

Industry Online Support

NEWS

Konfigurering av PN/PN-coupler för felsäker kommunikation.

Safety / PN/PN-coupler / failsafe communication

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Säkerhets-	Detta är ett tips/exempel på en lösning som ska hjälpa användaren att komma
mormation	igång och se möjligheterna med Siemens industriprodukter.

Användaren måste själv anpassa detta tips/exempel till sin applikation.

Användaren ansvarar för att förhindra obehörig åtkomst till sina anläggningar, system, maskiner och nätverk. System, maskiner och komponenter bör endast anslutas till företagsnätverk eller internet om och i den utsträckning det är nödvändigt och med lämpliga säkerhetsåtgärder på plats (t.ex. brandväggar och nätverkssegmentering).

Dessutom bör Siemens vägledning om lämpliga säkerhetsåtgärder beaktas. För mer information om industriell säkerhet se <u>www.siemens.com/industrialsecurity</u>

Siemens tar inget ansvar om materiel och/eller personal skadas i samband med användning av detta tips/exempel.

Vi kan heller inte garantera att innehållet är helt felfritt och vi förbehåller oss rätten att ändra tipset/exemplet vid behov.

1 Konfigurering av PN/PN-coupler för felsäker kommunikation

1.1 Sammanfattning

Exempel på hur felsäker kommunikation kan sättas upp mellan flera CPU:er via en PN/PN-coupler som Shared device.

Förståelse för våra mjukvaror, nätverksuppbyggnad och programmering krävs för att använda exemplet. Framförallt hur man sätter upp ett Profinet-nätverk samt programmering av felsäkra styrsystem förutsätts.

1.2 Produkter och mjukvaror som använts

Produkt	Version	Beställningsnummer
Step 7 Professional (TIA Portal)	V16 UPD2	
Safety Advanced	V16	
Step 7 (classic)	V5.6 SP2	
S7 Distributed Safety	V5.4 SP5	
CPU S7-1500 CPU1516F-3PN/DP	Fw v1.8	6ES7 516-3FN00-0AB0
CPU S7-1500 CPU1511F-1PN	Fw v2.6	6ES7 511-1FK01-0AB0
CPU S7-1500 CPU315F-2PN/DP	Fw v3.2	6ES7 315-2FJ14-0AB0
PN/PN Coupler	Fw v4.2	6ES7 158-3AD10-0XA0

Produkter och mjukvaror som använts vid framtagande av tipset

2 Beskrivning

2.1 Konfigurering av hårdvara

		PnCouplerGsdX1X2 > Devices & networks	🖬 🗙 Hardware catalog 📰 🔳 🛛
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I första exemplet konfigueras PN/PN med GSD fil och sidorna X1 och X2 i separata projekt. Ladda hem gsd-fil från Industry Online Support och installera den. Börja med att dra in PLC och PN/PN-coupler X1 från hårdvarukatalogen samt knyt ihop dessa och assigna device name till PN/PN-couplern, detta görs genom att högerklicka på PN/PN-couplern och välja Assign device name.



Tanken är att felsäker kommunikation ska upprättas till två PLC:er från PN/PNcouplerns X1-sida;

- en send/recive med en CPU 1511F i ett separat projekt i Tia Portal - en recive från en CPU 315F i Step 7 V5.6 SP2.

Konfigureringen sker i device view för PN/PN-couplern, här finns färdiga moduler att dra in från hårdvarukatalogen.

Här dras in från katalogen en recive och en send (PROFIsafe12/6, PROFIsafe6/12) som döps till mer passande namn för uppsättningen mot CPU1511F samt en recive ext. Comp. V3.x för att vara kompatibel med Step 7 Classic projektet. Den senare döps inte om för att visa på skillnaden när de sedan adresseras.



Ovan ser vi modulerna på respektive Slot 1, 2, 3 som sedan ska vara motsvarande fast tvärtom på X2 sidan, alltså IN arean blir UT area och vice versa.

Nedan visas det andra TIA Portal projektet där samma knytning mellan PLC och X2 gjorts, EN VIKTIG SAK ÄR att bocka ur att PLC(PnX2) ska ha ensam Acces till X2 och PN-IO(de två översta raderna) samt modulen som är till CPU315F i Step7 Classic projektet, Slot 3.



I Step7 Classic projektet görs samma sak, PLC kopplas ihop med X2 sidan och modulerna läggs in från hårdvarukatalogen, HÄR BOCKAS ACCES ut för modulerna som tillhör Tia projektet.

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Device name kan lämpligast kopieras från TIA Portal projektet och behöver då inte tilldelas igen då den redan fått sitt namn.



Programmering av den felsäkra kommunikationen 2.2

Tillbaka till det första projektet med X1-sidan av PN/PN-couplern.

I Main_Safety_RTG1 läggs de felsäkra kommunikationsblocken in, RCVDP först och SENDDP sist (blocken finns i instruktionskatalogen under Communication>PROFIBUS/PROFINET).



Läs i hjälpen hur dessa block fungerar, lite kort är DP_DP_ID en variabel för identifiering av blocket, TIMEOUT är tiden innan blocket passiviseras vid kommunikationsbortfall, LADDR för 1500 PLCer HW ID för modulen som konfiguerades i PN/PN-couplern och här är det idé att ge ett förståligt symboliskt namn.

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Lika för RCVDP blocket för de signaler som skickas från 315 PLCn. blocks > PnPnSafe

PoX1 [CPU 1516E-3 PN/DP] > Progr

Motsvarande i TIA Portal projektet för X2-sidan på PN/PN-couplern, först i Main Safety RCVDP:



I Step 7 Classic projektet, där vi har ett F_SENDDP block, är skillnaden att istället för HW_ID är det startadressen för modulen i PN/PN-couplern som ska in på LADDR benet, 18 i det här fallet.



2.3 Online

Från CPU315F till X2 på PN couplern skickas två Bool från SD_BO_00 och SD_BO_01...

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... till CPU1516F i TIA Portal projektet där de tas emot på RCVDP blockets RD_BO_00, RD_BO_01.

		Pr/CouplerGsdX1X2 + PnX1 [CPU 1516F-3 PN/DP] + Program blocks + PnPnSafeCommunication + SafeProgram + Main_Safety_RTG1 [F81]	_@=×	Testing 🗊 🗊 🕨
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Från CPU1516F och PN/PN-couplerns X1-sida skickas en Bool från SENDDP blockets SD_BO_B00 till CPU1511F...



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... som tas emot på RCVDP blockets RD_BO_00.

2.4 Alternativ konfiguration

Det går att göra samma sak med Siemens GSD fil för PN/PN-couplern, då är båda sidorna med i konfigureringen.

Då ser det ut enl. nedan med båda 1500 PLC:erna i samma projekt, Siemens filen dras in från Networks components->Gateways->PN/PN Coupler.

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	Conclusion munication							and 2 ports;)	2 (on right): PW update via bus: port		
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1	Details view	11-110						data record c	oupling; firmisare V4.2		
	Name										
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I konfigurering av PN/PN-couplern, under Transfer mapping bocka ur Acces från PLC för CPU315F.

nCoupler > Ungrouped device	es ► PNP	XCoupler					-		-									- * *
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Catalog information A lidentification & Mointe PROFINET interface (X1) General Ethernet addresses	Transfer Data	mapping		ctivate data status														
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Advanced options Module parameters Diagnostics Transfer mapping SC(10x2 Safex2Tox1 Safex1Tox2 color2700																		

Samt under Shared Device full Acces till X2 och portarna.



3 Referensmaterial

3.1 Relevanta manualer, FAQs m.m.

- Hjälpen i TIA Portal
- PROFINET GSD files : Gateway <u>https://support.industry.siemens.com/cs/se/en/view/23742537</u>
- SIMATIC STEP 7 Basic/Professional V16 and SIMATIC WinCC V16 <u>https://support.industry.siemens.com/cs/es/en/view/109773506</u>
- Simatic Bus links PN/PN coupler <u>https://support.industry.siemens.com/cs/es/en/view/44319532</u>
- SIMATIC Industrial Software SIMATIC Safety Configuring and Programming <u>https://support.industry.siemens.com/cs/es/en/view/54110126</u>

3.2 Andra länkar

- Siemens Sverige Industriella tjänster <u>https://new.siemens.com/se/sv/produkter/tjanster/industriella-tjanster.htm</u>
- Siemens Industry Online Support
 <u>https://support.industry.siemens.com/cs/se/en/</u>
- Siemens utbildning Sverige https://www.sitrain-learning.siemens.com/SE/
- TIA Portal Tuturial center http://www.siemens.com/tia-portal-tutorial-center
- Where do you procure the current trial software for STEP 7, WinCC and Startdrive for TIA Portal V16? <u>https://support.industry.siemens.com/cs/ww/en/view/109772992</u>
- Programming Guidelines and Programming Styleguide for SIMATIC S7-1200 and S7-1500 <u>https://support.industry.siemens.com/cs/ww/en/view/81318674</u>
- TIA Selection Tool
 <u>http://www.siemens.com/tia-selection-tool</u>