FAQ Kommunikation over PROFIBUS

Service & SUPPORT

FDL connection over PROFIBUS between PC station and SIMATIC S5 95-U



FAQ



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Question

How do I create a FDL connection to a SIMATIC S5 95-U over PROFIBUS for the SIMATIC NET OPC Server with the SIMATIC NET PC Software?

Answer

The instructions and notes listed in this document provide a detailed answer to this question.

1 Assignment of tasks

In this example a CP5611 is used, that implements FDL communication over the OPC Server with a SIMATIC S5 95-U on PROFIBUS.

NOTE The method described in these instructions also applies to the communications processors CP5613/14 (A2), CP5621, CP5511 and CP5512.

1.1 Condition

It is assumed that one of the two following configuration tools is installed:

• NCM PC

NCM PC is supplied with the SIMATIC NET CD and allows you to create PC projects and open STEP 7 projects. It is, however, not possible to edit S7 blocks in the STEP 7 project with this software.

 STEP 7 STEP 7 is a separate software package with which you can create S7-400, S7-300 and PC projects. S7 blocks can be edited with this software.

Only one of these tools can be installed.

In chapter 2 "Configuration of the PC station" is described the configuration of PC station so that you can use the FDL communication over PROFIBUS to exchange data between PC station and SIMATIC S5 95-U.

2 Configuration of the PC station

After successful completion of the hardware and software installation of the SIMATIC NET CD and the configuration tool and after restarting your computer, you start NCM PC or STEP 7 with "Start \rightarrow (in Windows XP: All Programs \rightarrow) SIMATIC \rightarrow SIMATIC Manager or SIMATIC NCM PC Manager or using the desktop icon of the same name.

Create a new project with "File \rightarrow New".

	-	
Name	Storage path	
•		
 ▲		Lype:
 ▲ I ame: C_Station orage location 	on	Iype: Project

Figure 2-1 giving the project a name

Confirm the project name you have entered (in the example: "PC_Station") with OK. An empty STEP 7 or NCM PC project is then created.



Figure 2-2 inserting the PC	station	
SIMATIC NCM PC Manager - PC	_Station	
<u>File E</u> dit Insert PLC ⊻iew Opti	ons <u>W</u> indow <u>H</u> elp	
	Po :- ::: ::: ::: < No Filter >	- <u>7</u> 2 580 <u>8</u>
PC_Station C:\Program File:	s\SIEMENS\SIMATIC.NCM\S7proj\PC_Stat	
E PC_Station	SIMATIC PC Station(1)	[™] MPI(1)
Press F1 to get Help.	, The second sec	CP5611(MPI)

With the menu command "Insert \rightarrow Station \rightarrow SIMATIC PC Station", you insert the PC station.

Figure 2-3 changing the name of the PC station

SIMATIC NCM PC Manager - PC_Station	
Eile Edit Insert PLC View Options Window Help	
X 🖻 🗈 🌆 °₂ 🏹 🔠 📾 < No Filter >	
PC_Station C:\Program Files\SIEMENS\SIMATIC.NCM\S7proj\PC_Stati	
PC_Station PC_Station PC_Station	
Press F1 to get Help.	5611(MPI)

Give the PC station you have just inserted the same name as your computer (in the example: "PC_Station").

Now open the hardware configuration of the PC station by selecting the PC station, then pressing the right mouse button and selecting "Open Project" (STEP 7: "Open Object").

Figure 2-4 hardware configuration of the PC station

SIMATIC NCM PC Config - [PC_S	tation (Configuration) PC_	Station]				
In Station Edit Insert PLC View	Options Window Help					_ 8 ×
	8 4 4 8 4	N?				
1 A A A A A A A A A A A A A A A A A A A					Eind:	ntai
4 5 6 7					PROFIBUS DP PROFIBUS-PA PROFINET IO SIMATIC PC Station	
				•		
(0) PC						
Index Module	Order number	Firm	M 1	C		
				-		
23		-	\vdash	-		
4						
5						
6		-		-		
8		-		-	PROFIBUS-DP slaves for SII	MATIC SZ, MZ, and CZ
		-		-	(distributed rack)	
10				-		
		S16 (4			J	
Press F1 to get Help.						11.

You will see an empty rack. If you cannot see the hardware catalog, click on the button marked in red.



		/ marc	mai	0 000	ulog		
SIMATIC NCM PC Config - [PC_St	ation (Configuration) PC_9	Station]					
mail Scation Fait Tusett Brc Alem	Options window Help					_	비미즈
	a 🛍 🖆 🖪 🖼	<u></u>					
P. (0) PC				-			= 믜죄
					Eind:		nt ni
4 5 6 7 8 9 9 • •				* *	PRU PRU PRU SIM PRU SIM PRU SIM	DFIBUS DP DFIBUS-PA DFINET 10 IATIC PC Station CP Industrial Ethernet CP PROFIBUS CP 5411 CF 5412 A2 CP 5511 CP 5511	*
Index Module	Order number	Firm	[м [c 1		CP 5512	
1						CP 5611	
2						SW V6.0 SP5	
3						CP 5613	
4			$ \downarrow \downarrow$			CP 5613 A2	
5			\vdash	- 1	Ð	CP 5613 F0	
<u>b</u> 7			+	-	÷-	CP 5614	-
8			+	-	6GK1 561-1	AA00	- E
9			+		SIMATIC N	ET CP 5611 PROFIBUS, S7 connections, D	Р <u> </u>
10				-	2, PCI bus,	/1, DP slave, PG functions, DP master class routing, SIMATIC NET CD 7/2001 SP5	
Press F1 to get Help.					0		Chg //

Figure 2-5 selecting the modules from the hardware catalog

Now place your PC modules in this rack (for example by dragging them from the hardware catalog).

If you use a CP5613/14 (A2) (or CP5511 or CP5512) you will select the CP5613/14 (A2) (or CP5511 or CP5512) from the STEP7 hardware catalog.

If you use a CP5611 A2 or CP5621 you will configure these modules as CP5611.

The following dialog appears automatically after you insert the module in the PC station.



- :	<u> </u>			dialan
Flaure	2-n	address	assignment	dialod
igaio		444.000	abolginnoine	ananog

Properties	- PROFIBUS i	nterface CP 5	611 (R0/59)		×
General	Parameters				
<u>A</u> ddress:			If a subnet is selected the next available add	l, dress is suggested.	
<u>S</u> ubnet: not	networked			<u>N</u> ew	
				Properties	
				Dejete	
OK			Ca	ncel Help	

Click on the button "New" to create a new PROFIBUS subnet. The property view of the PROFIBUS subnet will open. Change to the register "Network Settings"and set the relevant bus parameters.

Figure 2-7 configuring bus parameters for PROFIBUS subnet

<u>Hig</u> hest PROFIBUS Address:	126 💌 🗖 Chang	e Options
Iransmission Rate:	19.2 Kbps 93.75 Kbps 187.5 Kbps 500 Kbps 1.5 Mbps	
<u>P</u> rofile:	DP Standard Universal (DP/FMS) User-Defined	Rus Parametere



Confirm the dialog with "OK".

Figure 2-8 property view of the CP5611

eneral \ddress: fighest ad 'ransmissie	Parameters dress: 126				
∖ddress: tighestad 'ransmissio	dress: 126				
lighest ad Transmissio	dress: 126 an rate: 1 E Mbr				
ransmissio	water 1 E Mba				
	onnate. 1.5 Mbp	s			
jubnet:					
not net net net net net net net net net ne	etworked	15 M	hos	<u>N</u> er	w
	5(1)			Prope	rties
				Del	lete

Connect the CP5611 to the PROFIBUS subnet which you just have configured or to a PROFIBUS subnet which already exist.

Close the property view of the CP5611 with "OK".

The configuration and networking of the CP5611 is finished now.



HW Konfig - PC_Station					_ 🗆 🗵
tion <u>B</u> earbeiten <u>E</u> infügen	Zielsystem Ansicht Extras Eer	ister <u>H</u> ilfe			
		程 12			
PC_Station (Konfiguration	n) FAQprojekt_IE_SR			Suchen:	nt ni
(0) PC				Profil: Standa	rd 💌
2				🕀 📅 PROFIBL	JS-DP
3				PROFIBL	JS-PA
5					300
6					400
7				🗄 🔠 SIMATIC	PC Based Control 300/4
8					PC Station
9 UP 5611				🕀 🛄 Benu	tzer Applikation
11					dustrial Ethernet
			- II	E CP-P	ROFIBUS
					P 5411
) → Im.ec					P 5412 A2
(0) PC					P 5412 A2
(0) PC	Bestellnummer	Firmware	MPI-Adres:	#sto #sto ⊕0 #sto	P 5412 A2
(0) PC	Bestellnummer	Firmware	MPI-Adres:		P 5412 A2
(0) PC Index Baugruppe	Bestellnummer	Firmware	MPI-Adres:	-#to -#to -#to -#to -#to	P 5412 A2
	Bestellnummer	Firmware	MPI-Adres:		P 5412 A2 P 5412 A2 H P 5511 P 5512 P 5511 F SW V6.0 SP4 E SW V6.0 SP4
	Bestellnummer	Firmware	MPI-Adres:		P 5412 A2 P 5412 A2 H P 5511 P 5512 P 5511 F SW V6.0 SP4 E SW V6.0 SP4
(0) PC Index Baugruppe 1 2 3 4 5 6	Bestellnummer	Firmware	MPI-Adres	+# c +# c +# c +# c +# c = 0 +# c - 4 56K1 561-1AA000	P 5412 A2 P 5412 A2 H P 5511 P 5512 P 5611 SW V6.0 SP4 SW V6.0 SP4 SW V6.0 SP5
(0) PC Index Baugruppe 2 3 4 5 6 7	Bestellnummer	Firmware	MPI-Adres	GGK1 561-1AA00 SIMATIC NET CF S7-Verbindunger	P 5412 A2 P 5412 A2 H P 5511 P 5511 P 5512 P 5611 E SW V6.0 SP4 E SW V6.0 SP4 E SW V6.0 SP4 E SW V6.0 SP4

Figure 2-9 hardware configuration - projecting the CP5611

The module has now been placed in a slot in the rack. You can select any slot. There are no restrictions.

HW Ko	nfig - PC_St	ation								
tation E	Bearbeiten E	infügen	Zielsystem	Ansicht Extra	as <u>F</u> enster	Hilfe				
] ≈		8		m m	i 🗖 🔡	N?				
Dec_s	tation (Konf	iguratio	n) FAQpr	ojekt_IE_SR					Suchen:	M1
😐 (0) PC									Profil	Standard
1	-							<u>^</u>	Tions	Torquad
2	OPC Serv	er							王哉	PROFIBUS-DP
3										PROFIBUS-PA
5									世苗	PRUFINET IU
8										SIMATIC 300
7								_		SIMATIC PC Based Control 3007
8								_		SIMATIC PC Station
9	CP 5611									Benutzer Applikation
10										- Applikation
11										🖻 🧰 OPC Server
12										📜 SW V6.0 SP4
		_				11-00-05	_	101111100		SW V6.0 SP5
	I m pc									
										SW V6.2 SP1
Index	Baug	uppe	Be	estellnummer		Firmw	are	MPI-Adres		CR-Industrial Ethernet
1										
2	OPC Ser	ver				V6.2.1			1 1	
3										SE CP 5412 62
4									•	•
5									OPC Se	rver 🔺
b 7						-			EDI EN	rver tur die Protokolle DP,
1/2							_		ISO/TCI	P, SNMP, DP Master Klasse -1
									0155559466350	COMPANY AND ADDRESS AND ADDRESS A

Figure2-10 configuring the OPC server



Select the OPC server in the hardware catalog and then drag it to any slot.

Figure 2-11 button "NetPro"



Now open the NetPro program. Use the button marked red in the toolbar in Figure 2-11 button "NetPro".

In NetPro you configure a FDL connection to exchange data between the OPC server and the SIMATIC S5 95-U.

NetPro - [PC_Station (Netz) -- C:\Programme\...\\$7proj\PC_Stati] - 0 × 😤 Netz Bearbeiten Einfügen Zielsystem Ansicht Extras Fenster Hilfe _ 8 × Netzobiekte Ctrl+G 🗃 🖬 👰 ■ ! № Neue Verbindung... Ctrl+N MPI(1) . IN MPI nt ni Suchen: Auswahl der Netzobjekte PC_Station PROFIBUS-DP U CP 5611 🕀 🦲 Stationen 🛨 🧰 Subnetze PROFIBUS(1 PROFIBUS F Partner Lokale ID Partner ID . Typ ₹ś PROFIBUS-DP-Slaves der SIMATIC S7, M7 • nd C7 (dezentrale

Figure 2-12 configuring the FDL connection in NetPro anlegen

Select the OPC server and choose the menu command "Insert \rightarrow New Connection" to create a new connection for the OPC server or right-click the OPC server \rightarrow "Insert \rightarrow New connection".



sert New C	onnection	2
- Connection	Partner	
n D	the current project PC_Station [Unspecified] All broadcast stations All multicast stations unknown project	
Eroject:	[] Inspecified]	₹ <u></u>
Module:		_
Connection		
T	EDL connection	-
Type:	I BE CONNECTION	
Lype:	properties before inserting	

Figure 2-13 insert a new connection in NetPro

Because the communication partner isn't configured in the same S7 project like the PC station, you have to configure unspecified connection. In the dialog box "Connection Partner" you have to select "Unspecified" for the connection partner.

Des Weiteren wählen Sie den Verbindungstyp "FDL-Verbindung" aus.

Click on the button "Apply" so that the property view of the FDL connection will open.



erties - FDL conne	ction		
General Information	Addresses Options OPC	Overview	
Name (ID): FDL Co Via <u>C</u> P: CP 561	nnection1		
_ ,	<u>R</u> oute		

Figure 2-14 property view FDL connection → register "General Information"

Insert a name for the FDL connection. Following change to the register "Addresses".

Figure 2-15 property view FDL connection \rightarrow register "Address	es"
--	-----

Properties - FDL conne	ction				2
General Information	Addresses	Options	OPC	Overview	1
Describes the address FDL-connection.	parameters of th	ie local endp	oint of an		
	Local		Remote		
PROFIBUS	2		10		
LSAP:	11 💌	l.	3	-	
Free layer 2 access					
ОК				Cancel	Help

For "Remote" set the PROFIBUS address of the SIMATIC S5 95-U.

Following set the LSAPs for "Local" and "Remote". That's neccessary to uniquely identify the FDL connection between PC station and SIMATIC S5 95-U.



The following LSAP rules have to be considered in a connection project with a SIMATIC S5 95-U:

- local LSAP: PROFIBUS address of the partner + 1
- remote LSAP
 local PROFIBUS address + 1

These settings are set by the S5-95U. They must be taken into account.

NOTE You will have to consider the indication of the PROFIBUS addresses and LSAPs if you configure the FDL connection in the S5 station.

Change to the register "OPC-Properties".

Figure 2-16 property view → register "OPC-Property"

operties - FDL connection				
General Information Addre	esses Opti	ons OPC - I	Properties	Overview
Job timeout:			15000	ms
Max. number of send retries:			5	-
Send buffer size:			240	Bytes
Max. number of parallel send job	is:		3	
Number of resources for indicati	ons:		1	-
Send with higher priority			1	
OK			Cancel	Help

Deactivate the function "Send with higher priority", because the SIMATIC S5 95-U doesn't support a high sending priority. The size of the send buffer is up to a maximum of 240 Byte for a SIMATIC S5 95-U.

Apply the settings with "OK".

If you select the OPC server in the PC station you will see the FDL connection which you have just configured in the connection table of the PC station.



Thetwork Edit I	ntion (Network) C:\Pi nsert PLC View Option	rogram Files\\S' ons Window Help	7proj\PC_Stati]		
	1) Station ^{CP} 5611 2			Eind: Eind: Eind: PROFIBUS DP PROFIBUS-PA PROFINET IO Stations Comparison Subnets	: = ×
4				T	
∢ Local ID	Partner ID	Partner	Туре		
Local ID EDL Connection1	Partner ID	Partner Unknown	Type FDL connection		

Now the configuration of the of the FDL connection is finished.

Check the network settings referring transmission rate and bus profile. Therefore in NetPro right-click the PROFIBUS subnet which is assigned to the CP5611. Open the object properties of the PROFIBUS subnet.

Figure 2-18 opening object properties of the PROFIBUS subnet

KetPro - [PC_Station (Network) C:\Program Files\\\$7proj\PC_Stati]	
Retwork Edit Insert PLC View Options Window Help	
2 4 4 5 6 6 6 6 7 8 7 8 6 1 8	
PROFIBUS(1) PROFIBUS PC_Station Print parameters Rearrange Object Properties Alt+Return	Eind: Selection of the network PROFIBUS DP PROFIBUS-PA 9 770 PROFINET IO 9 55 Stations 9 Subnets
Displays properties of the selected object for edition. PC internal (local) X 221 Y 41	PROFIBUS-DP slaves for SIMATIC S7, M7, and C7 (distributed rack)

In the object properties of the PROFIBUS subnet change to the register "Network Settings". Select the profile "User Defined" and click the button "Bus Parameters…".

Figure 2-19 property view of the PROFIBUS subnet

	Ontions
	Options
45.45 (31.25) Kbps 93.75 Kbps 187.5 Kbps 500 Kbps 1.5 Mbps 3 Mbps	
DP Standard Universal (DP./FMS) User-Defined	Bus Parameters
	45.45 (31.25) Kbps 93.75 Kbps 187.5 Kbps 500 Kbps 1.5 Mbps 3 Mbns DP Standard Universal (DR/EMS) User-Defined

The bus parameters are forced by the SIMATIC S5-95U. In the PC station you have to adapt the bus parameters according to this presetting.

Table 2-1	bus parameters	forced by the	SIMATIC S5 95-U
-----------	----------------	---------------	-----------------

baud rate in kBit/s	9,6	19,2	93,75	187,5	500	1500
bus parameter in bit times						
Tset	10	15	45	80	80	80
Tslot	100	170	240	400	1000	3000
Min. Tsdr	12	15	45	80	80	150
Max. Tsdr	60	65	200	360	360	980

The baud rate is 1500 kBit/s in this example.

Click the button "Recalculate" to define the parameters which are missing.



OFIBUS(1)				
Bus Parameters	1			
Turn on cy	clic distribution of the bus p	parameters		
Tslot_Init:	3000 t_bit	Tslot	3000 t_bi	t
Max.Tsdr:	980 🕂 t_bit	Tid2:	980 сы	t
Min.Tsdr:	150 🕂 t_bit	Trdy:	150 сы	t
Iset:	80 🕂 t_bit	Tid1:	195 t_bi	t
Tqui:	0 🕂 цый	Ttr:	84668 t_bi	t
		=	56.4 ms	
Gap Factor:	10 -	Ttr typically:	15268 t_bi	t
Retru limit	13	=	10.2 ms	
riouy min.		Watchdog:		
			202437 Lbi	t
		-	135.0 ms	
		R	ecalculate	
OK			Cancel	Help

Figure 2-20 dialog "bus parameter"

After you have adapted the bus parameters close the dialog with "OK".

Save and compile the S7 project. Therefore select the PC station in NetPro and click the button "Save and Compile" in the toolbar. This updates the information in the S7 project.

 Compile and check everything Compile changes only 		ompile
	k <u>everything</u> only	Compile and ch Compile change

NOTE Warning indications can be displayed while proceeding with the "Save and Compile" of a S7 project. Warnings serve as piece of information and have no functional effect. In case error warnings occur, search for possible divergences in the previous steps of the instructions.

3 Download the configuration into PC station

Open the "Station Configuration Editor" in the Windows START Menu \rightarrow "Station Configuration Editor" or with the following button in the Windows task bar.

Figure 3-1 button "Station Configuration Editor"



Figure 3-2	Station	Configuration	Editor
------------	---------	---------------	--------

				prov	-•** //		
Index	Name	Туре	Ring	Status	Run/Stop	Conn	
1							
2							1
3							
4							
5				_			4
6							
7							-
8			_	-	-		1
9				_			-
10	-						4
11							4
12							+
13				-	-		+
14				-	-		+
10							
10							
New dia	gnostic entry arrive	edl					
	Add	Edit	1 0)elete	1	Ring ON	
Sta	ion Name	Import Station	5		Dis	able Stati	on

Click the button "Import Station...". A message about restarting the PC station will open.



Figure 3-3 message about restarting the PC station	
Station Configuration Editor	×
The station will be restarted. Make sure that no communication is active over the components involved. Do you want to import the station?	
Yes No	

Confirm the message about restarting the PC station with "Yes". The following dialog to select the XDB file, which should be import, opens.

Figure 3-4 selecting the XDB file



In this dialog you enter the path of the XDB file. The XDB file is always created in the project by NCM PC / STEP 7 (see Figure 2-1 giving the project a name). With the combo box "Search in: "you navigate in the path of the XDB file.



1 2 3		and summer that a resource of the second sec	Status	Ellol	
2	0000				
3	UPC Server	OPC Server			
4					
5					
6					
7					-
8					
9 🕅	CP 5611	CP 5611			
10					
11					
12					
13					
14					
15					
16					

Figure 3-5 Information from the XDB file

As information, you can see once again which modules and applications are configured in the XDB file.



Station:	PC_Station		Mode:	RUN	LP		
Index	Name	Туре	Ring	Status	Run/Stop	Conn	
1							
2	OPC Server	OPC Server			0		
3							
4							
5							
6							
7							
8				10-21	· · ·		
9	CP 5611	CP 5611		<u> </u>		φĵ	
10							
11							
12							
13							
14							
15							
16							
1/							
vew dia	gnostic entry arrived!						
	<u>A</u> dd	<u>E</u> dit		Delete		Ring <u>O</u> N	
	in Name 1	International Charling	1		Die	able Ctatic	

Now the import of the XDB file is finished and the configuration is downloaded.

In the column connection, which is marked red, you see that the connection is also been downloaded.

So the configuration of the PC station is finished.

4 Configuration of the SIMATIC S5

4.1 Initialize the PROFIBUS Interface of the SIMATIC S5 95-U and create a PLC-to-PLC link

Start STEP 5 clicking Start \rightarrow SIMATIC \rightarrow STEP 5.

Create a new S5 project file e.g. <u>AG95U@ST.S5D</u> press on "File \rightarrow Project \rightarrow Adjust \rightarrow Modules.

Connect yourself to the PLC with the mode "Online" press on "File \rightarrow Project \rightarrow Adjust \rightarrow AG".

Transfer the modules FB252 and FB253 from the PLC to the S5 program file "AG95U@ST.S5D" with "File \rightarrow Modules \rightarrow Transfer ".

Starting the configuration tool COM DB1 press on "Switch \rightarrow COM DB1".

Choose the language of the program with "F" keys.

Assign a MLFB number to the dialog box that has appeared.

Enter the S5 filename in which the configuration data block will be transferred later.

STEP 5						_ 0
Defaults				S)	IMATIC S5	/COM DB1
Online/Offline:	OFFL.	INE				
Order No.: PLC rev. level:	GES5	095-8MB02)				
Drive:	C	Program file:	(AL	<u>950@</u> st.s5D)	
Drive:		Printer file:	@	CCCCCDR.INI		
Drive:		Footer file:	@	00000F1.INI		
Drive:		Output file:	@	CCCCCLS.INI		
	53	E A			. 7	E 8
s s	elect		13	Store	Info	Return

Figure 4-1 presetting for the configuration of the interface

Adopt the settings with "F6".

In the next dialog all parameters will be shown. Select "SINEC L2" and confirm you choice with "Return".



Figure 4-2 possible configurations: SINEC L2

STEP 5 Overview	table					SIMATIC S5/	COM DB1
	Dermicci	ible paramet	or blocks			Sattings	
Onboa Onboa SINEC Timer Clock Suste SINEC Error	rd interru rd counter rd analog L1 function parameter -depender L2 return	upt inputs block s nt parameter	s	(081) (08C) (08A) (SL1) (TFB) (CLP) (SDP) (SL2) (ERT)	Paramet Paramet Paramet Not par Paramet Not par Not par Not par	terized(defi terized(defi terized(defi terized(defi terized(defi ameterized terized(defi ameterized	ault) ault) ault) ault) ault) ault)
F1 New DB1	F2 Load DB1	F3 Transfer DR1	F4 Print DB1	F5 Delete block	F6 Select	F7 PLC function	F8 Return

Select "Basic parameters" from the authorized parameters and confirm it with "Return".

Figure 4-3 possible configurations: Basic parameters

<u>e:v</u>	STEP 5							
0.	verview	table SIN	EC L2			S	IMATIC S5.	COM DB1
		Permissi	ble parame	ter blocks		S	ettings	
	Basic Standa PLC-to Cyclic Cyclic FMA so Layer	parameters ard connecto p-PLC link c I/O - mas c I/O - sla ervices 2 services	Ster ave			Not para Not para Not para Not para Not para Not para Not para	meterized meterized meterized meterized meterized meterized	
	F1	F2		F4	E5	F6		F8
					Delete block	Select block		Return

The "Basic parameters" include the configuration of the bus parameter and the definition of the PROFIBUS address (Own station address) for the SIMATIC S5.



In order that the data are exchanged between SIMATIC and PC station you have to set the "Own station status" to "active".

The bus parameters were set in NetPro. Adopt the setting from Figure 2-19 and Figure 2-20.

Figure 4-4 Basic parameters

STEP 5							_ 0
SINEC L2	basic par	ameters				SIMATIC S5	COM DB1
Own s	tation add	lress:			<u>1</u> 0		
Own s	tation sta	tus:			ACTIV	1	
Baud	rate:				1500		
Highe	st station	address o	n bus:		126		
Targe	t rotation	time:			29524		
Set-u	p time:				80		
\$lot	time:				3000		
Short	est delay	time:			150		
Longe	st delay t	ime:			980		
F1	F2	F3	F4	F5	F6	F7	F8
		Select			Store	Info	Keturn

Adopt the "Basic parameters" with "F6".

Select "PLC-to-PLC link" and confirm it with "Return".

Figure 4-5 PLC-to-PLC link

STEP 5 Overview	table SINE	C L2			S	IMATIC S5	/COM DE
Basic Stand PLC-t/ Cycli Cycli FMA s Layer	Permissib parameters and connect o-PLC link c 1/0 - mas c 1/0 - slat ervices 2 services	le paramet ion ter ve	er blocks	;	Parameter Not param Not param Not param Not param Not param Not param	ettings neterized neterized neterized neterized neterized neterized	
F1	F2	F3	F4	F5 Delete	F6 Select	F7	Ft Retur

In the first column "PLC-PLC link to station" you have to select the row with the PROFIBUS address of the PC station. In this example the PROFIBUS address of the PC station is "2".

In the row, which you have selected, set two status bytes for the indication of the PLC-PLC link.

Because the SAPs are uniquely defined by the PROFIBUS addresses of the PC station and SIMATIC S5 it's not possible to edit the local and remote SAP.

Figure 4-6 configuring PLC-PLC link



Adopt the setting with "F6".

Leave the interface configuration with "F8".

Saving the configuration which you have created with F3 - DB1 transferred".

Following transfer the DB1 to the S5 project file which you have selected with "F1 – Transfer to FD".

Switch back to STEP 5 with "ESC".

4.2 Description of the S5 program

Open the DB1 which was created by the configuration tool COM DB1. The configuration appears.



Figure 4-7	configuration	block	DR1
i iguio i i	ooningaration	DIOOK	

STEP 5	
DB1	C:AG95U@ST.S5D
0: 12: 24: 36: 48: 56:	KS ='DB1 SL2: TLN 10 STA AKT '; KS ='BDR 1500 HSA 126 TRT 295'; KS ='24 SET 1 ST 300 SDT 1 11'; KS =' SDT 2 150 STBS 2 MB20 S'; KS ='TBR 2 MB21 ; END';
Expand	DC2Delete DC3Expand DF4Delete DF5 KG Test 6

Adopt the setting with "F7".



Call the blocks L2-SEND and L2-RECEIVE in the OB1

Create the OB1.

Build a VKE = 1 with the following commands:

- O M0.0
- ON M0.0

Call the function block FB252 "L2-SEND" (see Figure 4-8).

Build a VKE = 1 with the following commands:

- O M0.0
- ON M0.0

Following call the function block FB253 "L2-RECEIVE" (see Figure 4-8).



SILP 5	
OB 1 Segment 1	C:AG95U@ST.S5D
:0 F 0.0	
JU FB 252	
Name :L2-SEND	
QTYP : KS DB	
DBNR : KY 0,10 DANF - KF +0	
QLAE : KF +5	
:0 F 0.0 :0N F 0.0	
:JU FB 253	
ZTYP : KS DB	
ZANE : KE +5	
ZLAE : KF -1	
Addresses Sumb. Sumb.	YMaLine Com a -> LAD a Seg Co

Figure 4-8 calling the function blocks FB252 "L2-SEND" and FB253 "L2-RECV"

NOTE The function blocks L2-SEND and L2-RECV are executed only when VKE = 1 prior to the call.

The length of the send area is specified in words (parameter: $QLAE = 5 \rightarrow 5$ words).

If the length of the receive area is preset with "-1" the length of the data will detect automatically (parameter: ZLAE = -1).

Saving OB1 with "F7".

Creating the send and receive buffer

Because the send and receive buffer must be located in DB10, this must be created in the project and declared with an adequate length.

Then download the entire program to the S5 station.

5 Start of the OPC-Scout

Start the OPC Scout with "Start \rightarrow SIMATIC \rightarrow SIMATIC NET \rightarrow OPC Scout".

Double-click the "OPC.SimaticNet"for connection with the SIMATIC NET OPC server. In the dialog that appears, enter a suitable group name and confirm this with OK.

Figure 5-1 connecting with the OPC server and enter a group name

🔄 OPC Scout - Nev	v Project1				
File View Server	?				
🖻 🖬 🙆	盘归				
Servers and groups		Items incl. status	information		
E-Server(s)	rver(s) SimaticNET	1	Item Names	Value	Format
	New group]				
Constant of the second	Add Group Group Propertie Enter a ' <u>G</u> roup N FDL Create <u>n</u> ew grou Requested <u>u</u> pda	s: lame': up active ate rate in ms	₽ 500	×	
	Extended	<u>0</u> K	<u>Cancel</u>	spply	

Double-click the OPC group which you have created. The "OPC-Navigator" opens. You will now see your protocols in the OPC-Navigator. Double-click on "FDL". The connection name you configured in NetPro appears.



Figure	5-2	OPC-Navigator
riguie	0-z	Of O-Mavigator

Nodes	Leaves	Item Nam	Bas
Connections			
🕀 🍻 DX			
🖻 🏘 \DP2:			
🕀 💏 NDP:			
🖻 🔁 VFDL:			
🔁 💏 ICP 5611			
FDL Connection1			
E 🚱 VFMS:			
E ∰ APNIO:			
⊡-∰a \SNMP:			

Double-click the FDL connection to define new items and add existing items respectively for the communication.

In the OPC-Navigator select "send". In the middle section appears an item. Move this "send" item to the right section with the button " \rightarrow ".

Double-click the "send"item in the right section.

Figure 5-3	adding the	"send" item
i iguio o o	uuuung ino	"oona nom

DPC-Navigator Nodes Connections A DX DD2	Leaves	Item Nam FDL:[FDL	Basis FDL:[FDL Conn.	OrgName	T	The listed Iter	n(s) will be ad nnection1]sen	× ded to Group: id
	Enter an item [Devicename [FDL:[FDL Co Enter an Item) Item with the follow jltemname onnection1]ser	wing Syntax: nd Iodify Item	<u>C</u> ancel	× -2 			
send is selected						Eilter	<u>0</u> K	Cancel



Change the name of the "send" item (see Figure 5-4 changing the name of "send" item) and click the button "Modify Item".

Figure 5-4 changing the name of "send" item

🚰 Modify an Item	×
Enter an item with the following Syntax: [Devicename]Itemname	
FDL:[FDL Connection1]send10,80,10	
Modify Item Car	icel
Enter an Item	

NOTICE The item "... send 10, ..." means, that a send buffer of 10 Bytes is reserved on the PC station.

In the OPC-Navigator select "receive". Move the existing "receive" item which appears in the middle section to the list in the right section with the button " \rightarrow ".

Following click the button "OK".

Figure 5-5 adding the "receive" item

Nodes	Leaves	Item Nam	Basis	OrgName		The listed Ite	em(s) will be ad	ded to Group
₩ Connections ♥ DX ♥ M ♥ VP2. ♥ VP1. ♥ ● ♥ ● ♥ ● ♥ ● ♥ ● ♥ ● ♥ ● ♥ ● ♥ ● ♥ ● ♥ ● ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥	⊖ receive	FDL:[FDL	FDL:[FDL Conn		<u>-2</u> <u>-</u> -	FDL:[FDL Cd FDL:[FDL Cd	onnection1]rec	eive d10,80,10
Billing von:						Eilter	<u>o</u> k	Cancel

The items are added in the OPC Scout. If the quality is good the connection is established and it's possible to read and write the items respectively.



Figure 5-6 OPC-Scout

OPC Scout - New Project1							
Eile View Server Group Item ?							
🖻 🖬 🚳 🐺 🕅 🕅 🛛	+-						
Servers and groups	Items in	cl. status information					
🖃 🎪 Server(s)		Item Names	Value	Format	Туре	Access	Quality
E B Local Server(s)	1	FDL:[FDL Connection1]send10,80,10	{0 0 0 0 0 0 0 0	Original	uint8[]	BW	good
OPC.SimaticNET	2	FDL:[FDL Connection1]receive	{0 0 0 0 0 0 0 0	Original	uint8[]	B	good
PCC SimaticNET.DP OPC. SimaticNET.DP OPC. SimaticNET.PD ProfiDrive.ProfilServer Remote Server(s) Add Remote Servers(s)	3			-			

Double-click the column value of the "send" item to write values to the send buffer.

Figure 5-7 writing values

💱 Write Value(s) to the	Item(s)	×
Value		
{10 11 12 13 14 15 16 17 18	3(19)}	
Format conversion	-	
	Sync write	
(• Unginal	C Async write	
C Hex		
C Binary		
	OK Count	Accel

The default structure of the value input $\{0|0\}$ must not be modified. Only the values themselves may be modifying $\{1|1\}$.

Figure 5-8 successful write job

	Item Names	Value	/rite Resu	Error
1	FDL:[FDL-Verbindung-1]receive	{10 11 12 13 1		
2	FDL:[FDL-Verbindung-1]send10.80.10	{10 11 12 13 1	OK	The operation completed successfully
3				



With the services send and receive successful writing of data must be checked in the columns "Write Result" and "Error". The columns "Write Result" and "Error" can be made visible in the "View \rightarrow Options" menu.

6 History

Version	Date	Changes
V 1.0	02.04.2008	First Issue