Application Note
Mitsubishi Compact PLC and GX IEC Developer

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 Mitsubishi equipment placed on the customer site using your GX IEC Developer programming software.

You may be able to project the descriptions to other MELSoft applications, such as GX Works2 and FX Configurator, but these are not covered by this guide.

This guide may also work with other Mitsubishi PLCs than the FX3U compact series

Prerequisites for this guide are:

- You have an operational LinkManager installed on your PC with a LinkManager certificate that allows you to connect to the SiteManager agents.
- You have the Mitsubishi FX3U compact PLC and the GX IEC Developer software installed.
- You have the Mitsubishi device agent installed and configured on the SiteManager at the remote site, and there is access between the SiteManager and the PLC. (A Serial attached PLC must be configured with agent device type **Serial** or **Ethernet+Serial** on the SiteManager. A network attached PLC must be configured with agent device type **Ethernet** on the SiteManager).

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.

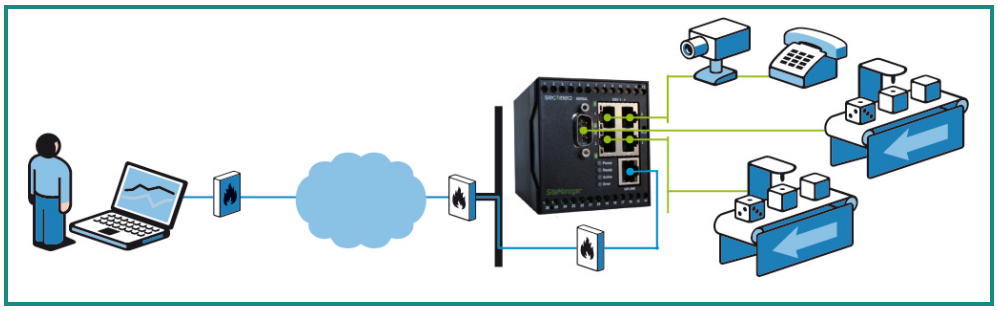
System Overview

The communication path is as follows:

GX IEC Developer → LinkManager → GateManager → SiteManager → PLC.

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

The following system overview depicts a SiteManager 3134 at the customer location.

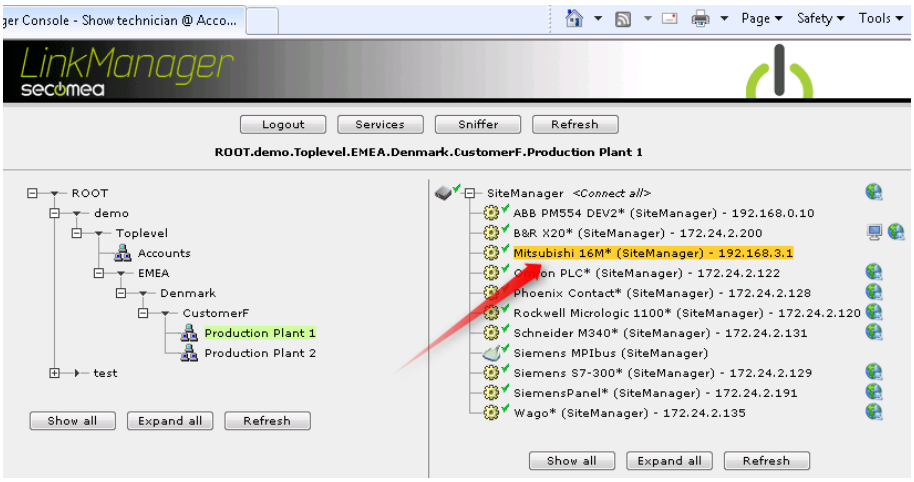


The procedures in the following apply to any SiteManager model.

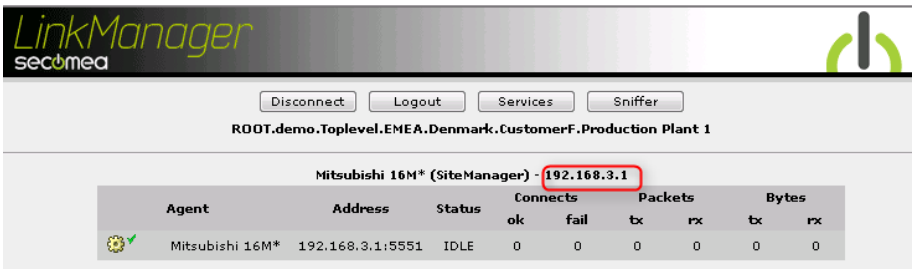
1. Ethernet Connection

The following describes how to connect the GX IEC Developer to a Mitsubishi compact PLC equipped with a FX3U ENET module that is attached to a SiteManager via Ethernet.

1. Locate the agent that represents your TCPI/IP attached PLC. Click the text (that turns orange at mouse over) to connect to the PLC.

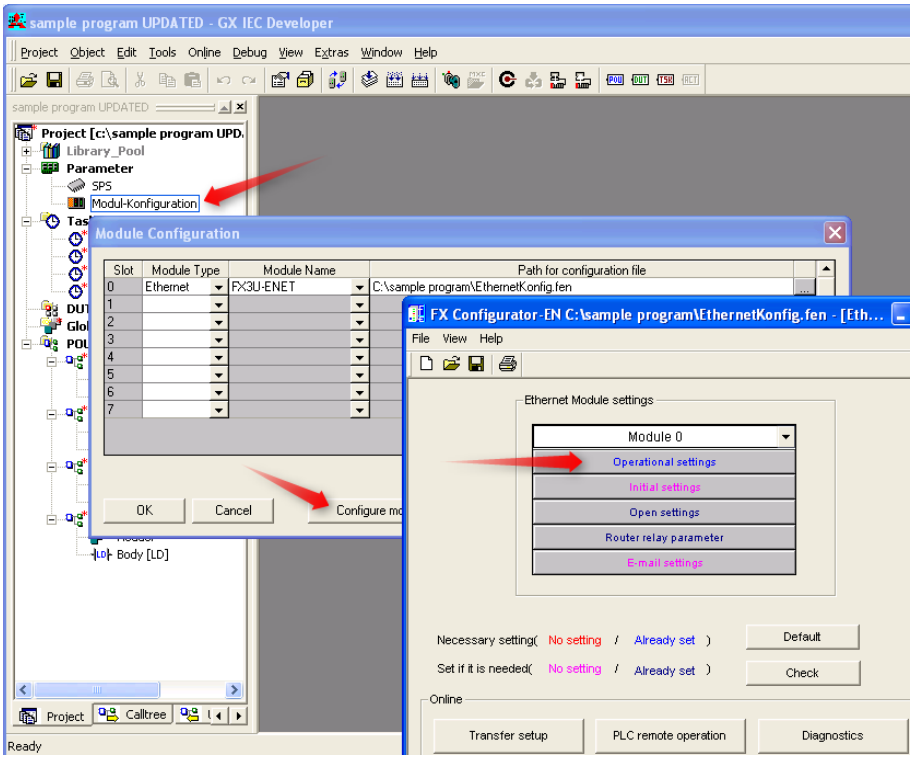


2. You will not see any activity on it yet. This only starts when you connect to the PLC via your project (Make a note of the IP address of the PLC):

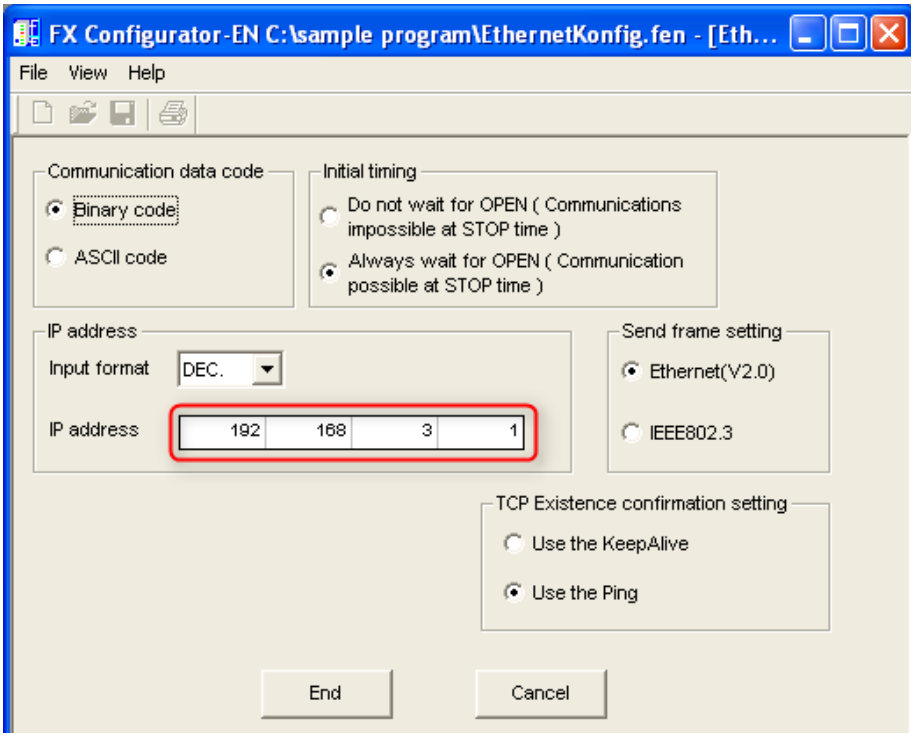


Hint: You are in princple now connected to the PLC, and you could make a ping to the PLC IP address.

3. Open your project. Check in the module configuration the setting of the FX3U ENET module, and select **Configure module**:

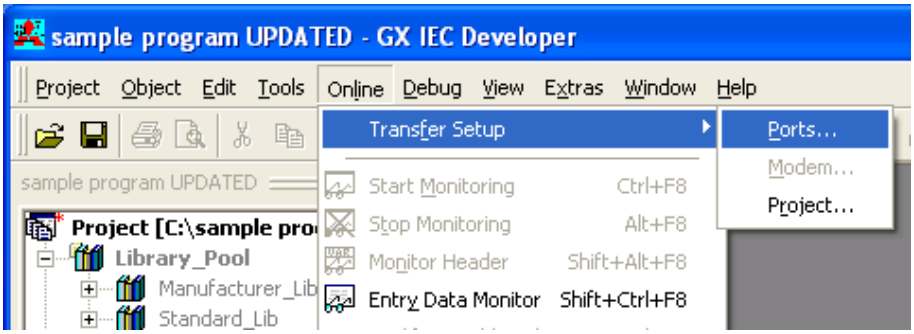


4. Under Operational settings you find the IP address that is configured in the project

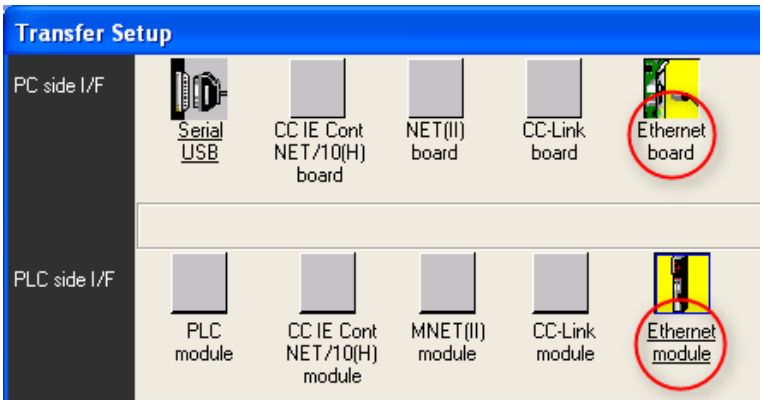


It is always a good idea to check this before loading the project into the PLC and potentially overwrite a configured IP address.

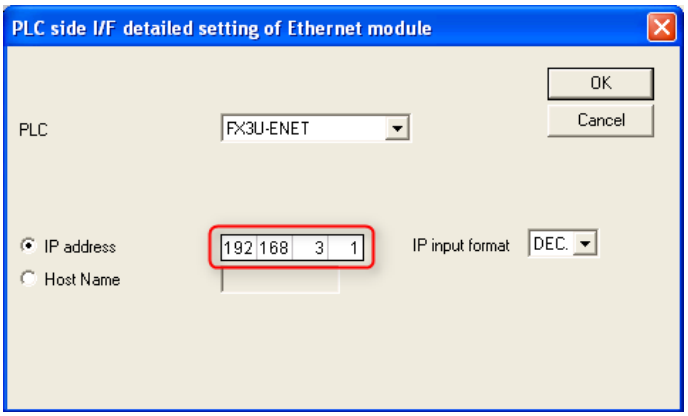
5. Select **Online → Transfer Setup → Ports.**



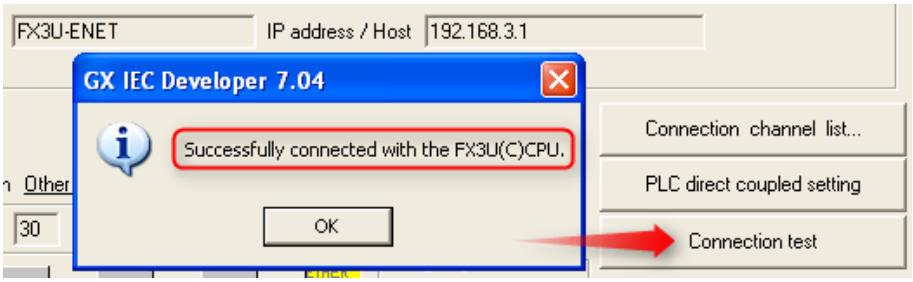
6. Set **PC side I/F** to “Ethernet board” and set **PLC side I/F** to “Ethernet module”:



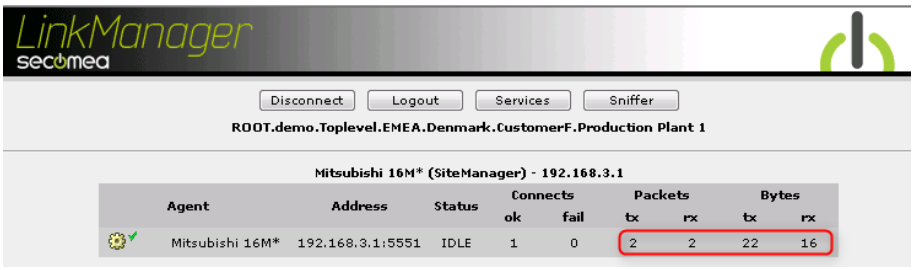
7. Double click “Ethernet module”, and ensure that the IP address corresponds to the one connected to by LinkManager.



8. You should now be able to perform a transmission test. **If successful you are online.**



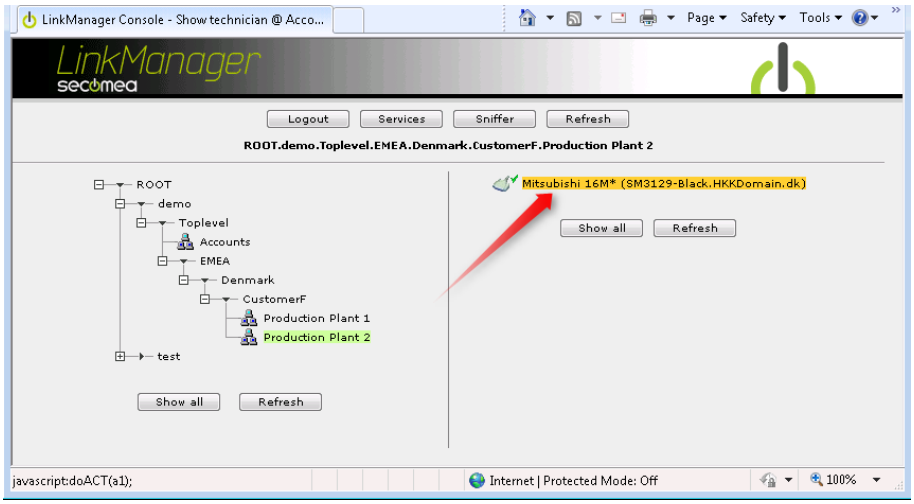
9. You can now also observe data traffic in the LinkManager:



2. Serial Connection

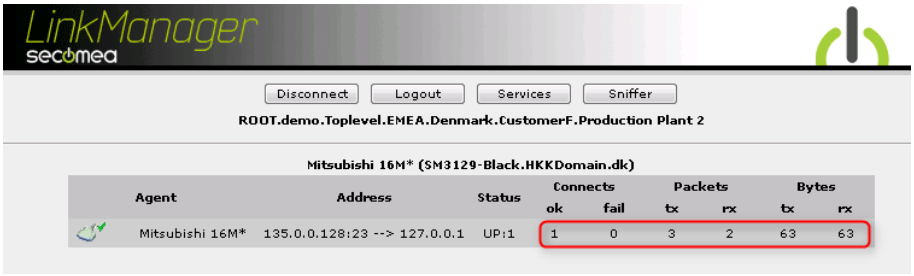
The following describes how to connect GX Developer to a Mitsubishi PLC that is attached to a SiteManager via a SC-09 RS232/RS422 converter cable for Melsec FX and A.

1. Locate the agent that represents you serial attached PLC. Click the text (that turns orange at mouse over) to connect to the PLC.

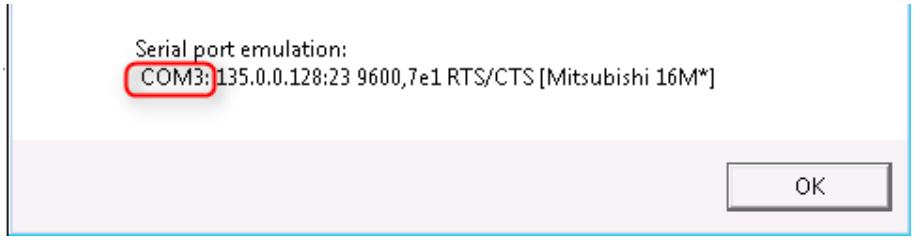


2. When connecting, you should after a few seconds see some activity in the tray icon area, which is the auto-configuring of a virtual COM port driver facilitated by the LinkManager.

   If your SiteManager, and PLC are correctly attached, you should also see the status of the agent become OK, and a few bytes of data traffic:

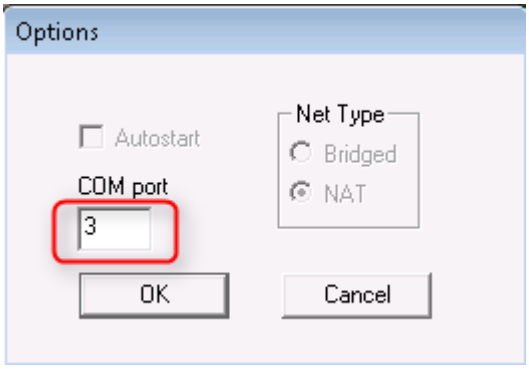


3. Now right click the LinkManager system tray Icon, and select **Status**. Make note of the Serial port that has been assigned (in this case COM3):



   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.

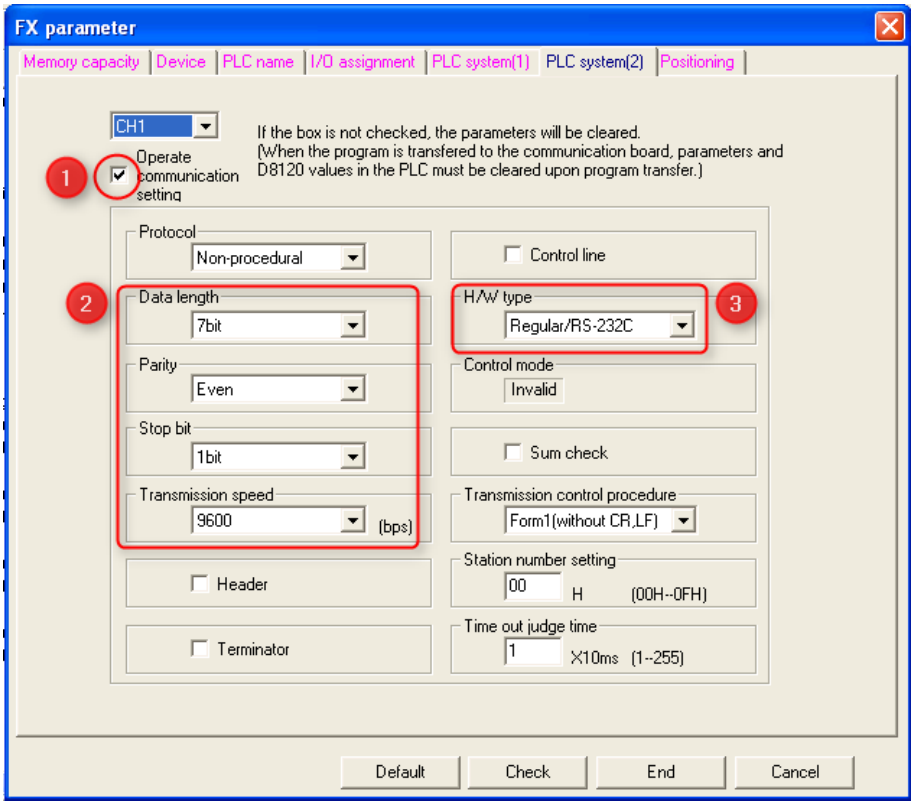
Note that if you set or change the COM port setting you must Stop and Start the LinkManager for the changes to take effect.



Hint: 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.

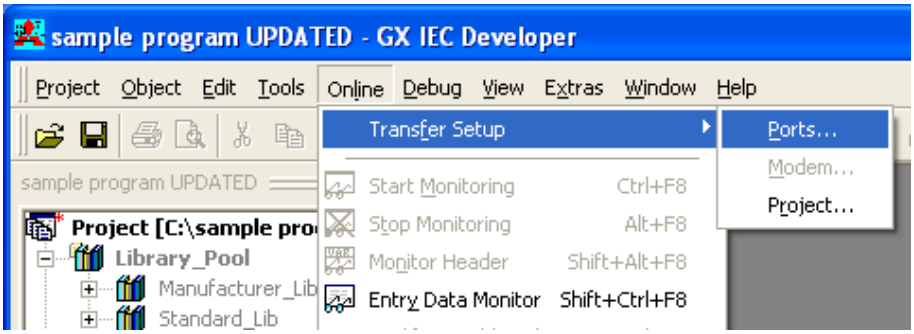
4. Open GX IEC developer and unfold **Parameter** and double click the PLC/SPS icon to enter FX parameters and select **PLC system(2).**

   When first entered, the "Operate communication settings" (1) may not be enabled. Enabling it will fill default serial communication values (7bit, Even, 1bit, 9600). You can leave these, as the LinkManager/SiteManager will auto-detect these settings (based on support of RFC 2217)

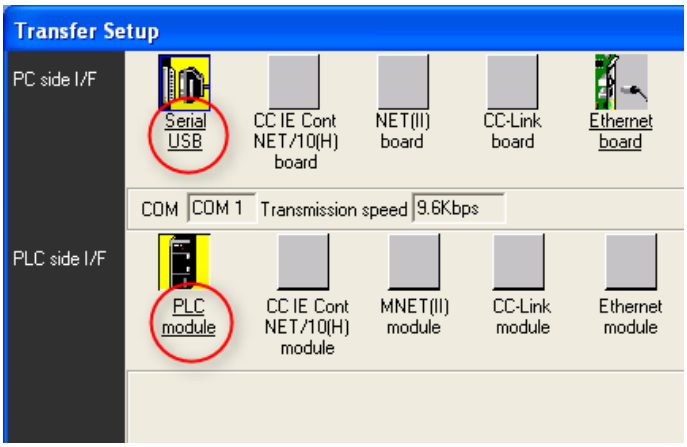


Hint: For more info on these settings visit www.mitsubishi-automation.com and search for the document "Communication Manual" art. no.168594 (Japanese art. no. JY997d16901)

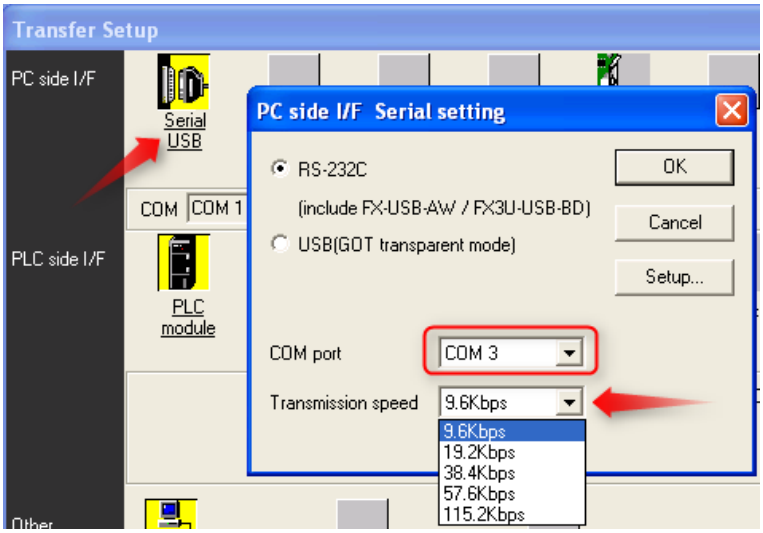
5. Select **Online → Transfer Setup → Ports.**



6. Set **PC side I/F** to “Serial USB” and set **PLC side I/F** to “PLC module”:



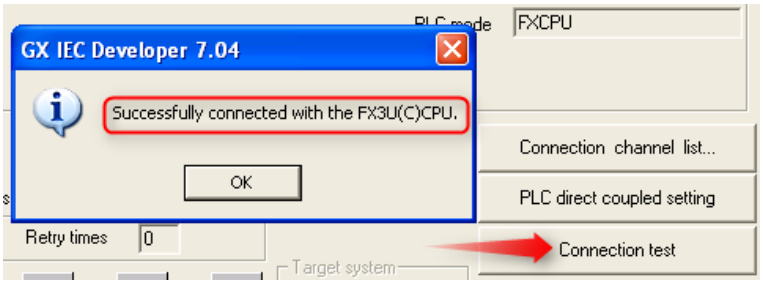
7. Double click “Serial/USB”, and ensure that the COM port is set to the COM port used by the LinkManager. It is recommended to lower the transmission speed (e.g. to 9.6Kbps) to ensure a stable communication.



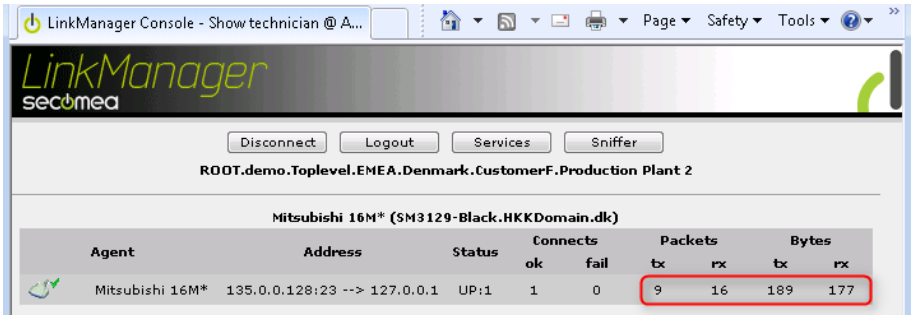
Note: If you run GX Developer inside VMWare, you should set the port to the default COM port of the client OS, which is typically **COM1** (Not the COM port that the VMWare Virtual Machine Settings defines as the physical port, and which is also the one used in the LinkManager)

Hint: It should not be necessary to alter the serial communication settings under **Setup**, as the LinkManager/SiteManager will auto-detect these settings (based on support of RFC 2217). You can verify the current settings by right clicking the LinkManager icon and select Status (only visible when LinkManager is connected to the Serial PLC):

8. You should now be able to perform a transmission test. **If successful you are Online.**



Hint: You will also notice that the LinkManager counters will show the traffic. This will give an indication of the amount of data transferred:



Note: You may be able to increase the transmission speed in the PC side I/F Serial settings and still get a successful connection test. In order to verify a proper speed, you should verify by uploading or downloading a project.

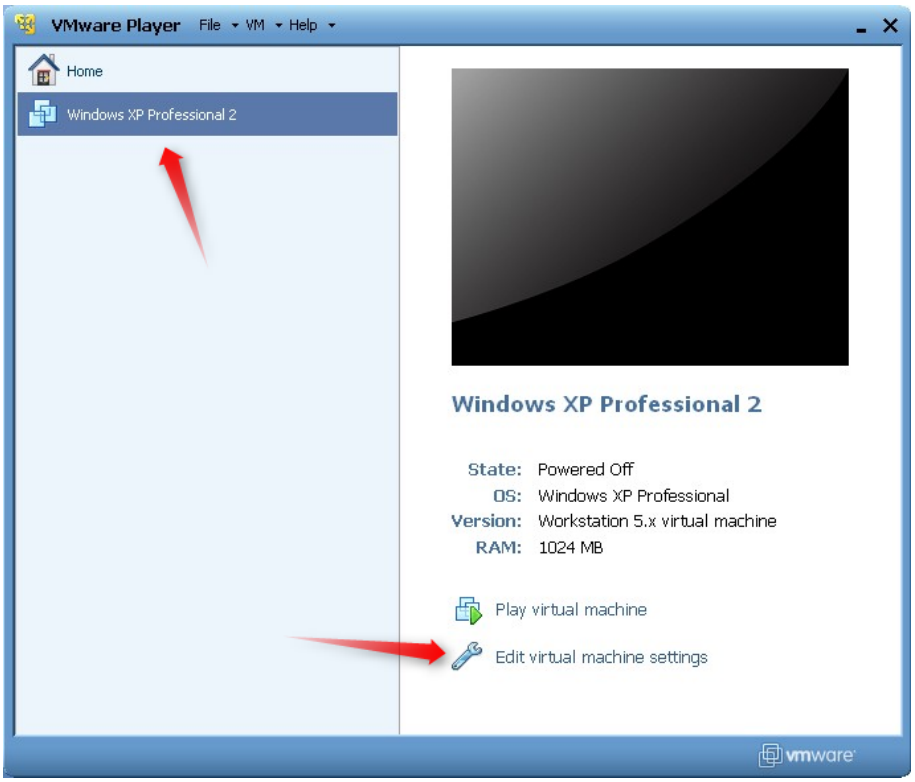
3. Ethernet connection via WindowsXP under VMWare

You can run the GX IEC Developer software inside a VMWare engine, to a Mitsubishi compact PLC that is Ethernet attached to a SiteManager.

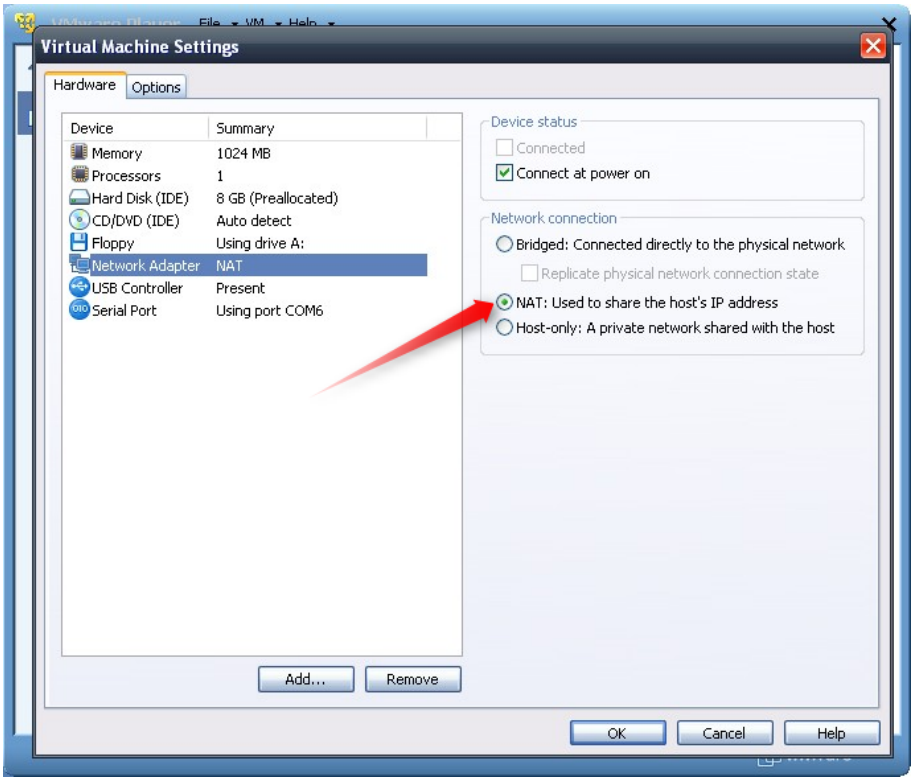
Note: LinkManager must be installed on the hosting machine, and NOT inside the VMWare Windows XP image. LinkManager cannot run inside a VMWare virtual machine.

The following illustrates VMWare Player, which can be downloaded from http://www.vmware.com/support/product-support/player/

9. Locate your WindowsXP that has GX IEC Developer installed, and enter **Edit virtual machine settings.**



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



11. Start the VMWare engine and on the host PC start LinkManager.

12. Follow the procedure of section **1. TCP Ethernet Access** to get access to the PLC via LinkManager

4. Serial connection via WindowsXP under VMWare

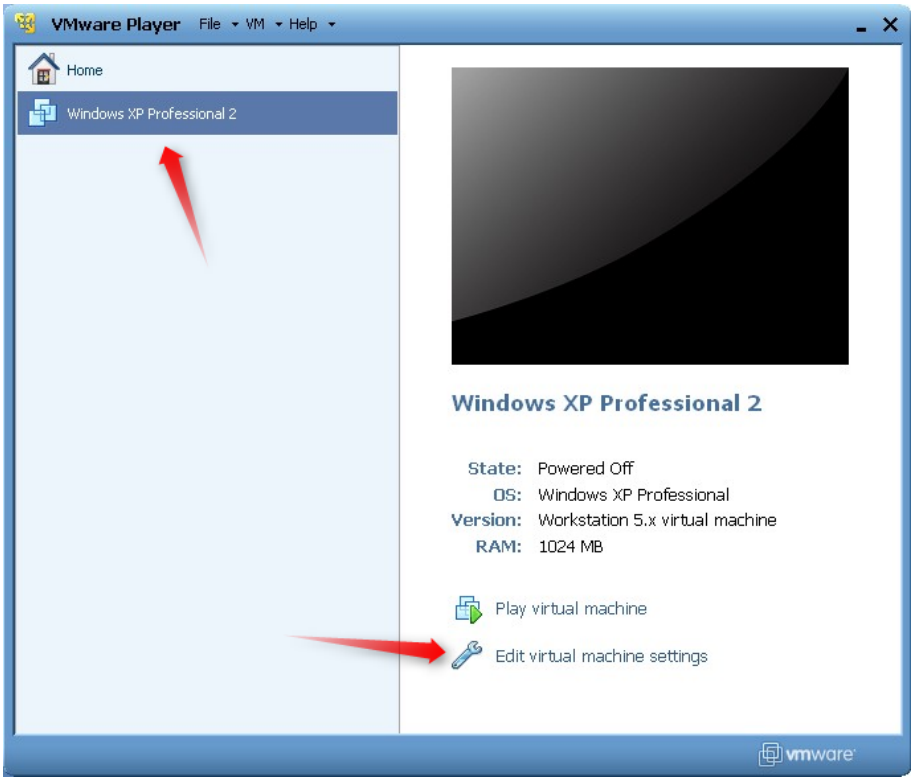
You can run the GX IEC Developer software inside a VMWare engine, to a Mitsubishi compact PLC that is Serial attached to a SiteManager.

Note: LinkManager must be installed on the hosting machine - and NOT inside the VMWare Windows XP image. LinkManager cannot run inside a VMWare virtual machine.

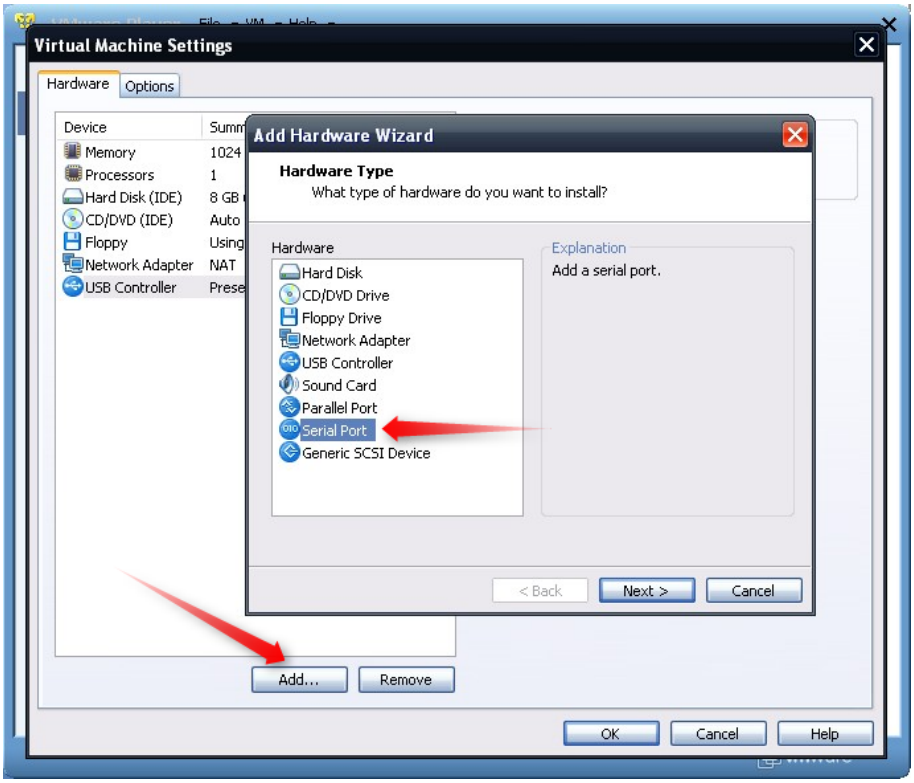
The following illustrates VMWare Player, which can be downloaded free of charge from http://www.vmware.com/support/product-support/player/

1. Follow step 1-3 of section **2. Serial Connection** on page 8. This will create a COM port even if the PC does not have a physical COM port.

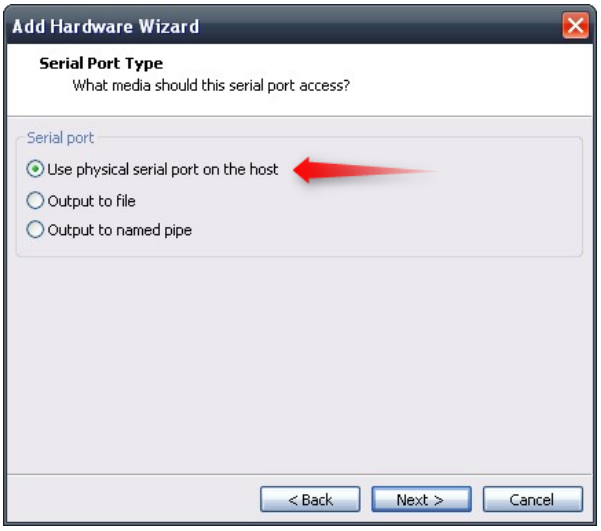
2. Locate your Windows XP that has GX IEX Developer installed, and without starting it, enter **Edit virtual machine settings.**



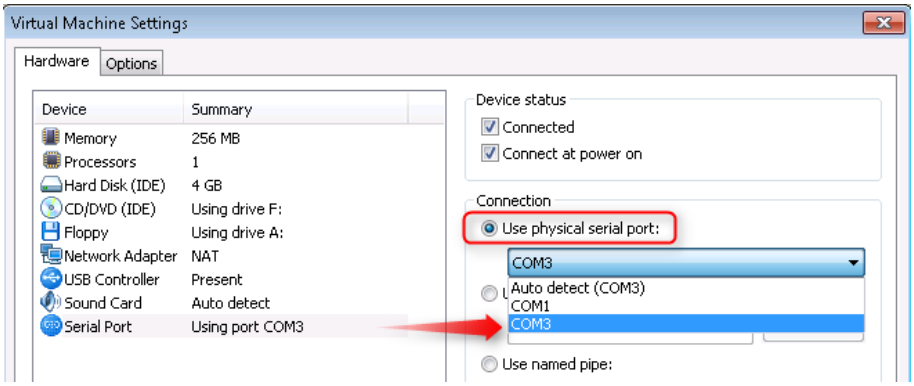
3. Add Serial Port to the Hardware list (if it does not already exist).



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



5. Set the port to the COM port used by the LinkManager (see section **2. Serial Connection** on page 8)



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 GX IEC Developer 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 GX IEC Developer to use the port of VMWare (COM1) and not the physical port of the host system (COM3) that is used by LinkManager.

4.1. Startup order of VMWare, LinkManager and GX Developer

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 GX Developer software.
6. Start the VMWare image.
7. Start GX Developer and connect to the PLC

Appendix A, Organizing COM ports in Windows

Clean up Windows Registry for redundant COM ports:

You may want to use 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 → run → 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

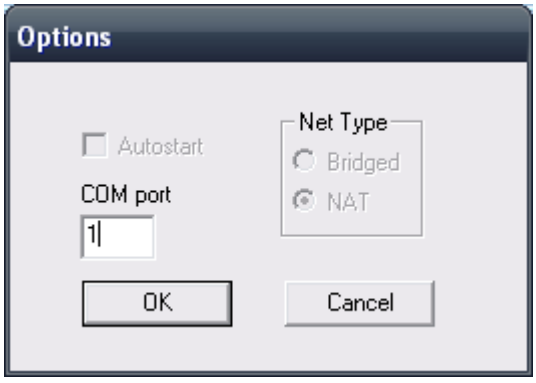
Enable LinkManager to use COM1:

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:

1. 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 → Port Settings → 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.



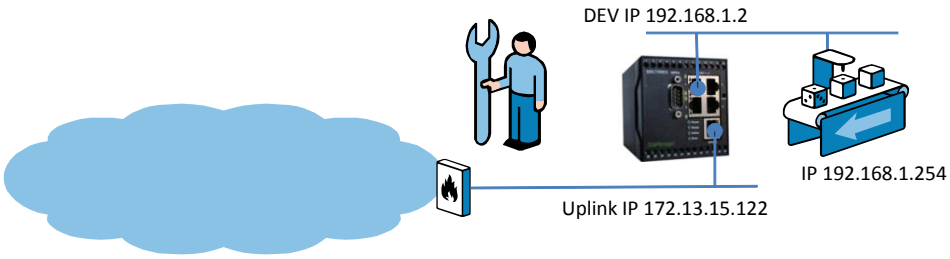
7. Stop and Start the LinkManager and start the Serial agent.

Appendix B, Tips on verifying and setting the PLC IP address

Using the default IP of the PLC

If you have not configured the IP address on the PLC yet, you can choose to just use the factory default address 192.168.1.254/255.255.255.0, and configure the DEV port on the SiteManager to use the same subnet.

The subnet mask reflect a class C subnet, and require that the DEV ports first 3 numbers (192.168.1) must be the same as that of the PLC, while the last number must be different (.e.g 192.168.1.2), and must not be the same as any other TCP/IP device in the network.



Note: If you are using a SiteManager model 3134 you have 4 DEV ports which can be configured with individual subnets. So you can choose to just connect the PLC directly to e.g. DEV2 which you have assigned an IP address in the same subnet as the PLC's default IP address.

Verifying the PLC IP address.

If you do not know the IP address of the PLC and you do not have the project where it is defined in, you can use the CPU programming port and look inside the Ethernet module buffer memory with CX IEC Developer. BFM 0 + BFM 1 hold a 32 bit word in hex, which is the current IP address of the module.

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