# Application Note Omron MX2 Inverter and CX-Drive

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 Drive 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 inverter.
  - A network attached inverter must be configured with agent device type **Omron / Ethernet inverter** on the SiteManager.
  - A USB attached Inverter (such as the MX2 inverter) must be configured with agent device type **Omron / USB Inverter** on the SiteManager. Note that this connection type requires a SiteManager model with USB support and minimum SiteManager version 12035 and LinkManager version 12081.

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-Drive**  $\rightarrow$  LinkManager  $\rightarrow$  GateManager  $\rightarrow$  SiteManager  $\rightarrow$  PLC.

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

The following system overview depicts a SiteManager 1029 at the customer location:





#### 1. Ethernet connection

To establish an Ethernet connection to the inverter through the LinkManager, you need to have a PLC working as a Gateway for the inverter. This setup is not covered in the guide. For details on how to do this, please consult your local Omron support.

1. You need to establish an Ethernet connection to the Omron PLC, before you can connect to the MX inverter. So first click on the agent which represents your Ethernet connected Omron PLC



2. Go to CX-Drive, select File → New





3. Select the correct Drive Type, and click Settings. Set up the values to match your setup. In our scenario, we used the following setup:

Drive Type Settings [3G3MX2]				
General				
3G3MX2-A2/B004-PRG4	3234309			
+3G3AX-MX2-EI	P			
Drive Type				
Installation type/Option:	A 🔻			
Voltage Class:	2/B (200 V) 🔹			
Maximum Motor Capacity:	004 🔹			
Specifications:	<b></b>			
Special Specifications	<b></b>			
Software Number:				
43234309: 💌				
Show Special Softwares				
Option Board Type				
Option Boards:				
3G3AX-MX2-EIP	•			
Software Number				
0: EIP EtherNet/IP MX2 🔹				
Make default				
ОК	Cancel Help			

4. Click OK, and then select Connection Type  $\rightarrow$  Via PLC (EtherNet/IP). Click Settings

New Drive		×
Drive Name		
Drive2		
Drive Type		
Inverter 🔹	3G3MX2 🔻	Settings
3G3MX2	-A2/B004-PRG43234309	
4	-3G3AX-MX2-EIP	
Connection Type		
Via PLC (EtherNet/IP)	•	Settings
Direct (USB) , Direct Via MC (EtherCAT) Via MC (MECHATROLINK-II) Via PLC (CompoNet)		•
Via PLC (DeviceNet) Via PLC (EtherNet/IP) Via PLC (MC[]72/MECHATROLI Via PLC (NC[]81/EtherCAT) Via PLC (PROFIBUS) Via PLC (SCU/SCB)	NK-II)	telp



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5. Type the address of the MX Inverter and the Unit number of the PLC. Then, select the tab Gateway PLC

Network Settings [Via PLC (EtherNet/IP)]					
Network Gateway PLC					
Slave Unit Address	10 . 58 . 19 . 110				
Master Unit Address	0				
Маке	e derauic				
ОК	Cancel Help				

6. Select Properties

Network Settings [Via PLC (EtherNet/IP)]	<b>—</b>
Network Gateway PLC	
Default	Properties
	Add Remove
Make default	
ОК С	ancel Help

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7. Choose the PLC type, and click Settings and choose the right CPU (in this scenario, we used a CJ2M-CPU33

Device	e Type Settings [CJ2M]		×
Gene	eral		
	СРИ Туре		
	CPU33 🔻		
	Total Program Area Size		
	20K [Step]	🔲 Read Only	
	Expansion Memory		
	32KW [1 Banks] 🔹	Read Only	
	File Memory		n II
	None	Read Only	
	Timer / Clock		
	V Installed		
	Make Defa	ult	
	OK	Cancel He	elp

8. Click OK, and set the Network Type to EtherNet/IP. Then, click Settings and type in the IP address of the PLC. Click OK four times, and the Drive is created in CX-Drive.

Network Settings [EtherNet/IP]	×
Network	
Target PLC	
IP Address: 10 . 58 . 19 . 50	
Response Timeout (s)	

9. You are now able to go Online with the MX Inverter through the PLC.



#### 2. USB Connection

To establish a USB connection to the inverter through the LinkManager, you will need to upgrade your LinkManager and SiteManager to the latest firmware (v13063 or later for LinkManager and v13025 or later for SiteManager).

The following steps have been performed with CX-Drive 2.7.4.2 and USB drivers already installed on the PC.

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

iffer Refresh
✓ SiteManager <cronect all="">  └──────────────────── MX2 usb (SiteManager)</cronect>
Show all Expand all Refresh

2. Next, go to CX-Drive, and select Drive → Autodetect Options

💡 CX-Drive				
<u>F</u> ile <u>V</u> iew <u>D</u> riv	ve <u>T</u> ools <u>H</u> elj	р	1	
🗅 🎭 🛛 💑	Auto <u>d</u> etect	Ctrl+D		i 🗟 🗟 i M i 🤣 🐼
Ø Ø 🛪 🚬	Autodetect <u>O</u> p	otions		
		××		



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3. Select the correct type on inverter and connection (in this scenario, we used the 3G3MX2 Inverter), and click Advanced Options.

Options		<b>—</b> ×
General Drive Parameter Onli	ne Autodetect Monitoring Drive Progra	amming
Drive Type Selection: Inverter Servo Series Type Selection: 3G3EV 3G3FV (G5) 3G3HV (P5) 3G3LX 3G3MV (V7) 3G3MX2 3G3MX2 3G3MX2 3G3RX A (A1000) CIMR-E7	Connection Type Selection:	Advanced Options: Direct (3G3MX2/USB)
		чрріу Неір

4. Adjust the Communications Timeout. For the test, we used a connection with an added delay of ~450ms. It took around 2 minutes and 30 seconds to upload a standard program, and around 4 minutes to download it. 5000 seconds worked for us, but you may want to set it higher, if you have a slower connection.

Advanced Options [Direct (3G3MX2/	'USB)]	<b>×</b>
Port Selection:	Speed Selection:	Unit Selection:
V HUSBO	Auto Optimise	<ul> <li>RS-232</li> <li>RS-422/485</li> </ul>
		V 01
		02
Select All	Select All	03
		04
		05
Communications Timeout	<u>auu</u>	06
		07
Data Dits;		08
Parity:		09
Chan hiter		10
Stop bits:		11 -
Set Defaults		Select All
	OK Cancel	



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5. Click OK twice, and select Drive  $\rightarrow$  Autodetect



6. The CX-Drive software will now look for the inverter. Wait until it is finished, and you are now online with the inverter.

🌺 AutoDetec	tion:				
		Prope	Connecti	Description	Settings
6% /	Autodete		Direct (CO		Start
					Exit
,		ļ	50 %		Help



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#### 3. USB to serial cable

To establish a USB connection to the inverter through the USB to serial cable via the LinkManager, you will need to upgrade your LinkManager and SiteManager to the latest firmware (v13063 or later for LinkManager and v13025 or later for SiteManager).

The following steps have been performed with CX-Drive 2.7.4.2 and Profilic USB to serial drivers already installed on the PC.

NOTE: This type of connection was very slow during our test. The main reason for this is the baud rate. Combined with a high delay, it took nearly xx minutes for download and about 19 minutes to upload. We also experienced that if you have a very slow internet connection (or a high delay), then the transfer got interrupted, regardsless of the timeout settings.

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

iffer Refresh
✓ □ SiteMacager *Connect all>  □ □ ③ * MX2 usb (SiteManager)
Show all Expand all Refresh

2. Next, go to CX-Drive, and select Drive → Autodetect Options

💡 CX-Drive	
<u>F</u> ile <u>V</u> iew <u>D</u> rive <u>T</u> ools <u>H</u> elp	
🗅 🍇 🛛 🎝 Auto <u>d</u> etect Ctrl+D	
Autodetect Options	



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3. Select the correct type on inverter and connection (in this scenario, we used the 3G3MX2 Inverter), and click Advanced Options.

Options		<b>×</b>
General Drive Parameter	Online Autodetect Monitoring Drive Progr	amming
Connect automatically at fi Drive Type Selection: Inverter Servo Series Type Selection: 3G3EV	rst detection Connection Type Selection: Direct (3G3MX2/USB) Direct (X-Series) Via MC (EtherCAT) Via MC (MECHATROLINK-II) Via PLC (CompoNet)	
3G3FV (G5) 3G3HV (P5) 3G3LX 3G3MV (V7) 3G3MX2 3G3RX A (A1000) CIMR-E7	Via PLC (DeviceNet)         Via PLC (MC[]72/MECHATROLIN         Via PLC (MC[]81/EtherCAT)         Via PLC (PROFIBUS)         Via PLC (SCU/SCB)	
	OK Cancel	Apply Help

4. Adjust the Communications Timeout, and select the correct COM port. For the test, we used a connection with an added delay of ~30ms. It took around 19 minutes to upload a standard program, and around 25 minutes to download it.

Advanced Options [Direct (X-Serie	25)]	<b>—</b>
Port Selection: COM1 COM2 COM8	Speed Selection: Auto Optimise  4800 Select All	Unit Selection:
Communications Timeout Data bits: Parity: Stop bits: Set Defaults	5000 💌 8 💌 Even 💌 1 💌	Select All
0	OK Cancel	



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5. Click OK twice, and select Drive  $\rightarrow$  Autodetect



6. The CX-Drive software will now look for the inverter. Wait until it is finished, and you are now online with the inverter.

🌺 AutoDete	ction				
		Prope	Connecti	Description	Settings
6%	Autodete		Direct (CO		Start
					Exit
,		Į	5 <mark>0</mark> %		Help



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#### 4. Ethernet connection via Windows XP under VMWare

You can run the Sysmac Studio software inside a VMWare engine, to an Omron PLC that is Ethernet attached to a SiteManager.

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)

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

VMware Player File + VM + Help +	_ ×
Home Windows XP Professional 2	
	Windows XP Professional 2
	State: Powered Off OS: Windows XP Professional Version: Workstation 5.x virtual machine RAM: 1024 MB
	<ul> <li>Play virtual machine</li> <li>Belit virtual machine settings</li> </ul>
	🗐 <b>vm</b> ware:



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

Device	Summary	Device status
<ul> <li>Memory</li> <li>Processors</li> <li>Hard Disk (IDE)</li> <li>CD/DVD (IDE)</li> <li>Floppy</li> </ul>	1024 MB 1 8 GB (Preallocated) Auto detect Using drive A:	Connected Connect at power on Network connection O Bridged: Connected directly to the physical network
Serial Port	Present 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 **1 Ethernet connection** to get access to the PLC via LinkManager.



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#### 5. USB connection via Windows XP under VMWare

You can run the Sysmac Studio 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. 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 Sysmac Studio installed, and enter **Edit** virtual machine settings.

With the second	_ ×
Home Windows XP Professional 2	
	Windows XP Professional 2
	State: Powered Off OS: Windows XP Professional Version: Workstation 5.x virtual machine RAM: 1024 MB
	Play virtual machine
	🗊 <b>vm</b> ware



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

Virtual Machine Settings		
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

- 7. Start the VMWare engine and the LinkManager inside the VMWare engine.
- 8. Follow the procedure of section **2 USB Connection** or section **3 USB to serial cable** to get access to the PLC via LinkManager.



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