

FAQ • 03/2015

Connecting a PC Station to S7-1200 using OPC

STEP 7 Professional V13 (TIA Portal V13)

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1 Introduction

This entry shows you how to configure an S7-1200, a PC station and an S7 connection in the TIA Portal so that you can exchange data between the stations via Industrial Ethernet.

Note In the TIA Portal you need STEP 7 Professional, because with STEP 7 Basic you cannot configure a PC station, but only the SIMATIC S7-1200.

Optimized S7 access for the OPC server to PLC data

With firmware V4.0 and higher the S7-1200 CPU supports S7 connections with access to optimized data blocks.

The OPC Server V12 and higher supports only the communication to S7-1200 via OPC UA (OPC Unified Architecture). In this connection optimized data blocks or standard data blocks can be used. In TIA Portal the access to optimized data blocks is preset.

For S7 access to optimized data blocks via OPC UA and using OPC server V12 or higher, you require an OPC client which supports OPC UA.

This entry shows how to configure the S7 connection between the S7-1200 V4 and the PC station in order to be able to use an OPC client which only supports OPC DA (OPC Data Access).

Create a project

In Windows, select the command "Start > All Programs > Siemens Automation > TIA Portal V13" to start the TIA Portal.

- 1. In the Portal view, select the "Create new project" action.
- 2. Enter the project name in the appropriate field.
- 3. Click the "Create" button to create a new project.

Figure 1-1



Switch to Project View

Use the "Project View" link to switch to the Project View.



2 Procedure for S7-1200 V4.0 and Higher

This chapter shows:

- The configuration of a SIMATIC S7-1200 and a PC station in the TIA Portal
- The configuration of an S7 connection for data exchange between the SIMATIC S7-1200 and the PC station

2.1 Configuration of the S7-1200

You configure your S7-1200 station in the TIA Portal. Then you create the user program and define which data is to be monitored over the S7 connection of the OPC server.

2.1.1 Configure the Hardware

Add an S7-1200 station

In the Project tree, double-click the "Add new device" item. The "Add new device" dialog opens.

恐	Siemens - S7communication_PC_S7-1200
Pr	oject Edit View Insert Online Options Tools Window He Provide Save project 🚇 💥 🗐 🗎 🗙 🏷 ± 🍽 ± 🙀 🖥 🛄 !
	Project tree 🔲 🖣
	Devices
	🖻 O O 🖻
Start	 S7communication_PC_S7-1200 Add new device Devices & netwo PLC_1 [CPU 121 C/DC/DC] PC station [SIMATIC PC station] Common data Documentation settings Languages & resources Online access
	Card Reader/USB memory

- 4. Click the "Controller" button in the working area.
- 5. Go to "Controller → SIMATIC S7-1200 → CPU" and select the required controller.
- 6. Click the "OK" button to add the selected S7-1200 CPU to your project.



Define IP address and assign subnet

In the Project tree, double-click the "Devices & networks" item. The Devices & networks editor opens.

Minde

	oject Euro Meter Mater Online Options Tools Mindow	
2	🖥 🖪 Save project 💄 🐰 🏥 🏛 🗙 🖄 セクセ 🌆 🖥 🛽	
	Project tree	◀
	Devices	
	1 O O 1	•
	 S7communication_PC_S7-1200 	
Ħ	Add new device	
S,	🚠 Devices & networks 🛌	
	→ 🛅 PLC_1 [CPU 1211C 🛛 🏹)/DC]	
	C station [SIMATIC station]	
	Common data	

- 1. In the Network View or Device View of the Devices & networks editor you mark the S7-1200 CPU.
- The properties of the S7-1200 CPU are displayed in the inspector window. Go to the "General" tab and in the area navigation you select the "PROFINET interface > Ethernet addresses" item.
- 3. In this example you enter the IP address 192.168.0.5 and the subnet mask 255.255.255.0 for the PROFINET interface of the S7-1200 CPU.
- 4. Assign a subnet to the PROFINET interface. Click the "Add new subnet" button to create a new subnet.



The connection between the subnet, PN/IE_1, for example, and the S7-1200 is now displayed in the "Network View" of the Devices & networks editor. Figure 2-5

S7communication_PC_S	7-1200 🕨 Devices & networks
Network Connections	HMI connection 💌 🐫 🔍 ± 100%
CPU 1211C	
	-
	PN/IE_1

Permit access with PUT/GET communication from remote partner (PLC, HMI, OPC, ...)

In example it is the S7-1200 CPU server for the S7 connection, in other words it participates passively in establishing the connection.

The PC station is client for the S7 connection, in other words the PC station actively established the S7 connection.

In the S7-1200 CPU you must permit the client-side access to the CPU data, which means that the communication services of the CPU are then no longer restricted. Proceed as follows.

- 1. In the Network View or Device View of the Devices & networks editor you mark the S7-1200 CPU.
- 2. The properties of the S7-1200 CPU are displayed in the inspector window. Go to the "General" tab and in the area navigation you select the "Protection" item.
- 3. Enable the "Permit Access with PUT/GET communication from remote partner (PLC, HMI, OPC, ...)" function.



2.1.2 Create a User Program

Add a data block

In the Project tree, navigate to the device folder of the S7-1200 CPU, "PLC_1 [CPU 1212C ...]", for example. The device folder contains structured objects and actions that belong to the device.

In the device folder you navigate to the "Program blocks" subfolder and doubleclick the "Add new block" action. The "Add new block" dialog opens.

Fig	jure	e 2-	1
-			

~ -

Project tree	- III 🖣
Devices	
1 O O 1	a
 S7communication_PC_S7-1200 	
💕 Add new device	
📩 Devices & networks	
Device configuration	
🚱 Online & diagnostics	
🗢 🕞 Program blocks	
💕 Add new block	
📲 Main [OB1] (🏝)	
OPC_DATA [DB1]	
🕨 🚂 Technology objects	
External source files	
🕨 🚂 PLC tags	
PLC data types	
Watch and force tables	

- 1. Click the "Data block (DB)" button.
- 2. Enter the name of the data block.
- If the "Automatic" option is enabled, the number of the data block is assigned automatically.
 Enable the "Manual" option if you want to assign the desired number of the data block manually.
- 4. Apply the settings with "OK".

The data block DB1 "OPC_DATA" is created in this example.

Figure 2-8					
Add new block					×
Name:					
OPC_DATA					
AI					
	Type:	🧧 Global DB	-		
OB	Language:	DB	-		
Organization	Number:	1	\$		
DIOCK		O Manual			
	3	 Automatic 			
	Description:				
Function block	Data blocks (DBs)	save program data.			
FC					
Function					
Data block					
	More				
> Additional inform	nation				
Add new and open				ОК	Cancel

In the Properties of the data block, under "Attributes" you disable the "Optimized block access" function.

Data blocks with standard access have a fixed structure. The data elements in the declaration include both symbolic names and a fixed address in the block. The address is displayed in the "Offset" column. You can address the tags in this block both symbolically and absolutely.

C_DATA [DB1]			_	_		_
General General Information Time stamps Compilation Protection Attributes Download witho	Attributes Only store in Data block w Optimized bl	load memory rite-protected in th ock access	ne device			
					OK	Cancel

Define static tag in the data block

Define 4 static variables of the "Bool" data type in the DB1 "OPC_DATA".

- 1. In the Project tree you go to the "Program Blocks" folder and double-click the data block DB1 "OPC_DATA". The data block DB1 "OPC_DATA" opens in the working area.
- 2. Insert 4 static variables of the "Bool" data type in the data block DB1 "OPC_DATA".
 - Static01
 - SetStatic01
 - ResetStatic01
 - OutputStatic01
- 3. Click the "Compile" button.

	5						
VA	Siemens - S7communication_PC_S7-1200						
Pr	oject Edit View Insert Online Options Tools Window H	elp					
	* 🞦 🗔 Save project 🔒 🐰 🏥 🏦 🗙 🏷 セ 🥵 🛄	16	민	$\left[\frac{1}{2} \right]$	🛔 💋 Go online 🔊 Go offli	ne 🔥 🖪 🖪 🗡	ا 🖃 🕻
	Project tree	\s7	′c0	m	munication_PC_S7-1200	0 ▶ PLC_1 [CPU 1	211C D
	Devices	3					
	🖻 O O 🖻	3	¢ 1	<i>ä</i> ¢	5 5 K K 6 6 6	🖿 🔢 🛸	
E			0	PC	_DATA		
Ē	▼ S7communication_PC_S7-1200	-		N	Name	Data type	Offset
am	📑 Add new device	1		1	 Static 		
5	h Devices & networks	2	-0	1	Static01	Bool	0.0
Į,	- 🚰 PLC_1 [CPU 1211C DC/DC/DC]	3	-	1	SetStatic01	Bool	0.1
Ĕ	Device configuration	4	-0	1	ResetStatic01	Bool	0.2
	Q Online & diagnostics	5		1	OutputStatic01	Bool	0.3
	🗢 🙀 Program blocks						
	💕 Add new block						
	📲 Main [OB1]						
	OPC_DATA [DB1]						
	🕨 🙀 Technology objects					2	
	🕨 🔚 External source files						

Create Main [OB1]

In the "Program blocks" folder, you double-click the "Main [OB1]" block to open the corresponding dialog window.



Create the program as shown in <u>Figure 2-12</u>. The bit links are in the "Instructions" task card under "Basic instructions > Bit links".

Use drag-and-drop to add the normally open contact, the flip-flop and the Assignment to Network 1 of the "Main [OB1]" block.

Assign the tags assigned in <u>Table 2-1</u> to the flip-flop, to the normally open contact at inputs S and R of the flip-flop and to the assignment at output Q of the flip-flop. Click the "Compile" button.

Tab	ole	2-1	

	Variable	Description
Absolute address	Symbolic name	
DB1.DBX0.1	"OPC_DATA".SetStatic01	SR flip-flop input S: NO contact
DB1.DBX0.2	"OPC_DATA".ResetStatic01	SR flip-flop input R: NO contact
DB1.DBX0.0	"OPC_DATA".Static01	SR variable
DB1.DBX0.3	"OPC_DATA".OutputStatic01	SR flip-flop output Q: Assignment



Note The "%" character before the absolute address is added automatically by the TIA Portal.

2.2 Configuration of the PC Station

Before you start configuring the PC station in the TIA Portal, determine or change the IP address of the network card via which the PC station is connected to the S7-1200. You enter the IP address and subnet mask of the network card when you configure the PC station in the TIA Portal.

Determine and change the IP address and subnet mask of the network card

In Windows you open the "Network and Sharing Center" and select the "Change adapter settings" functions. Open the Properties dialog of the network card via which the PC station is connected with the S7-1200.

In this example the network card receives the IP address 192.168.0.10 and subnet mask 255.255.255.0.

Figur	е	2-'	13

Internet Protocol Version 4 (TCP/IPv4	4) Properties
General	
You can get IP settings assigned autor supports this capability. Otherwise, yo administrator for the appropriate IP se	matically if your network ou need to ask your network ettings.
Use the following IP address:	iiy
IP address:	192.168.0.10
Subnet mask:	255.255.255.0
Default gateway:	· · ·
Obtain DNS server address auto	matically
• Use the following DNS server ad	dresses
Preferred DNS server:	· · ·
Alternate DNS server:	· · ·
Validate settings upon exit	Advanced
	OK Cancel

Note The IP address configured for the PC station in the TIA Portal must match the IP address set in Windows.

If you are not using a router, then the IP addresses of the PC station and the S7-1200 CPU must be in the same subnet.

Setting the PG/PC interface

Go to the Control Panel and start the configuration program "Set PG/PC Interface": "Start > Settings > Control Panel > Set PG/PC Interface".

In the "Access Point of the Application" list box you select the access point "S7ONLINE".

In the "Interface Parameter Assignment Used" list box you select the network card with TCP/IP to which the S7-1200 CPU is connected.

Figure 2	2-14
----------	------

Set PG/PC Interface	×	
Access Path LLDP / DCP PNIO Adapter Info]	
Access Point of the Application:		
S7ONLINE (STEP 7)> Intel(R) 82579LM Gigal	bit Network Connection. T 💌	
(Standard for STEP 7)		
Interface Parameter Assignment Used:		
Intel(R) 82579LM Gigabit Network Connection.	Properties	
CP5711.FWL_FAST_LOAD.1		
Intel(R) 82579LM Gigabit Network Const	Сору	
Intel(R) 82579LM Gigabit Network Conne	Delete	
(Parameter assignment of your NDIS-CP withTCP/IP protocol (RFC-1006))		
ОК	Cancel Help	

Add a PC station

In the TIA Portal you open the project that contains the configuration for the S7-1200 station.

In the Project tree, double-click the "Add new device" item. The "Add new device" dialog opens.

Fig	ure 2-15
VA	Siemens - S7communication_PC_S7-1200
Pr	oject Edit View Insert Online Options Tools Window He Project 🚇 🗶 🗉 🗎 🗙 🖘 🕈 🖓 🗄 🛄
	Project tree 🔲 🗸
	Devices
	B O O E
	▼ S7communication_PC_S7-1200
art	📑 Add new device
S	🚠 Devices & netwo 🔁 🔪
	• 🕞 PLC_1 [CPU 1211 //DC/DC]
	PC station [SIMATIC PC station]
	🕨 🥁 Common data
	Em Documentation settings
	Languages & resources
	Image: Second
	Emp Card Reader/USB memory

- 1. Click the "PC systems" button in the working area.
- 2. Go to "PC systems \rightarrow PC general" and select the "PC station" item.
- 3. Click the "OK" button to add a PC station named "PC Station" to your project.

Figure 2-16	
-------------	--

Add new device			×
Device name:			
PC station]	
Controllers Controllers HMI PC systems PC systems Drives	C systems PC general PC station Industrial PCs SINUMERIK operator components User application User applications	Device: Order no.: Version: Description: SIMATIC PC st	SIMATIC PC station SIMATIC PC-Station V1.0 ation
Open device view			OK Cancel

Open the "Device View" of the PC station in the Devices & networks editor

In the Project tree, navigate to the device folder of the PC station, "PC Station [PC station]", for example. The device folder contains structured objects and actions that belong to the device.

In the device folder double-click the "Device configuration" object to open the "Device View" of the PC station in the Devices & networks editor.



Configure user application and communication module of the PC station

In the "Device View" of the PC station you configure and parameterize the modules of the PC station.

- 1. In the "Hardware catalog" task card, the "Catalog" palette contains the user applications and communication modules which you can configure in the PC station. Mark the "IE General" communication module.
- 2. Using drag-and-drop you add the "IE General" communication module to Slot 1 of the PC station.



- 1. In the Hardware catalog you go to the "Catalog" palette and mark the user application "OPC Server".
- 2. In the "Information" palette you select the version "SW V8.2..." for the OPC server. This ensures that no S7 connection with access to optimized data blocks is created later.
- 3. Using drag-and-drop you add the "OPC server" user application to Slot 2 of the PC station.



Define IP address and assign subnet

In the Project tree, double-click the "Devices & networks" item. The Devices & networks editor opens.

Via	Siemens - S7communication_PC_S7-1200
Pr	roject Edit View Insert Online Options Tools Window He * 🎦 🖬 Save project 📇 🐰 🗐 🗎 🗙 🏷 ± 🍽 🖬 🛄
	Project tree 🔲 🖣
	Devices
	🖻 O O 🖻
	▼ S7communication_PC_S7-1200
art	Add new device
S,	🚠 Devices & networ 🕅 🎽
	▶ 🚰 PLC_1 [CPU 1211 2/DC/DC]
	PC station [SIMATIC PC station]
	🕨 🎑 Common data
	Em Documentation settings
	Languages & resources
	Image: Continue access
	E Card Reader/USB memory

- 1. In the Network View or Device View of the Devices & networks editor you mark the network card in the PC station.
- 2. The properties of the network card are displayed in the inspector window. Go to the "General" tab and in the area navigation you select the "PROFINET interface > Ethernet addresses" item.
- 3. In this example you enter the IP address 192.168.0.10 and subnet mask 255.255.255.0 for the network card.
- 4. Select the subnet that you have already assigned to the S7-1200 CPU and assign it also to the network card of the PC station.



<	
IE general_1 [IE General]	
General IO tags Sys General General General Options General General	tem constants Texts Ethernet addresses Interface networked with 4 Subnet: PN/IE_1 Add new subnet
	ISO protocol Use ISO protocol MAC address: 08 -00 -06 -01 -00 -00
	IP protocol Use IP protocol 3 IP address: 192.168.0.10 Subnet mask: 255.255.255.0 Use router Router address: 0.0.0.0

Note The IP address configured for the PC station in the TIA Portal must match the IP address set in Windows.

If you are not using a router, then the IP addresses of the PC station and the S7-1200 CPU must be in the same subnet.

The connection between the subnet, PN/IE_1, for example, and the S7-1200 and the PC station is now displayed in the "Network View" of the devices and networks editor.

Figure 2	2-22
----------	------

S7communication_PC_S7-1200 ▸ Device	s & networks
Network Connections HMI connection	🔻 👯 🔛 🍳 ± 100% 💌
PLC 1 CPU 1211C	PC station SIMATIC PC
19	N/IE_1

Use symbols

- 1. In the Network View or Device View of the Devices & networks editor you mark the OPC server in the PC station.
- The properties of the OPC server are displayed in the inspector window. Go to the "General" tab and in the area navigation you select the "S7 > OPC tags" item.
- 3. Select the "Configured" option and click the "Configuring..." button. The "Symbol configuration" dialog opens.



<			
OPC Server_1 [OI	PC Serve	d	
General IC) tags	Sys	tem constants Texts
 General DP 			OPC tags
DP master class 2 FDL S7 OPC tags OPC messages OPC alarms mi	2 s apping tab	le	 None All Configured Configuring
S7 UA redunda ISO/TCP SNMP PROFINET IO	ancy	•	Field elements visible during runtime

Select the symbols via the Symbol selector and apply the selection with "OK".

Symbol selector						
S7communication_PC_S7-12	Name	Data type	Address	Visible	Connection	Access
✓ 1 PLC_1	Static01	Bool	%DB1.DBX0.0	True	S7_Connection_1	ReadWrite
PLCtags	SetStatic01	Bool	%DB1.DBX0.1	True	S7_Connection_1	ReadWrite
 Program blocks 	ResetStatic01	Bool	%DB1.DBX0.2	True	S7_Connection_1	ReadWrite
OPC_DATA	OutputStatic01	Bool	%DB1.DBX0.3	True	S7_Connection_1	ReadWrite
			8			
		Visible	e Access right:	Re	adWrite 💌	
lements with active branch	5		Connection	5	Connection 1	
lements with active branch)				_connection_i	
lements with active branch ymbols:)					
lements with active branch ymbols: ()	Low limi	t:	High lim	t:	
Iements with active branch ymbols: () SV Import / Export Importing file Export	file	Low limi	t: 000000	High lim	it:	
lements with active branch ymbols: (SV Import / Export Importing file Export : ccess path \$75communication_PC_\$7-1200_\$7-120) file	Low limi	connection. t: 000000	High lim	t: 000000	
Image: Sevent state state Sevent state Solution of the state Sevent state Importing file Export Access path S7communication_PC_S7-1200.S7-120) file 0 station_1.PLC_1.O	Low limi	connection. t: 000000	High lim	t: 000000	

2.3 Configure the S7 Connection

2.3.1 Add the S7 Connection

In the Project tree, double-click the "Devices & networks" item to open the Devices & networks editor.

- 1. In the toolbar of the Network View, click the "Connections" icon to switch to the mode for setting the connections.
- 2. In the drop-down list box you select "S7 connection" as connection type.



- 1. In the graphical area of the Network View, click the OPC server in the PC station and connect it to the S7-1200 CPU.
- 2. In the Network View, the S7 connection is displayed in the graphical area. Figure 2-26



2.3.2 Display and Change Properties of the S7 Connection in the Inspector Window

- 1. In the Network view area you open the "Connections" table.
- 2. Select the S7 connection which has the OPC server as local end point. The properties of the S7 connection are displayed in the inspector window.

General properties

- 3. Go to the "General" tab and in the area navigation you select the "General" item to display the connection path.
- 4. The S7 connection is between the OPC server and the S7-1200 CPU.

2 Procedure for S7-1200 V4.0 and Higher

	Network overview	Co	nnections / I/O co	mmun <mark>icati</mark>	VPN				
Net ork view	Connection name Connection_1 S7_Connection_1 S7_Connection_1	ne	Local end point PLC_1 OPC Server_1	Local ID (hex) 100 S7_Connec[ii]	Partner ID (hex) S7_Connectio 100	Partner OPC Server_1 PLC_1	C S ▼ S	7 connection 7 connection 7 connection	
\$7_	Connection_1 [S7 conne	ectio	ו]					S Properties	🗓 Info 🔒 🗓 Diagnos
G	eneral IO tags 9	Syste	m constants Tex	ts					
- G	eneral ocal ID		General						
S	pecial connection prope ddress details		Connection						
C	PC		Name:	S7_Connection_	1				
			Connection path						
				Local				Partner	
				OPC					
			End point:	OPC Server_1				PLC_1	
			Interface:	IE general_1, PR	OFINET interface[IE1]	-	PLC_1, PROFINET inte	rface_1[X1 : PN(LAN)]
	- 4-	4	Interface type:	Ethernet				Ethernet	
			Subnet:	PN/IE_1			='	PN/IE_1	
			Address:	192.100.0.10				192.100.0.3	

- 1. Go to the "General" tab and in the area navigation you select the "Special connection properties" item.
- Here you see a display of the special connection properties of the local end point, "Active connection establishment", for example. In this example, the OPC server establishes the S7 connection. The communication partner, S7-1200 CPU, participates passively in establishing the connection.

Local connection name	Local end point	Local ID (hex)	Partner ID (hex)	Partner		Connection typ
S7_Connection_1	PLC_1	100	S7_Connectio	OPC Server_1		S7 connection
57_Connection_1	OPC Server_1	S7_Connec	100 🔳	PLC_1		S7 connection
S7_Connection_1 [S7 connection General IO tags Syst	on]	da				P
		as				
General Local ID	Special con	nection proper	ties			
General Local ID Special connection properties Address details	Special con Local end	nection proper	ties		_	
General Local ID Special connection properties Address details OPC	Special con Local end	nection proper point	ties			

- 1. Go to the "General" tab and in the area navigation you select the "Address details" item.
- 2. Here you have a display of the local end point, the partner end point and the TSAP of both end points.



2.4 Compile and Download the Configuration and User Program of the S7-1200

Table 2-2	
No.	Description
1.	In the Project tree you mark the device folder of the S7-1200 CPU. In the toolbar you click the "Compile" button. The hardware configuration and the software of the S7-1200 are compiled. Siemens - S7communication_PC_S7-1200 Project Edit View Insert Online Options Tools Window Help Save project Image for the S7-1200 Project tree Devices S7communication_PC_S7-1200 S7communication_PC_S7-1200 Add new device Devices & networks FigPLC 1 (CPU 1211 C DC/DC/DC] Devices & networks FigPLC 1 (CPU 1211 C DC/DC/DC] Devices & networks FigPLC 1 (CPU 1211 C DC/DC/DC] Devices Fig Online access Fig Online access Fig Card Reader/USB memory
2.	In the Project tree you mark the device folder of the S7-1200 CPU. In the toolbar you click the "Download to device" button to download the project into the S7- 1200 CPU. The "Extended download to device" or "Load preview" dialog opens automatically.

-			Descrip	otion		
	The "Extended path from the P 4. Make the f - Type of - PG/PC i - Connect example 5. Enable the 6. Click the "S "Compatibl 7. From the " CPU. 8. Click the "I	download t G/PC to the ollowing se the PG/PC nterface: N tion to interface: "Show all o Start search le devices in Compatible	o device" dialog e SIMATIC S7-1 ttings: interface: PN/IE etwork card of th face/subnet: Sub compatible devic " button. The ST n target subnet:" devices in target	opens au 200 CPU ne PG/PC onet of the ces" option 7-1200 CF ' list. et subnet:	utomatically of has to be se se S7-1200 C n. PU is display " list you sele	only if the acces et. PU, PN/IE_1, fo red in the ect the S7-1200
	8. Click the I	LOAD DUTTO	n.			
		Configured acces Device PLC_1	s nodes of "PLC_1" Device type SI CPU 1211C DC/D 1	ot Type X1 PN/IE	Address 192.168.0.5	Subnet PN/IE_1
		0	Type of the PG/PC interfa PG/PC interfa Connection to interface/subr	ce: LPN/IE ce: Maintel(R) het: PN/IE_1	82579LM Gigabit Netv	work Connection
			1st gatew	ay:		▼ ♥
		Compatible devic	es in target subnet:	Tune	2 Sh	ow all compatible devices
	Para and and and and and and and and and an	<u>PLC_1</u> 4	CPU 1211C DC/D	PN/IE PN/IE	192.168.0.5 Access address	PLC_1
	Coline status information					Start search
	Scan and information	n retrieval complete	ed.			
						Load <u>C</u> ancel

No.		Description	
9.	In the "Load preview" dia	alog you make the following setting	js.
	 Select the "Stop all" device. 	action to stop the modules for dow	vnloading to the
	 The device configur CPU). 	ation is downloaded into the target	device (S7-1200
	3. The software and th device (S7-1200 CF	e text libraries are downloaded co PU).	nsistently to the target
	4. Click the "Load" but	ton to start the download procedur	e.
	Load preview		x
	Check before loading		
	Status ! Target	Message Ready for loading	Action
	Stop modules	The modules are stopped for downloading to device	1 Ston all
	Device configurat	Delete and replace system data in target	Download to device
	Software	Download software to device	Consistent download
	Text libraries	Download all alarm texts and text list texts	3 Consistent download
	- Fexing and		Consistent dominated
	<		
			Refresh
		Finish	Load Cancel
5.	In the "Load results" dial	og you make the following settings	S.
	1. Enable the action "S	Start all".	The status
	2. Click the "Finish" bu LED of the S7-1200	CPU indicates the "RUN" mode a	fter downloading.
	Load results	ading to device	×
	Statur I Tarret	Marrage	Action
	+↓ ♥ ► PLC_1	Downloading to device completed without error.	Action
	🔥 🕨 Start modules	Start modules after downloading to device.	1 Start all
	A > Start modules	Start modules after downloading to device.	1 Start all
	A Figure Start modules	Start modules after downloading to device.	1 Start all
	A > Start modules	Start modules after downloading to device.	Start all
	Start modules	Start modules after downloading to device.	1 Start all
	▲ > Start modules	Start modules after downloading to device.	Start all
	Start modules	Start modules after downloading to device.	Start all
	Start modules	Start modules after downloading to device.	Start all
	Start modules	Start modules after downloading to device.	€ Start all
	Start modules	Start modules after downloading to device.	Start all

2.5 Compile and Download the PC Station Configuration

Open the Station Configuration Editor

In the Windows taskbar you double-click the "Station Configuration Editor" icon. The Station Configuration Editor opens.



- 1. In the Station Configuration Editor you click the "Add..." button to add the modules, namely the OPC server and the network card, in accordance with the hardware configuration.
- 2. The modules are used at the following slots:
 - Slot 1: Network card
 - Slot 2: OPC server
- 3. Click the "Station Name..." button to change the station names. The name of the PC station must be identical in the TIA Portal and in the Station Configuration Editor.
- 4. The station name "PC station" is used in this example.

				_			_
Station:	PC station 4		Mode	: R	UN_P		
Index	Name	Туре	Ring	Status	Run/Stop	Conn	•
1	🃳 IE general_1	IE General		<u> </u>	0		
2 4	OPC Server_1	OPC Server		<u> </u>		1	
3							_
4							
5							_
6							Ξ
8							_
3							_
11							_
12							
13							
14							
15							
16							
17							
18							
19							
20							-
21							
					1		
	Add	Edit		Delete		Ring ON	
-	ation Namo	Import Station				Disable Sta	tion





		Desc	riptio	n		
The "Extended of path from the Po 1. Make the fo - Type of t - PG/PC in - Connect example 2. Disable the 3. Click the "S displayed in 4. From the "C card of the 5. Click the "I	download to c G/PC to the P ollowing settin the PG/PC int nterface: Netv ion to interfac "Show all con Start search" to the "Compa Compatible de PC station.	device" dial PC station h gs: erface: PN, vork card o e/subnet: S mpatible de putton. The tible device evices in tai	og op as to 'IE f the l subne evices netwo s in ta get s	PG/PC et of the s" optior ork carc arget su ubnet:"	PC station, n. d of the PC subnet:" list. list you sele	PN/IE_1, for station is ect the network
Extended download t	o device Configured access not Device	des of "PC station" Device type	Slot	Туре	Address	Subnet
		ype of the PG/PC int PG/PC int ection to interface/s	erface: erface: ubnet:	PN/IE PN/IE PN/IE PN/IE_1	192.108.0.11	vork Connection
	Compatible devices in	ist ga target subnet:	teway:		2 _ Sh	wall compatible devices
Flash LED	Device IE general_1 	Device type IE general	Type PN/IE PN/IE		Address 192.168.0.10 Access address	Target device Stationmanager
Online status information Scan and information Display only problem	: n retrieval completed. reports					Start search
						Load Cancel

No.				Description	
6.	In the proced	"Lo dur evie	ad preview" dia e. w before loading	log you click the "Load" button to star	t the download
	Statur	1	Target	Merrane	Action
	+[]	\$	 PC station 	Ready for loading.	Action
		4	Different modules	Differences between configured and target modules (online)	
		•	Device configurati.	. Delete and replace system data in target	Download to device
	<			8	> Refresh
				Finish	Load Cancel
7.	Comm config	niss ura	ioning of the PC tion.	C station is completed after downloadi	ng of the

2.6 OPC Scout V10

In this example the OPC Scout V10 is used as the OPC client. Using the OPC client you can access the data of the S7-1200 CPU via the OPC server.

Start the OPC Scout V10 by means of the Windows menu "Start > All Programs > Siemens Automation > SIMATIC > SIMATIC NET > OPC Scout V10".

2.6.1 Establish Connection to the OPC Server

In the Server Explorer you double-click the "OPC.SimaticNET" item to establish a connection to the OPC server.



2.6.2 Absolute Tag Access

The configured S7 connection named "S7_Connection_1" is displayed in the Server Explorer under OPC.SimaticNET in the "\S7:" folder. Figure 2-33

	nknow	/n) - Sie	emens AG	- OPC	Scout V10	
File	Edit	View	Server Ex	plorer	Workboo	k Tools
. B.		. IS 🗉	. 🖂 🔍		> 🔳 🗴	D D D
L Se	erver	Explo	rer			
Β.						
		COM se C.Sima C.Sima C.Sima (DP2: \DP2: \DP: \FDL: \PNIO: \S7: @L0	rver ticHMI.CoR ticHMI.Hmif ticNET	tHmiRT RTm ER	m	
		 85a 8ve 	piversion() rsion()			

Create OPC items

Add the items below to the DA view.

Table 2-4

OPC item	Description
S7:[S7_Connection_1]DB1,X0.0	By means of the OPC item you monitor Bit 0.0 of the DB1 data block in the S7-1200 CPU.
S7:[S7_Connection_1]DB1,X0.1	By means of the OPC item you monitor and control Bit 0.1 of the DB1 data block in the S7-1200 CPU.
S7:[S7_Connection_1]DB1,X0.2	By means of the OPC item you monitor and control Bit 0.2 of the DB1 data block in the S7-1200 CPU.
S7:[S7_Connection_1]DB1,X0.3	By means of the OPC item you monitor Bit 0.3 of the DB1 data block in the S7-1200 CPU.

⊑ <¦D	A view 1					
	Monitoring ON		Monitoring ON Generate values ON			
	ID	Туре	Access rights	Value	New value	Quality
a	S7:[S7 Connection 1]DB1,X0.0	bool	RW	False		good
.	S7:[S7 Connection 1]DB1,X0.1	bool	RW	False		qood
.	S7:[S7 Connection 1]DB1,X0.2	bool	RW	False		good
a -	S7:[S7_Connection_1]DB1,X0.3	bool	RW	False		qood

Monitor OPC items

Click the "Monitoring ON" button to monitor the values of the OPC items. The values of the OPC items are displayed in the "Value" column.

-igur	e 2-35					
≣s, D.	Monitoring ON	K	Generate	values ON		
	ID	Туре	Access rights	Value	New value	Quality
(h	S7:[S7 Connection 1]DB1,X0.0	bool	RW	False		qood
9 -	S7:[S7 Connection 1]DB1,X0.1	bool	RW	False		qood
G	S7:[S7 Connection 1]DB1,X0.2	bool	RW	False		qood
a	S7:[S7_Connection_1]DB1,X0.3	bool	RW	False		qood

Write values

1. In the "New value" column you enter the value that you want to write to the S7-1200 CPU. Enter the values below in the "New value" column (see <u>Table 2-5</u>).

Table 2-5

OPC item	New value
S7:[S7_Connection_1]DB1,X0.1	True
S7:[S7_Connection_1]DB1,X0.2	False

2. Click the "Write" button.

3. Bits 0.0 and 0.3 in DB1 are given the value "True". The results of the write procedure are displayed in the "Value" column.

Figure 2-36

Monitoring OFF Generate values ON						R R	tead Write	
	ID	Туре	Access rights	Value	New value	Quality	Display name	Time 2C)
À	S7:[S7 Connection 1]DB1,X0.0	bool	RW	True	-	good	-	02/25/2015 12:57:15.574 PM
À	S7:[S7 Connection 1]DB1,X0.1	bool	RW	True	True 🔪	qood	-	02/25/2015 12:57:15.153 PM
À	S7:[S7 Connection 1]DB1,X0.2	bool	RW 3	False	False	qood	-	02/25/2015 12:27:26.582 PM
<u>.</u>	S7:[S7 Connection 1]DB1 X0 3	bool	RW	True		boop	-	02/25/2015 12:57:15.574 PM

1. Enter the values below in the "New value" column (see Table 2-6).

Table 2-6

OPC item	New value
S7:[S7_Connection_1]DB1,0.1	False
S7:[S7_Connection_1]DB1,0.2	True

2. Click the "Write" button.

3. Bits 0.0 and 0.3 in DB1 are reset to the value "False". The results of the write procedure are displayed in the "Value" column.

I ≰D	A view 1							
₽.	Monitoring OFF	Generate values ON]		Read Write	
	ID	Туре	Access rights	Value	New value	Quality	Display name	Time s CC
1	S7:[S7 Connection 1]DB1,X0.0	bool	RW	False		qood	-	02/25/2015 12:58:46.082 PM
A	S7:[S7 Connection 1]DB1,X0.1	bool	RW	False	False	qood	-	02/25/2015 12:58:45.801 PM
a -	S7:[S7 Connection 1]DB1,X0.2	bool	RW 3	True	True	qood	-	02/25/2015 12:58:45.801 PM
a -	S7:[S7 Connection 1]DB1,X0.3	bool	RW	False		qood	-	02/25/2015 12:58:46.082 PM
				1				

2.6.3 Symbolic Tag Access

The symbols configured in the STEP 7 configuration (see section <u>2.2</u>) are displayed in the Server Explorer under OPC.SimaticNET in the "\SYM:" folder.

In this example we use the symbol table of the S7-1200 CPU, because an S7 connection to this CPU is configured for the OPC server. Here the symbols of the symbol table which refer to the data blocks (DB), markers, inputs and outputs, for example, are taken into account.

Figure 2-38
(unknown) - Siemens AG - OPC Scout V10
File Edit View Server Explorer Workbook Tools
Server Explorer
크.
🗄 🔄 Local COM server
🗉 🛃 OPC. SimaticHMI. CoRtHmiRTm
🗉 🛃 OPC.SimaticHMI.HmiRTm
🖻 🛃 OPC.SimaticNET
□ (57. □ \SNMP·
🖻 🦳 S7-1200 station_1
⊟- <u>)</u> PLC_1
🖻 🗀 OPC DATA
OutputStatic01
O ResetStatic01
SetStatic01
···· 🕖 Staticu1

Create OPC items

Add the items below to the DA view.

Table 2-7

OPC item	Description
S7-1200 station_1.PLC_1.OPC_DATA.Static01	By means of the OPC item you monitor Bit 0.0 of the DB1 data block in the S7-1200 CPU.
S7-1200 station_1.PLC_1.OPC_DATA.SetStatic01	By means of the OPC item you monitor and control Bit 0.1 of the DB1 data block in the S7- 1200 CPU.
S7-1200 station_1.PLC_1.OPC_DATA.ResetStatic01	By means of the OPC item you monitor and control Bit 0.2 of the DB1 data block in the S7- 1200 CPU.
S7-1200 station_1.PLC_1.OPC_DATA.OutputStatic01	By means of the OPC item you monitor Bit 0.3 of the DB1 data block in the S7-1200 CPU.

	Monitoring ON	Generate v	alues ON	
	ID	Туре	Access rights	Value
		heat	DW/	Epico
A.	S7-1200 station 1.PLC 1.OPC DATA.OutputStatic01	DOOL	INVV.	Faise
ĥ	S7-1200 station 1.PLC 1.OPC DATA.OutputStatic01 S7-1200 station 1.PLC 1.OPC DATA.ResetStatic01	bool	RW	True
	S7-1200 station 1.PLC 1.OPC DATA.OutputStatic01 S7-1200 station 1.PLC 1.OPC DATA.ResetStatic01 S7-1200 station 1.PLC 1.OPC DATA.SetStatic01	bool	RW RW	True False

Monitor OPC items

Click the "Monitoring ON" button to monitor the values of the OPC items. The values of the OPC items are displayed in the "Value" column.

-igure 	e 2-40 A view 1			
	Monitoring ON	Generate v	values ON	
	ID	Туре	Access rights	Value
.	S7-1200 station 1.PLC 1.OPC DATA.OutputStatic01	bool	RW	False
Q	S7-1200 station 1.PLC 1.OPC DATA.ResetStatic01	bool	RW	True
1	S7-1200 station 1.PLC 1.OPC DATA.SetStatic01	bool	RW	False
.	S7-1200 station 1.PLC 1.OPC DATA.Static01	bool	RW	False

Write values

1. In the "New value" column you enter the value that you want to write to the S7-1200 CPU. Enter the values below in the "New value" column (see <u>Table 2-8</u>).

Table 2-8

OPC item	New value
S7-1200 station_1.PLC_1.OPC_DATA.SetStatic01	True
S7-1200 station_1.PLC_1.OPC_DATA.ResetStatic01	False

- 2. Click the "Write" button.
- 3. The OPC items "S7-1200 station_1.PLC_1.OPC_DATA.Static01" and "S7-1200 station_1.PLC_1.OPC_DATA.OutputStatic01" are set to the value "True". The results of the write procedure are displayed in the "Value" column.

Figure 2-41

₽.	Monitoring OFF	Generate v	alues ON			ead Write	
	ID	Туре	Access right	Value	New value	Quality	Display na
1	S7-1200 station 1.PLC 1.OPC DATA.OutputStatic01	bool	RW	True		good	- 02/26/2
1	S7-1200 station 1.PLC 1.OPC DATA.ResetStatic01	bool	RW 2	False	False	good	- 02/26/2
1	S7-1200 station 1.PLC 1.OPC DATA.SetStatic01	bool	RW	True	True	qood	- 02/26/2
(2)	S7-1200 station 1.PLC 1.OPC DATA.Static01	bool	RW	True		aood	- 02/26/2

1. Enter the values below in the "New value" column (see <u>Table 2-9</u>).

Table 2-9

OPC item	New value
S7-1200 station_1.PLC_1.OPC_DATA.SetStatic01	False
S7-1200 station_1.PLC_1.OPC_DATA.ResetStatic01	True

2. Click the "Write" button.

3. The OPC items "S7-1200 station_1.PLC_1.OPC_DATA.Static01" and "S7-1200 station_1.PLC_1.OPC_DATA.OutputStatic01" are reset to the value "False". The results of the write procedure are displayed in the "Value" column.

	Monitoring OFF	alues ON			Re	ead 🖊	Write	
	ID	Туре	Access right	Value	New value	Quality	Display nan	2 .me
1	S7-1200 station 1.PLC 1.OPC DATA.OutputStatic01	bool	RW	False		good	-	02/26/2
R .	S7-1200 station 1.PLC 1.OPC DATA.ResetStatic01	bool	RW 3	True	True	qood	-	02/26/2
1	S7-1200 station 1.PLC 1.OPC DATA.SetStatic01	bool	RW	False	False	good	-	02/26/2
a –	S7-1200 station 1.PLC 1.OPC DATA.Static01	bool	RW	False		dood	-	02/26/2