

TE

Exercise

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STEMERS



Exercise 1

PROFINET IO System Engineering with STEP7 V5.5

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- 1. Create Project in STEP7 V5.5
- 2. Create HW-Config
- 3. Assign IP Address on PC and CPU
- 4. Test the connection with Ping Function
- Insert IO-Devices from your Training Kit (ET200S, SCALANCE X)
- 6. Define and assign Device Names
- 7. Copy Error OBs
- 8. Download and test
- 9. Configure Topology



Exercise 1: Assign IP-Address





Exercise 1: Assign IP-Address

eneral	
'ou can get IP settings assigned his capability. Otherwise, you ne he appropriate IP settings.	d automatically if your network supports sed to ask your network administrator for
C Obtain an IP address autor	matically
• Use the following IP addres	\$\$:
<u>I</u> P address:	172.16.0.80
S <u>u</u> bnet mask:	255.255.0.0
Default gateway:	S. 21
C Obtain DNS server address	s automaticallu
 Open on server dealess Use the following DNS server 	ver addresses:
Preferred DNS server:	
<u>A</u> lternate DNS server:	x x , x
	Ad <u>v</u> anced

Three Network Classes:

Class A: 1.0 - 127.0 Subnet: 255.0.0.0

Class B: 128.0-191.255 Subnet: 255.255.0.0

Class C: 192.0-223.255.255 Subnet: 255.255.255.0

- 1. Assign IP-Address for the Network Adapter.
- 2. Notice to make sure addresses are correct for the sub network, IP-Address needs to be unique!

Exercise 1: Assign IP-Address

3. OK



Exercise 1: Assign IP-Address





Exercise 1: Assign IP-Address

t Ethernet Node			×
Ethernet node			
MAC address:	00-0E-8C-CB-D6-68	Nodes accessible online Browse	1. Assign IP-Address
Set IP configuration			addresses of PC and
Use IP parameters			PLC are in the same
IP address: Subnet mask:	172.16.0.1 255.255.0.0	Gateway C Do not use router Use router	subnet, feedback must be "Reply" from ping function
		Address:	
Assign IP Configura	ation		
Assign device name —	C:\WINDOWS	\system32\cmd.exe	
Device name:	Microsoft Wi (C) Copyrig	indows XP [Versio ht 1985-2001 Mic)	on 5.1.2600] crosoft Corp.
	C:\Documents	s and Settings\t:	ime_limited_user>ping 172.16.0.3
Reset to factory setting:	s Pinging 172.	.16.0.30 with 32	bytes of data:
	Reply from 1 Reply from 1 Reply from 1 Reply from 1	172.16.0.30: byte 172.16.0.30: byte 172.16.0.30: byte 172.16.0.30: byte 172.16.0.30: byte	es=32 time=3ms TTL=30 ces=32 time=1ms TTL=30 ces=32 time=5ms TTL=30 ces=32 time<1ms TTL=30
Close	Ping statist Packets Approximate Minimum	tics for 172.16.0 Sent = 4, Rece round trip times = Oms, Maximum	0.30: ived = 4, Lost = 0 (0% loss), s in milli-seconds: = 5ms, Average = 2ms
	C:\Documents	s and Settings\t:	ime_limited_user>
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			Industry Sector









- 1. Select Device and configure IOs according to the real setup
- 2. IO-Address, access from User program



Image: Head of the second s	(Configuration) PROFINET-Rockbox] Wew Options Window Help Image: I
 Double click on Define Device N OK 	Device gingline.Filler.ET2005 ame tion Shared Access IM151-3PN IM151-3PN PROFINET ID device interface module IM 151-3 PN HF (ERTEC200) for ET 2005 electronic modules, supports packing; PROFINET interface and 2 ports; FW Update via bus; port diagnostics; I&M functionality; IRT and prioritized startup; Order no. / Firmware: 6ES7 151-3BA23-0AB0 / V7.0 Family: ET2005
	Device name: Image: Processing internet in 2005 Node in PROFINET IO System Device number: 1 Image: Processing internet in the internet in the internet in the internet in the internet
	OK Cancel Help



HW Config - [CPU317F	PNDP (Configuration) PROFI	NET-Rockbox]			
Station Edit Insert	PLC View Options Window H	lelp			
│ D 🚅 ≌~ 🖬 🖏 ∉	Download Upload	Ctrl+L			
😑 (0) UR	Download Module Identification. Upload Module Identification to P	 °G	PROFINET-IC	D-System (1)	
2 CPU3	Faulty Modules		Package		
X2 CPU3 X2 P1 R Port 1 X2 P2 R Port 2 3	Module Information Operating Mode Clear/Reset Set Time of Day Monitor/Modify	Ctrl+D ⊂trl+I			
	Update Firmware				
(1) Packaging	Save Device Name to Memory C	ard		Pack <u>A</u> d	dresses
Slot Module	Ethernet	2	Edit Etherne	et Node	A
	PROFIBUS	•	Verify Devic	e Name	
X1 Fort 1	Save Service Data		Assign Devi	ce Name	2
X11 Fort 2				8185	Fi
1 PM-E DC24/48V	/ AC24/ 6ES7 138-4CB10-0AB0			8182*	FL
2 2DI DC24V ST	6ES7 131-4BB01-0AA0	0.00.1			FL
3 4D0 DC24V/2A	HF 6ES7 132-48D30-0AB0		2.02.3		FL
4 2AI RTD HF	6ES7 134-4NB50-0AB0	256259			FL
5 2A01HF	6ES7 135-4MB02-0AB0		256259		FL
6 1 SI Modbus Ma	ster (4 B) 6ES7 138-4DF11-0AB0	260263	260263		FL
7					
8					

- 1. Select IO-System or IO-Device
- 2. Call "Assign Device Name" Dialog



				X	
<u>)</u> evice name:	Packagingline.Fille	er.ET200 🔨 1 vice ty	ype: ET 200S		
Avajlable devi	ices:	<u> </u>			
IP address	MAC address	Device type	Device name	Assign name (3)	
	00-0E-8C-CB-D6-68	ET 200S		Node flashing test	
172.16.0.20	00-0E-8C-CB-06-75 00-0E-8C-D4-73-C7		ethring-et200s-upj ethring-scalance-v	Duration (seconds): 3 💌	
172.16.0.40	00-0E-8C-CC-BF-F8		et200sxacontrolle		
				4	
				Flashing on Elashing off	
•			•		
	1		· · · ·		
5 how only	devices of the same	type I Display only d	evices without name:	s	
<u>U</u> pdal	te <u>E</u>	xport			
	2.40				
<u>C</u> lose	1			Help	
<u>C</u> lose]			Help	
<u>C</u> lose]			Help	
<u>C</u> lose	J			Help	
Close]		1.	Help Select Device name	
<u>C</u> lose	ame		1.	Help Select Device name Select Online Device	
<u>C</u> lose ign device n	ame Packagingline, Filler, ET	200 V Device type: E1	1. 2.	Help Select Device name Select Online Device	
<u>C</u> lose ign device n evice name:	ame Packagingline.Filler.ET	20(💌 De <u>v</u> ice type: E1	1. 2. 3.	Help Select Device name Select Online Device Assign Name	
<u>C</u> lose sign device n evice name: vajlable device	ame Packagingline.Filler.ET;	20(▼ De <u>v</u> ice type: E1	1. 2. 2005 3. 4.	Help Select Device name Select Online Device Assign Name After click "Assign Name	e" the
<u>C</u> lose sign device n evice name: vajlable device MAC address	ame Packagingline.Filler.ET: %: Device type	20(▼ Device type: E1	1. 2. 3. 4.	Help Select Device name Select Online Device Assign Name After click "Assign Name Device receives the Nam	e" the ne.
Close sign device n evice name: wajlable device MAC address 09-00-06-97-8 00-0E-8C-CB-1	ame Packagingline.Filler.ET: %: Device type A-D2_SCALANCE W/: D6-68_ET_200S	200 ▼ Device type: E1	200S 3. 4.	Help Select Device name Select Online Device Assign Name After click "Assign Name Device receives the Name	e" the ne.
Close	ame Packagingline.Filler.ET; ss: Device type A-D2 SCALANCE W/ D6-68 ET 2005 ET 2005 ET 2005 CALANCE X-2	20(▼ Device type: E1 Device name 200 PNI0 WLAN packagingline.filler emnng-eczous-upp 00 ethring-scalance-x	1. 2005 3. 4. ret200s ret200s ret200s	Help Select Device name Select Online Device Assign Name After click "Assign Name Device receives the Nam IP-Address will be set by	e" the ne. y the IO
Close ign device n evice name: vailable device MAC address 08-00-06-97-8 00-0E-8C-08-1 00-0E-8C-08-1 00-0E-8C-01 00-0E-8C-01	Ame Packagingline.Filler.ET Packagingline.ET Packagingline.Filler.ET	20(▼ Device type: E1 Device name 200 PNI0 WLAN packagingline.filler enring-scalance-x 0 CPU et200sxacontroller	1. 2. 3. 2005 4. error c f204irt. profin 351d	Help Select Device name Select Online Device Assign Name After click "Assign Name Device receives the Nam IP-Address will be set by Controller and the conne	e" the ne. y the IO ection
Close sign device n evice name: vajlable device MAC address 08-00-06-97-8 00-0E-8C-08-10 00-0E-8C-01 00-0E-8C-01 00-0E-8C-01	ame Packagingline.Filler.ET; sc: Device type A-D2_SCALANCE W: D6-68_ET_2005 ET_2005 SCALANCE X-2 IM151-8 PN/DF	200 ▼ Device type: E1 Device name 200 PNI0 WLAN packagingline.filler entring-et200s-up; 00 ethring-scalance-x CPU et200sxacontroller	1. 2005 3. 4. cet200s f204int.profin 351d	Help Select Device name Select Online Device Assign Name After click "Assign Name Device receives the Nam IP-Address will be set by Controller and the conner will be established autor	e" the ne. y the IO ection matical

Industry Sector







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SIMATIC Manager - Standard Libi	ary Window Help			
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PROFINET-Rockbox C:\Prog	am Files\Siemens	\Step7\S7Proj\Rockbox	(
PROFINET-Rockbox PROFINET-Rockbox CPU317F PNDP Program Program Blocks E-M ET200S CPU	Object name System dra OB1	Symbolic name MAIN	Created in langu STL	Do la companya de la
Standard Library C:\Prograves Standard Library Standard Standard Standard Standard S	m Files \Siemens \ Object name □ 0872 □ 0873 □ 0880 □ 0881 □ 0882 □ 0883 □ 0885 □ 0886 □ 0888 □ 0888 □ 0890 □ 0810 □ 0811	Step7 571 Copy FEI OB82 OT OB83 FEI OB83 OT OB83 OF OB85 OF OF O	Created in lange STL	
		FINET-Rockbox CAPPO PROFINET-Rockbox CAPPO PROFINET-Rockbox CAPPO PROFINET-Rockbox CAPPO PROFINET-Rockbox CAPPO CPU317F PNDP CPU317-2F PN/DP CPU317-2F PN/DP	System data COB82 COB83 COB86	



Exercise 1: Topology

u 🛩	■~ •••• ••₩ ∰ •10 €. JR		PROFINET: PROFINET	-10-System (100)	
1 2 X1 X2 X2P X2P 3 4 5	Image: CPU317-2F PN/DF MPI/DP CPU317F-ctrl CPU317F-ctrl Port 1 Port 2 D016xDC24V/0.5A		(4) EthRing (4) EthRing (4) EthRing (3) ET (3) ET (3) ET (3) ET (5) PROFIN (5) PROFIN (5) Specify	hared bject DFINET IO System IP addr ET IO Domain Managemer ET IO Topology Module	Ctrl+C Ctrl+V
6 7			Delete		Del
13	1		Size Minimize Maximiz	2	
-	g Topology Editor				•
	Topology Editor	e/online comparison			► Alt+Return Ctrl+Alt+O
	Table view Graphic view Offlin Table view Graphic view Offlin Intercon Intercon Intercon	e/online comparison nection table	Filter: Show all ports		Alt+Return Ctrl+Alt+O
Dev	<mark>g Topology Editor</mark> Table view Graphic view Offlin Intercon I▼ Show station name Port	e/online comparison nection table Partner port	Filter: Show all ports	nal del Comment	Alt+Return Ctrl+Alt+O Ctrl+F2 Ctrl+F7
Dev	Topology Editor Table view Graphic view Offlin	e/online comparison nection table Partner port	Filter: Show all ports	nal del Comment	Alt+Return Ctrl+Alt+O Ctrl+F2 Ctrl+F7 Ctrl+F6
Dev	Topology Editor Table view Graphic view Offlin Intercon ✓ Show station name Port Port Port 1 (X1 P1 R) Port 2 (X1 P2 R)	e/online comparison nection table Partner port	Filter: Show all ports Cable len Sign	nal del Comment	Alt+Return Ctrl+Alt+O Ctrl+F2 Ctrl+F7 Ctrl+F6
Dev	Topology Editor Table view Graphic view Offlin Intercon Intercon ✓ Show station name Port Port 1 (X1 P1 R) Port 2 (X1 P2 R) PerRing-ET200S-UpperRight	e/online comparison nection table Partner port	Filter: Show all ports Cable len Sign Cable Joint Cable view Graphic view Offline/onli	nal del Comment	Alt+Return Ctrl+Alt+O Ctrl+F2 Ctrl+F7 Ctrl+F6
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Dev 4 3 1	Topology Editor Table view Graphic view Offlin Intercon ✓ Show station name Port – EthRing-ET200S-LowerLeft – Port 1 (X1 P1 R) – Port 2 (X1 P2 R) – EthRing-ET200S-UpperRight – Port 1 (X1 P1 R) – Port 2 (X1 P2 R) – EthRing-ET200S-UpperRight – Port 2 (X1 P2 R) – Stight Mouse click ROFINET IO Syst	e/online comparison nection table Partner port on the em	Filter: Show all ports Cable len Sign Cable len Sign Table view Graphic view Offline/onling Table view Graphic view Offline/onling ET200S CPU	nal del Comment	Alt+Return Ctrl+Alt+O Ctrl+F2 Ctrl+F7 Ctrl+F6



Exercise 1: Topology



1. Start Network Detection

- 2. Select Ports
- 3. Apply Online Detection to your Offline Configuration



Exercise 1: Topology

¹ g Topology Editor	X
Table view Graphic view Offline/online comparison	
ET2005 CPU ET2005 CPU ET2005 CPU-ctri(BarRin Image: CPU at a region of the second seco	UF PNDP EthRing-ET200S- EthRing-Scalance Passive Components -XF204IRT.PR -SCALANCE X100 -XF204IRT.PR -Standard E -Standard E -Standard E -Standard E
ОК	Cancel Help
	Table view Graphic view Offline/online comparison List of nodes that cannot be assigned
 Interconnections are automatically created Online Diagnostic is poss 	sible
	Eviliaring-Erizous- LowerLeft EthRing-Scalance -xF204IRT.PR Online detection completed. Offline Update Module Information Options



Exercise

Exercise 2 Webinterface

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HW Config - [CPU317_AWP (Config II] Station Edit Insert PLC View C	uration) AWP] options Window Help	-		
D 😅 🏪 🖉 📲 🚭 🖻 💼	🏜 🋍 📳 🗖 😫 1	?		-1.
1 2 CPU 317-2PN/DP X1 MPI/DP X2 PN-IO-CPU317-V32 X2 P1 R Port 1 X2 P2 R Port 2 3 Port 2 4 CP 343-1EX30-V2. X1 P1 R Port 1 X1 P1 R Port 1 Y1 P1 P Port 1	Copy Paste Replace Object Add Master System Disconnect Master System Master System Isochronous Mode Insert PROFINET IO System Disconnect PROFINET IO System PROFINET IO Domain Management PROFINET IO Topology PROFINET IO Topology	Ctrl+C Ctrl+V	CFINET-IO-System (100)	Eind: Erofile: Profile: SIMA E SIMA E SIMA E SIMA E SIMA
PROFINET: PROFINET-IO-Sys	Specify Module Delete	Del	_	
Device Number IP addres	Go To Filter Assigned Modules	•	- iomment	
6 172.16.100.1	Edit Symbols			
2 <u>172.16.100.</u> 10 <u>172.16.100.</u>	Object Properties Open Object With Change Access	Alt+Return Ctrl+Alt+O		
	Assign Asset ID			
I Press F1 to get Help.	Product Support Information FAQs Find Manual	Ctrl+F2 Ctrl+F7 Ctrl+F6		
	Start Device Tool			

1. Call up Object Properties of the S7-PLC



ycle/Clock Memory Retentir General nostics/Clock ✓ Enable Web server on this r	ve Memory Inte Startup Protection module	errupts	Time-ol Sy Comm v acces	f-Day Ir nchron unicatio s only v	iterrup ous Cy on /ia HT	1. 2.	Activa Edit U	te Web interface ser Management
Languages to be Loaded on t Select up to 2 languages:	he CPU		atic Up ctivate	date —	<u>U</u> pdat	te inte	rval: 3 s	
I <u>►</u> nglish (United States)		Displa	y Classe	es of the	e Mess	ages		
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Spanish (Traditional Sort)	J	V 0	1 🔽	05 I	7 09	•	13	
I [talian (Italy]		V 0	2 🔽	06 I	7 10	•	14	
		V 0	3 🔽	07 J	✓ 11	•	15	
•1	1				ы	(Delete	
	Edit User Entry a	nd P <u>assv</u>	vord		•		Dele <u>t</u> e	
•	Edit User Entry a User Name:	nd Passv	vord				Dele <u>t</u> e	
• []	Edit User Entry an User Name:	nd Passv D	vord perator				Delete	2
	Edit User Entry an User Name: The user can I Query diag	nd Passv	vord perator					
• [Edit User Entry a User Name: The user can I Query diag Read varia	nd Passw	vord perator				Delețe	
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	Edit User Entry a User Name: The user can © Query diag © Read varia © Read varia © Call user-de Edit password	nd Passw D nostics ble status ble table efined pag	perator es				Delete Write to user-c	defined pages
< <u>○K</u>	Edit User Entry a User Name: The user can I Query diag Read varia I Read varia I Call user-de Edit password- Password:	nd Passw D nostics ble status ble table efined pag	perator es				Delețe	Jefined pages
	Edit User Entry a User Name: The user can Query diag Read varia Read varia Call user-de Edit password Password: Confirm passw	nd Passw D nostics ble status ble table efined pag	perator es	E Constantino de la constant			Delete	Jefined pages



G Station Edit Insert PLC Viev	Options Window Help		
- C 🏂 🏪 🖩 💀 🚑 📭	Customize	Ctrl+4 1	. Goto Report System
	Specify Module,		Error
	Configure Network Symbol Table Report System Error 1	Ctrl+4 2	. Tab "Diagnostic Support"
X1 MRI/DP X2 PN-IO X2 P1 R Port 1	Edit Catalog Profile Update Catalog	3	Activate "Diagnostic Status DB"
X2 P2 R Port 2 3	Install HW Updates Install GSD File	4	Generate and download
5	Find in Service & Support		RSE one more time
6	Create GSD file for I-Device.		

Report System Error - SITRAIN_Demo\Controller\CPU 315F-2 PN/DP	
General OB Configuration CPU in Stop Messages User Block Diagnostics Support 2 e Characteristics	
HMI Diagnostic Pictures	
PROFIBUS DP DB;	
PROFINET IO DB:	
J ✓ Diagnostic status DB: 127	

	Cancel	Help
Diage 4 cks are not up to date		





Creating DB127 in Report System Error is Mandatory for the Function "Module Information"

Industry Sector





Exercise 2: Web function

Image: Hw Config - [CPU319_Controller Image: Station Edit Image: Stat	(Configuration) Topologie_Geräte] Options Window Help 2 1 = 2 1
(0) UR 1 2 CPU 319-3 PN/DP X7 MPI/DP X2 DP X3 PN-IO X3 P1 Port 1 3 4 CP 343-1 Advanced-IT 5 6 7 8 9 10 11	(3) POFx1 (1) POFx2 (2) S1 (2) S1 (2) S1 (1) PROFINET: PROFINET-IO-System (101) PROFINET: PROFINET-IO-System (101) Station: CPU319_Controller Module: [0/2/0] CPU 319-3 PN/DP
	Cancel

- 1. "Save&Compile" of Hardware-Configuration is necessary.
- 2. Download of Hardware Config





Start Web Browser and Test functionality



- 1. Create Project in TIA Portal
- 2. Configure CPU and IO System
- Insert IO-Devices from your Training Kit (ET200S, SCALANCE X)
- 4. Define and assign Device Names
- 5. Copy Error OBs
- 6. Download and test

















PROFINET > Devices & ne	tworks	(1)	_ # # ×	Hardware catalog	a 🗉 🕨
	📑 Topology view	h Network view	Device view	Options	
💦 Network 👖 Connections	HMI connection	💌 🔝 Relations	🐮 🖽 🔍 ± ' 📑		
				✓ Catalog	
					init init
PLC_1	IO device_	1			
CPU 315-2 PN/DP	IM 151-3Pf	N .		PLC	
	Notassign	ned internet		MI systems	
	1			Ves & starters	
PN/IE_1				twork components	
				etecting & Monitoring	
				Distributed I/O	
				▼ Interface module	s
				PROFINET	
			N 5	🖌 🔽 🧰 IM 151-3 PN	1
	F • 1 1 -	ral Inte		6ES7 15	1-3AA22-0AB0
				$(2) = \frac{665715}{665715}$	1-3AA23-UABU
ET200S station_1[ET200S	S <u>Q</u> Properties	Linto 🛛 🖸 Dia	gnostics	6ES7 15	1-3BA23-0AB0
General				6ES7 15	1-3BA60-0AB0
General	General			0ES7 15	1-3BB22-0AB0
				6ES715	1-3BB23-0AB0
		Name:	ET 200S station 1	ET 200M	
		Author:	time limited user	• 🧊 ET 200iSP	
		Comment:		🕨 🍺 ET 200pro	
				ET 200eco	
	•			ET 200ECO PN	
				• 🛅 ET 200R	
				🕨 🧰 IM 174	
1. Change to "I	Network View	v"		Field devices	
				• In Other field devices	
2. Select your I Training Kit	Remote IO fr	om the			
2 Drage Drop i	t into your y	orking			
	t mto your w	Orking			
area			0		
		C	Siemens AG 20	12. All Rights Rese	rved.
				Industry S	ector



PLC_1 CPU 315-2 PN/DP	IO device_1 IM 151-3PN
	Not assigned
PN/IE_1	

🖉 Topolo	ogy view 🔒 Network view 🛽
Network 👯 Connections HMI connec	zion 💌 🗛 Relations 📲 🗄
	4 IO system: PLC_1.PROFINET IC
PLC_1 CPU 315-2 PN/DP	IO device_1 IM 151-3PN PLC_1 ET IO-Syste

- 1. Drag Interface of the remote IO
- 2. Drop it to the Controllers Interface and release mouse
- 3. Repeat this step for all IO Devices



Ing.Fille	elations 5 1 6	2 ± 100% ↓ 10 s Properties	system: PLC_
Ing.Fille	Network data	Ţ 10 s	system: PLC_
ste	Network data	Properties	1 Info
Name: Packag	Network data	Properties	1 Info
Name: Packag	Network data	Properties	1 Info
Name: Parkag	Network data	Properties	1 Info
Name: Parkag	<u> </u>	Properties 1	1 Info
Name: Packag			
Name: Parkag			
Author: Siemer	ging.Filler.ET200S ens	2	
			~









				🚽 Topology	view	hetwork vi
Network	Connections	HMI connection		Relations		Q ± 100%
PLC_1		HMI_1	Constant			
CPU 315F-2	PN/	1900	Comfort			
			Highlight	10 system:		
		1	PLC_1.1	PROFINET IO-Syst	em (100)	
		PN/IE_1	X Cut		Ctrl+X	
			🛅 Сору		Ctrl+C	
			🛅 Paste		Ctrl+∨	
			🗙 Delete		Del	
			Rename		F2	
	IO device_1		😨 Online 8	diagnostics	Ctrl+D	
	PLC 1		Assign d	evice name		(2)
	1001		Show for	ce values		
			🔍 Propertie	s		
S		8		22 55 - 25		

- 1. Right Mouse click on the PROFINET IO System
- 2. Call "Assign Device Name" dialog


Image:				IET device name:	packaging.filler.et200s		•
Image: Status Image: Status <td< th=""><th></th><th></th><th></th><th>турс.</th><th>IM 151-3 PN</th><th></th><th></th></td<>				турс.	IM 151-3 PN		
 Only show devices of the same type Only show devices with bad parameter settings Only show devices without names Accessible devices in the network: P address MAC address Type Name Status 172.16.0.12 08-00-06-97-BA-D2 SCALANCE W-700 PNIO_WLAN ◇ OK 172.16.0.20 00-0E-8C-CB-D6-75 IM151-3 ethring-et200s-upp ◇ OK 172.16.0.30 00-0E-8C-CB-EE8 ET200S CPU et200s controller ◇ OK 172.16.0.50 00-0E-8C-CB-EE8 ET200S CPU et200s controller ◇ OK 172.16.0.50 00-0E-8C-CB-EE8 ET200S CPU et200s controller ◇ OK	a ²		2 Туре	of the PG/PC interface PG/PC interface	: 🖳 PN/IE : 🕅 VMware Accele	rated AMD	•
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3 172.16.0.50 00-0E-8C-CB-D6-68 IM151-3 ethring-et200s-low ♂ OK 172.16.0.60 00-0E-8C-F0-69-64 niwi comion: panet ♂ OK	Flash LED	Acces IP address 172.16.0.12 172.16.0.20 172.16.0.30	Or or or MAC address 08-00-06-97-BA-D2 00-0E-8C-CB-D6-75 00-0E-8C-CB-72-FF	Ily show devices with Ily show devices with ork: Type SCALANCE W-700 IM151-3 S7-300	bad parameter settings out names Name PNIO_WLAN ethring-et200s-upp cpu317 controller	Status Status Sok Sok Sok	×
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	Flash LED	Acces IP address 172.16.0.12 172.16.0.20 172.16.0.30 172.16.0.40 172.16.0.50 172.16.0.50	Or Or	Ily show devices with Ily show devices with ork: Type SCALANCE W-700 IM151-3 S7-300 ET200S CPU IM151-3 IM151-3	bad parameter settings out names Name PNIO_WLAN ethring-et200s-upp cpu317 controller et200s controller et200s controller ethring-et200s-low	Status OK OK OK OK OK OK	

- 1. Select Device Name
- 2. Select Online Interface
- 3. Select Device you want to address
- 4. "Assign Name"







iert tree		PROFINET > PLC 1 [CPU 315-2
Jevices		
00	d	PLC_1
PROFINET		
Add new device	Add new block	·
Devices & networks PLC 1 [CPU 315-2 PN/DP]	Name:	
Device configuration	I/O_FLT1	
Program blocks		Time interrupts
Add new block		Ardware interrupts
Main [OB1]	OB	🕨 🔜 Startup
General source files	Organization	🕨 🔜 Alarming
PLC tags	DIOCK	🕶 🔜 Fault interrupts
De data types		
) 🧱 Watch and force tables		2 1/0_FLT1 [OB 82]
📴 Program info	FB	
M PLC alarms	Function block	
Text lists		COMM FLT [OB 87]
Cocal modules		
Distributed I/O		
	c	
Add now block	pn	
Add new block		
Add OB82, OB83, OB	86	
Download Blooks		
Download Blocks		





Exercise 3: Fieldbus Integration

- 1. Integrate IE/PB-Link in your project
- 2. Configure PROFIBUS Network
- 3. Download and test



Exercise 3: Fieldbus Integration



- 1. Select the Gateway you want to use
- 2. Drag and Drop it to your Network View
- 3. Connect the Ethernet Port to the IO-Controller



Exercise 3: Fieldbus Integration



Exercise 3: Fieldbus Integration



Industry Sector

- 1. Go Online, read CPU Diagnostic
- 2. Switch on Online mode in Network and Device view
- 3. Create Report System Error
- 4. Activate Web interface
- 5. Define a Watch table for the Web interface
- 6. Download and test

SIEMENS	CPU319-3/CP	U 319-3	8 PN/I	OP		English 💌 01:44:45 pm 22.01.2009	
SIMATIC CONTROLLER	CPU 319-3 PN/DP					🐼 <u>Off</u> 🔒	
 > Start page > Identification > Diagnostic Buffer 	CPU319-3 PN/DP BF 1 BF 2 DC5V FRCE RUN STOP PUSH TUN MRES	SIEMENS		General: Station name: Module name: Module trae:	CPU319-3 CPU 319-3 PN/DP CPU 319-3 PN/DP		
Module information	SIMATIC S7-300	SIEMENS	CPU	319-3/CPU	319-3 PN/DP	01:35:43 pr	English 🔽 n 22.01.2009
▶ Messages		SIMATIC CONTROLLER	Diagnos Diagnostic	tic Buffer	•		0 2
▶ PROFINET	318-3EL00-0AB0	▶ Start page	Number 1 2	Time 10:54:49:222 am 10:53:49:534 am	Date 22.01.2009 22.01.2009	Event Module problem or maintenance necessary Module problem or maintenance necessary	
Topology		 Identification 	3 4 5	10:53:49:523 am 10:51:17:915 am 10:51:17:901 am	22.01.2009 22.01.2009 22.01.2009	Module problem or maintenance necessary Module OK Module problem or maintenance necessary	
▶Tag status		Module	6 7	01:02:56:819 am 01:02:56:808 am	01.01.1994 01.01.1994	Module problem or maintenance necessary Module problem or maintenance necessary	
 Variable tables 		 Information Messages 	8 9 10	00:58:19:628 am 00:58:19:626 am 00:58:19:539 am	01.01.1994 01.01.1994 01.01.1994	Mode transition from STARTUP to RUN Request for manual warm restart Mode transition from STOP to STARTUP	
		▶ PROFINET					
► Introduction		►Topology	Details: 1				Event ID: 16# 394
		Tag status Variable tables Introduction	Module probl Module type: Output addre Channel infor User informa Module/subm External mod Channel erro Requested O	em or maintenance nec Distributed I/Os ss: 33 mation available tion available nodule fault ule error r detected B: Diagnostic interrupt (OB (OB82)		
						Industry	Sector





👔 Device configur 🔺 😨 Online & diagn 👻 🕞 Program blo 🔵	General Diagnostic status Diagnostics buffer	Bevents	iy CPU Time Stamps in PG/	°C local time	
💕 Add new block	Cycle time	No.	Date and time	Event	
🐲 Main [OB1] 🔵	Memory	1	3/10/2012 15:04:01.669	Mode transition from STARTUP to RUN	× 🔁
🕨 🚂 Technology obj 🗏	Communication	2	3/10/2012 15:04:01.669	Request for manual warm restart	<u>s</u>
External source	MPI/DP interface [X1]	3	3/10/2012 15:04:01.569	Mode transition from STOP to STARTUP	5
🕨 🌄 PLC tags		4	3/10/2012 15:04:01.569	New startup information in STOP mode	
🕨 🛄 PLC data types	✓ Ethernet address	5	3/10/2012 15:03:59.261	Distributed I/Os: End of the synchronization with a DP master/IO controller	
Watch and forc	Network connection	6	3/10/2012 15:03:59.261	New startup information in STOP mode	
📴 Program info	IP parameters	7	3/10/2012 15:03:59 260	New startup information in STOP mode	
PLC alarms	Ports	8	3/10/2012 15:03:59 199	New startup information in STOP mode	
Text lists	Statistics		3/10/2012 15:03:50 100	New startup information in STOP mode	-
	Run-time meter	2	3/10/2012 13:03:39:199	New startup information in Stor mode	
A Details view	Performance data	Freeze	e display		
Decaus view	▼ Functions				
	Assign IP address	Dotaile or	ovent:		
Name	Set time of day	Dottano on	ovon.		
🐐 🔰 Add new device	Firmware update		Details on event: 1	of 10 Event ID: 1	6#4302
Devices & networks	Assign name		Description: Mod	e transition from STARTUP to RUN tup information:	^
- WONE)			1314	Industry	Secto







Project tree	•	Den	10)	Master [CPU	315-2 PN/DF	P] → PLC	tags 🕨	Defau	lt
Devices			lb					1	a,
00	<u>∎</u> *		5						
		0	Defa	ult tag table					
▼ 📠 Master [CPU 315-2 PN/DP]	^			Name	Data type	Address	Retain	Visibl	F
Device configuration		1		InputData	Bool 🔳	%E 💌			
🛛 😨 Online & diagnostics		2		InputData_1	Bool	%E0.1			
🕨 🕞 Program blocks		3		InputData_2	Bool	%E0.2			
🕨 🕒 Technology objects		4		InputData_3	Bool	%E0.3			
🕨 🖬 External source files		5		InputData_4	Bool	%E0.4			
🕨 🍋 PLC tags		6		InputData_5	Bool	%E0.5			
🕨 🛅 PLC data types		7		InputData_6	Bool	%E0.6			
🔹 🗢 🥅 Watch and force tables		8	-	InputData_7	Bool	%E0.7			
📑 🚰 Add new watch table	2	9	-00	OutputData	Bool	%A1.0			
Force table	_	10	-00	OutputData_1	Bool	%A1.1			
1 🔛 Watchtable Web	=	11	-00	OutputData_2	Bool	%A1.2			
Program Into		12		OutputData_3	Bool	%A1.3			
PLC alarms		13		OutputData_4	Bool	%A1.4			
🔄 Text lists		14	-	OutputData_5	Bool	%A1.5			
🕨 🕞 Local modules		15		OutputData_6	Bool	%A1.6			
🕨 🕨 🛅 Distributed I/O		16	-	OutputData_7	Bool	%A1.7			
🕨 🧯 Common data		17	-	OutputData_8	Bool	%A2.0			
▶ 🛅 Documentation settings		18		OutputData_9	Bool	%A2.1			
🕨 😼 Languages & resources		19		<add new=""></add>					
· Co Autor	×								

- 1. Select "Watch & Force Table" and add a Watch table for the Web interface.
- 2. Define variables







	20					3	루 Topology via
F Master		🔾 😫 🛛 🔍					
		r (10	4.4	
Rail_0		5 6	/ 8	9	10		
	87						
					¥		
				Device d	ata		
aster [CPU 315-2 PN/DP]							Properties
General							
System diagnostics General	Web server	·					
▶ Alarms			\frown				-
Diagnostic support			2) 🗹 Enab	le Web sei	rver on thi	is module	
System diagnostic blocks			Permi	it access o	only with H	HTTPS	
Advonced settings	1						
Clock	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	odate					
Clock Web server	📜 Automatic u						
Veb server 1	Automatic u						

- 1. Select Web Interface
- 2. Activate Web Function for the PLC



roperties			
Controller [CPU 317-2 PN/DP]			
General			
General	Wahaanna		
 MPI/DP interface [X1] 	web server		
PROFINET interface [X2]			
Startup		🛃 Enable Web server	on this module
Cycle		Permit access only	with HTTPS
Clock memory		,	
Interrupts	Automatic undata		
Diagnostics system	Automatic update		
System diagnostics			(1)
Clock		🛃 Enable	
and the second			
Web server	Undate int	erval: 3	s
• Web server Automatic update	Update int	erval: 3	s
• Web server Automatic update Languages	Update int	erval: 3	S
Web server Automatic update Languages User management	Update int	erval: 3	5
 Web server Automatic update Languages User management Watch tables 	Update int	erval: 3	5
Web server Automatic update Languages User management Watch tables ♥ User-defined Web pages	Update int	erval: 3	s Assign project language
Web server Automatic update Languages User management Watch tables Vser-defined Web pages Advanced	Languages	erval: 3 Web server language	s Assign project language
 Web server Automatic update Languages User management Watch tables User-defined Web pages Advanced Display class of the alarm 	Languages	erval: 3 Web server language German English	S Assign project language None English (United States)
 Web server Automatic update Languages User management Watch tables User-defined Web pages Advanced Display class of the alarm Retentive memory 	Languages	erval: 3 Web server language German English Frencn	Assign project language None English (United States) English (United States)
Web server Automatic update Languages User management Watch tables User-defined Web pages Advanced Display class of the alarm Retentive memory Protection	Languages2	erval: 3 Web server language German English Frencn Spanish	Assign project language None English (United States) English (United States) None
 Web server Automatic update Languages User management Watch tables User-defined Web pages Advanced Display class of the alarm Retentive memory Protection Connection resources 	Languages2	erval: 3 Web server language German English Frencn Spanish Italian	S Assign project language None English (United States) English (United States) None None
 Web server Automatic update Languages User management Watch tables User-defined Web pages Advanced Display class of the alarm Retentive memory Protection Connection resources Overview of addresses 	Languages	erval: 3 Web server language German English Frencn Spanish Italian Japanese	S Assign project language None English (United States) English (United States) None None None None

- 1. Select Automatic Update
- 2. Select at least one language for the Web interface



🔍 Propertie:

Exercise 4: Diagnostic

Master [CPU 315-2 PN/DP]

General			
Cycle	^	Watah tablaa	
Clock memory			
Interrupts			
Diagnostics system		Name	Access
 System diagnostics 			Read
General			
▶ Alarms			_
Diagnostic support			2
System diagnostic blocks		Watchtable Web	2)
 Advanced settings 			-
Clock	4		
🕶 Web server			
Automatic update	≡,		
Languages			
User management			
Watch tables			
• User-defined wear-dges			
Display class of the alarm			
Retentive memory			
Protection			
Connection resources			
Overview of addresses	V		

1. Select Watch table

2. Insert it to the Web interface



Exercise 4: User Defined Webpage



- 1. Select User-defined Web pages
- 2. Select Directory and Start page of the user page
- 3. Define DB Number start number, HTML Code will be converted into DB's
- 4. Generate the Datablocks

Exercise 4: User Defined Webpage

V٩	Siemens - Demo				
Pr	oject Edit View Insert Online	Options	Tools Window Help	1	
	Y 🔄 🔒 Save project 📑 🐰 💷 🛛		▶) ± (**± 💵 🛅 🖽 🖽 5		💋 Go online 🧬 Gi
	Project tree			rks	
	Devices			-	
	1 0 0 U		Network Connections	HMI	connection 💌
Devices & nerv	Controller [CPU 315-2 PN/DP]		Controller CPU 315-2 PN/DP Controller [CPU 315-2 PN/D General Diagnostics system System diagnostics Clock	P]	User-defined Web
	 Program resources Web server DB 333 [DB333] DB 334 [DB334] DB 335 [DB335] DB 336 [DB336] DB 337 [DB337] DB 338 [DB338] System diagnostics 		 Web server Automatic update Languages User management Watch tables User-defined Web pages Advanced Display class of the alarm Betentive memory 		H Defau Appli Generate > Advanced
			increating of the the the the		

1. Web DBs are created for the Web server

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Industry Sector

Exercise 4: User Defined Webpage



- 1. Create Startup OB 100
- 2. Call Web Server SFC (WWW)
- 3. Define Ctrl DB and Status



Exercise 4: User Defined Webpage

1. Download and test



Exercise 5: Diagnostic / Panel

- 1. Insert the Panel in your Project
- 2. Insert a Screen or Screenlayout
- 3. Insert the Diagnostic View in your Screen
- 4. Test





SIEMENS Possibility 1

Exercise 5: Diagnostic / Panel



SIEMENS Possibility 2

Exercise 5: Diagnostic / Panel

1.

2.

3.

4.

5.



	HMI Device Wizard: OP 177B 6" PN/	/DP	×
Change to Portal View	PLC connections	C connections Configure the PLC connection(s).	
Add new device	Screen layout Alarms	5	
Select HMI	Screens 🥥 System screens 🥥	Communication driver:	
Add	Buttons 🥥	op 177	
Pre-configuration via Wizard is possible.		OF 177B 6" PNUDP	Select PLC
	Save settings	≪ <u>B</u> ack Next ≫	<u>F</u> inish <u>C</u> ancel

Industry Sector

Exercise 5: Diagnostic Standard Panel





- 1. Select the Panel in "Project view" and add a new screen
- 2. Select Alarm View
- 3. Bring it to your screen



Industry Sector

Exercise 5: Diagnostic for Comfort Panel





- 1. Add new screen
- 2. Besides "Alarm View" it is possible to select "System Diagnostic view" (Only available on Comfort Panel)
- 3. Bring it to your comfort panel screen.

Toolbox			
Options			
🕨 🤽 🗄	1 🔟		
← Basic	objects		
11	4	•	
A	۸ 🍒		
✓ Eleme	nts		
SI.0			05
		TE	•
Ŀ			
✓ Control	ols		
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	—		

Exercise 5: Diagnostic / Panel

Demo → OP177	7 [OP 177B 6" PN	'DP] 🕨 Screens 🕨 Diagnostic		
	•] • B <i>I</i>	<u>U</u> SA*± <u>≣</u> ± <u>A</u> ± <u>★</u> ±	클레프리 클레리에	± E ± 😫 ± 🛷 🍃 ±
SIEMENS		SIMA	ATIC PANEL	
F1 F3 F5	No. T	ime Date	F2 F4 F6	
Alarm View_2 Pronerties	Animations	Events	9	Properties Life
Property list		General		
General Appearance	1	Display 2		
Layout Display Text format Toolbar	=	 Current alarm states Pending alarms Unacknowledged alarms 	Alarm class Errors Warnings System	Enable
Column header Columns	s	O Alarm butter	Diagnosis events	☑ 3

- 1. Go to Properties
- 2. Activate for "Current Alarm States"
- 3. Activate "Diagnosis events"

Exercise 5: Diagnostic / Panel



- 1. Select your PLC Tags
- 2. You will see them in "Details View"
- 3. Drag & Drop a Variable to your screen, it will become automatically an IO Field.
- 4. The Connection between Panel and PLC is now configured!

Exercise 5: Diagnostic / Panel

Network U Connections	HMI conne	ction	- д Re	lations	16	€ ± 100%	2 T	opology v	riew	📥 Netv		
C C	ontroller PU 315-2 PN/I		DP: IM <u>Co</u> r	Slave 151-1 HI <u>ntroller</u> BUS_1	F				(b a a	Conr etwe ind F conf itom	necti een l Pane igur natic	ion PLC I is ed ally!
Filler IM 153-4PN <u>Controller</u>			OP177 OP177B	6" PN/DI	P							
					THE COURSE OF							
letwork overview	Connection	is Rel	lations	IO con	nmunicatio	on						
Network overview	Connection Local er	nd point 77	Local ID	IO com (hex)	nmunicatio	(hex) Partne	er ontroller		Connecti HMI conr	on type nection		
Network overview	Connection Local er OP1	nd point 77 ctions	Local ID	IO com (hex) ns	Partner ID	(hex) Partne	er ontroller		Connecti HMI conr	on type nection		
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Exercise 5: Diagnostic / Panel

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- 1. Compile the panel application
- 2. Download or start simulation for testing

Exercise 6: PROFINET Redundancy

- 1. Configure Topology
- 2. Define MRP-Manager and MRP-Clients
- 3. Test



Exercise 6: PROFINET Redundancy



- 1. Change to topological view
- 2. Configure the Port interconnections

Exercise 6: PROFINET Redundancy

TIA-Portal Rockbox with iwlan 🔸 Devic	ces & networks
	🚽 Topology view
ET200S Control IM151-8 PN/DP CPU317 Control	CPU317 Contro CPU 317F-2 PN/
PU 317 Controller [CPU 317F-2 PN/DP]	Properties 74 Info
General Fail-safe MPI/DP interface [X1] PROFINET interface [X2] > General F-parameter Ethernet addresses Advanced options Interface options Media redundancy > Real time settings > Port [X2 P1 R] > Port [X2 P2 R] Time-of-day synchronizat Operating mode Diagnostics addresses	edia redundancy Media redundancy role: Manager (auto) Ring port 1: PROFINET interface_1 [x2]\Port_1 [x2 P1] Ring port 2: PROFINET interface_1 [x2]\Port_2 [x2 P2] Diagnostics interrupts 1. Define one of your Devices as MRP- Manager
Ceneral General General PROFINET interface [X1] General Ethernet addresses Advanced options Interface options Interface options Ethernet addresses Comparison of the second se	Client Ring port 1: PROFINET interface [X1][Port_1 2 Ring port 2: Rin
Real time settings Port [X1 P1] Port [X1 P2]	Diagnostics interrupts 2012. All Rights Reserved. Industry Sector

Exercise 6: PROFINET Redundancy

ethring-et200s-upperright [IM	1151-3PN] Sector
General	
▶ General	> > IO cycle
 PROFINET interface [X1] 	Undeta time
General	Opuace ume
Ethernet addresses	Automatic
 Advanced options 	
Interface options	Can be set
Media redundancy	 Adapt update time when send clock changes
Real time settings	
Port [X1 P1]	Number of accepted update cycles without IO data
Port [X1 P2]	
Diagnostics addresses	Accepted update cycles
Module parameters	without IO data: 100 V POSSIDIIILY I
Diagnostics addresses	Watchdog time: 200.000 ms

Update time	Ossibil	ity 2
Automatic	0001011	ms
💿 Can be set	128.000	🔫 ms
Adapt update time wh	1.000 2.000	inges
Number of accepted u	4.000 8.000 16.000	ithout IO data
Accepted update	32.000 64.000	
without IO	128.000 256.000 512.000	
Watchdog	312.000	ms

1. Adjust the time behavior of your IO-Devices in the Ring that a <u>Watchdog</u> of 200ms is configured!

> Reason: MRP (Media Redundancy Protocol) max. Reconfiguration time is 200ms.

> If this parameter will not be changed, the IO-Device will drop off the network when Redundancy switchover occurs!

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Exercise 6: PROFINET Redundancy

Project Edit View Inse 🏄 🎦 🔒 Save project	ert Online O 📑 🐰 🗐 📬	ptions Tools Window Help X St (* ± 🙀 🖥 🛄 🟠 🚆 🕻	🛔 💋 Go online 🖉 Go offline 🛛 🛔 🌆
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CPU317 Controll CPU317 Controll CONTROL	er [CPU 317 er [IM151		
Comfort Panel [T	P700 Comf	L	

- 1. Download first!!!
- 2. Connect the Ring topology
- 3. Test Redundancy

Congratulation, you made it!!



Thank you for your attention!



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