

Application description • 06/2015

Process automation with the SIMATIC PCS 7 CPU 410-5H controller

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Preface

Introduction

There are various automation systems available for the SIMATIC PCS 7 process control system which differ in performance, quantity structure, communications interfaces and scalability, among other things. These include:

- AS 410 automation systems
- Complementary S7-400 systems (AS 412 to AS 417)

Depending on the automation performance requirements, CPU 412 to CPU 417 may be used on the complementary S7-400 systems. If the performance limit of one of the CPUs being used is reached, e.g., as a result of necessary modifications to the user program, the hardware must be exchanged to increase the performance, or a higher performance S7-400 system used.

The AS 410 offers a CPU - the innovative CPU 410-5H - which is versatile in use. The automation performance is scaled without having to change the CPU and is effected by means of the number of PCS 7 process objects. In this case the best performance is always available regardless of the area of application. The reduction of types on the AS 410 to a single CPU brings numerous benefits. It simplifies considerably the selection, configuration and planning of the automation system, as well as replacement parts holding and plant expansion.

Document contents

In this document, scenarios are described which explain relevant functions of the CPU 410-5H Process Automation in the AS 410 and illustrate advantages over the complementary S7-400 systems. Additionally you will gain an overview of important configuration steps and hints.

You will find information on the following topics in the document:

- General information on the CPU 410-5H Process Automation
- Advantages of the CPU 410-H
- Configuring the communications interface and establishing the connection between the ES and the AS
- Type Change in RUN (TCiR) function
- Configuration of the PN/Ethernet interfaces
- Online upgrade of process objects

Applicability

This application applies to:

- CPU 410-5H Process Automation, Firmware Version 8.1
- SIMATIC PCS 7 V8.1

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1.1 Introduction

1 CPU 410-5H at a glance

In this chapter you will find general information on the CPU 410-5H, its functions and areas of application.

1.1 Introduction

The CPU 410-5H is a controller specially designed for process automation which is versatile in use. With its robust, high performance hardware, the CPU 410-5H covers the entire performance spectrum of the AS 412 to AS 417 complementary systems.

Scalable performance

The performance range of the CPU 410-5H can be individually scaled according to the size and type of the PCS 7 applications. This is done by means of the PO volume, which is determined by the System Expansion Card (SEC). The volume extends from 100 PO to unlimited, at which point other performance data of the CPU act as the limiting factor.

The PO quantity structure of an SEC can be conveniently extended from the PCS 7 V8.1 by means of CPU 410 expansion packs. It is not necessary to dismantle the CPU or the SEC. There are CPU 410 expansion packs available for 100 POs and 500 POs. You have the following options when ordering CPU 410 expansion packs:

- Online via http://www.siemens.com/industrymall
- Through your Siemens contact person (<u>www.siemens.com/automation/partner</u>)

Communications

The CPU has two 10/100 MBit/s PN/Ethernet interfaces, which can be configured as follows:

- 2x PROFINET, e.g., for redundant configurations without the use of external CPs
- 1x Industrial Ethernet and 1x PROFINET, e.g., for connecting to the plant bus and the process bus without the use of external CPs.
- 2x Industrial Ethernet, e.g., to design redundancy into the plant bus

Additionally, the CPU has a 12 MBit/s PROFIBUS interface and allows the connection of up to 96 nodes. The distributed process I/O can be linked either directly (PROFIBUS DP) or via a subordinate process bus (PROFIBUS PA).

1.1 Introduction

The PROFINET interfaces can be used for connecting or expanding the I/O devices. 250 devices can be connected for each PROFINET interface.



Process safety functions

The SIMATIC PCS 7 CPU 410 is set up as standard for integrated process safety functions and offers all the functions required for safety-oriented applications. The controller is TÜV certified and meets all safety requirements up to SIL 3. The CPU is capable of multitasking, meaning that several programs can run simultaneously - both Basic Process Control Applications (BPCS) and safety-oriented applications. The programs are also reaction-free, with the result that potential errors in the BPCS applications have no effect on the safety-oriented applications and vice versa.

Fault tolerance

Two redundant, galvanically isolated controllers are used to guarantee maximum availability. They can be mounted on a common rack or also operated synchronously at a distance of up to ten kilometers from one another. In this case, one of the two CPUs functions as the master and the other as the reserve. In each case two synchronization submodules are used for redundant coupling, the two CPUs being synchronized by means of fiber-optic cables. The modules can be exchanged during operation. 1.2 Advantages of the CPU 410-5H

1.2 Advantages of the CPU 410-5H

General

The CPU 410-5H offers, among others, the following advantages:

• A hardware platform for all application uses, application sizes and performance ranges

Consequently the selection, configuration and planning of the automation system are simplified.

- Lower costs for spare or replacement part inventories, as only one CPU type is used in the project.
- Flexible expansion of the automation performance without replacing hardware
- Lower investment costs and greater possibilities for use in regions with coating requirements, due to the protective coating of the CPU 410-5H
- Reduction of plant downtime due to the possibility of type updating of AS blocks in RUN mode (TCiR).

Plant planning

The advantages of the CPU 410-5H come into their own above all when planning a new plant:

- When planning the automation performance necessary for your plant, you will no longer have to consider different CPU variants, as the CPU 410-5H can be used for all purposes (e.g. as an H or an F system, as well as for all application sizes).
- The required automation performance (PO volumes) can be ordered according to the application size after the engineering phase is complete.
- The automation performance can be conveniently expanded as required at any time by means of the CPU System Expansion Card (SEC), without any exchange of hardware or plant downtime.
- The planning of the CPU spares is simplified considerably by the use of standardized hardware. In this case you will only need one CPU 410-5H without SEC as a replacement part, since the SEC can be transferred if the CPU is exchanged.
- Due to networking with PROFINET (PN), switchgear and drives can be reached by every CPU without expensive cabling. Should program relocations to another CPU arise in the course of the implementation, it will not be necessary to rewire the station or the device.

Note The PN communication which spans the CPUs can influence the performance capability of all the CPUs in the PN network.

2 Application scenarios

2.1 Configuring the communications interface and establishing the connection between the ES and the AS

In order to implement the application scenarios described in this chapter, a connection must be set up between the Engineering Station (ES) and the Automation System. The configuration procedure depends on the communications interface used. A distinction is made between:

- As with additional CP
- Internal PN/Ethernet interfaces of the CPU

2.1.1 Establishing a connection using an additional CP in the AS

The following will describe how to establish a connection between ES and AS using the CP 443-1.

Requirement

In order to establish a connection between the ES and the AS (via the CP), the modules must be fitted in the rack as shown in the operating manual.

Preliminary considerations

Before establishing communication, you must define whether you want to use TCP/IP or ISO. The addressing (IP address, MAC address) is carried out on the basis of the interface selection.

Connection via ISO interface

The following points are a step-by-step description of how to establish the connection between the AS and the ES.

1. Configure the AS in the HW Config and assign the address for the CP (MAC address) accordingly.

operties	- Ethern	et interface CP 443-1 (R0/55)	
General	Paramet	ers		
🔽 Set M	IAC addre	ss / use IS <u>O</u> protocol		
MAC add	ress:	08-00-06-01-01-21	1	
IP pro	tocol is b	eing used		
IP addres	s:	192.168.0.1	Gateway	
- Su <u>b</u> net mask:		255.255.255.0	. Do not use router	
Subnet:				
not n Plantbus	networked		<u>N</u> ew	
			P <u>r</u> operties.	
			Delete	
ОК	1		Cancel	Help

- 2. Save and compile the configuration.
- From the menu command "Tools > Set PG/PC station..." in the SIMATIC Manager, set the "Interface parameter setting used" to "ISO" (e.g., CP1623.ISO.1).
- 4. Switch back to the HW Config.
- 5. Execute the menu command "Target system > Load in module...".

6. In the "Select Target Module" dialog window, select the relevant module and click on "OK".

	nduks biu
PU 410-5H	0 3
Select All	

7. If you have not changed the MAC address for the CP (configured MAC address is the same as the factory-set MAC address), click on the "OK" button in the "Select Node Address" dialog window.

C Local			
C Can be reache	ed by means of g	ateway	
to target station:	Station name	Madula nama	Disat designation
21	Station name	Module name	Plant designation
	to target station: Module type	to target station: Module type Station name	Can be reached by means or gateway to target station: Module type Station name Module name 1

If you have configured a different MAC address, then click on the "View" button. Then in the "Accessible Nodes" box, select the CP from which you want to load the configuration. Now click on the "OK" button.

elect Node Addres	s	×
Over which station a	ddress is the programming device connected to the module CPU 410-5H?	
<u>R</u> ack:		
<u>S</u> lot:	3 🚔	
Target Station:	 Local C Can be reached by means of gateway 	
Enter connection to	b target station:	T
MAC address	Module type Station name Module nam	e
08-00-06-01-00-00	CP 443-1	
Accessible Nodes		_
00-18-18-7E-95-DD	CP 4424	
08-00-06-01-01-22 08-00-06-9E-73-AE	CP 443-1 INC	
		1
	<u>U</u> pdate	
ОК	Cancel Help	

- 8. The configuration has now been loaded into the AS.
- **Note** After an address change, always load the configuration via the HW Config or NetPro. The accessible nodes to which you can make assignments by loading a new address are only shown here. When loading from the SIMATIC Manager, an attempt will be made to load via the configured address. Since this cannot be accessed, the loading procedure will be aborted, accompanied by an appropriate message.

Connection via TCP/IP interface

The following points are a step-by-step description of how to establish the connection between the AS and the ES.

1. Configure the AS in the HW Config. and assign the IP parameters for the CP (IP address, subnet mask) accordingly.

Set MAC address / use ISO protocol	
<u>1</u> AC address:	
IP protocol is being used	
P address: 172.10.1.31	Gateway
Bubnet mask: 255.255.255.0	
	<u>A</u> ddress:
<u>j</u> ubnet:	
not networked Planthus	<u>N</u> ew
	P <u>r</u> operties
	Delete

- 1. Save and compile the configuration.
- From the menu command "Tools > Set PG/PC station..." in the SIMATIC Manager, set the "Interface parameter setting used" to "RFC1006" or "TCPIP" (e.g., CP1623.RFC1006.1).
- 3. Switch back to the HW Config.
- 4. Execute the menu command "Target system > Edit Ethernet Node".

5. Click on the "Browse" button in the "Edit Ethernet Node" dialog window.

Ethernet Node			
thernet node			
IAC <u>a</u> ddress:		Nodes accessible online Browse	
et IP configuration			
Use IP parameters			
IP address:		Gateway	
-		Do not use router	
Subnet mas <u>k</u> :	1	Address:	
Client ID	C MAC address	C De <u>v</u> ice name	
Assign IP Configurat	ion		
Assign device name			
Assign device name		Assign Name	
Assign device name <u>D</u> evice name: Reset to factory settings		Assign Name	
Assign device name		Assign Name <u>R</u> eset	

6. In the "Browse Network" dialog window, select the CP by means of the MAC address and click on the "OK" button.

	! IP address	MAC address	Device type	Name
	0.0.0.0	00-0E-8C-9D-C8-9A	S7-400 CP	S7-400 C
Stop	172.10.0.209	08-00-06-9E-73-AE	INC	OSM TP8
	172.10.0.208	00-1B-1B-46-40-79	SCALANCE	h-rack-12
	172.10.0.203	00-1B-1B-06-1B-72	SCALANCE	labor1-x2
Fast search	172.20.66.202	08-00-06-9A-6D-26	INC	UPD-Ten
	169.254.210.195	00-1B-1B-7E-95	SIMATIC-PC	es13
	172.10.0.204	00-1B-1B-06-1B-CC	SCALANCE	labor1-x2
	172.10.0.202	00-1B-1B-89-02-3F	SCALANCE	labor2-x2
	172.10.0.201	08-00-06-97-1B-BE	SCALANCE	labor2-x4
	172.20.66.201	08-00-06-96-AE-AE	INC	UPD-Ten
	172.10.50.201	00-0E-8C-D3-63-AE	SCALANCE	platz50ar
	192.168.0.21	00-18-18-85-25-11	S7-400	pn-io
	172.10.0.206	00-1B-1B-46-40-0D	SCALANCE	h-rack-10
	•			•
et.u.				
Flash	MAC address. JUU-L	E-8C-9D-C8-9A		

Note

If not all or none of the connected nodes are displayed, check the settings for the network components used (switches,...).

7. The MAC address and the IP parameters for the CP are entered in the "Edit Ethernet Node" dialog window. Adapt the IP parameters according to your configuration in HW Config (see Step 1). Next click on the "Assign IP Configuration" button and then on the "Close" button.

thernet hode	Nodes 200	essible opline
	Nodes acc	essible online
IAC <u>a</u> ddress:	00-0E-8C-9D-C8-9A <u>B</u> row	se
et IP configuration		
• Use i <u>r</u> paramete	5	
IP address:	Gateway	
-	(• Do no	t use router
Subnet mas <u>k</u> :	255.255.0.0 C Use ro	puter
	A - 1.1	
Obtain IP addres	ss <u>f</u> rom a DHCP server	
Identified by		
C Client ID	C MAC address	C Device name
Client ID:	C MAC address	C De <u>v</u> ice name
Client ID	C MAC address	C De <u>v</u> ice name
Client ID Client ID:	C <u>M</u> AC address	C De <u>v</u> ice name
Client ID Client ID: Assign IP Config	C MAC address	C De <u>v</u> ice name
Client ID Client ID: Assign IP Config ssign device name	C MAC address	C De <u>v</u> ice name
Client ID Client ID: Assign IP Config ssign device name Device name:		C De <u>v</u> ice name
Client ID Client ID: Assign IP Config ssign device name Device name:	MAC address	C De <u>v</u> ice name
Client ID Client ID: Assign IP Config ssign device name Device name:	MAC address	C De <u>v</u> ice name
Client ID Client ID: Assign IP Config ssign device name Device name: esset to factory setti	MAC address	C De <u>v</u> ice name
Client ID Client ID: Assign IP Config ssign device name Device name: eset to factory setti	MAC address	C De <u>v</u> ice name Assign Name <u>R</u> eset
Client ID Client ID: Client ID: Assign IP Config ssign device name Device name: eset to factory setti	MAC address	C De <u>v</u> ice name Assign Name <u>R</u> eset

Note If you start the search again, you can check to see if the parameters have been correctly accepted.

- 8. Execute the menu command "Target system > Load in module...".
- 9. In the "Select Target Module" dialog window, select the relevant module and click on "OK".

	Induks	Slot
CPU 410-5H	0	3
- 24		
Select All		

10. In the "Enter connection to target station" box in the "Select Node Address" dialog window, select the relevant IP address and click on the "OK" button.

elect Node Addr	ess			
Over which station	address is the programn	ning device conne	cted to the modu	ule CPU 410-5H?
<u>R</u> ack:				
<u>S</u> lot:	3 =			
Target Station:	C Local			
	U Lan de reached i	by means or gatew	ay	
Enter connection	to target station:	Madula tuna	Ctation name	Madula pama A
102 169 1 1	MAC address	Module type	Station name	
172.10.1.32				-
1				•
A				
Accessible Nodes				
•				•
		⊻iew		
ОК			Cancel	Help

11. The configuration has now been loaded into the AS.

2.1.2 Establishing a connection via internal PN/Ethernet interfaces of the CPU

The following describes how to establish a connection between the ES and the AS using the internal PN/Ethernet interfaces of the CPU 410-5H.

Requirement

In order to establish a connection between the ES and the AS using the internal interfaces of the CPU 410-5H, the CPU 410-5H must be fitted in the rack as shown in the operating manual and be connected to the ES via the network (Ethernet).

Preliminary consideration

Before configuring, define which interface is to be used to connect the CPU to the plant bus. An IP address from the address range of the plant bus must be used for the interface.

Note The ISO protocol is not supported by the internal PN/Ethernet interfaces.

Connection via PN/Ethernet interface

The following points are a step-by-step description of how to establish the initial connection between the CPU 410-5H and the ES.

1. Configure the AS in the HW Config and assign the IP parameters (IP address, subnet mask) in the PN/Ethernet interface.

operties - Ethernet interface PN-	IO-X5 (R0/53.5)
General Parameters	
<u>I</u> P address: 172.10.1.32 Subnet mask: 255.255.0.0	Gateway © Do not use router © Use router Address:
Subnet: not networked Plantbus	<u>N</u> ew
	P <u>r</u> operties
	Deļete
ОК	Cancel Help

- 2. Save and compile the configuration.
- From the menu command "Tools > Set PG/PC station..." in the SIMATIC Manager, set the "Interface parameter setting used" to "RFC1006" or "TCPIP" (e.g., CP1623.RFC1006.1).
- 4. Switch to the HW Config.
- 5. Execute the menu command "Target system > Edit Ethernet Node".

6. Click on the "Browse" button in the "Edit Ethernet Node" dialog window.

Ethernet Node		
Ethernet node		
MAC <u>a</u> ddress:		Nodes accessible online Browse
		<u></u>
Set IP configuration		
Use IP parameters		
ID address.		Gateway
IP address:		Do not use router
Subnet mas <u>k</u> :		∫
		Addr <u>e</u> ss:
Client ID	C MAC address	C De <u>v</u> ice name
Assign IP Configurat	ion	
Assign device name —		
<u>D</u> evice name:	[Assign Name
Reset to factory settings		
Reset to factory settings		Beset

7. In the "Browse Network" dialog window, select the CPU by means of the MAC address and click on the "OK" button.

<u>S</u> tart	! IP address	MAC address	Device type	Name
	172.10.0.208	00-18-18-46-40-79	SCALANCE	h-rack-12
Stop	172.10.0.203	00-18-18-06-18-72	SCALANCE	labor1-x2
	172.20.66.202	08-00-06-9A-6D-26	INC	UPD-Ter
	169.254.210.195	00-1B-1B-7E-95	SIMATIC-PC	es13
Fast search	172.10.0.204	00-1B-1B-06-1B-CC	SCALANCE	labor1-x2
-	172.10.0.202	00-1B-1B-89-02-3F	SCALANCE	labor2-x2
	172.10.0.201	08-00-06-97-1B-BE	SCALANCE	labor2-x4
	172.20.66.201	08-00-06-96-AE-AE	INC	UPD-Ter
	172.10.50.201	00-0E-8C-D3-63-AE	SCALANCE	platz50a
	172.10.1.22	08-00-06-01-00-22	S7-PC	es22
	192.168.0.21	00-18-18-85-25-11	S7-400	pn-io
	172.10.0.206	UU-1B-1B-46-4U-UD	SUALANUE	h-rack-11
	1			Þ
Elsek (
	100-1	D-10-03-20-11		

Note

If not all or none of the connected nodes are displayed, check the settings for the network components used (switches,...).

8. The MAC address and the IP parameters for the Ethernet interface are entered in the "Edit Ethernet Node" dialog window. Adapt the IP parameters according to your configuration in HW Config (see Step 1). Next click on the "Assign IP Configuration" button and then on the "Close" button.

Ethernet Node		
thernet node		
		Nodes accessible online
IAC <u>a</u> ddress:	00-1B-1B-85-25-11	Browse
et IP configuration		
Use IP paramete	ns	
IP address:	172 10 1 22	_ Gateway
<u>n</u> dddroso.	[172.10.1.32	Do not use router
Subnet mas <u>k</u> :	255.255.0.0	O Use router
		A.22102.10_3.0.21
Clie <u>n</u> t ID:	juration	
ssign device name		
<u>D</u> evice name:	pn-io	Assign Name
eset to factory setti	ings	
		<u>R</u> eset

Note If you start the search again, you can check to see if the parameters have been correctly accepted.

- 9. Execute the menu command "Target system > Load in module...".
- 10. In the "Select Target Module" dialog window, select the relevant module and click on "OK".

elect Target Module	
[arget_modules:	
Module	Racks Slot
CPU 410-5H	0 3
Select All I	
<u></u>	

11. In the "Enter connection to target station" box in the "Select Node Address" dialog window, select the relevant IP address and click on the "OK" button.

elect Node Addi	'ess			
Over which station	n address is the program	ming device conne	cted to the mod	ule CPU 410-5H?
<u>R</u> ack:				
<u>è</u> lot:	3 🚍			
larget Station:	🖲 Local			
	C Can be reached	by means of gatew	ay	
Enter connection	n to target station:	Madula tuna	Station name	Madula nama
172 10 1 22	MAC address	Module type	Station name	Module name
192.168.1.1	00-16-16-35-25-11	37-100		
•				
•				
		⊻iew		
				1
OV.				1111

12. The configuration has now been loaded into the AS.

2.2 Loading interface changes from AS blocks in RUN mode (TCiR)

2.2 Loading interface changes from AS blocks in RUN mode (TCiR)

Introduction

The CPU 410-5H V8.1 supports type updating with interface changes in RUN mode (Type Change in RUN (TCiR)). It is thus possible to update the instances after an interface change to block types and load them into the target system in RUN mode. With the TCiR function you can, for example, also update a library without having to put the CPU in the STOP state.

NOTICE	The following changes to the block can only be loaded in the STOP mode:
	Changed default value of a connection
	Changed name of an input with configured message ("Message Event ID")

This chapter will describe as an example, how to add a new connection to the block and then load this change into the CPU 410-5H in RUN mode.

Requirement

The following requirements apply:

- A PCS 7 multiproject is open in the SIMATIC Manager.
- The automation program has been compiled and loaded into the CPU 410-5H.

Making interface changes

Open the standard library for the project in the component view.

- 1. Open the "Sources" folder.
- 2. Open the SCL source for the desired block type.



- 2.2 Loading interface changes from AS blocks in RUN mode (TCiR)
 - 3. Carry out the desired changes.

In this example, the connection "LOCK_2" will be added for an additional interlock on the block.

騣5CL - [seMOTOR TUWE5_Lib\57 Program(1)]	_ 🗆 ×
Ele Edit Insert PLC Debug View Options Window Help	- 8 ×
<u> </u>	
VAR_INPUT	<u> </u>
S7 link:='false';	
S7_m_c:='true';	
S7 string 0:='In Service'; S7 string 1:='Out of Service'} : BOOL := 0: // 1= Out of Service	
LOCK {S7_dynamic:='true';	
LOCK 2 (S7 dynamic:='true':	
S7_m_c:='true'} : BOOL := 0; // 1=Lock to OFF	
AUTO ON {S7 dynamic:='true';	
S7_contact:='true'} : BOOL := 0; // AUTO Mode:1=ON, 0=OFF	
1	
K Fror Info	
Press F1 for help. In 62 Col 29 INS	MOD //

- 4. Save the changes and compile the SCL program.
- 5. Close the SCL source.

2.2 Loading interface changes from AS blocks in RUN mode (TCiR)

Loading interface changes in RUN mode

- 1. Select the "Blocks" folder in the standard library.
- Execute the command "Extras > Charts > Update block types". The "Update block types" dialog will open.
- 3. Check the check box in the "Download in RUN" column and click on the "Calculate" button in the "Resources" column.

Update	block types			
*	Select the S7 program t	o be checked.		1(3)
	Download in RUN	Program	Resources	Status
N		TUWAS\AS410_B\CPU 410-5H\S7-Programm(1)		Г
	-	TUWES_Lib\\$7 Program(1)		
		TUWES_Prj\AS410\CPU 410-5H\S7 Program(1)	calculating	
		TUWES_Prj\AS417\CPU 417-5 H PN/DP\\$7 Program(2)		
Log file:	D:\Project\TU	WES\TUWE_Lib\@CentralBstActualize.TXT	<u>0</u> tł	ner file
Ba	ick <u>N</u> ext		Cancel	Help

The "Resource information" dialog opens. This contains information about resource requirements for type changing in the automation system in which the type change will be made.

Resource information X
Temporary work memory and communication job instances are used when downloading a CPU 410-5 in operating mode. The required resources can only be estimated prior to the type import.
An exact calculation is possible only immediately prior to the download. In some cases, only a complete download is possible.
Please read the information in the help.
Temporarily required work memory in bytes: 744 Bytes
Temporarily required communication job instances: 2
Close Help

- 2.2 Loading interface changes from AS blocks in RUN mode (TCiR)
 - 4. Close the "Resource information" dialog.
 - Click on the "Continue" button in the "Update block types" dialog. In this step, the display will show whether the type change can be carried out in the RUN state on the basis of the calculation in the "Consequence" field.

Upda	te block ty	pes				
×	Select th	e block types I	to be updated.			2(3)
	B	ock type	Program	Consequence		Status
E	seMO	TOR	TUWES_Prj\AS410\CPU 410	🐼 Download in RUN is possible after adapting all ins	tances	
	Back	<u>F</u> inish			Cancel	Help

- 6. Click "Finish". Wait until the updating procedure has successfully completed. A log file is displayed at the end of the procedure.
- 7. Select the "Charts" folder for the AS program and open a CFC chart.

The message "TCiR: Download required!" will be displayed in the status bar.



- 2.2 Loading interface changes from AS blocks in RUN mode (TCiR)
 - Click on the "Download" button in the toolbar. The "Compile program / Download to target system" dialog will open.
 - 9. Check the "Entire program" option in the "Compile charts as program" tab.

mpile Program /	Download to Target Sy	stem	2
Compile Charts as Pro	ogram S7 Download		
CPU:	CPU 410-5H		
Program name:	AS410\CPU 410-5	H\S7 Program(1)\	
Scope Entire program			
C Changes only			
Generate modul	le drivers	Block Driver Settings	

10. Open the "S7 download" tab and check the "Changes only" option.

npile Program / Down	load to Target System		
ompile Charts as Program	S7 Download		
CPU:	CPU 410-5H		
Program name:	AS410\CPU 410-5H\S7 Prog	ram(1)	
- Download mode			
C Entire program			
Changes only			
C To test CPU (entire	program)		
	Show Changes		
	15.		
 Include user data bloc 	ks		
Download S7 program?			
Read the notes in the onli	ne help about possible effects		
- Auto-archiving			
, all all all all all all all all all al	Versionenniekt durcheuchen		1
	veraionaprojekt durchadenem		
D:\Project\TUWES\TU	JW		
Archive project after	successful download		
OK	1	Cancel	Halo
UN		Caricer	Licih

11. Click on the "OK" button.

The interface changes will be downloaded into the CPU 410-5H in RUN mode.

2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H

2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H

In this chapter you will find information about configuration options for the PN/Ethernet interfaces of the CPU 410-5H.

2.3.1 Configuring the interfaces for connection to the plant bus and the process bus without using an external CP

Due to its two PN/Ethernet interfaces, the CPU 410-5H can provide the option of implementing a connection to the plant bus and the process bus without using an external CP. This yields the following benefits:

- Reduction of hardware costs
- More space due to the use of compact mounting racks

The configuration procedure is carried out in the following steps:

- Expand the project by one new AS station
- Configure the interface for the plant bus
- Configure the interface for the process bus

The following figure shows the configuration schematically:



2 Application scenarios

2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H

Requirements

The following requirements must be met:

- There is a PCS 7 multiproject present.
- A CPU 410-5H is connected.

Expand the project by one new AS station

- 1. Open a PCS 7 multiproject in the SIMATIC Manager.
- 2. Insert a new sub-project using the "File > New project" command.
- Click on the sub-project with the right mouse button and select the "Insert new object > Preconfigured station" command from the context menu. The "PCS 7 Wizard: Expand project" dialog will open.
- 4. Select the CPU 410-5H without CP and insert the station. In this example, the procedure will be explained using the example of a single station (AS410-Single (1H)).
- 5. Open the AS station with the CPU 410-5H in HW Config.

Configure the interface for the plant bus

1. Open the properties for the "PN-IO-X5" interface of the CPU 410-5H in HW Config.

HW Config - [SIMATIC 400(1) (Configuration) -	01_Plant]	-0×
The station and a state of the	dow Help	X
🗅 🍃 🐕 🎙 👫 🗁 👘 👘 🛍 🏜	🗈 🗖 🚼 😽	
Image: Constraint of the second sec	PROFIBUS(1): DP-Mastersys	Eind: Profile: Standard Erofile: Standard FOUNDATION FIELDBUS FOUNDATION FIELDBUS FOUNDATION FOUN
O) UR2ALU Slot Module Order numb Press F1 to get Help.	• Fi M I Q C	

- 2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H
 - 2. Enter a device name in the "General" tab.

Media Redund	lancy	Time-of-Day Synchronization	Options
General	Addresses	PROFINET	Synchronization
nort description:	PN-IO-X5		
evice name:	AS01		
Support device r	eplacement without	exchangeable medium	
late for a			
птепасе Туре:	Ethernet		
Device number:	0		
Device number: Address:	0 192.168.0.1		
Device number: Address: Networked:	0 192.168.0.1 No	Properties	
Device number: Address: Networked: mment:	0 192.168.0.1 No	Properties	
Device number: Address: Networked: mment:	0 192.168.0.1 No	Properties	<u>A</u>
Device number: Address: Networked: mment:	0 192.168.0.1 No	Properties	-

- 3. Click on the "Properties..." button
- 4. Enter a valid IP address and subnet mask for the plant bus.

roperties	- Ethern	et interface PN-1	(0-X5 (R0/53.5)
General	Parame	ters	
			If a subnet is selected, the next available addresses are suggested.
<u>IP</u> addres	3S:	192.168.1.1	Gateway • Do not use router
Su <u>p</u> net m	iask:	1200.200.200.0	C Use router Address:
Subnet:	networke	1	<u>N</u> ew
			P <u>r</u> operties
			Delete
ОК	7		Cancel Help

- 2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H
 - 5. Assign an existing subnet to the interface or create a new subnet for it. In this example, a new subnet will be created for the plant bus and assigned to the interface.

Properties	- Ethern	et interface PN-IC	0-X5 (R0/53.5)	×
General	Paramet	ers		1
			If a subnet is selected, the next available addresses are suggested.	
<u>I</u> P addres Su <u>b</u> net m	ss: nask:	192.168.1.1 255.255.255.0	Gateway	
Subnet: not r	networked	1	<u>N</u> ew	
			Properties Delete	
ОК			Cancel He	lp

6. Confirm the settings with the "OK" button. The interface will be connected to the plant bus. 2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H

Configure the interface for the process bus

- 1. Open the properties for the "PN-IO-X8" interface of the CPU 410-5H in the HW Config.
- 2. Select the "PN-IO-X8" interface with the right mouse button and select the "Insert PROFINET IO system" command from the context menu.

China Edit Insert PLC View Options Window Help □ C ² P _∞ III
Image: CPU 410-5H PROFIBUS(1): DP-Mastersys X7 DP IF1 Foundation FieldBus IF2 AS07 X5 AS07 X5 Profile X6 Profile Simatic 300 IF2 Simatic 300 X5 Profile X6 Profile Simatic 300 IF3 Simatic 300 IF4 Simatic 300 IF2 Simatic 300 X5 Profile X8 Philox8 X8 Philox8 IF5 Simatic 300 IF3 Simatic 300 IF4 Simatic 300 IF5 Simatic 300 IF5 Simatic 300 IF5 Simatic 200 IF4 Simatic 200 IF5 Simatic 200 IF6 <t< td=""></t<>
Image: Constraint of the second sec

The "Properties..." dialog will open.

- 3. Enter a valid IP address and subnet mask for the process bus.
- Assign an existing subnet to the interface or create a new subnet for it. In this
 example, a new subnet will be created for the process bus and assigned to
 the interface.

Properties - Ethernet interface PN-IO->	X8 (R0/53.8)
General Parameters IP address: 192.168.0.1 Subnet mask: 255.255.255.0	If a subnet is selected, the next available addresses are suggested. Gateway
Subnet: not networked Processbus	<u>N</u> ew P <u>r</u> operties Dejete
ОК	Cancel Help

- 2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H
 - Confirm the settings with the "OK" button. A PROFINET IO system for connecting the PROFINET IO modules will be created.



Further information on planning the PROFINET interface can be found in the application example "<u>SIMATIC PCS 7 with PROFINET – Typical Configurations</u>" (Chapter 4, "Configuration, Planning and Parameter Setting").

2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H

2.3.2 Configuring two separate PROFINET interfaces for connection to the process bus

When there is a large number of devices, the CPU 410-5 offers the option of configuring two PROFINET interfaces for connection to the process bus. In this case, the connection to the plant bus is made via an external CP.

The configuration procedure is carried out in the following steps:

- Expand the project by one new AS station
- Configure the CP interface for the plant bus
- Configure two PROFINET interfaces for the process bus

The following figure shows the configuration schematically:



Requirements

The following requirements must be met:

- There is a PCS 7 multiproject present.
- A CPU 410-5H is connected.

2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H

Expand the project by one new AS station

Proceed as follows to configure two PROFINET interfaces for the process bus:

- 1. Open a PCS 7 multiproject in the SIMATIC Manager.
- 2. Insert a new sub-project using the "File > New project" command.
- Click on the sub-project with the right mouse button and select the "Insert new object > Preconfigured station" command from the context menu. The "PCS 7 Wizard: Expand project" dialog will open.
- Select the CPU 410-5H with a CP and insert the station. In this example, the procedure will be explained using the example of a single station (AS410-Single (1H)) with a CP 443-1.

Configure the CP interface for the plant bus

- 1. Open the AS station with the CPU 410-5H in the HW Config.
- 2. Open the properties for the "PN-IO" interface of the CP 443-1.

HW Config -	SIMATIC 400(2)					
Station Edit	Insert PLC View Options Windo	w <u>H</u> elp				
0 🚅 🔓 🖥	• • • • • • • • • • • • • • • • • • •					
			1			
SIMATIC 4	00(2) (Configuration) 01_Plan					
(0) UB2A	10	1		<u>F</u> ind:		01 01
1	PS 407 10A			Profile:	Standard	
3	CPU 410-5H			E B PI	DUNDATION FIELDBU ROFIBUS DP	15
X1	DP	-	_	THE PL	ROFIBUS-PA	
IF1				H 짦 P	RUFINET IU IMATIC 200	
IF2		_			IMATIC 300	
X5	PN-10-X5	_			IMATIC PC Based Cont	rol 300/400
X5 PT R	Port 7	-		E SI	IMATIC PC Station	
XSP2R	POIT 2	-				
X8P1R	Port 1	-				
X8 P2 R	Port 2	-				
5	CP 443-1	-				
X1	PN-IO	r I				
X1P1R	Port 1					
X1 P2 R	Port 2					
6		_				
7		-				
8		-				
<u> </u>		-				
(0)	UR2ALU					
Slot	Module Order r	number F	irmwar			
1	PS 407 10A 6ES7 40	07-0KR02-0AA0		FOUNDA	TION FIELDBUS	ŧ
1						<u> </u>
				1		
Press F1 to get H	eip.					11.

- 2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H
 - 3. Open the "General" tab and enter a meaningful device name.

operties - PN-10 (F)/55.1)]
General Addresses	IP Configuration PROFINET	Synchronization	Media Redundar	ncy
Short description:	PN-IO			
Device name:	AS02			
Support device r	placement without exchangeable	emedium		
Interface	DI			
Type:	Etnemet			
Device number.	0			
Address:	192.168.0.1			
Networked:	No <u>Properties</u>			
Comment:				
				-
J				*
ОК			Cancel	Help

- 4. Click on the "Properties..." button
- 5. Enter a valid IP address and subnet mask for the plant bus.
- 6. Assign an existing subnet to the interface or create a new subnet for it.

operties - Ethernet interface PN-IO (R0)/55.1)
General Parameters	
Set MAC address / use ISQ protocol MAC address:	If a subnet is selected, the next available addresses are suggested.
IP protocol is being used IP address: 192.168.1.2 Subnet mask: 255.255.255.0	Gateway
Subnet: not networked Plantbus Processbus	New Properties Delete
ок	Cancel Help

 Confirm the settings with the "OK" button. The CP443-1 interface will be connected to the plant bus.

2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H

Configure the PROFINET interfaces for the process bus

- 1. Open the HW Config.
- 2. Open the properties for the "PN-IO-X5" interface of the CPU 410-5H in the HW Config.
- Select the "PN-IO-X5" interface with the right mouse button and select the "Insert PROFINET IO system" command from the context menu. The "Properties" dialog for the interfaces will open.
- 4. Enter a valid IP address and subnet mask.
- 5. Assign an existing subnet to the interface or create a new subnet for it. In this example, a new subnet ("Processbus_AS02_1") will be created for the process bus and assigned to the interface.

	If a subnet is selected, the next available addresses are suggested.
IP address: 192.168.2.1 Subnet mask: 255.255.255.0	Gateway © Do not use router © Use router Address:
Subnet: not networked Plantbus Processbus Bracessbus	<u>N</u> ew
Processous_ASU2_1	Dejete

- 2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H
 - Confirm the settings with the "OK" button. The PROFINET IO system "Processbus_AS02_1" will be assigned to the interface.

(0) UR2A	00(2) (Configuration) 01_Pla		Eind: Mt M
3 X1 IF1 IF2 X5 X5 P1 X5 P2 R X8 X8 P2 R X8 X8 P2 R X1 X1 P1 R X1 P2 R 5 X1 X1 P1 R X8 P2 R X8 P1 R X8 P1 R X8 P1 R X8 P1 R X8 P2 R X8 P1 R X8 P2 R X8 P1 R X1 P1 R X1 P1 R X1 P1 R X1 P2 R 8 P1 R X1 P1 R X1 P2 R 8 P1 R X1 P1 R X1 P1 R P1 R X1 P1 R P1 R P1 P1 P1 P1 P1 P1 P1 P1 P1 P1	■ CPU 410-5H ■ DP ■ DP ■ Port 1 ■ Port 2 ■ PN-IO-X8 ■ Port 1 ■ Port 2 ■ Port 2 ■ CP 443-1 ■ AS02 ■ Port 1 ■ Port 2	PROFIBUS(2): DP master system (1) Processbus_AS02_1: PROFINET-IO-Sys	FOUNDATION FORFIBUS DF FROFIBUS -PA PROFIBUS -PA FROFINET IO SIMATIC 400 SIMATIC PC S
Pro Device Num	cessbus_AS02_1: PROFINET-IO-Sy ber I IP addre Device I	stem (100) Name Order number Firmware Diagnostic	FOUNDATION E

- 2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H
 - 7. Select the "PN-IO-X8" interface with the right mouse button and select the "Insert PROFINET IO system" command from the context menu. The "Properties" dialog for the interfaces will open.

HW Config -	SIMATIC 400(2)		
Station Edit	Insert PLC View Options Window	Help	
0 🚅 🔓	5 🗣 🚭 🖻 🖻 🎪 🎪	🗈 🗖 🔡 😽	
SIMATIC 4	100(2) (Configuration) 01_Plant		D X
		1	Find: Mt Mi
(0) UR2A	LU		
1	PS 407 10A		Profile: PCS7_V{
3	CPU 410-5H		FOUNDATION F
10.00-0			
X1	DP	PROFIBUS(2): DP master system (1)	
IF1			E SIMATIC 400
X5	PN-10-X5	Processbus AS02 1: PROFINET-IO-Syste	🗄 🖳 SIMATIC PC Sta
X5 P1 R	Port 1		
X5 P2 R	Port 2		
X8	PN-IO-X8		
X8PTH	Port 7		
5	CP 443-1		
XT	AS02		
X1 P1 R	Port 1		
X1 P2 R	Port 2		
7			
8			
9			
		L	
(0) (= =	UR2ALU		
	I NAL LOL		
	Module Urder nul PS 407 104 SEST 407	-0KB02.0AA0	
J		-011102-0440	
Press F1 to get H	lelp.		1.

- 8. Enter a valid IP address and subnet mask.
- 9. Assign an existing subnet to the interface or create a new subnet for it. In this example, a new subnet ("Processbus_AS02_2") will be created for the process bus and assigned to the interface.

- 2.3 Configuring the PN/Ethernet interfaces of the CPU 410-5H
 - Confirm the settings with the "OK" button. The PROFINET IO system "Processbus_AS02_2" will be assigned to the interface.

HW Config -	- SIMATIC 400(2)	ns Window He	lo					
		is <u>window ne</u>						
JINATIC 4	roo(z) (configuration) -					Find:		
(0) UR2ALU	J					-		
1	PS 407 10A					Profile:	PCS7_\	/{ _
3	CPU 410-5H	-					FOUNDATI PROFIBUS	ON F DP
X1	DP	S(2): DP master	system (1)			⊡ ₩	PROFIBUS	PA
IF1							PROFINET	10
IF2	AN IO YE	-					SIMATIC 40	C Sta
X5 PT R	PIV-IU-XO	bus_AS02_1: P	ROFINET-IO-Syster	m (100)	8			
X5P2R	Port 2							
X8	PN-IO-X8							- 1
X8PIR	Port 1	Processbus_A	S02_2: PROFINET	-IO-System (10	1)			- 1
X8 P2 R	Port 2							- 1
5	CP 443-1							- 1
X1	AS02							- 1
XIPIR	Port 1							- 1
X1 P2 R	Port 2							- 1
6								- 1
7								- 1
8								- 1
9		-						- 1
				1				
Pro	ocessbus_AS02_2: PROFIN	VET-10-System (10	1)					
Device Num	nber 🚺 IP addre	Device Name	Order number	Firmware	Diagnostic	•		►
						FOUND	ATION	٠Ŧ
<u> </u>					1	FIELDB	BUS	
Press F1 to get H	lelp.							11.

Further information on planning the PROFINET interface can be found in the application example "<u>SIMATIC PCS 7 with PROFINET – Typical Configurations</u>" (Chapter 4, "Configuration, Planning and Parameter Setting").

2.4 Online upgrade of CPU 410-5H process objects

2.4.1 Introduction

When you load a PCS 7 project into the CPU, the system checks that the project can run with the current number of process objects (PO) in the CPU.

If the number is not sufficient, starting with PCS 7 V8.1 you have the option of increasing the PO volume by means of an online upgrade of the CPU 410-5H system expansion card (SEC).

CPU 410 expansion packs

You will need at least one CPU 410 expansion pack for the online upgrade of the process objects of a CPU 410-5H.

The CPU expansion packs are available in the following sizes:

- 100 PO
- 500 PO

The expansion packs can be combined in any way up to the maximum size. However note that with a redundant system (2 CPUs), the CPU 410 expansion packs must be distributed symmetrically between the CPUs.

The volume of a CPU expansion pack must always be assigned in its entirety to a CPU or SEC of the CPU. Distribution between several CPUs or SECs is not possible.

After a PO upgrade, the POs that are assigned to an SEC/CPU can no longer be relocated.

Example

If the number of POs in the CPU is not sufficient to load the engineering project, you can increase the PO volume of the CPU by means of an online upgrade.

Table 2–1



2 Application scenarios

2.4 Online upgrade of CPU 410-5H process objects



The following table contains further examples:

Table 2–2

PO expansion by	CPU 410 expansion packs required				
	Single AS	Redundant AS			
400 PO	4 x 100 PO	8 x 100 PO			
500 PO	1 x 500 PO or 5 x 100 PO	2 x 500 PO or 10 x 100 PO			
600 PO	1 x 500 PO + 1 x 100 PO or 6 x 100 PO	2 x 500 PO + 2 x 100 PO or 12 x 100 PO			
1000 PO	2 x 500 PO or 10 x 100 PO	4 x 500 PO or 20 x 100 PO			

2.4.2 Overview of the steps

The online upgrade is carried out in the following main steps:

Table 2–3

Schematic representation	Step
Management and Andreas	1. Order the CPU 410 expansion packs.
ALM SIMATIC PCS 7 AS 410 CPU 410-5H: PO 400 Upgrade Activation File Too PO	2. In the SIMATIC Automation License Manager (ALM), transfer the CPU 410 expansion packs to the CPU and create a PO activation file.
Activation File Support Request	 Send the PO activation file for checking and activation by means of a support request. Within 48 hours you will receive by e-mail a PO release file (for each PO activation file sent) as confirmation of the checking.
https://support.industry.siemens.com	
Relase File 700 PO 700 PO Image: Constraint of the second seco	 Transfer the PO release file to the SEC of the CPU using the ALM.

NOTICE When performing an online upgrade of the process objects, pay attention to the information and notes in the manual "SIMATIC PCS 7 Service Support and Diagnostics (V8.1)".

2.4.3 Order the CPU 410 expansion packs

You have the following options when ordering CPU 410 expansion packs:

- Through your Siemens contact person (www.siemens.com/automation/partner)
- Online via <u>www.siemens.com/industrymall</u>

SIEN	IND IND	ANT THE	> Register now! Industry Mall	> Logi
IND	USTRY MALL	the first the	Product catalogue and online ordering Industry Automation and Drive Technol	g system for the ology.
Home 🕨 G	erman Contact Help	A	1	Site Explorer
> Home >	Search for: cpu 410 expansion pack			🗋 Catak
cpu 410 ex	rpansion pack	Search ? Help		
Product IDs	Descriptions (4) Product Categories (0) Documents (28)			
Compare	More			
Product	t No. / Product Description Listpric	e / Your price		
	> 6E57853-2CA00-0XE0 SIMATIC PC5.7: SOFTWARE_CPU 410 EXPANSION PACK (PO 100) UPGRADE OPTION F.1 INSTALLATION R.SW, WITHOUT SW AND DOCU. LICENSE KEY ON USB KEY ON USB TICK, CLASS A, REFERENCE HW: PC5.7 IPC BUNDLE	> Show price	S Filter your search results) filters Apply Filter
	> 6E57653-2CA00-0XK0 SIMATIC PC5 7, SOFTWARE, CPU 410 EXPANSION PACK (PO 100) UPGRADE OPTION F.1 INSTALLATION R-SW, WTHOUT SW AND DOCU. LICENSE KEY DOWILOAD, CLASS A, REFERENCE HW, PC5 7 IFC BUNDLE MAIL ADDRESS IS MANDATORY FOR DELIVERY	> Show price	-	
⊇4 This produ	uct is downloadable only.		_	
	> 6E57653-2CC00-0XE0 SIMATIC PC5 7, SOFTWARE, CPU 410 EXPANSION PACK (PO 500) UPGRADE OPTION F.1 INSTALLATION R-SW, WITHOUT SW AND DOCU. LICENSE KEY ON USB TICK, CLASS A, REFERENCE HW: PCS 7 IPC BUNDLE	> Show price	8	
	> 6E57653-2CC00-0XK0 SIMATIC PC5 7, SOFTWARE, CPU 410 EXPANSION PACK (PO 500) UPGRADE OPTION F.1 INSTALLATION R-SW, WITHOUT SW AND DOCU, LICENSE KEY DOWINLOAD, CLASS A, REFERENCE HW; PC5 TIPC BUNDLE E.	> Show price	- S	

After you have received the CPU 410 expansion packs (by e-mail or USB stick), transfer them to a disk drive that can be accessed by the Engineering Station.

2.4.4 Create the PO activation file using the Automation License Manager (ALM)

1. Store the CPU 410 expansion packs on a drive that can be accessed in the Automation License Manager (ALM).



2. Select the menu command "Edit > Connect target system > Connect/disconnect AS 410...".

File E	Edit License Key Viev	v Help	
+	Undo Redo	Ctrl+Z Ctrl+Y	License keys 💌 🔝 🕄
	Connect Computer New Folder		
	Connect target syste	m 🕨	Connect/disconnect AS 410
	Disconnect target sys	stem	
	Cut Paste Rename Delete Delete Log	Ctrl+X Ctrl+V F2 Del	
	Select All Reverse Selection	Ctrl+A	_

The "Connect Target System" dialog opens.

- 2.4 Online upgrade of CPU 410-5H process objects
 - 3. Click on the "Add" button to establish an on-line connection to a CPU 410-5H.

onnect Target System	×
Set up access to the automation system and online connection to the automation system established. The connection can be set up.	is
Connected automation systems:	Add
	Remove
Settings	
The security functions of the upgrade are deactivated in expert mode. Additional failed a could put the automation system into STOP.	attempts
Enable expert mode	

4. In the PCS 7 project, select the CPU to which you wish to transfer the CPU 410 expansion packs or PO. Then click on the "OK" button.



The CPU will be displayed in the ALM.

5. Drag the license keys for the CPU 410 expansion packs and drop them on to the automation system for which you wish to perform the PO upgrade.



Note If you have selected the wrong automation system, you can move the license keys for the CPU 410 expansion packs using drag and drop.

- 6. Open the "Online" folder in the tree view for the automation system.
- 7. Select <u>the license</u> and then select the "License Key > Upgrade" menu command.

NOTICE When you initiate the upgrade, the selected CPU 410 expansion packs will be assigned to the SEC. Moving to another AS will no longer be possible.

ile <u>E</u> dit	License Key View Help				
→ = = =	Transfer Synchronize License Requiremen Offline Transfer	eys			
	Check Recover Recover Wizard	/ / 0y	License number SECSVPXXXX 190	Validity 600 (2600)	
E	Upgrade				

The license keys for the selected CPU 410 expansion packs will be deleted and a PO activation file will be created in the <u>"Your document > Siemens ></u> Automation > PCS 7 > Activations" folder.

The ALM will indicate that the PO activation file contains a volume expansion (in this example, from 600 to 700).



2.4.5 Send the PO activation file via Support Request

1. Start a support request via the following web page: <u>http://www.siemens.com/automation/support-request.</u>

SIEMENS		Industry Online	● Infranet > Register now! > Log in e Support	
▶ 📢 Industry Online Support → Language				Q
> Home > mySupport > Requests		Product Support	③ Services ▲ Forum mu mySupport	
Navigation Personal messages Requests	Support Request 1 Select a product 2 Select an application case 3	Our solutions	my Support Cockpit > Favorites > Personal messages > My requests	
> Create new request	Product/Order number *		> CAx downloads	
Notifications Filter Favorites	Please enter a product without a version specification (e.g. TIA Portal, STEP 7, S7-1500, PCS 7, ET 200SP, SIMOTION Scout,,) Search	User online (54)	
Tagging Entries last viewed	* = Mandatory field			
Documentation				
Personal data				
CAx data				
Extranets				

- 2. "Select product" step:
 - Enter "CPU 410" in the "Product/Order number" text box and click on the "Search" button.
 - Check the "Authorization > CPU 410 Activation File" radio button.
 - Check the "Problem with the authorization/license" check box and then click on the "Next" button.

Support Request

1	Select a product	> 2	Select an a	pplication case	> 3	Our solutions	
Produ	ict/Order number *						
Please e.g. T	e enter a product with TIA Portal, STEP 7, S	nout a ver 7-1500, P	sion specific CS 7, ET 200	cation SP, SIMOTION	Scout,)		
CPU 4	410					Search	
Produ	ict range *						
Please	e select the appropria	ite product	t exactly.				
SIM/	ATIC PCS7						
OF	PU 410 PCS 7 AS Automation	System					
0	COT NO Automation	- Cystem					
Auth	orization	ilo					
0	104107001400111						
CPU	410 SMART						
00	PU 410 SMART						
I Pr		authorizat	ion/liconco				
✓ Pro	oblem with SIMATIC	authorizat	ion/license				

- 2.4 Online upgrade of CPU 410-5H process objects
 - "Select application" step: Enter "Upgrade CPU 410" in the text box and click on "Next".

Support Request 1 Select a product 2 Select an application case 3 Our solutions "CPU 410 (SIMATIC PCS7)" When describing your application case, we will be able to give you targeted and direct advice Please give us a subject or keyword that best describes your problem: (e.g. version, communication, installation, configuration, compatibility) * Upgrade CPU 410 * Back Next

4. "Our solutions" step: Click on the "Next" button.

Forum

- A Simotion D 410 2 PN/DP
- AS 410 SE Card and AS Runtime PO
- 7 CPU 410 Smart
- 7 CF CARD CACTUS FOR SIMOTION D410-2
- > D410-2 Synchrous Operation Over Prifinet.

Downloads

- A Firmware V8.1.0 for CPU 410-5H Process Automation available for download
- A Operating System Update for CPU 410-5H Process Automation
- A Operating System Update for CPU 410-5H Process Automation
- → Hardware Upgrade Package "HUP CPU410-5H" Available for Download
- A SIMATIC PCS 7 Condition Monitoring Library V8.1 Available for Download

Product notes

- A Change of the AS-Bundle Configuration for AS 410 Automation Systems
- ↗ Instructions for Updating the CPU 410 Operating System
- A Sales Release for SIMATIC PCS 7 CPU 410-5H Process Automation
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 Sales Release for SIMATIC PCS 7 CPU 410-5H Process Automation
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 Sales Release for SIMATIC PCS 7 CPU 410-5H Process Automation
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 Sales Release for SIMATIC PCS 7 CPU 410-5H
 Sales Release for SIMATIC PCS 7
 Sales Release for SIMATIC PCS
 S
- A SIMATIC PCS 7 CPU 410-5H Process Automation Released for Delivery
- A Product Announcement for SIMATIC PCS 7 CPU 410-5H Process Automation

Back

Next

- 5. "Describe the problem" step:
 - Make the entries in the mandatory fields.
 - Enter the text "Request PO activation file" in the "Details" text box.
 - Insert the PO activation file as a Zip file using the "Choose File" button.
- **Note** PO activation files are automatically created in the following Upgrade directory in the Engineering Station:

"Your documents > Siemens > Automation > PCS7 > Activations"

Note You can send several PO activation files with one support request.

- Click on the "Next" button.

Details *		Remaining characters	s: 197
Request PO-Activation-File			
Attachment	Choose File	No file chosen	

- 6. "Specify contact data" step: Specify your contact data, then click on the "Next" button.
- "Summary and send" step: Check your details, then click on the "Send" button. Within 48 hours you will receive an e-mail containing a PO release file for each PO activation file sent.

2.4.6 Transfer the PO release file to the SEC of the CPU

- Transfer the PO release files received to the Upgrade directory in the Engineering Station: "Your documents > Siemens > Automation > PCS7 > Activations".
- 2. Open the menu command Automation License Manager (ALM). The automation systems that are connected to the Automation License Manager are shown in the list in the "Connect AS 410" dialog box.
- 3. Click on the "Add" button to connect a further automation system. In the PCS 7 project, select the CPU to which you wish to transfer the PO release file. Then click on the "OK" button.

	🗊 S7 Program(1)
🖻 🎒 K1_MP_Prj	Connections
i AS1	
⊡ CPU 410-5H	
E	
	1

The CPU will be displayed in the ALM.

1. Drag the PO release file and drop it on to the "Online" folder of the desired automation system.

Manager (p	reliminary)	
<u>File Edit License Key View Help</u>		
🕒 🗏 🖳 X 🗈 🗙 🔼 🖬	🔐 License keys 🗾 🗂 😂 ?	
My Desktop My Computer SYSTEM (C:)	License keys - AS410CP	U
Master License(s)	Status Family Product	٧
KINGSTON (F:)	1 Online	
SIMATIC PCS 7 AS 410	 SIMATIC PC Activation SEC PO 600 -> PO 700 	-
AS410CPU 410-5H	SIMATIC PC Release SEC PO 600 -> PO 700	-
Web License Key Download	Automation License Manager	
100	Transfer license key	
	1 of 1 Cancel	

The upgrade will be carried out. The time taken depends on the loading of the automation system.

After an upgrade is completed, the files used in the Upgrade directory will be deleted (PO release file and PO activation file).

2.5 Additional information

The Automation License Manager shows the new number of POs for the updated SEC.



Note You can also call up the volume of the SEC, as well as the process objects that are subject to license, in the SIMATIC Manager at "Extras > PCS 7 license information".

2.5 Additional information

2.5.1 Replacing an existing CPU with the CPU 410-5H

An existing CPU in the S7-400 series can be replaced by the CPU 410-5H with little effort. In addition to the hardware exchange, some adaptations must also be made to the hardware configuration of the PCS 7 project. You will find extensive information about this at

https://support.industry.siemens.com/cs/ww/en/view/85014617.

2.5.2 Extending availability

With the standard SIMATIC PCS 7 AS 410 automation system, you already have the option of selectively increasing the availability by means of redundant configuration of the Industrial Ethernet communications module.

With its redundant CPUs, the Type AS 410H redundancy station offers considerably greater availability. It works on the 1 of 2 principle, where the reserve system is switched in if there is a failure of the active subsystem. In the same way, you can also double up the power supply or the Industrial Ethernet communications modules for each subsystem and combine these measures with one another.

You can find extensive information about the procedure for expanding a Single Station to a Redundancy Station at https://support.industry.siemens.com/cs/ww/en/view/82523363.

3 Related literature

Table 3-1

	Торіс	Title / Link
\1\	Siemens Industry Online Support	http://support.industry.siemens.com
\2\	Download page of this entry	https://support.industry.siemens.com/cs/ww/en/ view/96839331
\3\	SIMATIC PCS 7 process control system CPU 410-5H Process Automation	https://support.industry.siemens.com/cs/ww/en/ view/74736822
\4\	SIMATIC Process Control System PCS 7 Service support and diagnostics (V8.1)	https://support.industry.siemens.com/cs/ww/en/ view/90682682

4 History

Table 4–1

Version	Date	Change
V1.0	10/2014	First edition
V1.1	12/2014	Reworking of Section 3.1 Loading interface changes from <u>AS blocks in RUN mode (TCiR)</u>
V1.2	03/2015	New Section 3.1 <u>Configuring the communications</u> interface and establishing the connection between the <u>ES and the AS</u>
		Reworking of Section 3.4 <u>Online upgrade of CPU 410-</u> <u>5H process objects</u>
V1.3	06/2015	Reworking of Section 2.4.5 <u>Send the PO activation file</u> <u>via Support Request</u>