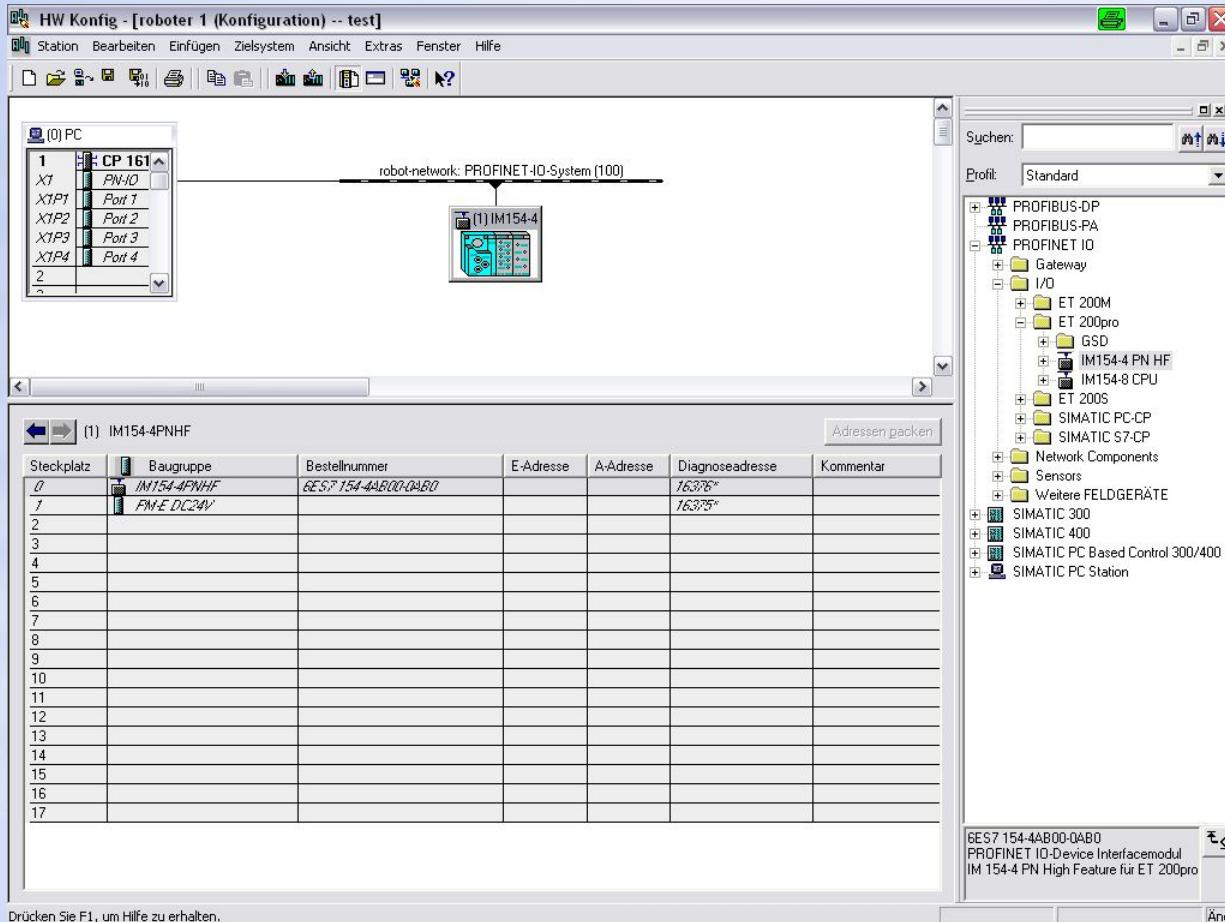


Drücken Sie F1, um Hilfe zu erhalten.

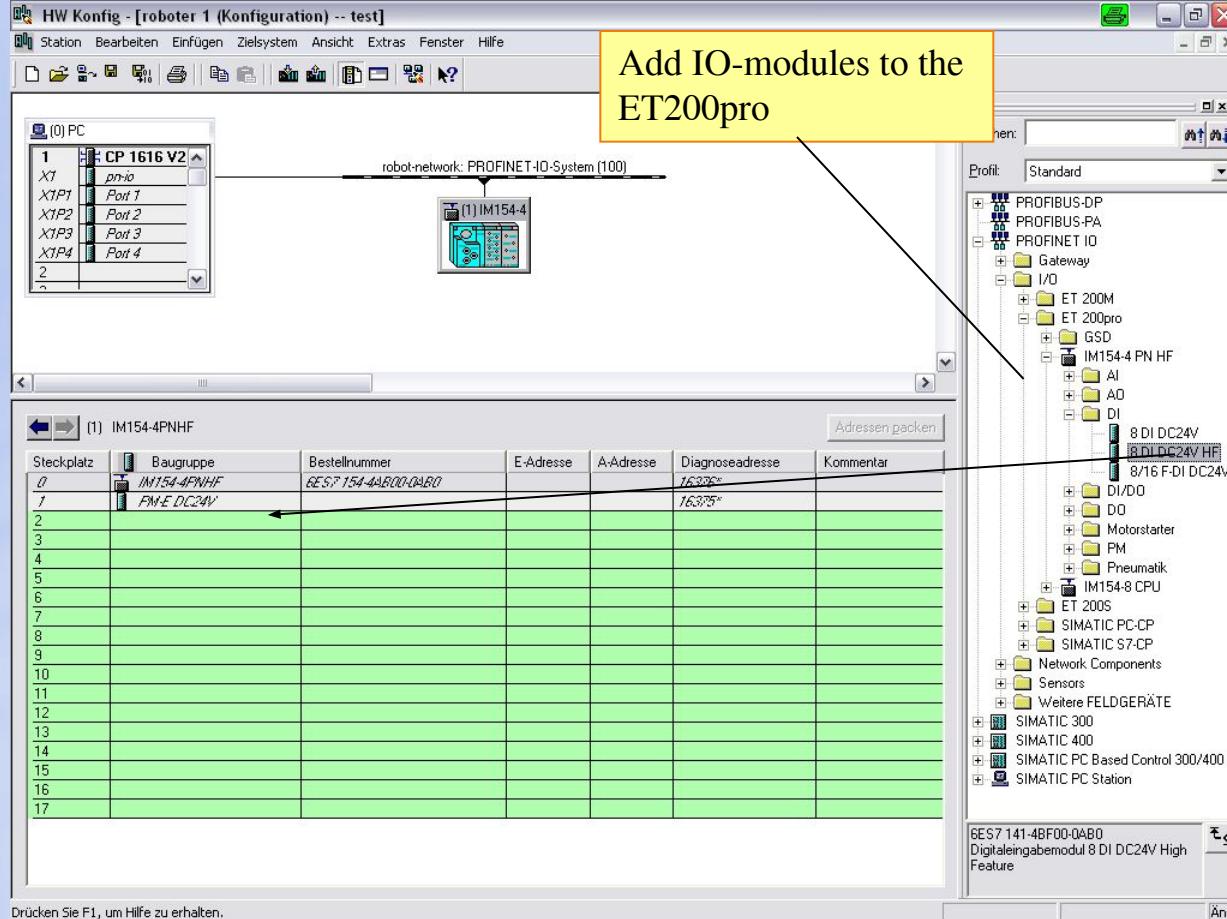
configuration roboter as controller in Step7/NCM-Manager



add IO-device to
robot-network



configuration roboter as controller in Step7/NCM-Manager



configuration roboter as controller in Step7/NCM-Manager



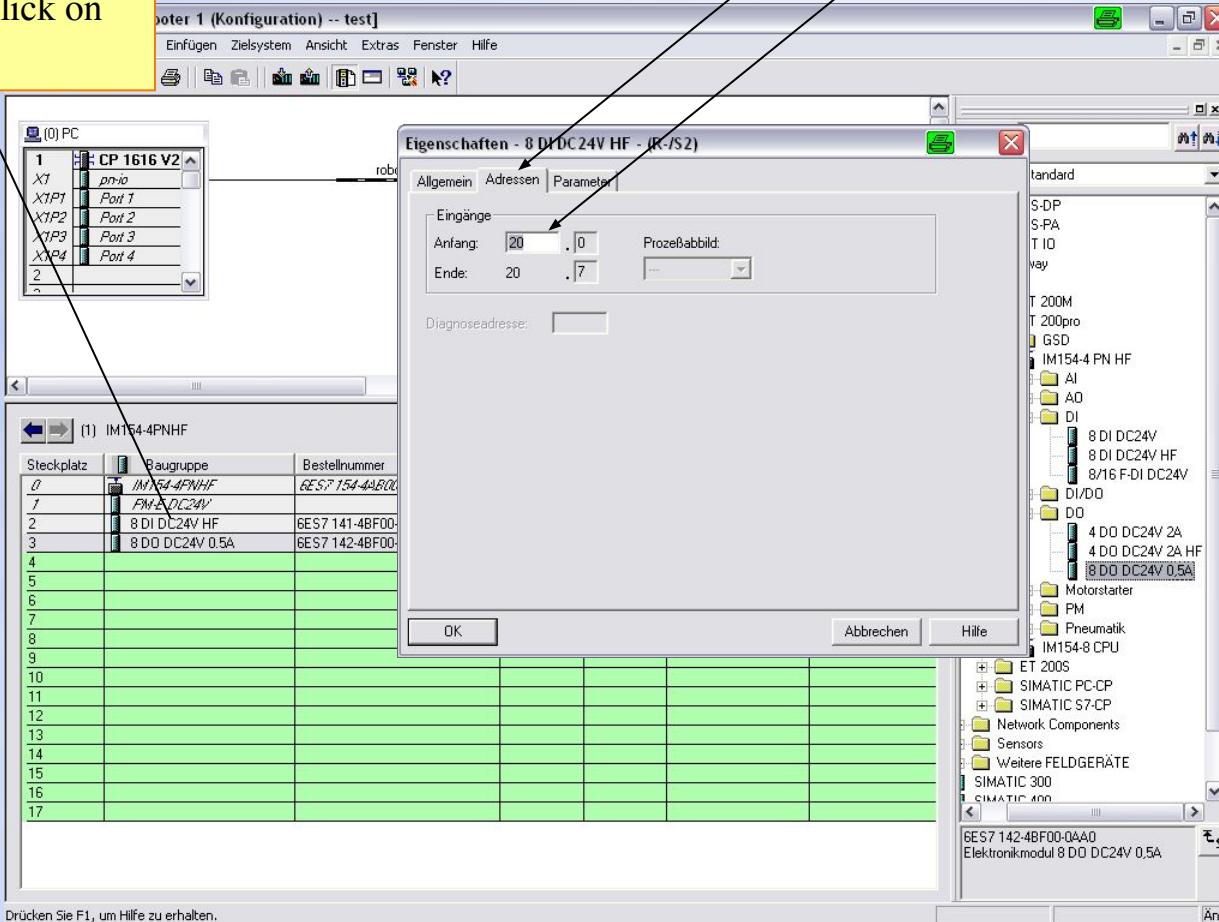
define IO-adress of the new modules

make double-click on the modul

Enter the new...

Select adress tab

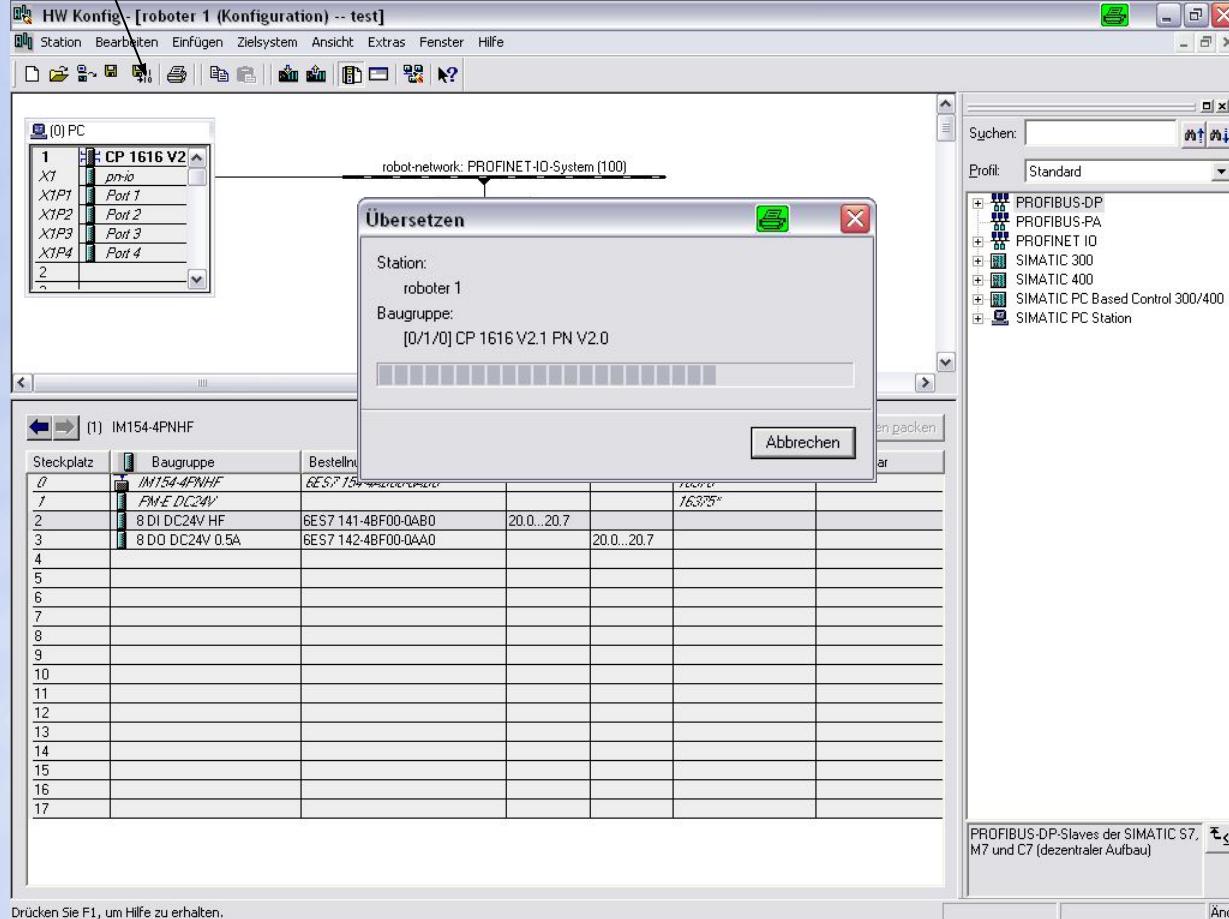
modul



configuration roboter as controller in Step7/NCM-Manager



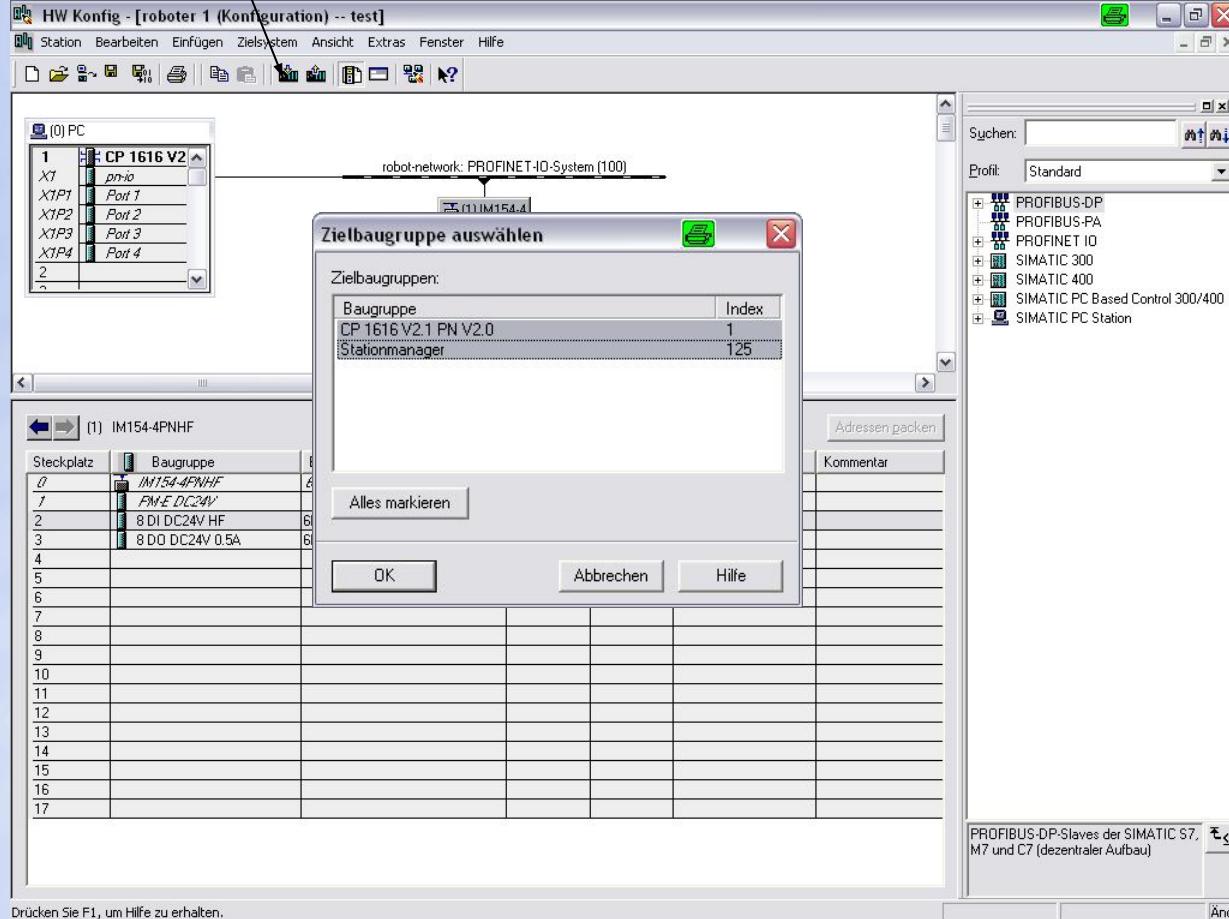
Save und compile the configuration at the end.



configuration roboter as controller in Step7/NCM-Manager

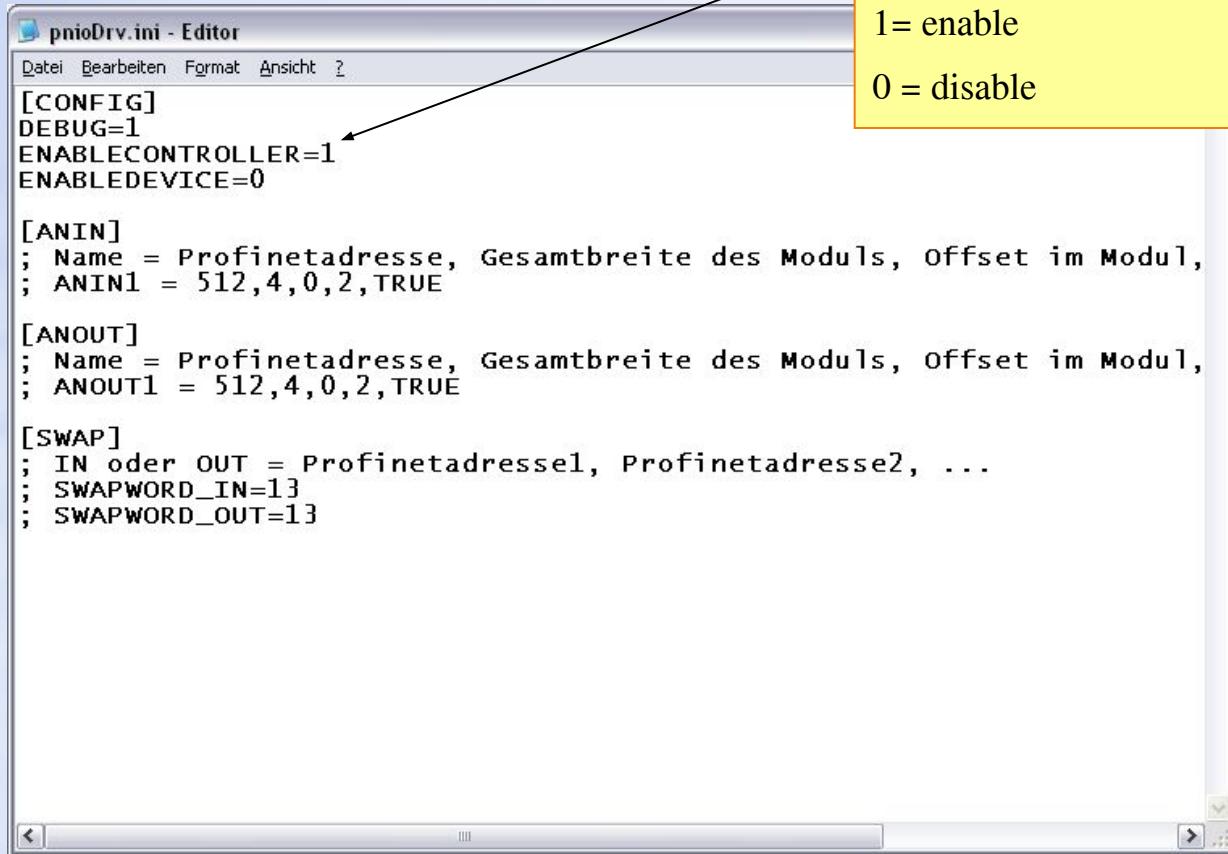


Send configuration to cp1616



Configuration on robot

PnioDrv.ini (C:\KRC\Roboter\Ini\PnioDrv.ini)



```

pnioDrv.ini - Editor
Datei  Bearbeiten  Format  Ansicht  ?
[CONFIG]
DEBUG=1
ENABLECONTROLLER=1
ENABLEDEVICE=0

[ANIN]
; Name = Profinetadresse, Gesamtbreite des Moduls, offset im Modul,
; ANIN1 = 512,4,0,2,TRUE

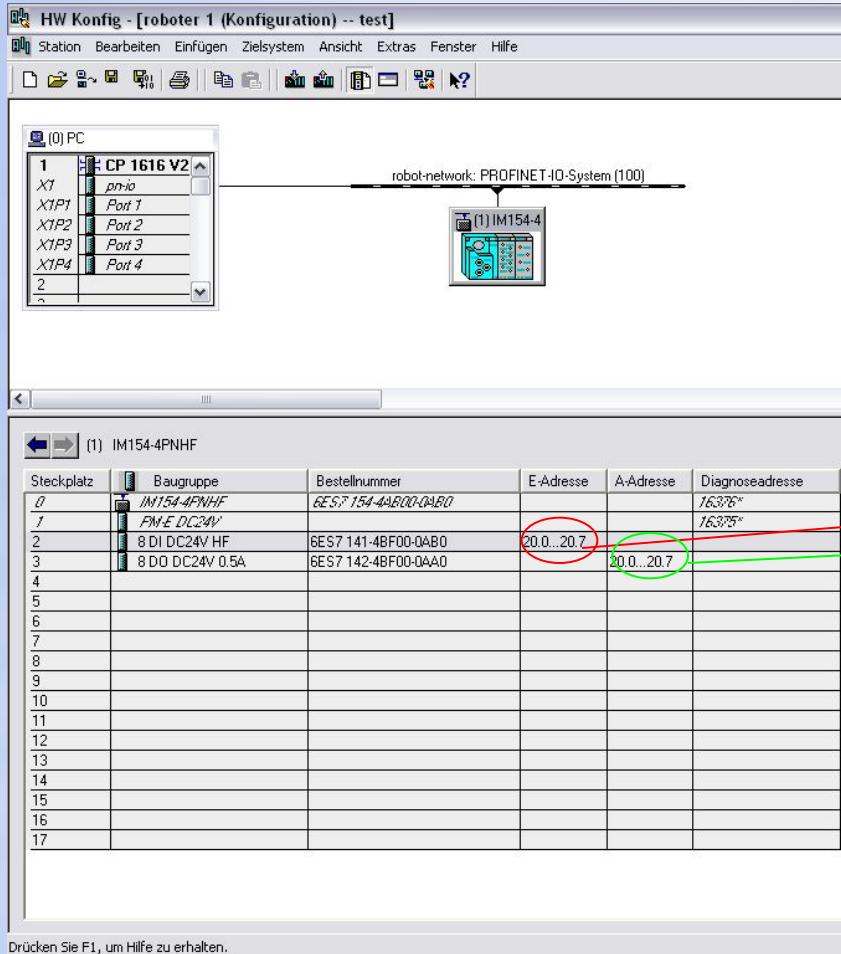
[ANOUT]
; Name = Profinetadresse, Gesamtbreite des Moduls, offset im Modul,
; ANOUT1 = 512,4,0,2,TRUE

[SWAP]
; IN oder OUT = Profinetadresse1, Profinetadresse2, ...
; SWAPWORD_IN=13
; SWAPWORD_OUT=13

```

Activate the requested mode
1 = enable
0 = disable

Configuration on robot – IOSYS.INI



iowsy.ini - Editor

Datei Bearbeiten Format Ansicht ?

```
;=====
; IOSYS.INI - Configuration file
;=====
; For configuration help go to
;=====
```

[CONFIG]
VERSION=2.00

[DRIVERS]
PNET=26,pnioInit,PnetDrv.o

[PNET]
;Controller
INB0=20,x1
OUTB0=20,x1|

[END SECTION]

Configuration on robot – IOSYS.INI



HW Konfig - [roboter 1 (Konfiguration) -- test]

ANIN1 -> \$anin[1]

2=ident for special handling

512=plc Input adress

14 = number of bit's inc. sign-bit

3 = type (left-justified, with Sign)

8000 = calibration factor

ANIN1=2,512,14,3,cal8000

[END SECTION]

iosys.ini - Editor

```

; =====
; IOSYS.INI - Configuration file
; =====
;
; [CONFIG]
; VERSION=2.00
;
; [DRIVERS]
; PNET=26,pnioInit,PnetDrv
;
; [PNET]
; ;Controller
; INB0=20,x1
; OUTB0=20,x1
;
; ANIN1=2,512,14,3,cal8000
;
; [END SECTION]

```

For analog I/O's you need a additional configuration in the PnioDrv.ini

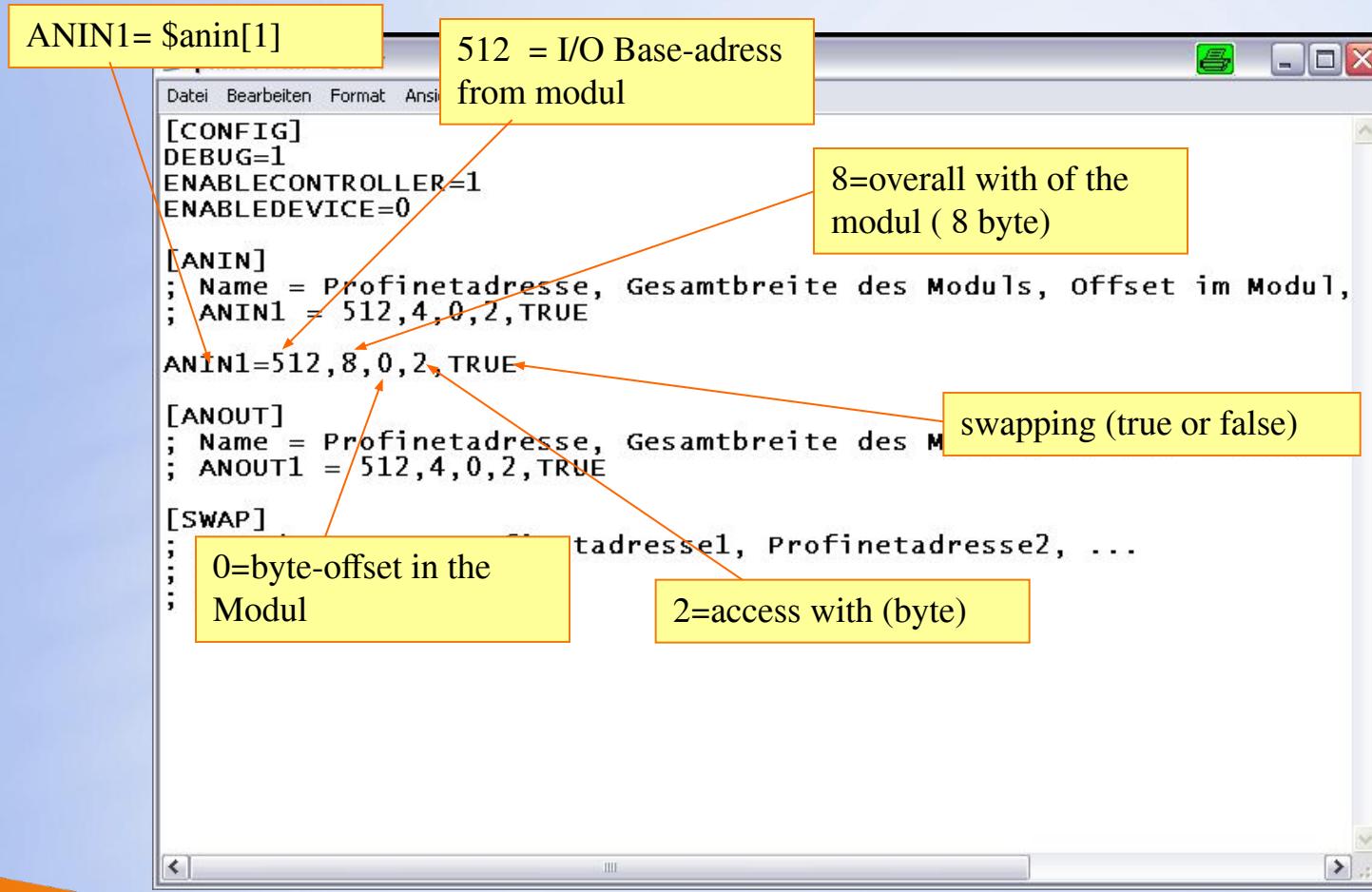
Steckplatz	Baugruppe	Bestellnummer	E-Adresse	A-Adresse	Di
0	IM154-4PNHF	6E57154-4B00-0A00			76
1	PNEF DC24V				76
2	8 DI DC24V HF	6E57141-4BF00-0AB0	20.0..20.7		
3	8 DO DC24V 0.5A	6E57142-4BF00-0A00		20.0..20.7	
4	4 AI I	6E57144-4GF00-0AB0	512..519		
5					
6					
7					
8					

13

Drücken Sie F1, um Hilfe zu erhalten.

Configuration on robot

PnioDrv.ini (C:\KRC\Roboter\Ini\PnioDrv.ini)



```

[CONFIG]
DEBUG=1
ENABLECONTROLLER=1
ENABLEDEVICE=0

[ANIN]
; Name = Profinetadresse, Gesamtbreite des Moduls, Offset im Modul,
; ANIN1 = 512,4,0,2,TRUE

ANIN1=512,8,0,2,TRUE

[ANOUT]
; Name = Profinetadresse, Gesamtbreite des Moduls, Offset im Modul,
; ANOUT1 = 512,4,0,2,TRUE

ANOUT1=512,8,0,2,TRUE

[SWAP]
; 0=byte-offset in the Modul
; 2=access with (byte)
; tadresse1, Profinetadresse2, ...

```

ANIN1 = \$anin[1]

512 = I/O Base-adress from modul

8=overall width of the modul (8 byte)

ANIN1=512,8,0,2,TRUE

swapping (true or false)

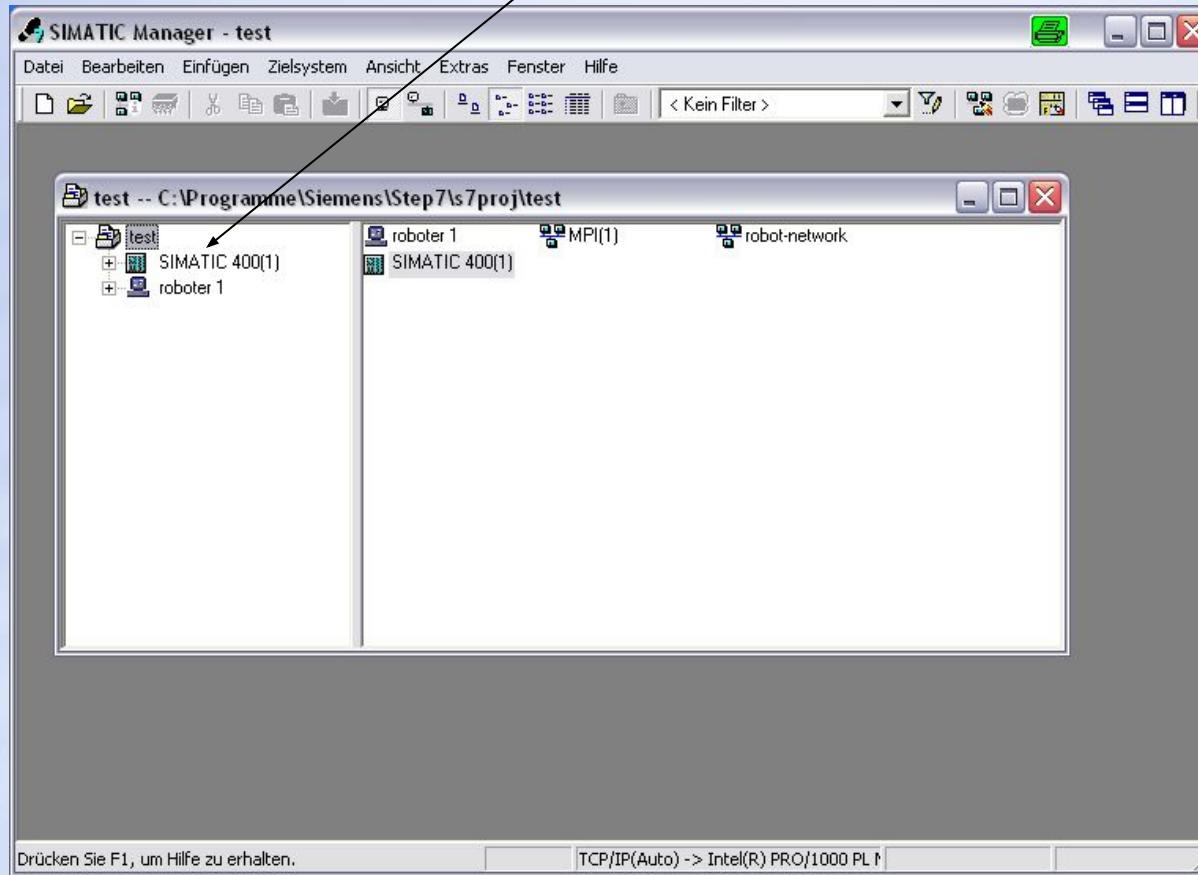
0=byte-offset in the Modul

2=access with (byte)

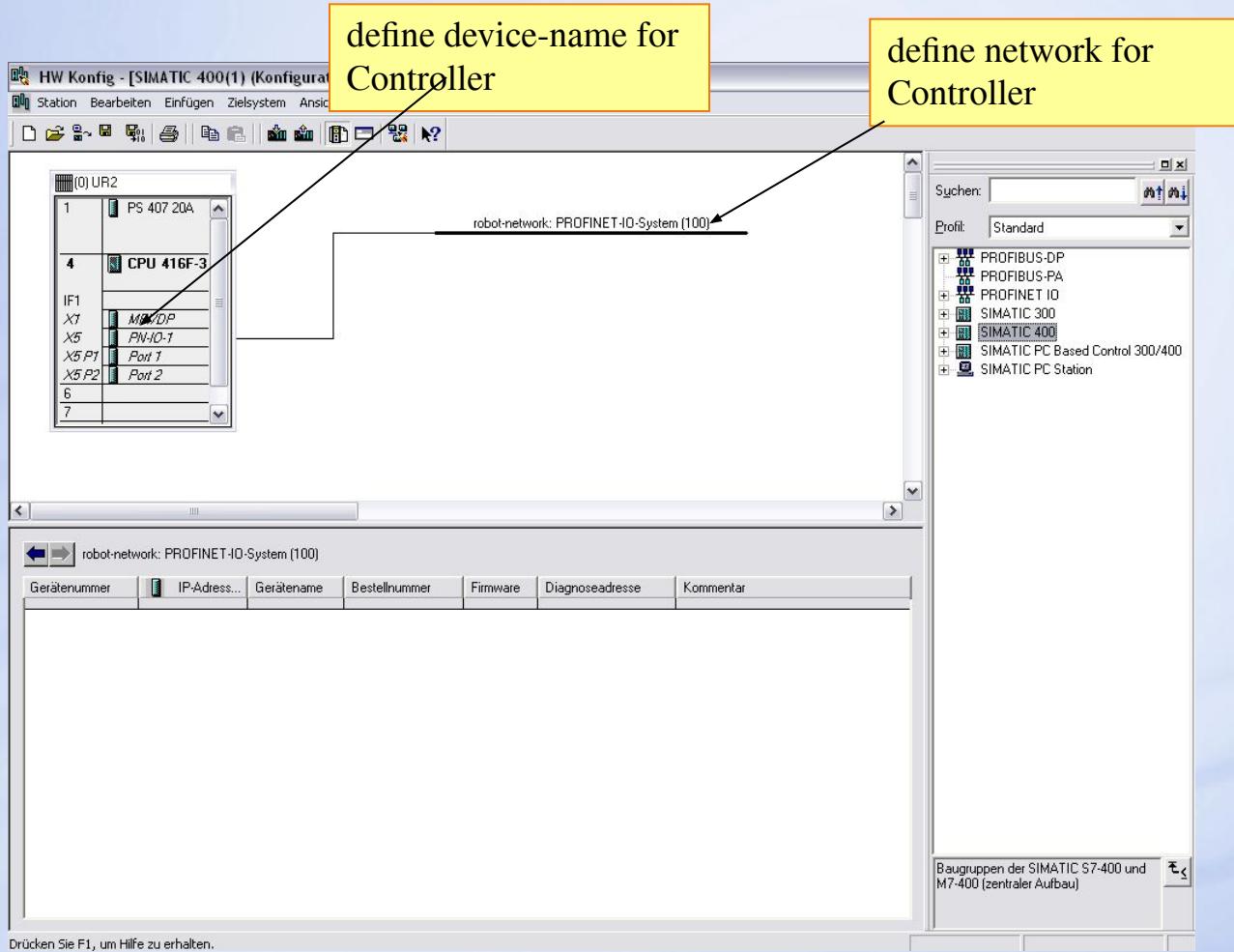
configuration roboter as device in Step7/NCM-Manager



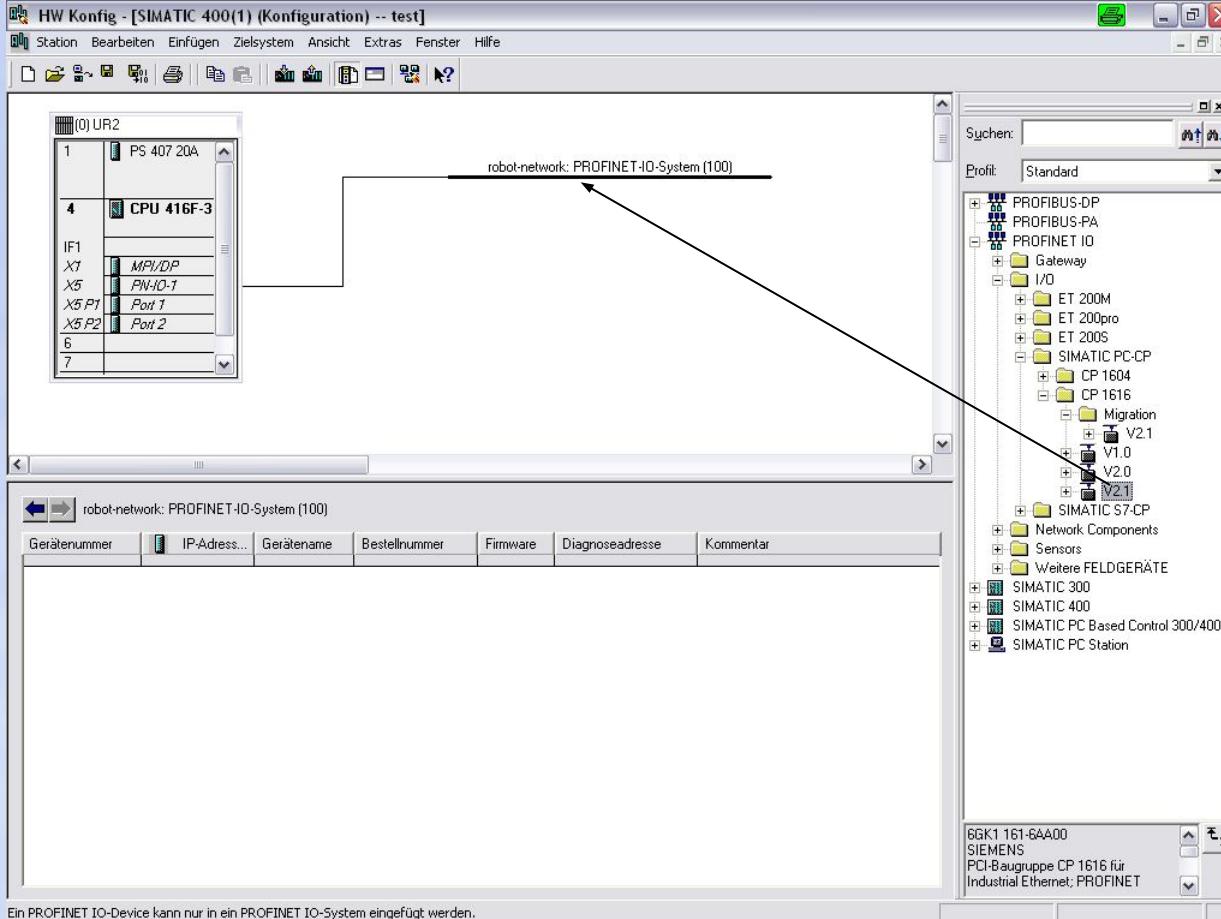
add Controller



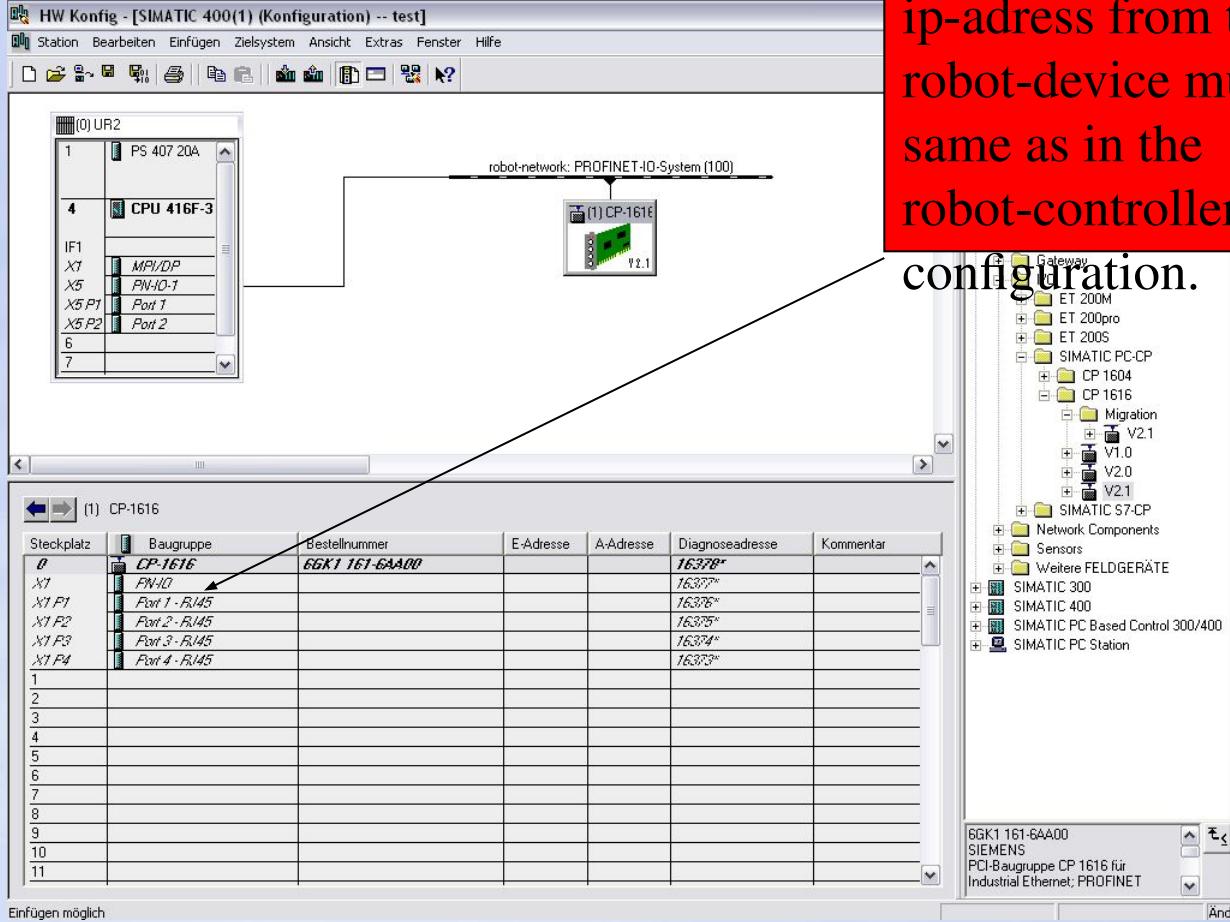
configuration roboter as device in Step7/NCM-Manager



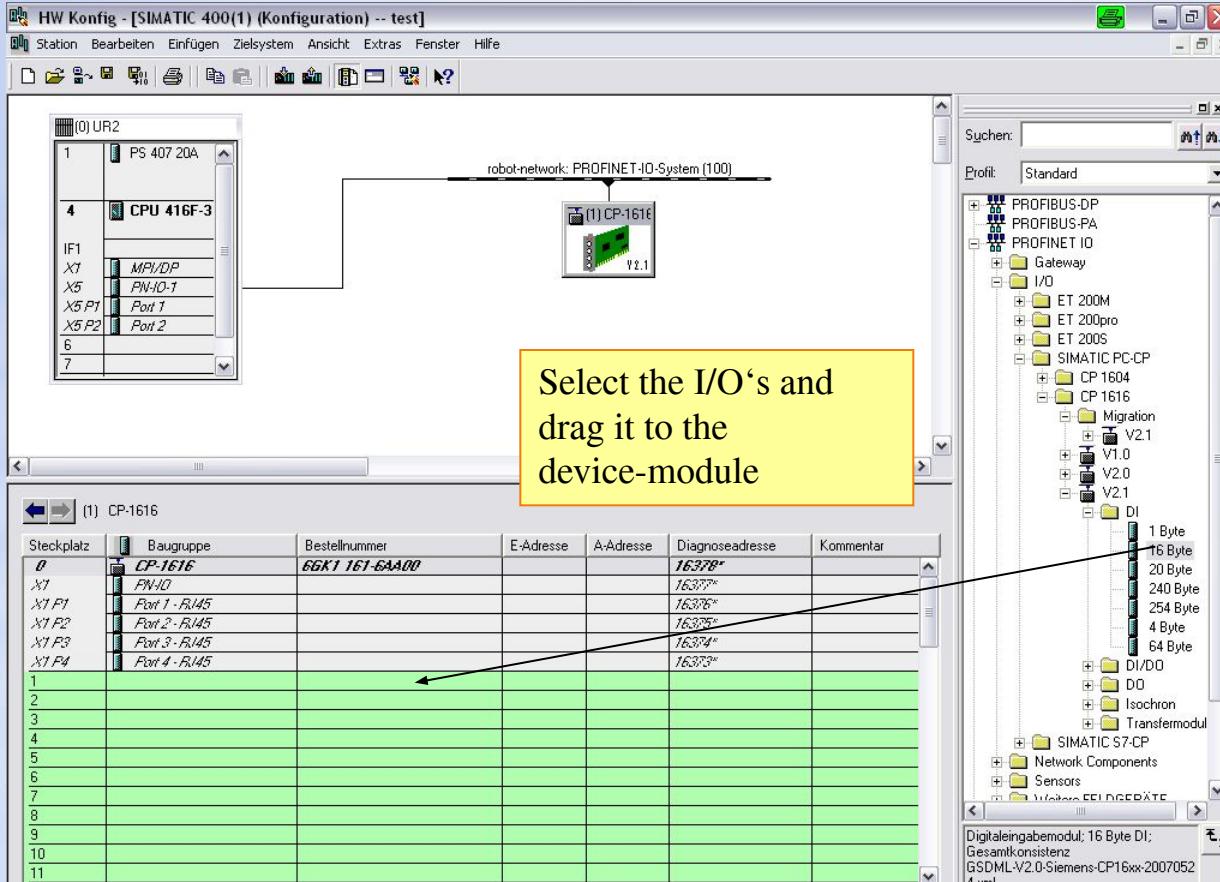
configuration roboter as device in Step7/NCM-Manager



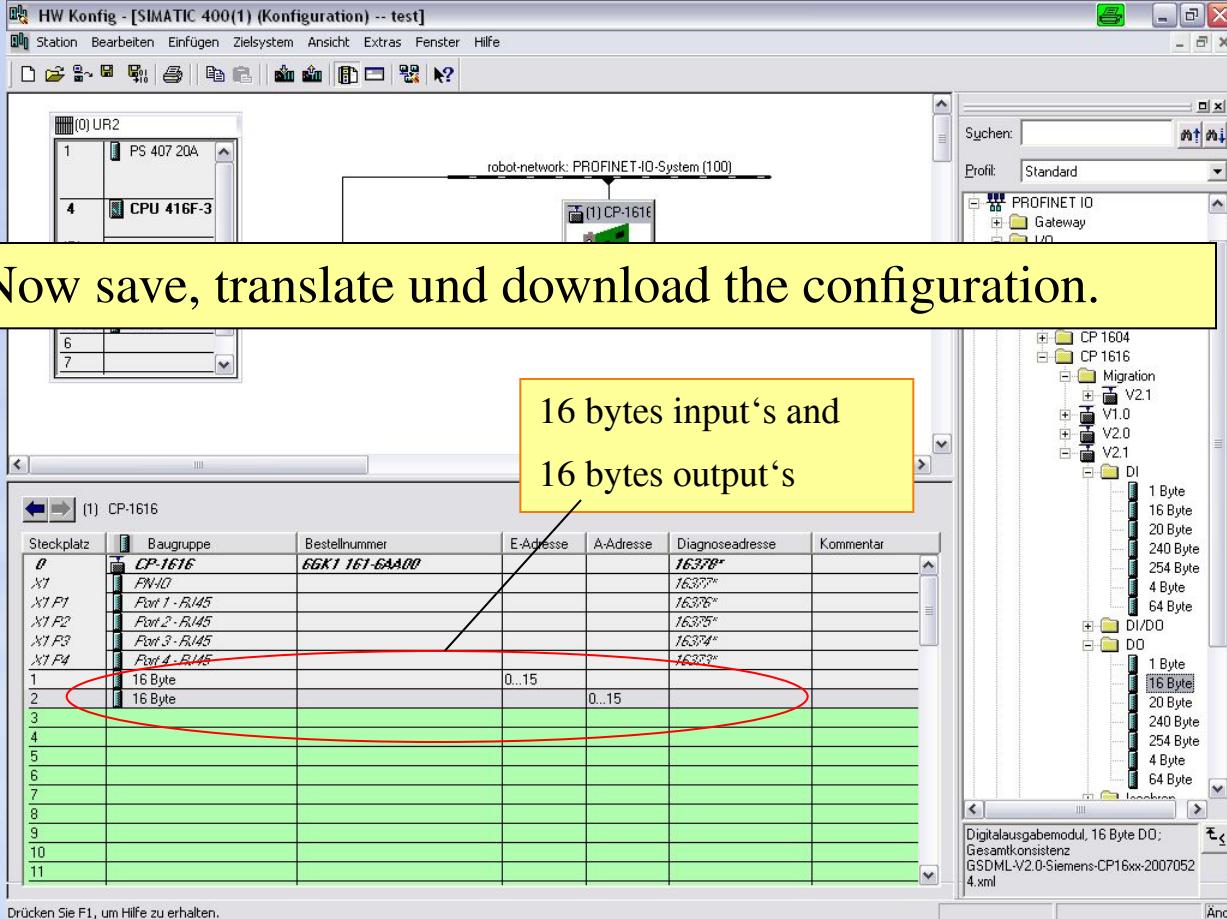
configuration roboter as device in Step7/NCM-Manager



configuration roboter as device in Step7/NCM-Manager



configuration roboter as device in Step7/NCM-Manager



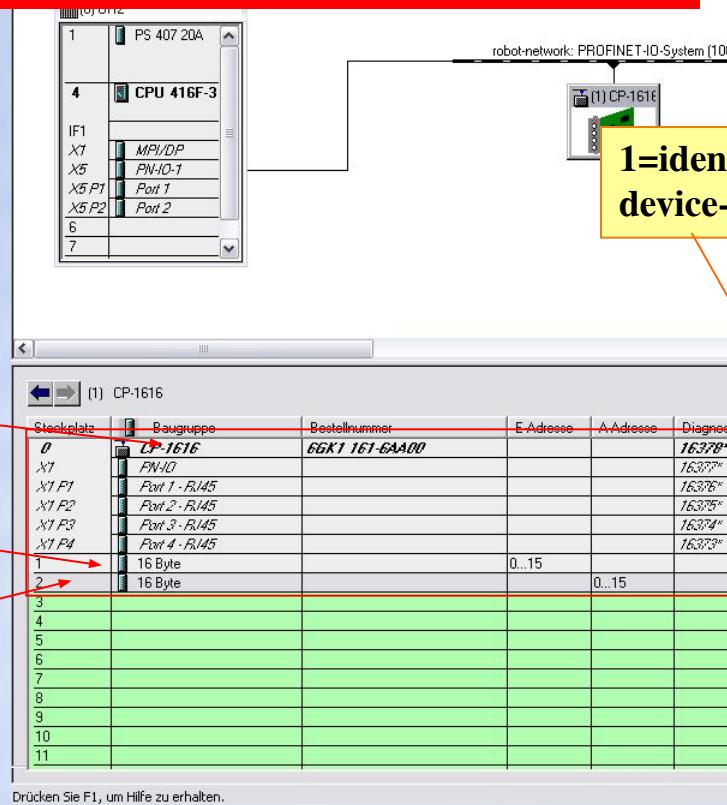
configuration roboter as device in iosys.ini



very important:

device-Input read from controller-output !

device-output write to controller-input !



iosys.ini - Editor

Datei Bearbeiten Format Ansicht ?

```
; =====
; IOSYS.INI - Configuration f
; =====
; For configuration help go to
; =====

[CONFIG]
; Controller .00
; -function

[DRIVERS]

PNET=26,| INB read from submodul 7 .0

[PNET]
;Controller
INB0=20,x1| OUTB0=20,x1
OUTB0=20,x1

;Device
INB40=1,7,xx16 ; 1=0
OUTB40=1,6,xx16 ; 1=0

[END SECTION]
```

INB read from submodul 7

OUTB write to submodul 6

Number of bytes