Application Note Omron PLC and CX-Programmer

This document guides you through the setup of proprietary vendor specific software installed on you 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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Prerequisites for This Guide

The following guide will assist you to setup a remote and online connection to the Omron equipment placed on the customer site using your Omron CX-Programmer 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 Omron software installed.
- You have the Omron device agent installed and configured on the SiteManager at the remote site, and there is access between the SiteManager and the Omron PLC.
 - A Serial attached PLC (Such as the CJ1M) must be configured with agent device type **Omron / Serial PLC** on the SiteManager.
 - A network attached PLC must be configured with agent device type **Omron / Ethernet PLC** on the SiteManager.
 - A USB attached PLC (such as the CP1H) must be configured with agent device type Omron / USB PLC on the SiteManager. Note that this connection type requires a SiteManager model with USB support and minimum SiteManager version 12035 and LinkManager version 12155.

If any of these prerequisites are not met, you should contact the person / department responsible within your own company or at the company responsible hereof.

System Overview

The communication path is as follows:

CX-Programmer \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. TCP Ethernet Access

The following describes how to connect the Omron CX-Programmer to an Omron PLC that is attached to a SiteManager via Ethernet. The description shows a CJ1M, but it could be any Ethernet enabled Omron PLC.

Note: A network attached PLC must be configured with agent device type **Omron/Ethernet PLC** on the SiteManager.



1. Locate the agent that represents you TCPI/IP attached Omron 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):

Link	MC ea	n	ager								d	1
			ROOT	Disconnect .demo.Toplevel.EMEA.D	Logout enmark.Cu	stome	Sniffer erF.Produc	tion Pla	ant 2			
				Omron PLC* (Site	Manager)	172.	24.2.122					
			Agent	Address	Status	Con	Connects		kets	By	tes	
					510105	ok	fail	tx	rx.	tx	rx .	
	€3*	•	Omron PLC*	172.24.2.122:80,9600	IDLE	0	0	0	0	0	0	
				:9600 (udp)	IDLE	0	0	0	0	0	0	

3. Start the CX-Programmer and open your project.

NOTE: The LinkManager does not allow CX-Programmer to scan for network attached devices. Therefore you will NOT be able to detect the PLC under the menu **Auto Online → EtherNet/IP Node Online.** 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.



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 Double click the CPU icon in the screen "NewPLC[CJ1M] Offline". Choose the Network Type "Ethernet(FINS/TCP)", and select Settings → Driver:

📟 Omrin-Using-UDP - CX-Programmer	- [NewPLC1.NewProgram1 [Symbols]]	Jax
File Edit View Insert PLC Program	Simulation Tools Window Help	- 8 ×
0 🛩 🖬 🖓 🎒 🖓 🕺 🖿 🖻	■ ユ ヱ ぬ ╦ ℁ \$? № ▲ 赤 巻 ᅑ Ⅱ 匝 과 丞 초	* &
■●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●	: 쮙@ ◎+ト+ト+リートーーーーーーーーーーーーーーーー ◎ ◎ ◎ 幽 13	
🗖 🗖 🐺 🛱 🖓 😭 🕺 🗒 🖉		
1)	Change PLC Value Rack Location Us	age Comm
NewProject The second	Device Name [NewPLC1	
IO Table and Unit Setup Settings Memory	Device Type CJ1M Settings	
ReverPrograms Section1 EVD END END	Network Type Ethernet(FINS/TCP) Settings Ethernet(FINS/TCP) Ethernet/INS/TCP) Ethernet/INS/TCP Ethernet/INS/TCP Ethernet/INS/TCP Ethernet/INS/TCP	
	NV-Thru (USB Port) NV-Thru (USB Port) NV-Thru (USB Port) OK Cancel Help	
N Project /		>
For Help, press F1	NewPLC1(Net:0,Node:0) - Offline rung 0 (0, 0) - 1	00%
Start	DA 1 🖄 👽 🧐 🎃 🗄	17:48

5. Specify the IP address of the PLC and Select OK

📟 Omrin-Using-UDP - CX-Progra	ammer - [NewPLC1.NewProgram1.Section1 [Diagram]]	X
🗗 File Edit View Insert PLC Pro	ogram Simulation Tools Window Help 🗧 🗄	×
	≞ Ē Ē ⊇ ⊆ # ≂ ╦ ⊈ ? ¥?] ≜ ≵ % ⊑ B R ≋ # .	Ø
< ≪ < < 8	■ 〒	
R 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	[[] [] 10 10 16 16 2 55 [] 명령 타 수 속 > [] [] 이 번 번 가 거 [] 대 Change PLC	
E Se NewProject	Device Name	-
NewPLC1[CJ1M] Offline	Network Settings [Ethernet(FINS/TCP)]	
IO Table and Unit Setup	Network Driver	
Memory	Workstation Node Number	
Programs		-
NewProgram1 (00)		
G Section1	IP Address Port Number	
- 🛱 END	172 . 24 . 2 . 122 9600	
Function Blocks		
	OK Cancel Help	-
		ſ
Project	Address or Value: Comment:	
For Help, press F1	NewPLC1(Net:0,Node:0) - Offline rung 0 (0, 0) - 100%	
🛃 start 🛛 📟 Omrin-Using-I	JDP - C DA 🛗 🖲 🧐 🎰 🖽 17:	



6. Click Yes to connect to the PLC via LinkManager:



7. In the top menu, select PLC \rightarrow Work Online:





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8. You are now online with the PLC. You can now observe data traffic in the LinkManager:

UinkMa	nager Con	sole - PH Field Engine	eer - PC3					6		🖶 👻 🔂 Pag	je
Link	Mai ea	nager								ch	
		ROOT	Disconnect	Logout enmark.C	Custome	Sniffer erF.Produ	uction Pla	ant 2			
			Omron PLC* (Site	Manager) - 172.	24.2.122					
				Charles	Con	nects	Pac	kets	By	tes	
		Agent	Address	Status	ok	fail	tx	FX	tx	rx	
	⊕* (Omron PLC*	172.24.2.122:80,9600	UP:1	1	0	62	62	1,942	3,586	
			:9600 (udp)	IDLE	0	0	0	0	0	0	



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2. UDP Ethernet Access

The following describes how to connect the Omron CX-Programmer to an Omron PLC that is attached to a SiteManager via Ethernet.

Note: A network attached PLC must be configured with agent device type **Omron/Ethernet PLC** on the SiteManager.

1. Locate the agent that represents you network attached Omron 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):

Link	KMC nea	nn	ager								1	
			ROOT	Disconnect demo.Toplevel.EMEA.D	Logout enmark.Cu	stome	Sniffer rF.Produc	tion Pla	ant 2			
				Omron PLC* (Site	eManager)	172.	24.2.122					
			Anost	Address	Chature	Connects		Packets		Bytes		
			Agent	Address	Status	ok	fail	tx	rx.	tx	rx .	
	€3*	•	Omron PLC*	172.24.2.122:80,9600	IDLE	0	0	0	0	0	0	
				:9600 (udp)	IDLE	0	0	0	0	0	0	

3. Start the CX-Programmer and open your project.

NOTE: The LinkManager does not allow CX-Programmer to scan for network attached devices. Therefore you will NOT be able to detect the PLC under the menu **Auto Online → EtherNet/IP Node Online.** 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.



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 Double click the CPU icon in the screen "NewPLC[CJ1M] Offline". Choose the Network Type "Ethernet(FINS/TCP)", and select Settings → Driver:

📟 Omrin-Using-UDP - CX-Programmer - [NewPLC1.NewProgram1.Section1 [Diagram]]
단 File Edit View Insert PLC Program Sim	ulation Tools Window Help
0 🛩 🖬 🔥 🎒 🖓 🖓 👘 👘 👘	8 2 2 # ≔ % ⊈ ? №] & ≵ %
₄ ≅	離[図] ↓ ↓ ↓ ↓ ↓ − ○ ∅ 日日元 – ↓
n n n n n n n n n n n n n n n n n n n	ਗ਼ <u>੶੶੶੶੶੶੶੶੶੶੶੶੶੶੶੶੶</u> ▶ਗ਼ਗ਼ਖ਼੶੶੶੶੶੶੶੶
	hange PLC
NewProject WewPLC1[CJ1M] Offline Symbols	Device Name
IO Table and Unit Setup	Cult Settings
Frograms Forgrams Forgrams Forgrams Forgram1 (00) Forgram1	Network Type Ethernet Ethernet[NIS/TCP] Ethernet[NIS/TCP] Ethernet/INS/TCP] DK Cancel Help
Project /	Image: Address or Value: Comment:
For Help, press F1	NewPLC1(Net:0,Node:0) - Offline rung 0 (0, 0) - 100%
🛃 start 🛛 🛄 Omrin-Using-UDP - C	DA 1 🖄 👽 🤣 📾 17:09

- 5. Specify the IP address of the PLC and Select OK.
- 6. Click Yes to connect to the PLC via LinkManager:

📟 Omrin-Using-UDP - CX-Progra	ammer - [NewPLC1.NewProgram1.Section1 [Diagram]]	🔳 🗗 🗾
💬 File Edit View Insert PLC Pro	ogram Simulation Tools Window Help	_ 8 ×
	ங வ வ ⊇ ⊇ # ≈ % % ? №	
4 火 Q へ 9 開 翌	■帰■■□□●キャキキ	
E A R R P 2 66 3		▮►₩₩₩>>∭■■
NewProject	Device Name	▲
NewPLC1[CJ1M] Offline	Network Settings [Ethernet(FINS/TCP)]	
IO Table and Unit Setup	Network Driver	5
Memory	Workstation Node Number	
Programs Programs Programs Symbols Section1 By END Function Blocks	IP Address Port Number 172 . 24 . 2 . 122 9600	· · · · ·
	OK Cancel Help	,=
Project	Address or Valu	ue: Comment:
For Help, press F1	NewPLC1(Net:0,Node:0) - Offline	rung 0 (0, 0) - 100%
🛃 start 🛛 🛄 Omrin-Using-U	JDP - C	DA 1 📸 🜒 🧶 🖗 17:44



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7. In the top menu, select PLC \rightarrow Work Online:



8. You are now online with the PLC. You can now observe data traffic in the LinkManager:

UinkM	lanager C	onsole	e - PH Field Engine	eer - PC3						•	🖶 🔹 🔂 Page
Link	< <u>M</u> (nea	חב	ager								d
			ROOT	Disconnect	Logout)enmark.(Custom	Sniffer erF.Prod	uction P	ant 2		
				Omron PLC* (Sit	eManage	r) - 172	.24.2.12	2			
			Agent	Address	Statue	Con	nects	Pac	kets	Ву	rtes
			Agent	Address	Status	ok	fail	tx	rx	tx	PX .
	'⊕*	•	Omron PLC*	172.24.2.122:80,9600	IDLE	1	0	247	246	7,876	11,950
				:9600 (udp)	UP:1	0	0	167	167	2,656	5,692

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3. Serial Access via Serial Omron cable

The following describes how to connect the Omron CX Programmer to an Omron PLC that is attached to a SiteManager via an Omron XM2S-09 Serial cable or Omron CS1W-CN226 cable (for the peripheral port).

Note: A Serial attached PLC (Such as the CJ1M) must be configured with agent device type Omron/Serial PLC on the SiteManager.

1. Locate the agent that represents you network attached Omron 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, and Omron PLC is correctly attached, you should also see the status of the agent become OK, and a few bytes of traffic:

LinkMu secomea	anage	r							d
		Disconnect ROOT.demo.Toplevel.	Logout Americas	Brazil.(niffer Customer	A			
		Omron PLC	(SM2034-1	TheWal)				
	174021004		C1 1	Con	nects	Pac	kets	By	tes
	Agent	Address	Status	ok	fail	tx	rx	tx	FX
Cr.	Omron PLC	172.24.2.11:23> 127.0.0.1	UP:1	1	0	3	3	63	73



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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 COM5):



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.

IMPORTANT: if you change the port you must stop and start the LinkManager.

Options	_
COM port	Net Type C Bridged C NAT
ОК	Cancel

Note: 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.

4. Open the CX-Programmer and select Auto Online \rightarrow Direct Online:





5. Select the COM port matching the COM port defined in the LinkManager:

Direct Online	
Goes online automatically. Select connection type and press [Connect] button.	
Connection Type Serial connection (also when using USB-Serial conversion cable) Serial port of PC	
COM2	Serial
Connection will automatically be made to the PLC connec the PC via serial cable. It is not possible to automatically connect to a CompoWay	ted directly to
Connect Cancel	

6. Click Connect, and it will start searching for the proper communication type:

Auto Online(Searching) 🛛 🔀				
PLC:	CS/CJ/CP Series			
Communication Settings:	COM1,9600,Even,7,2			
Protocol:	SYSMAC WAY			
	Cancel			

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7. You are now online with the PLC:



8. You can now observe data traffic in the LinkManager:

LinkM(secomea	anage	r							ch
		Disconnect ROOT.demo.Toplevel.	Logout Americas	.Brazil.	niffer Custome] r A			
		Omron PLC	(5M2034-	TheWa	II)				
			Ch-1	Con	nects	Pac	kets	Ву	rtes
	Agent	Address	Status	ok	fail	tx	FX	tx	FX
Cr.	Omron PLC	172.24.2.11:23> 127.0.0.1	UP:1	1	0	328	410	9,368	17,927

NOTE: In case you encounter connection or communication problems, refer to **Appendix B**, **Serial Troubleshooting and Hints**.



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4. Serial to USB conversion (Discontinued!)

Serial to USB conversion was introduced in SiteManager firmware version 11234, but has been replaced with true USB redirect support in version 12035. (See next section **5 USB Connection**)

The reason for removing the possibility of having a serial connection from CX-Programmer converted into USB on the SiteManager is that only a few Omron PLCs would support it properly.

IMPORTANT: If you already have and agent configured with agent device type **Omron/Serial USB PLC** and you upgrade to version 12035 or later, this agent will automatically be set to agent type **Omron/USB PLC**, and subsequently you must select USB in CX-Programmer as target port. Note that true USB redirect requires the LinkManager to be upgraded to version 12081 or newer.



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5. USB Connection (CP1H)

In SiteManager firmware version 12035 in combination with LinkManager 12081, true USB support is introduced. The new LinkManager version will, when connecting to the agent, create a USB controller on the PC that will perform redirection to the USB port on the SiteManager.

This means CX-Programmer should be configured to use a USB connected device.

The following steps have been performed with CX-One 4.03 including CX-Programmer 9.0 and USB drivers already installed on the PC, and a CP1H PLC. (NB: You can also connect to an Omron G9SP Safety PLC using the G9SP configuration. Refer to the separate guide for this)

1. Locate the Omron USB PLC agent and click on it to establish a connection to it:

GM Login	Sniffer Refresh	
ROOT.PH		
•*	SiteManager3239 <connect all=""></connect>	€ h

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2. First time the connection is opened, the "Found New Hardware" Wizard will pop up. Select to not search 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 <u>every time I connect a device</u> No, not this time			
Click Next to continue.				
	< <u>B</u> ack <u>N</u> ext > Cancel			

3. Select Installs from a specific location.

Found New Hardware Wizard				
This w US What OCICK N	izard helps you install software for: B Device Over IP If your hardware came with an installation CD or floppy disk, insert it now. do you want the wizard to do? Install the software automatically (Recommended) Install from a list or specific location (Advanced) lext to continue.			
	< <u>B</u> ack <u>N</u> ext > Cancel			

NOTE: In later LinkManager firmware the text "USB Device Over IP" may change to reflect the name of device USB driver.



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4. Even though the driver is already installed into the Windows driver store, Windows may not automatically choose to bind it (because it is not WHQL signed). So select don't search as in most cases In most cases it is necessary to select the driver manually

Found New Hardware Wizard				
Please choose your search and installation options.				
○ <u>S</u> earch for the best driver in these locations.				
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.				
Search removable media (floppy, CD-ROM)				
Include this location in the search:				
D:\ Browse				
Don't search. I will choose the driver to install.				
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.				
< <u>B</u> ack <u>N</u> ext > Cancel				

5. Omron has (incorrectly) classified the PLC USB driver as a USB controller, so you will find the driver in the section "Universal Serial Bus controllers":

Found New Hardware Wizard	
Hardware Type.	
Select a hardware type, and then click Next. Common <u>h</u> ardware types:	
 Smart card readers Sound, video and game controllers Storage volume shadow copies Storage volumes System devices Tape drives Universal Serial Bus controllers Windows CE USB Devices 	
< Back Next >	Cancel



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6. Select the SYSMAC device driver

Found New Hardware Wizard				
Select the device driver you want to ins	tall for this hardware.			
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.				
Model OMRON SYSMAC PLC Device				
This driver is not digitally signed! <u>Tell me why driver signing is important</u>	<u>H</u> ave Disk			
	< <u>B</u> ack <u>N</u> ext > Cancel			

7. Windows may warn that the driver may be incompatible with the hardware. Select "Yes" to continue installing anyhow:

Update Driver Warning				
	Installing this device driver is not recommended because Windows cannot verify that it is compatible with your hardware. If the driver is not compatible, your hardware will not work correctly and your computer might become unstable or stop working completely. Do you want to continue installing this driver?			
	Yes No			

8. You will get a warning that the driver is not WHQL signed. Select "Continue Anyway".





9. The driver should now be installed.



10. Optionally, you can verify that the driver started correctly. Open the Device Manager and look under USB controllers for the OMRON SYSMAC PLC Device:





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11. Check that Device status says "This device is working properly".

OMRON S	OMRON SYSMAC PLC Device Properties 🛛 🛛 🔀					
General	General Driver Details					
÷	COMRON SYSMAC PLC Device					
	Device type:	Universal Serial Bus controllers				
	Manufacturer: OMRON					
	Location:	Location 1 (on USB/IP Enumerator)				
Device	e status					
This	device is working pr	operly.				
lf you start t	If you are having problems with this device, click Troubleshoot to start the troubleshooter.					
	Iroubleshoot					
Device usage:						
Use thi	Use this device (enable)					
		ОК С	ancel			

12. In CX-Programmer select **PLC > Auto Online > Direct Online**. Select "USB connection" and select Connect:

Direct Online				
Goes online automatically. Select connection type and press [Connect] button.				
Connection Type C Serial connection (also when using USB-Serial conversion cable)				
Connects at baud rate 115,200 bps	USB			
Connection will automatically be made to the PLC connected directly to the PC via USB cable. Please select ""Serial connection"" when using USB-Serial conversion cable.				
Connect				



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13. Select what you prefer for the next dialog:



14. The program will now search for known PLC types and start the transfer

Auto Online(Se	earching) 🛛 🔀	
PLC:	CJ2/CP/NSJ Series	CX-Programmer v9.0 🔀
Communication Settings:	USB	
Protocol:	USB	Upload successful
	(Cancel)	(OK)

IMPORTANT: If LinkManager status is DOWN:

LinkManager sectmea									
Disconnect Logout Services Sniffer									
			ROOT.PH						
		Omron US	5B (SiteManage	r3239)					
	Agent	Address	Status	Status Connects ok fai		Packets tx rx		Byt tx	rx
	Omron USB	1 172.24.2.57:3240> 127.0.	.0.1 DOWN						

In the current LinkManager version, the connection is not automatically restored in case the PLC restarts, or if the cable is un-plugged/re-plugged.

It is necessary to Disconnect and re-establish the connection (first step of this section).



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6. Ethernet connection via Windows XP under VMWare

You can run the CX-Programmer software inside a VMWare engine, to an Omron 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 CX-Programmer installed, and enter **Edit** virtual machine settings.

😵 VMware Player File + VM + Help +	_ ×
VMware Player File • VM • Help •	Windows XP Professional 2 State: Powered Off DS: Windows XP Professional Version: Workstation 5.x virtual machine RAM: 1024 MB Play virtual machine Minimia Content of the settings
	65 Edit virtual machine settings

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2. Make sure the Network Adapter settings is set to NAT:

 Memory Processors Hard Disk (IDE) 	1024 MB	Connected
CD/DVD (IDE)	8 GB (Preallocated) Auto detect Using drive A:	Connect at power on Network connection O Bridged: Connected directly to the physical network
Serial Port	Using port COM6	Replicate physical network connection state 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 2 TCP Ethernet Access or section 3 UDP Ethernet Access to get access to the PLC via LinkManager



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7. Serial connection via Windows XP under VMWare

You can run the CX-Programmer software inside a VMWare engine, to an Omron PLC that is Serial 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)

- Follow step 1-3 of section 3 Serial Access via Serial Omron cable on page 11. This will create a COM port even if the PC does not have a physical COM port.
- 2. Locate your Windows XP that has CX-Programmer 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	Summ Add Hardware Wizard	
Memory Processors Hard Disk (IDE) CD/DVD (IDE)	1024 1 Hardware Type 8 GB What type of hardw Auto	are do you want to install?
Hoppy	Using NAT Prese Hard Disk © CD/DVD Drive Hoppy Drive Hoppy Drive Network Adapter © USB Controller © Sound Card Parallel Port © Generic SCSI Device	Explanation Add a serial port.
	Add Remove	< 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
⊙ Use physical serial port on the host
Output to file
Output to named pipe
< Back Next > Cancel



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5. Set the port to the COM port used by the LinkManager (see section **3. Serial Access via Serial Omron cable**)

irtual Machine Settings 🗾 🗾				
Hardware Options				
Device Memory Processors Hard Disk (IDE) OUVD (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 Connected Connect at power on Connection Coms Coms Coms Coms Coms Coms Coms Com		

- 6. If VMWare does not allow you to add a Serial port, it may be because the PC does not have a physical Serial port.
- 7. Press **OK** twice, and select the Select **Finish** and **OK**, Start the VMWare WindowsXP image, and start the CX-Programmer software.
- 8. Follow the procedure described in section **3 Serial Access** 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 the CX-Programmer to use the port of VMWare (COM1) and not the physical port of the host system (COM3) that is used by LinkManager.

7.1. Startup order of VMWare, LinkManager and CX-Programmer

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 do 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)
- 5. Check the COM port settings of the Virtual Machine Settings of the Windows image with the CX-Programmer software.
- 6. Start the VMWare image.
- 7. Start CX-Programmer and connect to the PLC



8. USB connection via Windows XP under VMWare

You can run the CX-Programmer software inside a VMWare engine, to an Omron PLC that is USB attached to a SiteManager.

Important: LinkManager must run inside the virtual machine also and must be version 12155 or later. 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)

5. Locate your Windows XP that has CX-Programmer installed, and enter **Edit** virtual machine settings.

With the second	- ×
Home	
	Windows XP Professional 2
	State: Powered Off OS: Windows XP Professional Version: Workstation 5.x virtual machine RAM: 1024 MB Play virtual machine Image: State of the settings
	🗐 vm ware



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

Virtual Machine Setting:	s	
Hardware Options		
Device Memory Processors Hard Disk (IDE) CD/DVD (IDE) Foloppy Sound Card Serial Port	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 Share Bluetooth devices with the virtual machine Share Bluetooth devices with the virtual machine
	Add Kellove	
		OK Cancel Help

- 7. Start the VMWare engine and the LinkManager inside the VMWare engine.
- 8. Follow the procedure of section **5 USB Connection (CP1H)** on page **16** 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:

You may experience that older versions of the Omron software require a lower COM port number. 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:

If you prefer 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 ○ Bridged ⓒ NAT
ОК	Cancel

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



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Appendix B, Serial Troubleshooting and Hints

Typical serial communication problems

If you experience problems with communication loss during transfer etc., it may be due to the CX Programmer trying to negotiate a high speed without flow control. This can be problematic, especially with slow lines (2G connection).

Try changing the parameters of the PLC and CX programmer to use a lower baud rate and use of flow control, e.g. 9600 8N1.

Also you may try to change the timeout to e.g. 10 seconds and decrease the package size to e.g. 260 bytes.

Please refer to your Omron documentation for details on changing these settings in your Omron hardware and software.

Special Serial Agent settings

If you experience problems connecting to your Serial Omron PLC, it could be due to your Omron PLC being configured with some special settings.

You could therefore try to alter the serial settings under **Parameter Details** for the agent in the SiteManager.

#55 OmronSerial Omron 🔍 Serial PLC 🔍

There are two settings that may be relevant.

Serial "OmronSerial" - Omron Serial PLC Agent
Note that the same Omron XM2S-09 serial cable for connecting a PC to a Omron PLC must be used for connecting the SiteManager to the PLC.
Refer to the Quick Guides on <u>www.secomea.com</u> for more info on setting up CX-Programme to connect via LinkManager.
Address on LinkManager:
Baud Rate:
Data,Parity,Stop:
Use CPM compatibility mode:
Save Back Serial >> Monitor >>

The **CPM compatibility mode** setting, forces serial settings to 9600/7e2. This may solve problems connecting to CPM1 or CJ2M Serial PLCs (and maybe others)

The **Use hardware flow-control** option may in some cases solve a problem with CX programmer reporting a communication error when shifting between going Offline and Online. Forcing hardware flow-control may have a positive effect on this. Note that if this does not solve your problem, it is recommended to disable it.



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Serial communication through the "peripheral port"

If you are experiencing trouble with the auto-search function, it might be due to speed-setting-negotiations between the SiteManager and the PLC's peripheral port (using the Omron CS1W-CN226 cable).

To avoid this, you need to manually tell the project which protocol to use, before connecting to the PLC.

1. Create a new project (or open an existing one), and right-click on the projects name, and select change:



2. Select Toolbus in network type, and click Settings





3. Click on the tab Driver, and make sure "Baud Rate Auto-Detect" is turned off. Select the proper speed to communicate via serial (usually 19200) and click OK and OK.



After this, you should be able to connect to the PLC.



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