Application Note Siemens PLC and SIMATIC STEP 7 / TIA Portal

This document guides you through the setup of proprietary vendor specific software installed on your PC. Your supervisor may provide you with additional or alternative instructions.

The document consists of standard instructions that may not fit your particular solution. Please visit our support website for latest revisions of documentation and firmware:

http://www.secomea.com

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Prerequisite for this guide

The following guide will assist you to setup a remote and online connection to the Siemens PLC equipment placed on the customer site using your Siemens SIMATIC S7 PLC or TIA Portal programming software installed on your PC.

Prerequisites for this guide are:

- You have an operational LinkManager installed on your PC with a GateManager certificate that allows you to connect to the SiteManager agents.
- You have the Siemens software installed.
- You have the Siemens device agent installed and configured on the SiteManager at the remote site, and there is access between the SiteManager and the Siemens PLC via one of the following connection methods:
 - PLC with a native Ethernet module, such as the CP-343 SIMATIC NET for S-300, or the integrated interface of a S-1200.
 - MPI equipped PLC such as the Siemens S-300 series connected via a RS232-to-MPI adapter configured with agent device type Siemens / MPI (Seriel) on the SiteManager.

Note: Secomea has stopped providing SE MPI100 due to incompatibility problems with the Siemens TIA portal)

 PPI equipped PLC such as the Siemens S-200 series connected via a RS232-to-PPI adapter configured with agent device type Siemens / PPI (Seriel) on the SiteManager.

Note: Secomea has stopped providing the SE PPI100 adapter due to incompatibility problems with the 64 versions of the Siemens Step7 and TIA portal programs. Also note that PPI require optimal bandwidth for both the LinkManager and the SiteManager, due to the PPI protocol and Siemens software per design does not take into account the transmission delays (latency) that may occur when relaying the communication over long distances.)

- Ethernet equipped PLC configured with agent device type Siemens / Ethernet on the SiteManager.
- PLC connected via an Ethernet-to-MPI adapter (such as the Hilscher netX NL 50-MPI) with agent device type Hilscher / NetLink Gateway on the SiteManager.
- MPI equipped PLC connected via a Siemens Simatic S7 PC Adapter USB Model (6ES7 972-0CB20-0XA0) or Model A2 (6GK1-5710BA00-0AA0) configured with agent device type Siemens / USB Adapter on the SiteManager. NOTE that the LinkManager and SiteManager must be version 14115 or later.

If this is not the case, we kindly ask you to contact the person / department responsible within your own company or at the company responsible hereof.



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System overview

The communication path is as follows:

Siemens Software \rightarrow LinkManager \rightarrow GateManager \rightarrow SiteManager \rightarrow PLC.

This guide will elaborate on the components marked with **bold**.

The following system overview depicts a SiteManager 3229 at the customer location:





1. STEP7: TCP connection via native Siemens Ethernet port

The following describes how to connect the SIMATIC STEP 7 program to a Siemens PLC with a native Ethernet module, such as the CP-343 SIMATIC NET for S-300 or the integrated Ethernet port of e.g. an S-1200.

1. Locate the agent that represents you TCPI/IP attached Siemens PLC



2. You will not see any activity on it yet. This only starts when you connect to the PLC via your project:

LinkManager sectimea Disconnect Logout Services Sniffer ROOT.demo.EMEA.Customer A Siemens 57-300 (SiteManager 3034) - 172.24.2.129													
LinkManager, Services Disconnect Sniffer Disconnect Sniffer ROOT.demo.EMEA.Customer A Siemens S7-300 (SiteManager 3034) - 172-24.2.129 Agent Address Packets Bytes ok fail tx rx tx rx Quarter of the second se													
	ROOT.demo.EMEA.Customer A												
			Siemens S7-300 (SiteM	lanager 3	034) - 1	72.24.2.1	29						
		Agent	Address	Status	Con	nects	Pac	kets	By	tes			
		Agent	Address	Status	ok	fail	tx	rx	tx	rx			
	(2)	🔮 Siemens Si	7-300 172.24.2.129:80,102	IDLE	0	0	0	0	0	0			
			:5800,5900	IDLE	0	0	0	0	0	0			

3. Start the STEP 7 software and select **Options** → **Set PG/PC Interface**:





4. Select TCP/IP -> VirtualBox TAP Adapter:

SIMATIC Manager			_
File PLC View Options Window Help			
🗅 🚅 🔡 🐖 🛞 候			
Set	PG/PC Interface	X	
A	ccess Path		
	Access Point of the Application:		
	S70NLINE (STEP 7) -> TCP/IP -> Virtu	alBox TAP Adapt	
	(Standard for STEP 7)		
	Interface Parameter Assignment Used:		
	TCP/IP -> VirtualBox TAP Adapter	Properties	
	🕮 ISO Ind. Ethernet -> VirtualBox TAP 📩	Diagnostics	
	TCP/IP -> Broadcom NetXtreme Gig	Coorr	
	TCP/IP -> Intel[R] PRU/Wireless		
		Delete	
	(Assigning Parameters to Your NDIS CPs		
	with TCP/IP Protocol (RFC-1006))		
	Interfaces		
	Add/Remove:	Select	
	OK C	ancel Help	
		nop	

5. Press OK to save.

NOTE: The LinkManager does not allow STEP 7 to scan for network attached devices. Therefore you will NOT see the PLC under the menu **PLC** \rightarrow **Display Accessible Nodes.** Neither will you see any activity on the LinkManager before you access it with a project where the PLC's specific IP address is configured.

6. Open your project, and make sure your project have the IP address configured to match the address of the LinkManager agent.

			Siemens S7-300* (Sit	eManage	r) - 172	24.2.129				
				C1-1	Connects		Packets		Bytes	
		Agent	Address	Status	ok	fail	tx	FX	tx	rx
⊕*	•	Siemens S7-300*	172.24.2.129:80,102	IDLE	1	o	15	8	334	387
			:5800,5900	IDLE	0	o	0	0	0	0



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7. In the project select PLC → Establish Connection to Configured CPU. You should see the green RUN indication at the bottom..





2. TIA Portal: TCP connection via native Siemens Ethernet port

The following describes how to connect via the Siemens TIA portal to a Siemens S7-1200 PLC equipped with an Ethernet module that is attached to a SiteManager via Ethernet (directly or via an Ethernet switch).

Please note; if you are connecting to a Siemens HMI, you need to set the transfer method on the HMI to "Ethernet". Furthermore, you will not be able to "Go Online", but you can download to the HMI. See Appendix C – Changing transfer method on Siemens HMI on how to change the transfer method on the HMI.

1. Login with your LinkManager and locate the agent that represents your TCPI/IP attached PLC. Click the text (that turns orange at mouse over) to connect to the PLC.



2. You will not see any activity on it yet. This only starts when you connect to the PLC via your project (Make a note of the IP address of the PLC):

LinkManager sectmea											
Disconnect Logout Services Sniffer											
ROOT.demo.Lyngby A											
	Siemens S7-1200 (SiteMa	nager 3034	4) - [17]	2.24.2.20	5						
Agent	Address	Chattan		Connects		kets	Bytes				
Agent	Address	Status	ok	fail	tx	rx	tx	rx			
③* Siemens S7-1200	172.24.2.205:80,102	IDLE	0	0	0	0	0	0			
	:5800,5900	IDLE	0	0	0	0	0	0			

Hint: You are in principle now connected to the PLC, and you could make a ping to the PLC IP address.

 Start the TIA portal and communicate on the IP address as you would normally have done if you were sitting in the local network with the PLC. The following illustrates some basic screenshots:

NOTE: The TIA portal's network discovery function will not work via the LinkManager connection, due to the nature of UDP broadcasts being limited to the physical local subnet. I.e. it will not work either to us the TIA portals ability to apply another subnet to the PG/PC interface.



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- 4. Open your project in the TIA portal and enter project view.
- 5. Ensure that your project is configured with the IP address that the LinkManager is connected to, by selecting the PLC



6. If matching the LinkManager, you can go Online on the PC.



Application note, Siemens PLC and SIMATIC STEP 7 / TIA portal



7. You can now also observe data traffic in the LinkManager:

Link	KM nea	an	ager									
	Disconnect Logout Services Sniffer											
	ROOT.demo.Lyngby A											
			Si	emens S7-1200 (SiteMan	ager 303	4) - 172	2.24.2.20	5				
			Acent	Addross	Connects			Connects Pack		B	ytes	
	Agent		Agent	Address	Status	ok	fail	tx	FX	tx	rx -	
	⊛*	•	Siemens S7-1200	172.24.2.205:80,102	UP:1	1	0	92	50	3,225	10,784	
				:5800,5900	IDLE	0	0	0	0	0	0	



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3. MPI or PPI connection via RS232-to-MPI/PPI Adapter

The following describes how to connect to the SIMATIC program, to a Siemens PLC that is attached to a SiteManager via a Siemens RS232-to-MPI or RS232-to-PPI adapter or the Secomea SE MPI100 or SE PPI100.

NOTE: This only applies to the 32 bit versions of the Step7 and TIA portal program. In the 64 bit versions of these programs the COM port driver has been removed, and you should use either the method described in section **4.MPI connection via Siemens PC USB Adapter** or **5.MPI or PPI connection via netX NL 50-MPI**/PPI adapter.

Ethernet-to-MPI/PPI are generally higher priced than RS232-to-MPI/PPI adapters, but you will also benefit from better performance and allows access to MPI/PPI/Profibus DP 1,5 and 12Mbit networks. Secomea has standardized on the Hilscher netLINK NL 50-MPI (Secomea part number 26940).

Also note about RS232-to-PPI, that this communication form is sensitive to the speed of the connection. For very slow connections with high latency, you may experience instability or event that it does not work at all.

The following illustrates setup of a MPI connection via Step7.

1. Locate the agent that represents you Serial Siemens PLC.



2. When connecting the agent, you should see some activity in the tray icon area, which is the auto configuring of a virtual serial port. If your SiteManager, the MPI100 and the Siemens PLC is correctly attached, you should also see the status of the agent change to UP, and a few bytes of traffic:

Lin	ikMu mea	anager							(5
			Disconnect Logout	Service	25	Sniffer	•			
ROOT.demo.EMEA.Customer A										
			Siemens MPIbus (SiteManag	er 3034)				
		Acent	Addross	Status	Connects		Pac	kets	Byt	es
		Agent	Aug 235	otatus	ok	fail	tx	rx	tx	rx
	St.	Siemens MPIbus	172.24.2.1:23> 127.0.0.1	UP:1	1	0	4	2	56	56



3. Now right click the LinkManager system tray Icon, and select **Status**. Make note of the Serial port that has been assigned (in this case COM6):



4. Right click the LinkManager system tray icon again, and select **Options**. Enter the number of the COM port you found under status. This will ensure that you will always get this port in the future.

Options	
COM port	Net Type Bridged NAT
ОК	Cancel

Important: You must stop and start the LinkManager for the forced port to take effect

Tip: You can also force another COM port (e.g. COM2). Just ensure in your Windows device manager, that the port is not conflicting with an existing COM port. See Appendix A for info on how to organize COM ports.



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5. In the SIMATIC program, select **Options** → **Set PG/PC interface**:

S.	SIM	ATIC	Mai	nager						
File	PL	.C V	liew	Options	Window	Help		_		
	۵ 🖬	2	1	Custo	mize		Ctrl+Alt+E			
				Simula	ite Module	s				
				Set PG	5/PC Interl	face				

6. Select **PC Adapter(MPI)**, If you do not see this adapter in the list, click **Select** and install the PC Adapter:

SIMATIC Manager	
File PLC View Options Window Help	
🗅 🚅 🔡 🛲 🛛 🖉 🛞 📢	
Set PG/PC Interface Access Path Access Path Access Point o Selection: Solution: Standard for S Interface Parar TCP/IP > VM Interface Parar Interface Parar TCP/IP > VM Interface Parar Interface Parar	Installed: Module ISD Ind. Ethernet -> VMware Accelerated AMD PC/PPI cable ICP/IP -> VMware Accelerated AMD
I ISO Ind. E IIII PC/PPI ca IIII TCP/IP IIII TCP/IP	
	✓ Display modules ready for operation only
(Assigning Para with TCP/IP Pr	of the PC
Interfaces Close	Help
Add/Remove:	



7. For the **PC Adapter (MPI)**, select properties and select the COM port you found on the LinkManager Status screen. (Make sure that "Apply settings for all modules" is NOT checked)

SIMATIC Manager
File PLC View Options Window Help
Set PG/PC Interface Access Path Access Path Access Path Access Path Stondard for STEP 7) Interface Parameter Assignment Used: PC Adapter(MPI) PC Adapter(MPI) PC Adapter(MPI) PC Adapter(MPI) PC Adapter(MPI) Properties PC Adapter(MPI) Prometer assignment of your PC adapter Pormeter assignment of your PC adapter Interfaces Add/Remove:
OK Cancel Help
Press F1 to get Help. PC Adapter(MPI)

8. In the SIMATIC software select PLC → Display Accessible Nodes

SIMATIC Ma	anager				
File PLC View	Options Windo	w Help			
Display A	Accessible Nodes				
PROFIBL	JS	•			
Edit Ethe	rnet Node				
Update t	ne Operating Syst	tem			

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9. If the SIMATIC software displays some accessible MPI nodes, you have configured everything correctly, and you should be able to start a project and communicate with the PLC.

SIMATIC Manager - Accessible Nodes							
File Edit	Insert PLC View Options Wi	ndow Help					
0 🖨	🚼 🛲 X 🖻 🛍 🌰	9 오 :- ::: ::: ::: ::: < No Filter >	J 🏹 號 🗃 🗖 🖬 🕅 校				
ä	Accessible Nodes MPI						
Θ	Accessible Nodes	🛐 MPI = 2 (directly) 🛐 MPI = 3					



4. MPI connection via Siemens PC USB Adapter

The following describes how to connect to a Siemens PLC that is attached to a SiteManager via a Siemens PC USB adapter. The following screenshots depicts the SIMATIC Step7 software)

Both the Siemens Simatic S7 PC Adapter USB 6ES7 972-0CB20-0XA0 (hard-ware revision 1.2 and 1.3), and USB A2 6GK1-5710BA00-0AA0 have been verified to work.

NOTE: that SiteManager and LinkManager version must be 14115 or later

1. Locate the agent that represents you USB Siemens PLC, and connect to it.

LinkManager sectmea	
Logout Services GM	Login Sniffer Refresh
XXX-gm07: ROOT.de	mo.APAC.Customer A
ROOT demo APAC Customer A D - EMEA D - test Show all Expand all Refresh	 ✓ - SiteManager3239 < Connect all> ✓ Beckhoff (SiteManager3239) - 172.24.2.199 ✓ Siemens USB (SiteManager3239) Show all Expand all Refresh

2. First time the connection is opened, the "Found New Hardware" Wizard will pop up. Select to <u>not search</u> for drivers on Windows Update site:

Found New Hardware Wizard					
	Welcome to the Found New Hardware Wizard Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission). Read our privacy policy				
	Can Windows connect to Windows Update to search for software? Yes, this time only Yes, now and every time I connect a device No, not this time Click Next to continue.				
	< Back Next > Cancel				



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3. Select "Install the software automatically", click **Next** and the process should proceed automatically.



Found New Hardware Wizard					
Found New Hardware Wiz	Ard Completing the Found New Hardware Wizard The wizard has finished installing the software for: SIMATIC PC Adapter USB				
	Click Finish to close the wizard.				
	< Back Finish Cancel				

4. Start the SIMATIC Manager program, and select **Options** → **Set PG/PC Interface**.



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5. Select "PC Adapter (Auto) from the list, and click Properties.



6. Select "Local Connection" and choose USB from the dropdown menu. Click **OK** twice.

Properties - PC Adapter(Auto)						
Automatic Bus Profile Detection Local Connection						
Connection to:	USB COM1 COM2 USB					
Apply settings for all modules		13				
OK		Cancel	Help			



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7. Now, you should be able to access the PLC via the USB PC Adapter. To get a list of available nodes, select PLC → Display Accessible Nodes.

	SIMA	TIC M	anager					
File	PLC	View	Options	Window	Help			
)	Display /	Accessible	Nodes				
	F	PROFIBL Edit Ethe Update I	JS ernet Nod the Opera	e ting Systen	• •			
6 :	SIMAT	IC Man	ager - Ac	cessible l	Nodes			
File	Edit	Insert	PLC View	v Options	Window He	əlp		
D	2	#	1 X B	a 🖪 🖬				
	10 -	ccessi	ble Node	s MPI				
	÷	ම් Acce:	ssible Node	8	MPI =	2 (directly)	ε MPI	= 3



5. MPI or PPI connection via netX NL 50-MPI/PPI adapter

The following describes how to connect the SIMATIC program, to a Siemens PLC that is attached to a SiteManager via a Hilscher netX NL 50-MPI/PPI adapter (Secomea part number 26940).

Important: The IP address of the NL-50 adapter <u>must</u> be configured locally and saved permanently into the adapter before shipping it to the final destination. You <u>cannot</u> set the IP address on a new NetX adapter remotely via a LinkManager connection.

The following depicts the SIMATIC Step7 software only.

- Set a static IP address on the NL-50 adapter that matches the subnet of the SiteManager DEV port. (For more details, refer to Appendix B - Setting the IP address on the NL 50-MPI)
- 2. Install the Step7 IBHNet driver from the CD that is included with the NL-50 adapter. Follow the on-screen instructions. Remember to restart your computer when the installation is finished.
- 3. In the LinkManager locate the agent that represents your NL-50 adapter, and connect to it.

LinkManager sectmea	
Logout Services GM	Login Sniffer Refresh
JHS-GM05-ESX	: ROOT.test.JHS
ROOT.test.JHS	JHS-GM05-ESXi [hkkxpima]
Show all Refresh	JHS-TOGU-HOME JHS-TOGU-HOME Sig5 V-B-SiteManager_ <connect (sitemanager)="" -="" 10.0.0.30<="" all2="" th="" wmpi=""></connect>
	Show all Expand all Refresh

4. Start the SIMATIC Manager program, and click **Options** → **Set PG/PC Interface**.





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5. Select the "IBHNet(MPI)" interface from the list, and click **Properties**.

Set PG/PC Interface	2						
Access Path							
Access Point of the Application:							
S70NLINE (STEP 7)> IBHNet	S70NLINE (STEP 7)> IBHNet(MPI)						
(Standard for STEP 7)							
Interface Parameter Assignment Used:							
IBHNet(MPI)	Properties						
₩ <none></none>							
BHNet(COM PROFIBUS)	Copy						
(IBHNet(MPI))	2						
⊢ Interfaces							
Add/Remove:	Select						
 	Cancel Help						

6. Click the IBH network settings button

IBH Network (MPI)	
Station:	•
OK IBH network settings	Cancel



7. Click the New station button.

9	IBH Netw	ork settir	ngs			_ 🗆 🛛
Fil	e Stations	IBH Links	Options	Help		
Γ	Station:					
	Station Nan	ne			Address	
	C - Min					
	Settings:	1		1		1
	New st	ation	Char	nge station	Dele	te station
	IDLL SAL O					1
	IBH LINK S		H LINK 55			Language
Г	Class		Valia	1.40		Hala
L	Liose		version:	1.48	_	нер

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8. Give the station a name, so you can identify it later on, and type in the IP address of the NL-50 adapter. Click **OK** and **Close**.

Station	
Name: Siemens s7-300 IP Address or name in network: 10.0.0.30 Timeout: 4000 milliseconds Profile: © MPI © Profibus © PPI	Type: IBH Link S7 / IBH Link S7++ IBH Link S7 Plus IBH Link S5 / IBH Link S5++ S7-CX SoftPLC v3.x / v4.x SoftPLC v2.x SoftPLC (variables only) RFC1006 (variables only) Hilscher API (variables only) S7-1200 (variables only)
Advanced connection settings: Test network connectivity (r Take profibus parameters fr OK Test	recommended) om project Apply Cancel

9. Select the station you just created from the dropdown list, and click **OK** twice.

IBH Network (MPI)	
Station:	
Siemens s7-300	
OK IBH network settings	Cancel



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10. Now, you should be able to access the PLC via the MPI. To get a list of available nodes, select PLC → Display Accessible Nodes.

Se s	SIMATIC Manager												
File	PLC	View	Option	is Wini	dow	Help							
	[Display A	Accessibl	e Nodes			1						
	F	PROFIBL Edit Ethe Jpdate I	JS #net Noo the Oper	de ating Sy	/stem	•							
- s	МАТ	IC Man	ager - A	ccessi	ble No	odes							
File	Edit	Insert	PLC Vie	ew Opt	ions \	Window	v Hel	P					
D	2		1 % 1	h R		9		<u>a</u> <u>a</u>				< No Filter	>
	18 (A	ccessi	ble Nod	es M	PI								
		Acce:	sible Noc	les		F	9 = 2	(direc	(y) 💼	MPI	= 3		



6. VMWare: TCP connection via native Siemens Ethernet port

You can run the Siemens software inside a VMWare engine, to a Siemens PLC that is Ethernet attached to a SiteManager.

From LinkManager version 12155 you can choose to run the LinkManager inside or outside the virtual machine. Note that LinkManager can only run inside VMWare if the host OS is Windows 7 and the PC's CPU has support for virtualization.

The following illustrates VMWare Player, which can be downloaded from http://www.vmware.com/support/product-support/player/, and for LinkManager running outside the virtual machine (i.e. on the host OS system)

1. Locate your Windows XP that has Step7 installed, and enter Edit virtual machine settings.



2. Make sure the Network Adapter settings is set to **NAT** (If running LinkManager inside VMWare, you can run either **NAT** or **Bridged** mode)

Device	Summary	Device status
 Memory Processors Hard Disk (IDE) CD/DVD (IDE) Floppy 	1024 MB 1 8 GB (Preallocated) Auto detect Using drive A:	Connected Connect at power on Network connection Bridged: Connected directly to the physical network
Serial Port	Present Using port COM6	NAT: Used to share the host's IP address Host-only: A private network shared with the host

- 3. Start the VMWare engine, and on the host PC start LinkManager.
- 4. Follow the procedure of section **1 STEP7: TCP connection via native Siemens** Ethernet port to get access to the PLC via LinkManager



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7. VMWare: MPI connection via RS232-to-MPI Adapter

You can run the Siemens software inside a VMWare engine, to a Siemens PLC that is attached to a SiteManager via a MPI-to-RS232 adapter.

You can choose to run the LinkManager inside or outside the virtual machine. Note that LinkManager can only run inside VMWare if the host OS is Windows 7 and the PC's CPU has support for virtualization.

The following illustrates VMWare Player, which can be downloaded from <u>http://www.vmware.com/support/product-support/player/</u>, and for LinkManager running outside the virtual machine (i.e. on the host OS system)

- Follow step 1-3 of section 3 MPI or PPI connection via RS232-to-MPI/PPI Adapter. This will create a COM port even if the PC does not have a physical COM port.
- 2. Locate your Windows XP that has STEP 7 installed, and without starting it, enter **Edit virtual machine settings.**



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3. Add Serial Port to the Hardware list (if it does not already exist).

Device Memory Processors Hard Disk (IDE)	Summ 1024 1 8 GB What type of hard	d 🛛 🗶 dware do you want to install?
COJUST (UE) Floppy Network Adapter USB Controller	Auto Using MAT Prese Hard Disk © CD/DVD Drive Eloppy Drive Elopy Drive Sund Card Serial Port Generic SCSI Devic	Explanation Add a serial port.
	Add Remov	< Back Next > Cancel

4. Select "Use physical port" (Even though LinkManager makes a virtual COM port, VMWare sees it as a physical port)

Add Hardware Wizard 🛛 🔀
Serial Port Type What media should this serial port access?
Serial port
O Use physical serial port on the host
Output to file
Output to named pipe



5. Set the port to the COM port used by the LinkManager (see section **3 MPI or PPI connection via** RS232-to-MPI/PPI Adapter)

Virtual Machine Setting	s	X
Hardware Options		
Device Memory Processors Hard Disk (IDE) CD/DVD (IDE) Floppy Network Adapter USB Controller Sound Card Serial Port	Summary 256 MB 1 4 GB Using drive F: Using drive A: NAT Present Auto detect Using port COM3	Device status Image: Connected Image: Connect at power on Connection Image: Use physical serial port: COM3 Image: Use named pipe:

- If VMWare does not allow you to add a Serial port, it may be because the PC does not have a physical Serial port. But if you have started LinkManager and connected to the Agent, the virtual COM port of the LinkManager should be regarded as a physical COM port by VMWare.
- 7. Press **OK** twice, and select the Select **Finish** and **OK**, Start the VMWare WindowsXP image, and start the STEP 7 software.
- Follow the procedure described in section Error! Reference source not found. Error! Reference source not found. on getting access to the PLC via LinkManager.

Note: VMWare will typically make the physical COM port of the host system (e.g. COM3) appear to the virtual OS as COM1. You should configure STEP 7 to use the port of VMWare (COM1) and <u>not</u> the physical port of the host system (COM3) that is used by LinkManager.

7.1. Startup order of VMWare, LinkManager and STEP 7

If you have already preset a COM port in LinkManager as well as in VMWare, the startup order would be irrelevant. You can stop and start the components individually.

If you encounter problems, or you have changed the COM port setting of LinkManager it is recommended to try the following:

- 1. Stop the VMWare engine.
- 2. Stop LinkManager completely.
- 3. Start LinkManager.
- 4. Connect to the Serial PLC and check the assigned COM port under Status (by right-clicking the LinkManager tray icon)
- Check the COM port settings of the Virtual Machine Settings of the Windows image with the STEP 7 software. (COM port should be COM1 or COM2, and <u>not</u> the virtual COM port assigned to the LinkManager)
- 6. Start the VMWare image.
- 7. Start STEP 7 and connect to the PLC



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8. VMWare: MPI connection via Siemens PC USB Adapter

You can run the Siemens software inside a VMWare engine, to a Siemens PLC that is attached to a SiteManager via a MPI-to-USB adapter.

Important: LinkManager must run inside the virtual. Note that LinkManager can only run inside VMWare if the host OS is Windows 7 and the PC's CPU has support for virtualization.

The following illustrates VMWare Player, which can be downloaded from <u>http://www.vmware.com/support/product-support/player/</u>, and for LinkManager running outside the virtual machine (i.e. on the host system)

1. Locate your Windows XP that has Step7 or TIA portal installed, and enter **Edit** virtual machine settings.

With the state of	_ ×
VMware Player File + VM + Help + Home Windows XP Professional 2	- × Windows XP Professional 2 State: Powered Off OS: Windows XP Professional
	RAM: 1024 MB
	🗐 vm ware



2. Make sure that USB Controller has been added as Hardware component:

Virtual Machine Setting:	5	
Hardware Options		
Device	Summary 512 MB 1 4 GB (Persistent) Auto detect Using drive A: NAT Present Auto detect Using port COM8	Connections Enable high-speed support for USB 2.0 devices Automatically connect new USB devices Show all USB input devices Share Bluetooth devices with the virtual machine
	Add Remove]
_		OK Cancel Help

- 3. Start the VMWare engine and the LinkManager inside the VMWare engine.
- 4. Follow the procedure of section **4 MPI connection via Siemens PC USB** Adapter to get access to the PLC via LinkManager



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Appendix A - Organizing COM ports in Windows

Clean up Windows Registry for redundant COM ports:

We have experienced that some versions of the Siemens software require a COM port number less than 7. In case your PC assigns a COM port of e.g. 13, it may be due to previous installs of virtual COM ports from in relation to installation of other programs.

You can clean your PC for redundant COM ports in Windows registry:

- 1. Open regedit (Start \rightarrow run \rightarrow Regedit)
- 2. Navigate to:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\COM Name arbiter

- 3. In the ComDB set all values to 00
- 4. Restart your PC

Enable LinkManager to use COM1:

Some Siemens programs (such as the "Flexible Transfer Tool") require the COM port to be COM1.

Even if no COM ports are installed on the PC, Windows will never assign a COM port lower than COM3 to the LinkManager. You therefore have to do the following to force LinkManager to use COM1:

- Open Windows Control Panel → System → Hardware → Device Manager → Ports (COM & LPT).
- 2. If there already are physical COM ports listed, you must re-assign the port numbers to free up COM1.

Right click a COM port and select Properties \rightarrow Port Settings \rightarrow advanced

- 3. Change the COM port number in the drop down list.
- 4. Restart your PC.
- 5. Right click the LinkManager system tray icon and select Options.
- 6. Enter 1 in the COM port field.

Options	
COM port	Net Type C Bridged I NAT
OK	Cancel

7. Stop and Start the LinkManager and start the Serial agent.



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Appendix B - Setting the IP address on the NL 50-MPI Adapter

In order for the MPI adapter to work, you need to program the IP address permanently into the adapter locally, prior to shipping the adapter to the site.

Note that you $\underline{\mathsf{cannot}}$ set the address remotely via the LinkManager connection.

The following refer to the procedure for SIMATIC Step7. It is assumed that the same drivers works for the TIA Portal.

1. Install the software from the CD enclosed with the NL-50 adapter. Select "Install Step7® Driver IBHNet".

netLINK MPI / netTA	P MPI
	A THE
Install STEP7® Driver IBHNet Install SyCon Configuration Tool	
Open Documentations Directory	
0	



2. Next, "select IBHNet-Treiber installieren" (German for "Install driver").

IIIIBilsoftee						
Home						
Produkte	IBH Link S7, IBH Link S7++, IBH Link S7 Plus					
Onlineshop						
Support	- IBHNet Dokumentation					
Download						
Kontakt						
Messen / Events						
Internationale Handler						
) Presse						
IBHsoftec GmbH						
64743 Beerfelden	▲ Zum Seitenanfang					
Telefon: +49 6068 3001						
info@ibbsoffec.de						

3. Follow the on-screen instructions.

IBHNet - InstallShield Wizard		
Choose Setup Language Select the language for the installa	ation from the choices below.	
	English German	
InstallShield	<back next<="" td=""><td>Cancel</td></back>	Cancel



IBH_Net - InstallShield Wize	ard	×
License Agreement Please read the following licen:	e agreement carefully.	
	Press the PAGE DOWN key to see the rest of the agreement.	
	License Agreement This is a legal agreement between you (either an individual or an entity), the end user, and IBH softec GmbH. 1. Grant of license. This license agreement ("License'") permits you to use one copy of the specified version of the IBH softec GmbH software product on any single computer. If the software is permanently installed on the hard disk or other storage device of a computer (other than a network server) and one person uses that computer more than 80 percent of the time it is in use, then that person may also use the software on a portable or home computer. 2. Copyright. The software is owned by IBH softec GmbH and is protected by copyright laws. Therefore, you must treat this software the same as any other copyrighted material except that you may	
	either (a) make one copy of the software solely for backup or archival purposes, or (b) itansfer the software to a single hard disk provided you keep the original solely for backup or archival purposes. You may not copy the written materials accompanying the software. Do you accept all the terms of the preceding License & greement? If you select No, the setup will close. To install IBH_Net, you must accept this	•
InstallShield	agreement. < <u>B</u> ack <u>Y</u> es <u>N</u> o	





IBH_Net - InstallShield Wizard		×
Select Program Folder Please select a program folder.		
	Setup will add program icons to the Program Folder listed below. You may type a new folder name or select one from the existing folders list. Click Next to continue.	e,
	Program Folder: IBH softec GmbH\IBHNet	
	Existing Folders: Administrative Tools Games Secomea LinkManager Startup SyCon System Configurator WinPcap	
InstallShield	< <u>B</u> ack <u>N</u> ext> Cancel	



IBH_Net - InstallShield Wiz	ard	×
Setup Type Select the setup type that bes	t suits your needs.	
	Please select your language	
	German German French	
InstallShield	K Back Next S Cancel	

IBH_Net - InstallShield Wiza	ard
l de 3.	InstallShield Wizard Complete
	The InstallShield Wizard has successfully installed IBH_Net. Before you can use the program, you must restart your computer.
	 Yes, I want to restart my computer now. No, I will restart my computer later.
	Remove any disks from their drives, and then click Finish to complete setup.
InstallShield	K Back Finish Cancel



4. After reboot, start the "IBH Link S7" search application.

	SIMATIC Manager										
		Set Program Access and Defaults									
	1	Windows Catalog									
	2	Windows Update		•							
		Simatic	۲								
	1	Programs	•	•	Accessories	•					
		. .			Startup	•					
000	3	Documents	1		Secomea LinkManager	•					
a l	1	Settinas	•		WinPcap	•					
<u>p</u>				n	Wireshark						
SSS	\mathbf{P}	Search	•		SyCon System Configurator	•					
Jo	9	University Comments		١.	IBH softec GmbH	₽	IBHNet	•		Additional Tools	
ā	9	Help and Support			¥			ľ	5	Administrate IBHNet stations	
P,		Run							3	Documentation	
S									2	IBHNet Documentation	
0	\mathcal{D}	Log Off admin								Search IBH Link S5 and configure	
Ĕ		2							9	Search IBH Link S5++ and configure	
3	0	Turn Off Computer							5	Search IBH Link S7 (Plus,++) and configure	
	l oto	rt		-					-		F
"	0 314										0
То	return to	your computer, press Ctrl+Alt.									

5. If you have more than one network adapter in your computer, select the one that the NL 50-MPI adapter is attached to, and click **OK**.

📱 IBHLinks in the l	ocal network					×
Found IBHLinks:						
MAC Address	Tupe	Serial Number	IP Address	•	Station na	me
Multiple Network	Cards detec	ted				
Please choose the Net	twork Card for the	IBH Link searc	n			
Description		IP a	ddress	MAC ad	dress	Address
VirtualBox TAP Adapt	er - Packet Scher °CI Ethernet Adap	duler Min 169 oter - Pa 172	.254.93.114 .16.15.109	00-FF-F8 00-0C-2	3-B6-A8 9-B1-6B	DHCP
1				1		
Multiple Network Cards	were detected in	your PC.				
Please choose the Net	work card for the	IBH Links searc	h. 🖌			
			OK	Ca	ancel	Help
ОК	Settin	js I	Searc	:h again	1	Help

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6. The software will automatically search for the MPI adapter, and it will show up on the screen. Select it, and click **Settings**.

9	BHLinks in the local network								
Г	Found IBHLinks:								
	MAC Address	Туре	Serial Number	IP Address	Station name				
	00-02-A2-24-75-A6	NL50MPI	33831	0.0.0.0					
	1								
	Configuration via B	outer	1		0.0.0	-			
	,			I					
	OK	Setti	ngis	Search again	Help				

7. Give the adapter a temporary IP address in the same subnet as the network adapter of your PC, and click Set.

9 IBł	HLinks in the lo	ocal network	٢			X				
Four	Found IBHLinks:									
MA		Туре	Serial Number	IP Address	Station name					
00-	02-A2-24-75-A6	NL50MPI	33831	0.0.0.0						
					/					
	Set IP	-Address								
	⊢IP-A	.ddress:								
	Г	172 . 16 .	15 . 249	Set						
				Cance	:I					
П	Configuration via Router 0.0.0.0									
	_			1						
	ОК	Setti	ngs	Search again	Hel	p				



8. If the IP address is in the correct subnet, the software will tell you that it has set the IP address temporarily, and it needs to be saved permanently.

Click OK, and then click Settings again.

9	BHLinks in the local network									
Г	Found IBHLinks:									
	MAC Addre	SS	Туре	Serial Number	IP Address	Station name				
	00-02-A2-24	I-75-A6	NL50MPI	33831	0.0.0.0					
		BHLink								
	IP-Address was successfully set. The address is only temporary. In the IBHLink settings 'Save permanently' needs to be executed.									
	1									
	Configuration via Router 0.0.0.0									
]	OK Settings Search again Help									

 Type in the IP address that should be used by the MPI adapter on the DEV network of the SiteManager. Press Save permanently and select Yes when prompted for restarting the adapter.

BHLink settings - 000	133831 MAC: 00-02-A2-24-75-A6 🛛 🔀
<u>N</u> etwork <u>M</u> PI/Profib	us <u>T</u> ime synchronisation <u>F</u> irmware <u>D</u> iagnostics
Address settings:	
Network name:	
IP-Address:	10 . 0 . 0 . 30 © Static
Subnet mask:	255.0.0.0 C DHCP
Gateway:	0.0.0
IBHNet part (Por	t 1099 is always active):
Authentification	
Username:	
Password:	
	Change password
- Routing options	
Configuration wit	h NetPro
	/
Save permanently	Cancel

10. The MPI adapter is now configured with a permanent IP address, and is ready to be attached to the DEV side of the SiteManager.



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Appendix C – Changing transfer method on Siemens HMI

In order to be able to download to a Siemens panel, you need to change the transfer method to Ethernet. You do so by entering "Control Panel" on the panel, select Transfer Method and change the method to Ethernet:

B	<u> </u>	-	9	Kauba	1	()	Notwork a
Date/Time	Display	Inputranei	Options	Keybo	aru.	MUUSe	Dial-up Co.
4	HOUSE	-	SCR	1	2	2.	T
Printer	PROF	nsfer Settings		OK	×	Transfer	UPS
	C	annel Directoria	55				
	5	Enable Transfer	Re Re	mote Con	trol		
		PI ROFIBUS	•		-		
		SB device	• P	roperties			
		12			1		
		OK		Cancel			

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